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KELP FOREST ECOLOGICAL MONITORING
1982-1989

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Abstract

This report presents the results of the first eight years of the Kelp Forest Ecological Monitoring program at Channel Islands National Park. This program was designed to monitor the population dynamics of indicator species within the kelp forest habitat of the southern California Channel Islands, a kind of health check-up for the for the ecosystem. Permanent sites were established at 16 locations around the five park islands providing a range of exposures and representing different biogeographic zones. From a list of nearly 1,000 species, 68 taxa were selected as indicators. Various sampling schemes were adapted to fit species size, mobility, and distribution based on samples taken during the design phase.

During the first eight years of the project, 132 divers participated, conducting thousands of dives. Some of the divers were staff marine biologists; many were volunteers from other programs in the National Park Service, other government agencies, universities, and the diving industry.

In 1983, the Channel Islands, and indeed much of the world was affected by climatic conditions associated with the largest El Niño event ever recorded. Storm waves and warm water combined to change the face of the kelp communities, some of the effects are still evident more than a decade later. Summaries from the various sampling techniques are presented in the appendices. Highlights from this period are discussed in the text.

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Executive Summary

At 16 sites around the five park islands, population dynamics of 68 taxa were monitored to provide insight into the health of the kelp forest ecosystem. Following specific protocol (Davis, 1988), nine sampling techniques were used to assess populations along a 100 m fixed transect. Quadrats, band transects, random-point-contacts, and visual transects were used to collect information on abundance and cover of algae, invertebrates and fish. Photogrammetric plots and video were used to document the sites, while size frequency measurements provided information on population structure. A general species list provided presence/ absence data and hydrothermographs provided temperature and tidal stage information at six sites. Most of the work was performed during five-day cruises between June and October each year.

During 1982-1986, monitoring was done as part of the design study. During this phase, some techniques were modified and species selections were adjusted. Most of the sites were established in 1981, but three sites were added later; Rodes Reef in 1983 and Cat Canyon and Yellow Banks in 1986. Sites at Sutil Island, Scorpion Rock, Gull Island North, and Nifty Rock were established in 1981 but abandoned during the design phase, mostly because of similarity to nearby sites. The monitoring protocol was published (Davis, 1988) and implemented by the National Park service in 1987.

Following El Niño events of large storm waves during the winter of 1982-1983 and exceptionally warm temperatures during the summer of 1983, giant kelp, *Macrocystis pyrifera,* declined at most sites. Sea urchins underwent a population explosion during 1984-1985. As a result most sites had very little kelp remaining in 1986. Surges of recruitment of juvenile kelp occurred in 1983, 1986, and 1988. Only the later event was successful at reestablishing mature kelp forests.

Purple sea urchin, *Strongylocentrotus purpuratus,* populations peaked at densities as high as 154 m^{-2} at Arch Point on Santa Barbara Island. Where these high densities occurred, even the coralline algae was scraped from the rock. Wasting disease was observed in sea star populations during the warm water events and populations plummeted to lows in 1984 and 1985. As predators on sea urchins, the reduction in sea star numbers may have precipitated the sea urchin population explosion. Effects of the sea star wasting disease were less severe at the deeper and northwestern sites. Large storm swells in early 1988 may have reduced sea urchin numbers as we never observed any apparent disease at that time.

White sea urchins, *Lytechinus anamesus*, were negligible at all sites before 1985. The rapid growth of their populations required some adjustments to monitoring techniques. All sea urchin populations declined noticeably when sea star populations began to increase.

Sea urchin barrens are part of the natural cycle forming mosaics in the kelp forest community. Some species thrive in the absence of others. Cup coral populations did seem to benefit from the bare space created in the sea urchin barrens, increasing at many of the barrens sites. Wavy turban snails, *Astraea undosa,* initially thrived in many of the sea urchin barren sites but eventually declined where kelp did not return. Small sea cucumbers (mostly *Pachythyone rubra*) became spatial dominants at several sites around Santa Rosa and Santa Cruz Islands in the urchin barrens.

Other species seemed to be episodic in their recruitment. Black-eye goby densities blossomed in 1988 especially at Pelican Bay where densities reached 17 m^{-2}. Stalked tunicates, *Styela montereyensis,* had a massive recruitment at Rodes Reef in 1984 and were virtually gone two years later. The brown alga, *Desmarestia ligulata,* uncommon most years, dominated Wyckoff ledge in 1983 and 1988, and Rodes reef in 1988. Smaller blooms occurred at both these sites in 1986.

Red abalone *Haliotis rufescens*, at Wyckoff Ledge and pink abalone, *H. corrugata*, at Anacapa Landing Cove remained fairly stable during this period. The later site is in a State Ecological Reserve and harvest of marine life is prohibited. Populations at other sites generally declined, and red abalone numbers crashed at Johnson's Lee North, formerly one of the largest populations.

The Anacapa Landing Cove site also showed stability with other aspects of the community. Giant kelp, *Macrocystis pyrifera,* and sea urchin, *Strongylocentrotus* spp., populations remained at stable and low levels throughout this period. Sea star populations in the cove are very low, however lobster, *Panulirus interuptus*, and sheephead *Semicossyphus pulcher*, (both predators on sea urchins) have healthy populations.

Fish abundance most easily exemplifies the mix of the biogeographic provinces at the islands. Cold water species such rockfish and striped surfperch were seldom found at the southern islands while garibaldi and opaleye were not observed at the northern sites.

During the years reported here, 132 divers from different agencies and affiliations participated in the kelp forest monitoring program, making over 6,000 dives. This collaborative approach has been beneficial to the program, developing a cadre of professional scientist/divers who are familiar with the program's objectives and approach.

Introduction

The waters of Channel Islands National Park and Channel Islands National Marine Sanctuary harbor one-third of southern California's kelp forests (Davies, 1968). Over 1,000 species of macro flora and fauna can be found here (Woodhouse 1981, J. M. Engle pers. comm.). The giant kelp, *Macrocystis pyrifera* is the primary constituent of southern California kelp forests. Many other species, while not specifically part of the kelp forest community, are still dependent upon the existence and productivity of the kelp forest. The kelp forest serves as food, shelter, substrate and nursery to migratory as well as resident species. Kelp forest detrital flux provides an important source of nutrients to nearby rocky shore, sandy beach and estuary communities. The existence of kelp forests is essential to our commercial and sport fisheries as well as to recreation and the associated tourist industry.

Channel Islands National Park consists of five of the eight California Channel Islands (San Miguel, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara) and the submerged lands and waters within one nautical mile of each of the islands. The Channel Islands National Marine Sanctuary overlaps the subtidal portions of the park, and its boundary extends six miles seaward from the park islands. Channel Islands National Park also bears the designation of International Biosphere Reserve, State Ecological Reserves and state designated Areas of Special Biological Significance. The State of California maintains jurisdiction over the marine resources and manages them through the Department of Fish and Game.

The Federal Law which established Channel Islands National Park (16-USC-410) directed development of inventories and monitoring of the natural resources in the park. Kelp forest monitoring is part of the long-term ecological monitoring at the park designed to measure the health of the ecosystems. By determining the limits of normal variation and diagnosing abnormal conditions we hope to prescribe remedial action through management recommendations.

Monitoring sites were established in 1981. Species and techniques were refined during the design phase. Following a five year design study begun in 1982, the kelp forest monitoring was implemented in 1987 by the park resource management division, using the published protocol (Davis, 1988). Monitoring design rationale is discussed in Davis and Halvorson (1988). Preliminary results and specific design considerations can be found in reports written by Davis

(1984, 1985, 1986). Reports for individual years from 1990 through 1994 have been printed (Richards et al. 1993a, 1993b, Richards and Kushner 1994, Kushner et al. 1995a, 1995b).

This report uses a different format than those reports for the data presentation and describes the monitoring efforts and results for 1982-1989. Data summaries are presented in appendices for each of the monitoring techniques. Data for sites no longer monitored, are included as additional baseline information for the kelp forest environment. Both raw and summarized data are available in digital form, from Channel Islands National Park upon request to the park superintendent. Specifics of the methodology are reported here. We also discuss some of the more important points we have observed over the years. The purpose of this report is document the activities and findings of this program for the years 1982-1989.

Methods

Population dynamics of 68 taxa (Table 1) were measured at 16 fixed sites around the five park islands (Table 2, Fig. 1). Site and species selection criteria are provided in the Kelp Forest Monitoring Handbook (Davis, 1988). Sites were monitored between June and October from 1982 through 1989. Some data are presented for an additional five sites that were abandoned after a number of years during the design phase of the program.

Each site is marked by a 100 m-long transect permanently affixed to the seabed. The nine sampling techniques employed to gather population dynamics information are summarized in Table 3. At each station, randomly placed 1 m x 2 m quadrats and 3 m x 20 m band transects were used to determine densities and distribution of discrete benthic organisms, 1000 randomly selected points were used to determine percent cover of encrusting invertebrates, algae, and substrate composition, 2 m x 3 m x 100 m fixed transects were used to determine fish abundance and recorded on video tape to document site appearance, abundance and distributions of benthic organisms was documented in 20 m^2 photogrammetric plots, and size frequency measurements were collected to determine population structure. A general species list was made for each station, noting presence/absence and relative abundance for all recognizable species. Hydrothermographs measured benthic sea temperature and depth (tidal stage) hourly at six locations.

Specific sampling methods are provided in the monitoring handbook (Davis, 1988). Variations in protocol are discussed under each of the technique headings in the results. Species nomenclature used here has been kept consistent with Morris et al. (1980) and Abbott and Hollenberg (1976) to avoid confusion.

Some general changes in sampling methods should be noted. Starting in 1985, quadrat data were collected as number per 2 m^2 and entered as such. Because of extremely high densities, white urchins, *Lytechinus anemesus*, were sampled at some sites (SCIPB, SCIYB, ANIAR, and SBISESL) using quadrats rather than band transects, which are the usual technique. Sampling of three small benthic fish species (black eye goby, *Coryphopterous nicholsii*, blue-banded goby, *Lythrypnus dalli*, and island kelp fish, *Alloclinus holderi*) was included in the quadrat sampling after 1985. Random point contact (RPC) data collection has undergone the most changes, and variations in sample sizes and taxa groupings will be discussed below. An important change in the random point contact methods was the shift, in 1984, from SCUBA to surface-supplied-air with diver-to-surface communication, increasing sampling efficiency and accuracy. A variety of fish sampling techniques were employed during the design phase (Davis and Anderson 1989) including visual and video transects, visual and video circular plots, and baited-fish counts. Only the results of visual transects are reported here. Some changes were made in regards to species/taxa monitored during the design phase, particularly those used in the Random Point Contact method, and are discussed below in appropriate sections. Table 1 lists the years each taxa was monitored. Taxa broader than species were chosen based on what we felt gave the most consistent results with least loss of ecological data.

Table 1. Regularly monitored species by taxonomic grouping, common name, scientific name, and associated monitoring technique.

TAXA	COMMON NAME	SAMPLING TECHNIQUE	YEARS MONITORED	DATA APPENDICES
ALGAE				
Green Algae		R	85-89	Appx. 3
Red Algae		R	85-89	Appx. 3
Articulate Coralline Algae		R	82-89	Appx. 3
Crustose Coralline Algae		R	82-89	Appx. 3
Gelidium spp.	Agar weed	R	82-89	Appx. 3
Gigartina spp.		R	82-89	Appx. 3
Miscellaneous Brown Algae		R	82-89	Appx. 3
Desmarestia spp.	Acid weed	R	83-89	Appx. 3
Laminaria farlowii	Oar weed	R,Q	82-89	Appx. 1,3
Cystoseira spp.	Bladder chain kelp	R	82-89	Appx. 3
Sargassum spp.		R	82-84	Appx. 3
Macrocystis,*Pterygophora*, *Eisenia* (combined)		R	85-89	Appx. 3
Macrocystis pyrifera adult		Q,S	83-89	Appx. 1,6
Macrocystis pyrifera juvenile		Q	83-89	Appx. 1
Macrocystis pyrifera all	Giant kelp	Q	82-89	Appx. 1
Eisenia arborea	Southern palm kelp	Q	82-89	Appx. 1
Pterygophora californica	Northern palm kelp	Q	82-89	Appx. 1
Miscellaneous plants		R	85-89	Appx. 3
INVERTEBRATES				
Sponges		R	85-89	Appx. 3
Leucetta losangelensis	Sponge	R	82-84	Appx. 3
Tethya aurantia	Orange puffball sponge	B,S	83-89	Appx. 1,5
Diaperoecia californica	So. staghorn bryozoan	R	82-89	Appx. 3
Other bryozoans		R	85-89	Appx. 3
Allopora californica	California hydrocoral	B,S	83-89	Appx. 1,5
Tealia lofotensis	Rose anemone	B,S	83-89	Appx. 1,5
Lophogorgia chilensis	Red gorgonian	B,S	83-89	Appx. 1,5
Muricea fructicosa	Brown gorgonian	B,S	83-89	Appx. 1,5
Muricea californica	Ca. Golden gorgonian	B,S	86-89	Appx. 1,5
Corynactis californica	strawberry anemone	R	82-89	Appx. 3
Balanophyllia elegans	Orange cup coral	R	82-89	Appx. 3
Astrangia lajollaensis	La Jolla cup coral	R	82-89	Appx. 3
Hydroids		R	85	Appx. 3
Diopatra ornata	Ornate tube worm	R	82-89	Appx. 3
Phragmatopoma californica	Sand-castle worm	R	82-89	Appx. 3
Spirobranchus spinosus		R	85	Appx. 3
Cypraea spadicea	Chestnut cowrie	Q,S	82-89	Appx. 1,5
Astraea undosa	Wavy turban snail	Q,S	82-89	Appx. 1,5
Patiria miniata	Bat star	Q,S	82-89	Appx. 1,5
Pisaster giganteus	Giant-spined star	Q,S	82-89	Appx. 1,5
Pycnopodia helianthodes	Sunflower star	B,S	83-89	Appx. 1,5
Lytechinus anamesus	White sea urchin	B,(Q),S	83-89	Appx.1,2,5

Table 1. Regularly monitored species by taxonomic grouping, common name, scientific name, and associated monitoring technique.(continued)

TAXA	COMMON NAME	SAMPLING TECHNIQUE	YEARS MONITORED	DATA APPENDICES
Strongylocentrotus franciscanus	Red sea urchin	Q,S	82-89	Appx. 1,
Strongylocentrotus purpuratus	Purple sea urchin	Q,S	82-89	Appx. 1,5
Parastichopus parvimensis	Warty sea cucumber	Q,S	82-89	Appx. 1,5
Pachythyone rubra	Red sea cucumber	R	82-84,88-89	Appx. 3
Haliotis rufescens	Red abalone	B,S	83-89	Appx. 1,5
Haliotis corrugata	Pink abalone	B,S	83-89	Appx. 1,5
Haliotis fulgens	Green abalone	B,S	83-89	Appx. 1,5
Kelletia kelletii	Kellet's whelk	B,S	83-89	Appx. 1,5
Megathura crenulata	Giant keyhole limpet	B,S	83-89	Appx. 1,5
Aplysia californica	Calif. Sea hare	B,S	83-89	Appx. 1
Serpulorbis squamigerus	Scaled tube snail	R	82-89	Appx. 3
Hinnites giganteus	Rock scallop	B,S	83-89	Appx. 1,5
Balanus spp.	Barnacle	R	85-86	Appx. 3
Panulirus interruptus	Calif. Spiny lobster	B,S	83-89	Appx. 1
Tunicates		R	85-89	Appx. 3
Styela montereyensis	Stalked tunicate	Q	82-89	Appx. 1
Miscellaneous Invertebrates		R	82-89	Appx. 3
SUBSTRATE				
Bare Substrate		R	85-89	Appx. 3
Substrates: Rock		R	82-89	Appx. 3
Cobble		R	82-89	Appx. 3
Sand		R	82-89	Appx. 3
FISH				
Lythrypnus dalli	Blue-banded goby	Q	85-89	Appx. 1
Coryphopterus nicholsii	Black eye goby	Q	85-89	Appx. 1
Alloclinus holderi	Island kelp fish	Q	85-89	Appx. 1
Chromis punctipinnis	Blacksmith	V	85-89	Appx. 4
Oxyjulis californica	Señorita	V	85-89	Appx. 4
Sebastes mystinus	Blue rockfish	V	85-89	Appx. 4
Sebastes serranoides	Olive rockfish	V	85-89	Appx. 4
Sebastes atrovirens	Kelp rockfish	V	85-89	Appx. 4
Paralabrax clathratus	Kelp bass	V	85-89	Appx. 4
Semicossiphus pulcher	Sheephead	V	85-89	Appx. 4
Embiotoca jacksoni	Black surfperch	V	85-89	Appx. 4
Embiotoca lateralis	Striped surfperch	V	85-89	Appx. 4
Damalichthys vacca	Pile srufperch	V	85-89	Appx. 4
Hypsypops rubicundus	Garibaldi	V	85-89	Appx. 4
Girella nigricans	Opaleye	V	85-89	Appx. 4

B= Band Transect
Q= Quadrat Count
R= Random Point Contact
S= Size Frequency Measurement
V= Visual Transect

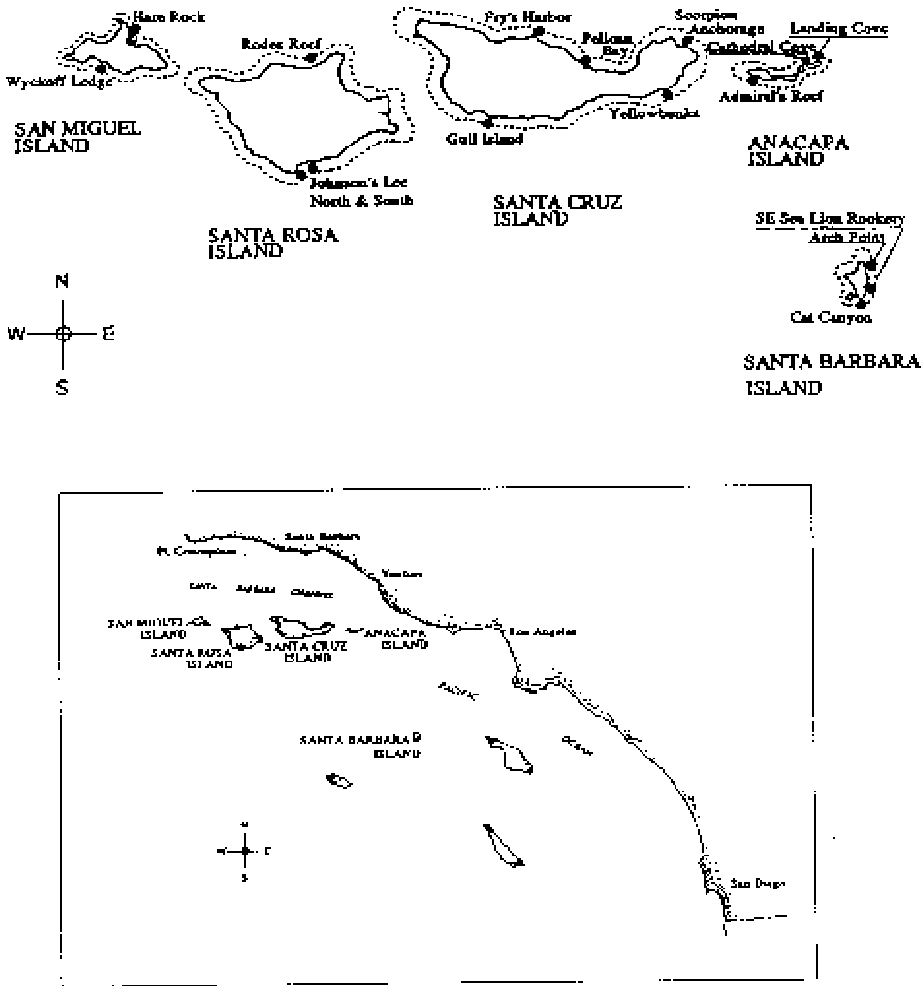


Figure 1. Kelp Forest Monitoring Locations (•) on Channel Islands National Park. Insert shows location of the five park islands in the southern California Bight

Table 2. Station information.

STATION NUMBER	ISLAND	LOCATION	ABBREVIATION	DEPTH (FEET)	YEAR EST.
1	San Miguel	Wyckoff Ledge	SMIWL	43-49	1981
2	San Miguel	Hare Rock	SMIHR	20-30	1981
3	Santa Rosa	Johnson's Lee North	SRIJLNO	31-36	1981
4	Santa Rosa	Johnson's Lee South	SRIJLSO	46-52	1981
5	Santa Rosa	Rodes Reef	SRIRR	43-49	1983
6	Santa Cruz	Gull Island South	SCIGISO	45-54	1981
7	Santa Cruz	Fry's Harbor	SCIFH	39-42	1981
8	Santa Cruz	Pelican Bay	SCIPB	21-27	1981
9	Santa Cruz	Scorpion Anchorage	SCISA	15-20	1981
10	Santa Cruz	Yellowbanks	SCIYB	48-51	1986
11	Anacapa	Admiral's Reef	ANIAR	42-49	1981
12	Anacapa	Cathederal Cove	ANICC	20-35	1981
13	Anacapa	Landing Cove	ANILC	15-40	1981
14	Santa Barbara	SE Sea Lion Rookery	SBISESL	40-46	1981
15	Santa Barbara	Arch Point	SBIAP	22-27	1981
16	Santa Barbara	Cat Canyon	SBICC	22-30	1986

Table 3. Summary of sampling techniques used to monitor population dynamics of selected kelp forest organisms.

TECHNIQUE	SAMPLE SIZE	NUMBER OF REPLECATES
Quadrat count	1 m X 1 m	40X / site
Band Transect count	3 m X 10 m	24X / site
Random Point Contact	40 points, (0.5 x 3 m)	25X / site
Visual Fish transects	2 m(w) X 3 m(h) X 100 m(l), (5 minutes)	8X / sites
Video transects	5 minutes / 100 m	2X / site
Size frequency measurements	30 to 200 / species measurement dimensions below)	1X / site (see size frequency
Species Checklist	30 - 90 minutes	1X / site
Artificial Recruitment Modules	7 - 15 modules / site	

Results and Discussion

Sampling was conducted by divers using SCUBA or surface-supplied air. In 1987, 33 scientist-divers made 605 dives. In 1988, 33 scientist-divers made 632 dives, and in 1989, 38 scientist-divers made 779 dives during seven, week-long cruises aboard the NPS vessel Pacific Ranger. The 1989 dives included 55 diver hours devoted to the Abalone Habitat Project co-sponsored by the California Department of Fish and Game. The scientist-divers included four resource management marine biologists, the boat crew and other NPS personnel from Channel Islands, personnel from other national parks, collaborating scientists from federal and state agencies, teachers from high schools, colleges and universities, college students, and representatives from diving related industries. The professional involvement and on-site critiques of approach, experimental design, and sampling techniques by the many participants are important facets of the project's long-term design. This collaborative approach developed a cadre of professional scientist/divers who are familiar with the program's objectives and approach. During the years reported here, 132 divers participated in the program making over 6,000 dives. Table 4 lists the diving participants from 1982-1989.

Site information and establishment dates are provided in Table 2. Results are presented in summary form for all years in appendices 1-7. Table 1 provides a reference to the data appendices for each species monitored. During 1982-1986, monitoring was done as part of the design study, and as a result, various techniques and sample sizes were used.

Data high points that demonstrate the kelp forest community dynamics in time and space are outlined below. For the sake of brevity, abbreviations are used for site names. Please refer to Table 2 for complete names and locations.

QUADRAT DATA:

Quadrat data summaries are presented in appendix 1. *Macrocystis pyrifera* declined at most stations in 1984 and 1985, resulting in many sites being devoid of kelp by 1986. Surges of recruitment in juvenile kelp occurred in 1983 (SCISA, ANIAR, ANICC, SRIJLNO), 1985 (SCISA), 1986 (SMIWL, ANILC), and 1988 (SRIRR, SRIJLNO, SRIJLSO). Except 1988, these massive recruitment's failed to reestablish kelp forests. *Pterygophora californica* also recruited successfully at SRIJLNO and SRIJLSO in 1988.

The purple sea urchin, *Strongylocentrotus purpuratus*, underwent a population explosion at most locations beginning in 1984-1985. The most extreme examples of this were at Santa Barbara Island, where density peaked at 154 m^{-2} in 1986 at SBIAP, and 99 m^{-2} in 1988 at SBISESL (Fig. 2).

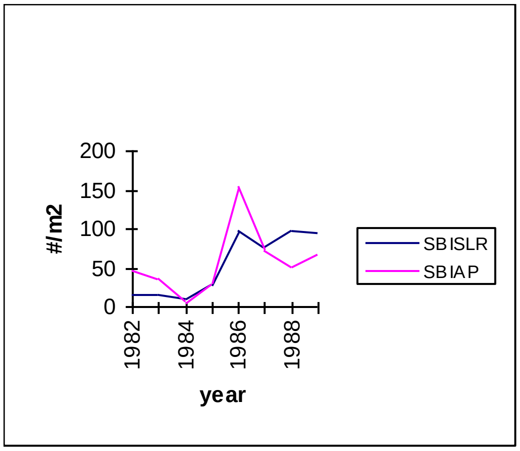


Figure 2. Purple sea urchin (*Strongylocentrotus purpuratus*) densities at Arch Point and Southeast Sealion Rookery, Santa Barbara Island.

Population declines in *S. purpuratus* at these "urchin barrens", where even much of the encrusting coralline algae (see Random Point Contact results) had been scraped from the substrate, was most likely due to starvation or disease (although the lesions symptomatic of urchin disease were not evident). Many dead sea urchin tests were noted at the Santa Barbara Island sites in 1988 and 1989 with no apparent signs of predation.

Sea star populations plummeted to lows in 1984 and 1985 as a result of a wasting disease brought into California or exacerbated by the warm waters of El Niño (Schroeder and Dixon 1986, observations this study). The sea star wasting disease had an earlier, more prolonged effect at the southeastern sites than northwestern sites (Figs. 3 and 4) and deep sites were less affected than shallow sites (Figs. 3 and 5). Unlike the sites at San Miguel Island and Santa Rosa Island, the densities of sea urchin-eating sea stars at Santa Barbara Island remained low (*Patiria miniata*, *Pisaster giganteus* and *Astrometis sertulifera* [from species list]) or non-existent (*Orthasterias koehleri* [species list] and *Pycnopodia helianthoides* [band transects]). The increase in *P. miniata* density in 1988 at SBIAP diminished to zero by 1989 (Fig. 3).

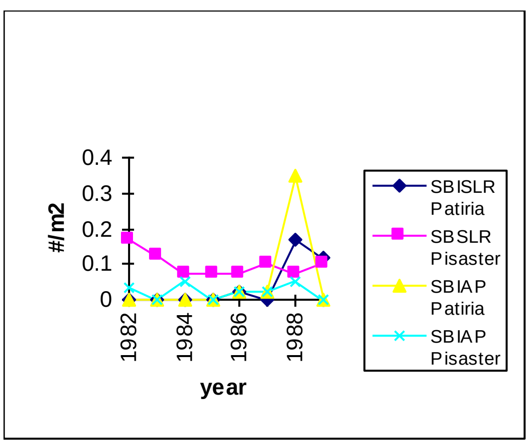


Figure 3. Seastars (low density) at Arch Point and SE Sealion Rookery, Santa Barbara Island.

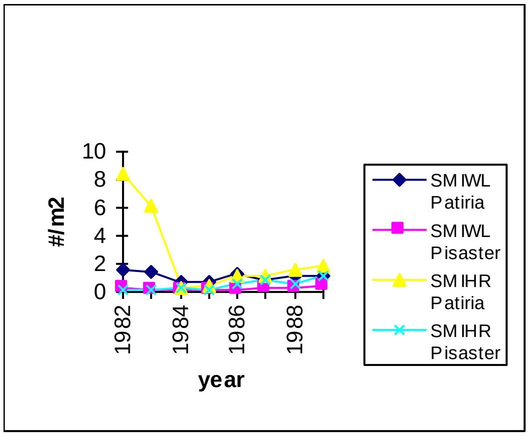


Figure 4. Seastars (high density) at Wyckoff Ledge and Hare Rock, San Miguel Island.

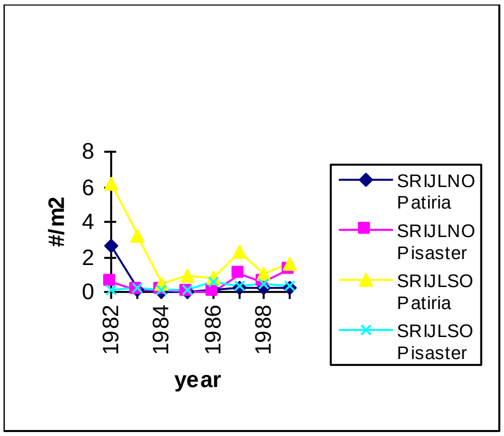


Figure 5. Seastars at Johnson's Lee North (shallow site) and Johnson's Lee South (deep site), Santa Rosa Island.

The densities of other sea urchin predators (i.e. the spiny lobster, *Panulirus interruptus* and the sheephead wrasse, *Semicossiphus pulcher* [see FISH TRANSECTS] which are also the only predators on the large red urchin, *S. franciscanus*, other than man (Tegner and Dayton, 1981)) remained low at the Santa Barbara Island sites.

S. franciscanus densities peaked in 1985-86 at stations 1-9 and have decreased at eleven stations since then, having reached a maximum of 14.7 m^{-2} at SMIHR in 1985. Urchin densities indicative of *S. franciscanus*-caused barrens in a study at San Nicolas Island (Harrold and Reed, 1985) were only $\leq$ 10 m^{-2}. Their study indicated that the mechanism driving the patch dynamics of that system involved a behavioral switch in the mode of feeding of the sea urchins that was independent of sea urchin density. SMIHR is unique in that, other than SCIGI - 1985, it has had consistently higher densities of *S. franciscanus* than other stations, ranging from 8.1 m^{-2} to 11.85 m^{-2}.

One species that seems to have initially thrived and increased in number in the shallower urchin barren sites (SCIPB, SCISA, ANICC, and SBIAP) was the wavy turban snail, *Astraea undosa* (Fig. 6 and 7). Densities more than doubled at these four sites as *Macrocystis* disappeared. After five years without kelp at SCIPB, SCISA, and SBIAP, the *Astraea* densities declined in 1988 and 1989.

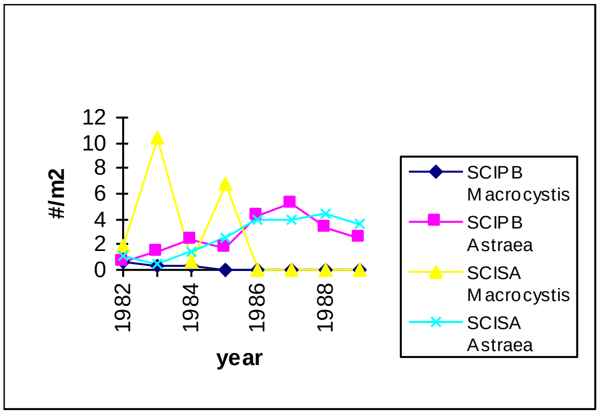


Figure 6. Wavy top snail (*Astraea undosa*) and giant kelp (*Macrocystis pyrifera*) at Pelican Bay and Scorpion Anchorage, Santa Cruz Island.

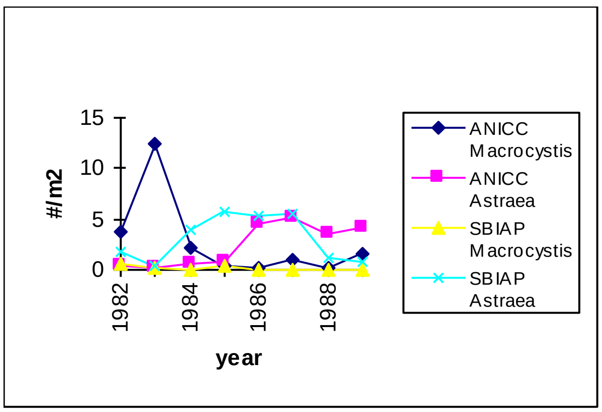


Figure 7. Wavy top snail (*Astraea undosa*) and giant kelp (*Macrocystis pyrifera*) at Cathedral Cove, Anacapa and Arch Point, Santa Barbara Island.

Coryphopterous nicholsii density reached 17 m^{-2} at SCIPB in 1988. Other Santa Cruz and Anacapa stations reached densities of 2-4 m^{-2} in 1988 and 1989. Increases were seen these years at all other stations as well.

Styela montereyensis is a good example of the variability within a species in the kelp forest system. In 1984, a massive recruitment occurred at SRIRR, reaching a density of 10 m^{-2}. Two years later, *S. montereyensis* was virtually gone from the site. *S. montereyensis* has been unremarkable at other sites.

BAND TRANSECT DATA:

Summaries of band transect data are presented in appendix 2. At locations where both band transects and quadrats were used to monitor white urchins, *Lytechinus anamesus*, (SRIRR, SCIGI, SCIPB, and SCIFH in 1986, and SBISESL in 1988 and 1989), results were similar for both techniques at all stations except SRIRR where *L. anamesus* density was 6.33 m^{-2} on quadrats and only 2.70 m^{-2} on band transects and at SBISESL where band transect densities were one-half in 1988 and one-third in 1989, of the densities found on quadrats. Comparison of the two techniques shows greater precision of measure in the band transect data.

Densities of *Lytechinus anamesus* were negligible at all stations until 1985. Highest densities of *L. anamesus* at two stations, (SCIYB and ANIAR) exceeded 38 m^{-2} (Fig. 8). By 1989, the sites where *L. anamesus* had been the most dense (SRIRR, SCIGI, SCIFH, SCIPB, SCIYB, ANIAR, SBISESL, and SBIAP), showed marked declines in *L. anamesus* density.

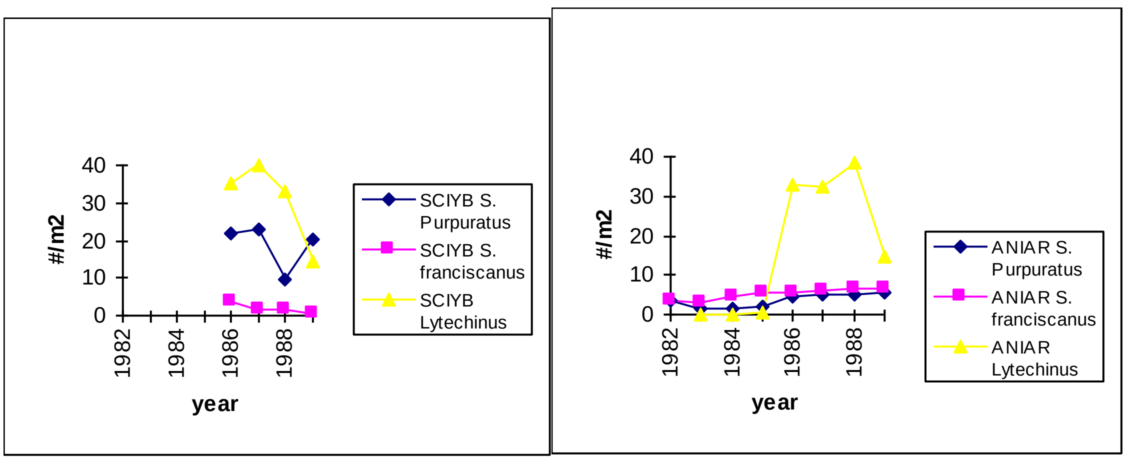


Figure 8a-8b. Red (*Strongylocentrotus franciscanus*), purple (*S. purpuratus*), and white (*Lytechinus anamesus*) urchins at Yellowbanks, Santa Cruz and Admiral's Reef, Anacapa Island.

Pycnopodia helianthoides, the large, swift (up to 1 meter per minute), predatory "sunflower star" had been an early victim of the sea star wasting disease during the late 1970's at Santa Barbara Island (Schroeder and Dixon 1986) and was only present on band transects at SMIHR when monitoring of this species began in 1983. (*P. helianthoides* had been noted on species lists at stations 1-6 prior to 1984). Then, in 1985, *P. helianthoides* began to appear on the band transect surveys at all San Miguel and Santa Rosa Island stations. On all five of the transects at these two islands, the densities of the three urchin species, *Lytechinus anamesus*, *Strongylocentrotus purpuratus*, and *S. franciscanus* began to decline. *Pycnopodia* were observed in the process of consuming *L. anamesus* and *S. purpuratus*, and the clean, empty urchin tests typical of *Pycnopodia* kills (Mauzey et al. 1968) were fresh, plentiful and obvious at each of these five sites. At SRIRR, where *Pycnopodia* densities were highest, the affects upon sea urchin densities (especially *S. purpuratus*) were most abrupt (fig. 9).

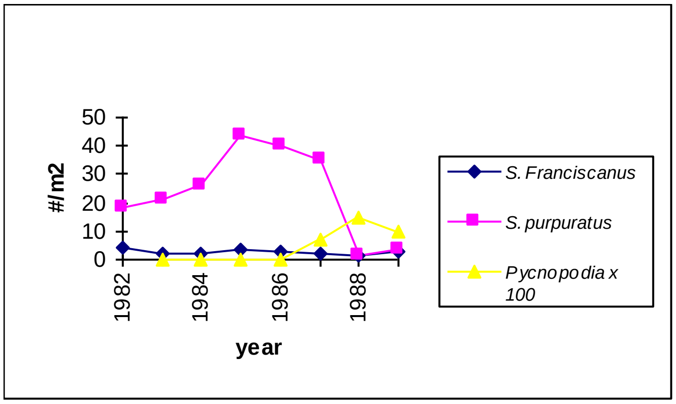


Figure 9 Sun stars (*Pycnopodia helianthoides*) and sea urchins (S. *franciscanus, S. purpuratus*) at Johnson's Lee North, Santa Rosa Island.

Densities of *Haliotis rufescens*, and *H. corrugata* declined dramatically at Santa Rosa and Santa Cruz islands similar to the decline which occurred in the intertidal species, *H. cracherodii* (Haaker et al. 1989). *H. fulgens* is a shallow water species that only rarely occurred in transects. The most extreme decline took place at SRIJLNO (see Fig. 10). *Pycnopodia* was observed consuming a large *H. rufescens* at SMIHR in 1989, and is suspected as the main cause of mortality in hatchery abalone transplanted to artificial habitats located at SRIJLNO.

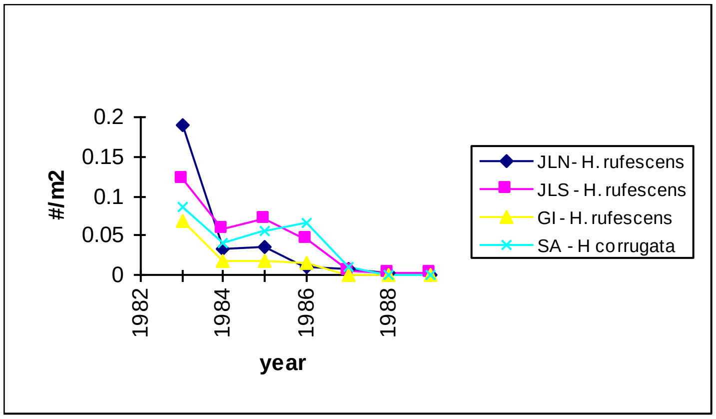


Figure 10. Example of red abalone (*Haliotis rufescens*) declines from Johnson's Lee North and South, Santa Rosa and Gull Island, Santa Cruz Island and pink abalone (*H. corrugata*) from Scorpion Anchorage, Santa Cruz Island.

Haliotis rufescens densities remained relatively stable on band transects, however fewer abalone were found for size frequency measurements. Pink abalone, *H. corrugata*, density was most consistent at ANILC which is located within an ecological reserve, and protected from exploitation by commercial and sport divers. Harvest, however, is unlikely as the sole factor of the decline. A series of events punctuated by El Niño is more likely the cause (Davis et al. 1989).

POINT CONTACT DATA:

Summaries of percent cover of algae, sessile invertebrates and substrate for all stations by species groupings are given in Appendix 3. Graphs of changes in percent cover for selected species and/or phylum groupings at selected stations are shown in Figures 11-16. Several changes have occurred in the species groupings monitored. The "other brown algae" category has been redefined since 1982, the most significant changes being the splitting-out of a separate *Macrocystis-Pterygophora-Eisenia* grouping in 1985, and the inclusion of *Sargassum* spp. into the "other brown algae" category beginning in 1985. Although *Macrocystis* and other phaeophytes were monitored separately in the field prior to 1985, during those years, all brown algae except *Desmarestia* spp., *Laminaria farlowii*, *Cystoseira* spp. were summed for data entry. In general, target species and phylum grouping categories have remained constant since 1985.

"Miscellaneous invertebrates" was the dominant encrusting invertebrate category at most locations because it is a catch-all for any invertebrate species that was not already included in the eleven general and specific encrusting invertebrate categories. Dominant invertebrate species within the miscellaneous invertebrate category differed between locations and years, and could be identified by the abundance ratings assigned to the species list and by notations in the daily activity log.

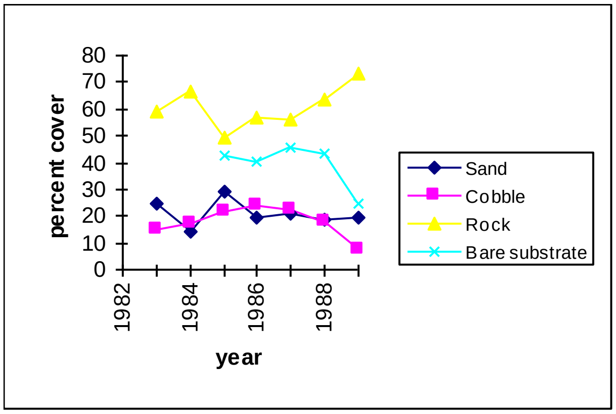
At all three Santa Barbara Island stations, *Spirobranchus spinosus* was a dominant in the miscellaneous invertebrate category. Small sea cucumbers (*Pacythyone rubra* and *Cucumaria* sp.) were important as miscellaneous invertebrates at some stations.

The proportions of rock/cobble/sand substrate remained relatively constant for each site since the monitoring began. The ecological significance of small changes in these proportions is not clear. In years where sand cover increased, the difference was apparently not extreme enough to cause any direct change in the densities of foliose algae or invertebrates.

"Bare substrate" was not regularly recorded prior to 1985. Our use of the term "bare" means that a spot was void of any visible encrusting life. This should be kept in mind when the term "urchin barrens" is used. Lawrence (1975), who coined this term, used it in reference to areas which still had encrusting coralline algae coating the substrate.

The peak value for bare substrate usually coincides with, or follows the year of peak *Strongylocentrotus purpuratus* density. In 1987, at SCIPB, bare substrate value peaked at 45.4% and the *S. purpuratus* density peaked at 16.2 m^{-2} (fig. 11). During the same year at SCISA, 43.6% of the substrate was bare and *S. purpuratus* densities had peaked the year before at 64.7 m^{-2} (fig.

12). As *S. purpuratus* densities declined in 1988 and 1989, bare substrate also declined. At SCIYB and ANIAR (fig. 8), where *Lytechinus anamesus* densities exceeded 30 m^{-2} (1987, 1988), there was no coinciding peak in bare substrate. According to Austin and Hadfield (1983), "they [*L. anamesus*] consume smaller algae so effectively that reestablishment of algal growth on denuded surfaces occurs only when populations are below about 10 urchins per square meter." Yet algal cover, on average at SCIYB and ANIAR, slightly increased from 1987 to 1989 in spite of high *L. anamesus* densities (fig. 8 and 13).



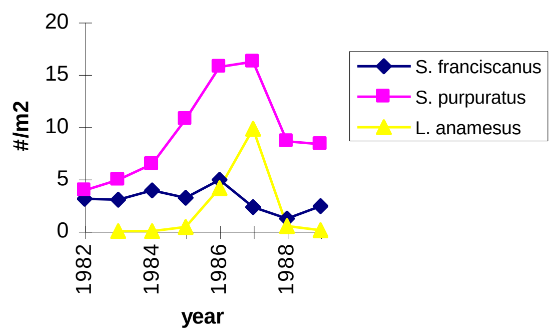


Figure 11a. Substrate composition and percentage of bare substrate and (11b) density of sea urchins at Pelican Bay, Santa Cruz Island.

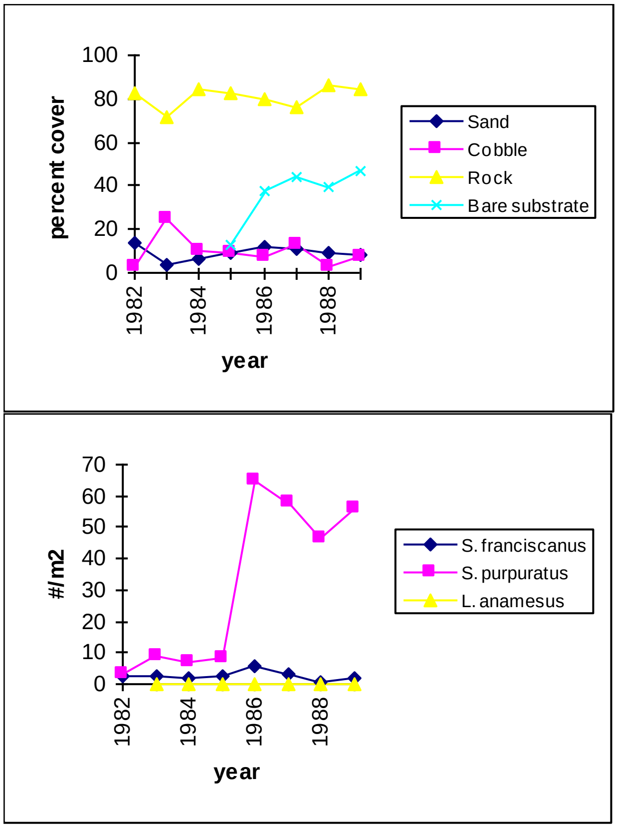
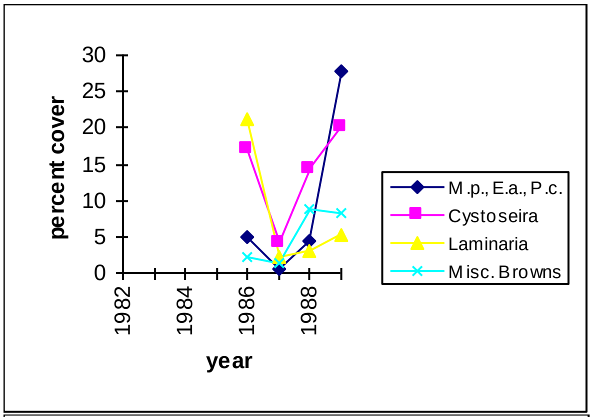


Figure 12a. Substrate composition and percentage of bare substrate and (12b) density of sea urchins at Scorpion Anchorage, Santa Cruz Island



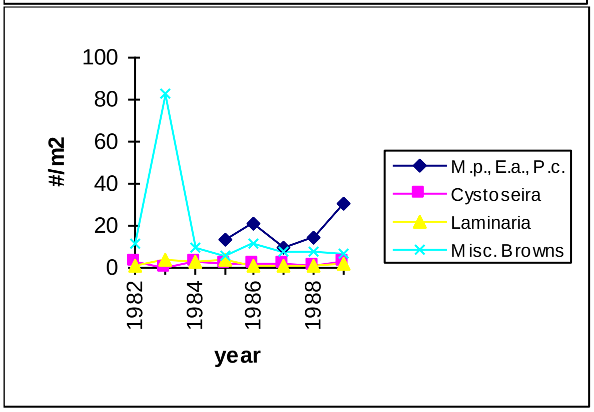


Figure 13a-13b. Dominant brown algae at high White sea urchin (*Lytechinus anamesus*) density sites Yellow banks, Santa Cruz Island and Admiral's Reef, Anacapa Island.

The most dramatic example of algal cover decline following El Niño occurred in 1985 at SCIPB (fig. 14). All species of algae were affected including kelps, brown and red foliose algae, and articulate coralline algae. Foliose algae disappeared after El Niño, leaving the substrate clear and allowing invasion by encrusting corallines. Encrusting corallines are the last of the algal types to be destroyed by high urchin densities and often the first algae to recover the bare substrate (Johansen and Austen, 1970). After 1987, there were notable increases in the percent cover by foliose algae at all San Miguel and Santa Rosa Island stations. As foliose algae increased, there was a corresponding decrease in percent cover by encrusting coralline algae (fig. 15). Red algae cover increased at SMIWL in 1989 as a result of kelp canopy reduction. At the Santa Rosa Island stations, red algae cover increased along with kelp which formed a dense canopy. Articulate coralline algae followed the same pattern.

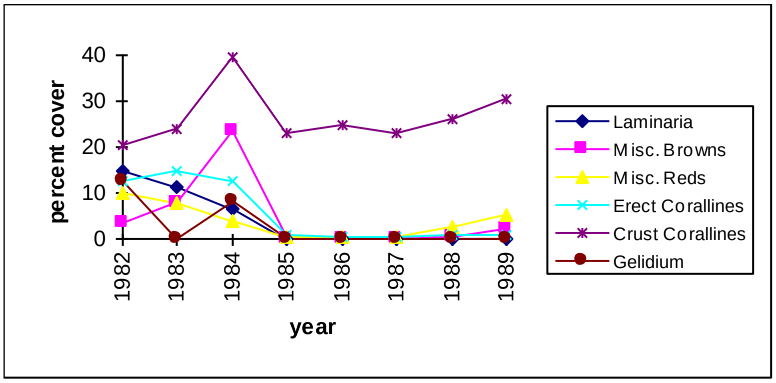
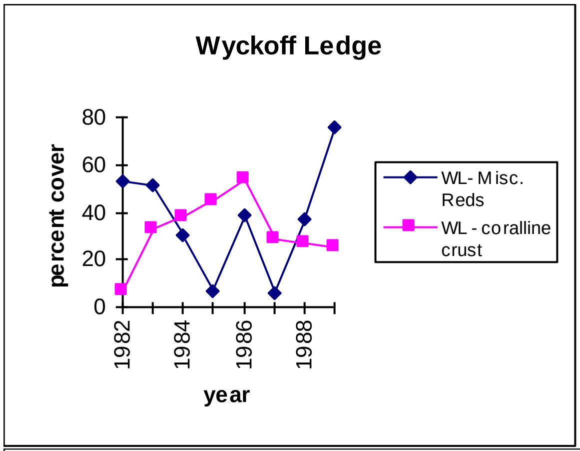


Figure 14. Percent cover of algae at Pelican Bay, Santa Cruz Island.



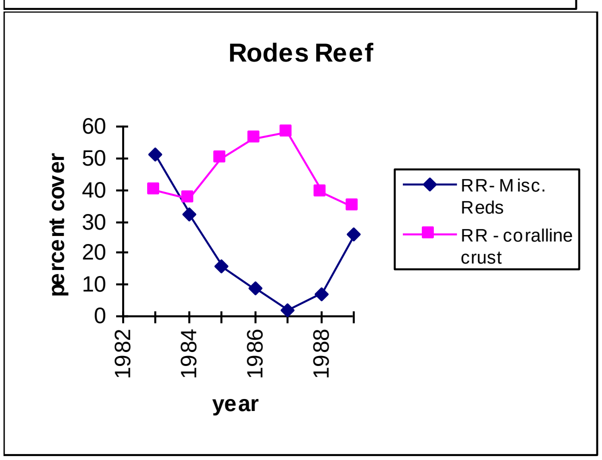


Figure 15 a,b. Inverse relationship of red algae and encrusting coralline algae cover at Wyckoff Ledge, San Miguel Island and Rodes Reef, Santa Rosa Island

In 1988, *Desmarestia sp*. temporarily covered more than 50% of the substrate at SMIWL and SRIRR. A smaller settlement occurred in 1986 at SMIWL and SRIRR. *Desmarestia* was a dominant cover at SMIWL in 1983, but was included in the miscellaneous brown algae category at that time. Other stations with a high percentage of miscellaneous brown algal cover in 1983 were most likely dominated by *Macrocystis* or *Eisenia*.

The reduction of algal cover in 1985 facilitated colonization by the Cnidarians *Astrangia lajollaensis* (SRIRR, SCIFH, and SCIPB), *Corynactis californica* (SRIJLSO, SCIGI, SBIAP, and SMIHR), and *Balanophyllia elegans* (SRIJLSO, SRIRR, SCIGI). *A. lajollaensis* was one of the three most dominant encrusting invertebrates at eight of the sixteen sites. *B. elegans* was one of the three most dominant encrusting invertebrates at six of sixteen stations. Gerrodette (1981) states that urchin barrens offer a superior habitat to *B. elegans*. *C. californica* has been described as an "aggressive colonizer that can invade and overgrow other organisms" (Lissner 1988). The suggestion that *C. californica* larvae may need clean substrate for settlement could explain the increased cover by *C. californica* at SBIAP in 1988 which followed the year of highest "bare" substrate (fig. 16). The more gradual increase in *C. californica* at SCIGI may be explained by *C*. *californica*'s alternate colonization strategy of cloning.

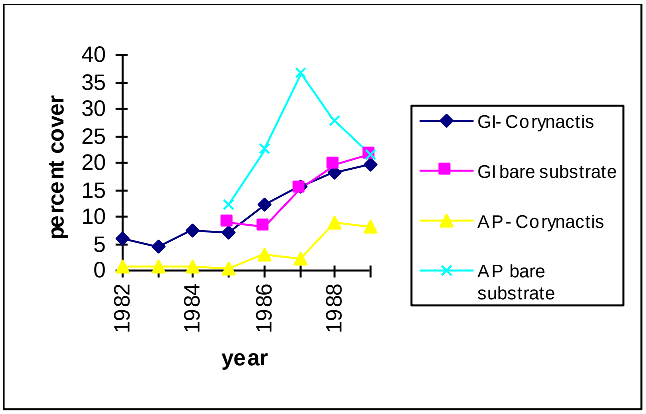


Figure 16 Relationship of bare substrate and strawberry anemone (*Corynactus califonica*) at Gull Island, Santa Cruz and Arch Point Santa Barbara Island.

FISH TRANSECTS:

Visual fish transects have been conducted since 1985. Tables of means presented in three different forms (by date of sample/adults and juveniles separate, by date of sample/adults and juveniles combined, and by year with samples and age classes combined) and can be found in Appendix 4. Inherent limitations to visual fish sampling techniques in variability in fish abundance with changing physical aspects through the day creates variance in population estimates. Our sampling tries to minimize variability by confining the sampling between 0900 and 1500 hrs. and by sampling each site on at least two different dates. Visibility and surge are measured each time and have not been shown to have any direct affect on population estimates. Daily fluctuations in water mass may cause population fluctuations, increasing variability in abundance estimates. Frequent sampling to overcome this is logistically and economically unfeasable.

Chromis punctipinnis, a planktivore, occurred in higher densities than any other target species. It was most plentiful at the Anacapa Island sites and SCIFH. SCIFH had consistently high densities of adults. Adults may aggregate prior to breeding in June (North and Hubbs 1968), but numbers observed in early summer at our sites were not consistently greater than numbers observed in late summer. *C. punctipinnis* juveniles were extremely dense at all three Anacapa Island sites in October of 1987, and at SCIFH in August of 1988. *C. punctipinnis* reached it's highest density at 50% of the sites in 1987. The decreased density at SRIJLNO in 1988-1989 may be connected with the reappearance and expansion of the kelp forest.

The overall mean of combined samples for *Oxyjulis californica* was highest at SCIYB. Increased numbers at SRIJLSO coincided with the reappearance of the kelp forest. Densities at SRIJLNO did not parallel the increased kelp densities. Juveniles were noticeably absent from the Santa Cruz Island transects (see also species list).

Sebastes mystinus is one of three rockfish species monitored on fish transects. Few juveniles and no adults were observed at the sites southeast of Fry's Harbor (stations 8-16). SCIGI had consistently high numbers of juveniles in 1985 through 1988. Highest densities for blue rockfish (juveniles and adults combined) were found at SRIRR and SMIHR in 1985 and 1987, and SCIGI in 1987 and 1988.

Sebastes serranoides was most abundant at SMIWL and SMIHR, both in highest recorded densities and overall mean of combined samples from 1985 through 1989. Large numbers of juveniles were seen in July of 1986 at SMIWL, and in July 1988 at SMIWL and SMIHR. This species was not seen at ANILC or the Santa Barbara Island sites.

Sebastes atrovirens was common at the northwestern stations, but was also found at the southern stations including Santa Barbara Island. *S. atrovirens* showed an increase in density at Johnson's Lee which corresponded to the increase in *Macrocystis* in 1988. Higher numbers were recorded at SMIHR where there was little algal cover. Juveniles were rarely seen. Highest juvenile numbers were seen at SMIWL and SRIRR in September, 1988.

Paralabrax clathratus was most common in the transition zone especially at SCIFH and SCIPB. The highest densities of *P. clathratus* did not correspond to the years and locations of highest kelp density during the sampling period 1985-1989. Adult kelp bass do not require *Macrocystis* as part of their habitat (Feder et. al., 1974). In fact, total numbers were lower during kelp recovery years (1988, 1989) than the urchin barren years (1985-1987) at SRIJLNO and SRIJLSO.

Semicossyphus pulcher recruited to northern sites in 1984 (Davis 1985). It was thought at that time that the numbers would decrease at these northern sites as sea temperatures declined after the El Niño event. The highest numbers from 1985 to 1989 occurred at SCIFH and ANIAR. The highest densities of males occurred at ANILC. Females were much more abundant overall than males (male/female sex ratios ranged from 1:3 at ANILC to 1:184 at SRIJLNO).

Embiotoca jacksoni exhibited the highest densities at SRIJLNO and SRIJLSO. An abrupt decrease in density occurred in 1988, the year that the kelp forest and associated understory algae returned to Johnson's Lee. This corresponds with an abrupt increase in the density of *E. lateralis*. This data tends to support work (Schmitt and Holbrook 1986, Alevizon 1975, Hixon 1979) which showed that *E. lateralis* excludes most *E. jacksoni* in shallow depths (<6 m) where they are in competition for small crustacea that occur on red algae. Lowest densities of *E. jacksoni* occurred at SBISESL, SBICC, and SCIYB. Juveniles were rarely seen, but when they were seen, it was most often during late summer surveys. *Embiotoca lateralis* was most common at San Miguel and Santa Rosa Island. Density was highest at SMIHR even though this site had the lowest percent cover of algae of sites 1-5.

Hypsypops rubicundus was always present at sites 3, 6-9 and 11-16, and never present at 1,2,4,5 and 10. The most striking aspect of this data set is the lack of variability from year to year at some sites (in particular, ANILC) which may reflect the unchanging nature of the boundaries that this notoriously territorial fish defends.

Girella nigricans was never present on the San Miguel Island transects or at SBISESL. It was always present on the southern transects 11,13,15 and 16. At the transition zone sites 4-7 and 9, 1987 (the year of the mini El Niño) was the year of peak density.

SIZE FREQUENCY DATA:

Beginning in 1985, measurements for size frequency target species (Appx. 5) were obtained at each site. Four species: *Tethya aurantia*, *Pisaster giganteus*, *Pycnopodia helianthoides*, and *Lytechinus anamesus*, were added to the size frequency measurements in 1986. Over 800 size frequency distributions are available in histogram form for species where one dimension was measured. Data for *Allopora*, gorgonians, and *Macrocystis*, (where two or more measurements are taken for each specimen) is still being analyzed. Population age structure, recruitment cohorts, growth and mortality can be traced for some species at most locations (urchins, seastars, *Cypraea*, *Astraea*) while other species exhibited extremely variable population structures (*Hinnites*, *Megathura*) and/or sample sizes were consistently low (*Kelletia*, *Tethya*), defying interpretation.

Tethya aurantia sample sizes were rarely $\geq$ 10 at any site for all five years of sampling. The best set of records were obtained from SCIYB and SBISESL. Sizes ranged from 15 mm to 94 mm in diameter. Small sizes (<40 mm diameter) were present every year (1986-1989) at SBISESL. Progressively smaller sizes were detected each year from 1986 (minimum size = 36 mm), through 1989 (minimum size = 20 mm), but cohorts were not well defined, and growth rates cannot be determined. Confounding efforts to trace recruitment and growth, propagation in this sponge species can be by sexual as well as by several asexual means of reproduction (Morris, et. al., 1980).

Abalone, *Haliotis spp*., as mentioned above (see BAND TRANSECTS), underwent declines in density. The only sites where reasonably consistent sample sizes could be obtained were at Anacapa Island for the pink abalone, *Haliotis corrugata*.

ANILC abalone densities were consistently high as a result of legal protection and ease of finding the abalone there. ANILC is the only site where recruitment (26% of the 1987 sample was below 35 mm) and survival to emergent size ($\geq$40 mm) was detected. This may suggest that a minimum density of reproductive abalone over a long span (5-10 yrs) of time is essential for recovery of this species. If we estimate the age of 30 mm animals to be approximately one year old (Haaker, et. al. 1986), the density of the adult abalone population (1986) enabling this recruitment was 0.021 m^{-2}, which is relatively low. In the 1989 surveys, only ANILC, ANIAR, and SMIWL showed densities $\geq$ 0.02 m^{-2}. Readers are cautioned that pre-emergent abalone (<40 mm) are very difficult to find and inconsistent efforts may have great influence on conclusions regarding recruitment.

In our samples of *Cypraea spadicea*, the population structure was unimodal. The population modes were slightly smaller at southern sites compared with northern sites. The most striking feature of the data set for this species, is the similarity of the population structures regardless of time, location, density and/or changes in densities of associated kelp forest species. Range was usually within 30-56 mm shell length, with an average mode of 42 mm. According to Morris et. al., 1980, *Cypraea spadicea* exhibits quick shell growth to 44 mm and then almost no shell growth, having the ability to dissolve partially or resorb the early whorls, making more room for its body as it ages (Keen, 1971).

At SMIWL, *Astraea gibberosa* was measured, while *A. undosa* was measured at all other sites. Diameters for *A. gibberosa* ranged, on average, between 48 mm and 75 mm for all years at SMIWL. A growth rate of approximately 12 mm/year is inferred from the histograms. *A. undosa* density/sample sizes are too low/inconsistent at sites 2-5 for analysis. The inferred growth rate at most stations averaged approximately 10 mm/year. Data from SCIFH suggests that growth rates decreased from 16 mm/year to 10 mm/year following the decline of the kelp forest. At SCIPB, where the disappearance of all foliose algae was most abrupt in 1985, the size range of the *A. undosa* population quickly became concentrated within a smaller size range. At SCISA, the size range gradually narrowed from a spread of 85 mm to 20 mm. SCIYB is unique in that larger sizes (90 mm-140 mm) were well represented in all sampling years (1986-1989). At all other sites, sizes larger than 95 mm occurred infrequently. At ANILC, where algae has been relatively more abundant, growth seemed more rapid (10-20 mm/year) and yet, no large (>94 mm) sizes were present. At SBISESL, there was evidence of good recruitment in 1985 (25% of the sample was near 27 mm). Over time, overall size range decreased and became consolidated between 49 mm and 72 mm, similar to a pattern seen at SCIPB and SCISA. Recruitment occurred at SBIAP in 1985, 1986 and 1989.

At SRIJLNO, *Megathura crenulata* growth rate was slow between 1985 and 1987 (approx. 5 mm/yr), then appeared to increase in 1988 and 1989 when food (algae and tunicates) was more abundant and limpet density was lower. At SCIFH, where food was much less abundant, growth rate was similar (4-8 mm/yr) to that at SRIJLNO prior to the return of the kelp forest. Although good sample sizes were regularly obtained, the histograms were rather amorphous.

Hinnites giganteus measurements are of shell diameter. This scallop is harvested by sport divers and has no minimum size limit. The most complete data are from ANILC, where harvesting is prohibited, seastar populations were low, and scallop densities remained consistently high. The clearest picture of population size distribution there, was obtained in 1987 when the sample size was temporarily doubled (N=62). Sizes ranged from 33 mm-127 mm with a distinct mode at 67 mm. The mode in 1988 was 72 mm, suggesting a growth rate of 5 mm/year.

Measurement for seastars is the arm length taken from the mouth to the tip of the longest ray. *Patiria miniata* has consistently had the best representation over the widest size ranges in a unimodal population structure at the northwesternmost sites (SMIWL, SMIHR, and SRIRR). Maximum size increased yearly from 1985 through 1989 at SMIWL and SMIHR, and successful recruitments occurred in 1987 through 1989. There was a distinct difference between the population structure of SRIJLNO (depth = 8-12 m) and SRIJLSO (depth = 15-18 m). The deeper, SRIJLSO population was similar in structure to the aforementioned northern sites, while SRIJLNO did not have sample sizes ≥ 10 until 1986, when a small recruitment was detected. By 1987, the population structure at SRIJLNO began to resemble that of the northern sites. It is likely that the quick recovery (1986-1987) was due to immigration from deeper water as well as recruitment and growth of new individuals. As one moves east and south through the sites in the transition zone around Santa Cruz Island and Anacapa Island, densities became progressively lower and sample sizes were progressively poorer over longer time periods. Recruitment took place at SCIPB in 1985 (and 1989) and ANILC in 1987 without subsequent survival and recovery of population densities. Santa Barbara Island had massive recruitments of *Patiria* beginning in 1987 at SBISESL, where over 70% of the population was within 11-35 mm armlength (recovering to a "normal" population structure by 1989). In 1988 at SBIAP, the entire population sample (N=50) was within 8-16 mm arm length. Data for 1989 shows survival and growth [10 mm/yr] of the 1988 cohort, and shows the appearance of some larger [≥35 mm] animals.

Pisaster giganteus sizes were often spread out over such a wide range (16-304 mm), that an increase in the target sample size (from 30 to 50) is indicated for future monitoring. Definite recruitment occurred at SMIWL in 1988 (N=32, and 25% of the population was under 29 mm arm length). The population at SMIHR remained fairly stable, with the mode always near 80 mm. Recruitment took place at all three Santa Rosa Island sites in 1989. This recruitment may have been directly related to the return of the kelp forest. Herrlinger et al. (1987) suggest that *Pisaster giganteus* may specifically recruit to the *Macrocystis* canopy. The bulk of the populations at sites 1-6 were concentrated below 120 mm arm length. SCIGI showed no recruitment, but was similar in range and mode to stations 1-5. Sites with low *Pisaster* densities (stations 7-16), often had fewer individuals scattered over a wide range of sizes, sometimes followed by recruitment and/or the appearance of populations concentrated within a medium (80 mm-175 mm) size range (SCIFH, SCIYB, SBISESL, SBIAP, and SBICC). The northeastern sites on Santa Cruz Island (SCIPB and SCISA) and Anacapa Island had low seastar densities and small sample sizes, composed of large (≥ 95 mm-350 mm) individuals. At SBISESL, the population was scattered over a wide range in 1986 (24 mm-145 mm), and was concentrated around a mode of 88 mm by 1989 (range = 53-131 mm, 84% = 67-99 mm). No recruitment was seen at the Anacapa Island or Santa Barbara Island sites.

Sample sizes of *Pycnopodia helianthoides* were ≥ 10 at stations 2-5 between 1987 and 1989. Initially, sizes were scattered over a wide size range (28 mm -310 mm). Recruitment occurred at SRIRR in 1988, and at SMIHR and SRIJLNO in 1989. At SRIJLSO, the population structure went from a wide size range (62 mm-310 mm) to a population, where 94% of the sample was consolidated between 131-179 mm in 1989. SRIRR 1989 data suggest a growth rate of 24 mm/year for this species.

Lytechinus anamesus is a small urchin with a limited size range. Densities were high enough for complete sample sets (1986-1989) at SCIGI, SCIPB, SCIYB, ANIAR, SBISESL, and SBIAP. At each site, population structure was unimodal with the mode and range remaining unchanged, although there are intersite differences. In general, populations at the Santa Cruz and Anacapa Island stations included broader size ranges and larger sizes than the Santa Barbara Island stations. Recruitment was most notable at SCIFH and SCIPB in 1986, ANIAR and SCIGI in 1987, and SCIYB in 1987-88.

There are good data sets for both species of *Strongylocentrotus* for all sampling years at all locations. *Strongylocentrotus franciscanus* is a large, commercially harvested species which can grow to over 160 mm test diameter. The spine canopy of large (≥90 mm) *S. franciscanus* provides a refuge for young urchin recruits (Tegner and Dayton, 1981). According to Ebert (1977), *S. franciscanus* can attain a size of 30 to 40 mm during their first year. In our samples, urchins less than 30 mm represent the young of the year. The commercially harvested size range (≥ 90 mm test diameter) was absent at sites 1-5, with the exception of SRIJLSO, where 10% of the population was greater than 90 mm. In recent years, the bulk of the populations at sites 1-6 was below 50 mm test diameter. At SCIGI, sizes greater than 41 mm comprised only 9% of the population in 1988, and in 1989 the entire population was below 40 mm.

Red urchin recruitment occurred at most sites in 1985. At SCIFH and SCIYB and all three Anacapa Island stations, where sizes larger than 90 mm had not been totally extirpated, recruitment was frequent. At ANILC, which is protected from legal harvesting, recruitment sizes (≤25 mm) were consistently present every year from 1985-1989, and the bulk of the population was greater than 90 mm. At most sites, growth was approximately 20 to 30 mm/year until 70 mm test diameter. The growth rate at ANILC was high, with the recruitment cohort of 1985 growing approximately 40 mm by 1986. At SCIPB and SCISA, where urchin barrens prevail, growth rates of red urchins slowed to 10 mm per year, and the bulk of the population remained less than 50 mm in diameter. At the urchin barrens at Santa Barbara Island, this pattern was repeated with large sizes present but not abundant. There was regular recruitment, and growth slowed over time. Few survivors remained above 50 mm test diameter, with the bulk of the population skewed towards the smaller sizes. The typical bimodal population structure model described by Tegner and Dayton (1981) which existed for *S. franciscanus* at deep (18 m) urchin beds at Point Loma, was occasionally reflected by our data. At some sites, the 40-90 mm size range predicted by Tegner and Dayton's model (1981) to be eliminated by predators has become a distinct mode instead.

The population structure of *Strongylocentrotus purpuratus* was typically unimodal, with sizes ranging from 4 to 80 mm test diameter. At locations where exceptionally large recruitment occurred, population structures showed a temporary bimodality. *S. purpuratus* grow 25 mm in their first year, and sizes less than 20 mm test diameter are considered the young of the year (Ebert, 1977). Recruitment of *S. purpuratus* was annual at most sites. Extraordinarily large recruitment occurred at some sites.

At sites where *S. purpuratus* densities had been the highest for the most prolonged periods (see QUADRATS; SRIJLNO, SCIGI, SCIPB, SCISA, SBISESL, SBIAP, and SBICC) there was a progressive decrease in the maximum sustainable size. In addition to this, the growth rate slowed to possibly as little as 3 mm/yr until, at densest sites, over half of the population was concentrated below 30 mm test diameter. There is a possibility that negative growth occurred. The higher the urchin density, the slower the growth rate and the lower the maximum supportable/sustainable size. The exception to this generalization occurred at SBIAP, which in 1986, had the highest density of any site (154 purple urchins m^{-2}). Data show that during this year almost 90% of the population was within the 7-11 mm size range. This incredibly huge cohort survived and grew approximately 7-12 mm/year. At ANILC, where urchin predator populations remained high, algae abundant, and urchin density low, the mean size (40 mm) of *S. purpuratus* was almost double that seen at sites with urchin barrens (example: at SBIAP the average mean test diameter was 19 mm).

Table 4. Locations and years where population structures of *Strongylocentrotus franciscanus* reflected the bimodality described by Tegner and Dayton (1981); " . . . juveniles (up to 40mm) are protected by the spine canopies of adults, urchins of intermediate size (50-80 mm) are very vulnerable to predators and large adults (>90 mm) attain a partial refuge in size".

LOCATION	YEAR	+% 0F POPULATION	
		< 40 mm	> 90 mm
SRIJLNO	1989	16%	40%
SRIJLSO	1985	51%	10%
	1989	53%	9%
SCIGI	1985	24%	38%
	1986	66%	14%
	1987	50%	17%
SCIFH	1986	57%	16%
SCIYB	1989	66%	16%
ANICC	1985	7%	52%
	1986	45%	33%
	1988	37%	58%
	1989	19%	40%

ANILC	1985	34%	50%
	1986	3%	70%
	1987	2%	67%
	1989	27%	47%
SBISESL	1985	63%	12%
	1986	77%	5%
	1987	83%	6%
	1988	91%	3%
	1989	77%	9%
SBIAP	1985	82%	13%
	1986	57%	8%
	1987	43%	8%

Table 5. Locations and years where recruitment size (≤ 20mm test diameter) *Strongylocentrotus purpuratus* comprised more than 25% of the total *S. purpuratus* population.

LOCATION	YEAR	% OF POPULATION < 20mm TEST DIAMETER	RECRUITMENT SIZE RANGE
SMIHR	1985	74%	10-20mm
SRIJLNO	1989	21%	6-20mm
SRIJLSO	1985	35%	5-19mm
SRIRR	1987	30%	3-17mm
SCIGI	1986	75%	3-17mm
	1988	57%	6-16mm
SCIFH	1985	21%	5-19mm
	1986	68%	10-20mm
SCIPB	1987	44%	15-21mm
SCISA	1986	35%	10-20mm
SCIYB	1989	30%	8-18mm
	1987	40%	2-20mm
	1989	42%	5-19mm
ANILC	1985	44%	4-18mm
	1989	26%	5-19mm
SBISESL	1985	64%	3-17mm
	1986	88%	3-17mm
	1987	59%	5-19mm
	1988	33%	7-17mm
	1989	54%	7-17mm
SBIAP	1985	64%	3-17mm
	1986	87%	5-19mm
	1987	87%	6-20mm
	1989*	46%	3-17mm
SBICC	1986	62%	2-20mm

SPECIES LIST:

Comprehensive species lists were compiled for monitoring sites and a limited number of other locations during Kelp Forest Monitoring cruises for the years 1982 through 1989. Only a combined list of species noted as present at each monitoring site is included here (Appx. 6). Lists for each year are available with relative abundance information. Compilation of thorough species lists at each location was dependent upon the monitoring crew's ability to identify over 1,000 possible species known to be associated with kelp forests. Species composition varied from site to site because of many factors including, but not limited to; biogeographical location, variability of habitat, proximity to currents and/or upwelling, exposure to wave action, light availability, and depth. Time allotted to the species list surveys was often limited. Given the variability in diver effort and the fact that the kelp forest surveys are annual, the temporal changes of each particular species are hard to trace and the appearance of seasonal, ephemeral species may be missed entirely. Those trends that can be traced are fascinating and enlightening, and pose a whole new set of questions for graduate students, researchers and scientists to answer.

The sixteen kelp forest monitoring sites were initially established in kelp forests. The species lists for 1982 show an absence of ephemeral algae species (i.e. *Ulva*, *Colpomenia*, *Giffordia*), predominance of perennials (i.e. *Gigartina*, *Rhodymenia*, and articulated corallines), and a low algal diversity indicative of mature kelp forests (Foster, 1975). After the disappearance of the kelp forests at most sites in 1984-1985, the vast extent of this clearance and the development of high urchin densities precluded the stages of algal succession known from much smaller, experimentally cleared patches and settlement experiments. As noted by North (1971), the recovery of kelp forests that have been reduced to barrens does not follow a classic, well-defined ecological succession. When urchin populations are sufficiently reduced (by predation, starvation, disease or migration) to permit algal recruitment, *Macrocystis* will not necessarily be the climax species. Although many similarities between our sites have been noted, the species composition and interaction within each site is unique and is in constant flux. The sites we have chosen to discuss were those from each island that have the most complete records.

At SMIWL, foliose red algae species were equally plentiful and even more diverse in 1988 than in 1982. Although algal density has fluctuated over the years, the diversity of algae, especially foliose reds, has always remained high at this site. The ephemeral *Desmarestia ligulata* was present every year, showing biennial percent cover peaks (see RPC's) which exceeded 70% in 1988. *Cryptolithodes sitchensis* is an example of a species typical of the Oregonian biogeographical province that was seen at this site and at no other. Unlike other sites, *Cancer* spp. were apparent every year and probably played an important role as urchin predators. The only other site where urchin densities were this low (≤ 3 m^{-2}) was ANILC, which has a large population of another urchin predator, *Panulirus interruptus*.

Kelp curlers, a type of gammarid amphipod, were observed in 1989 at SMIWL. This amphipod was probably responsible for the poor condition of *Macrocystis* at that site. Kelp curlers were implicated in the kelp bed degradation at San Nicholas Island earlier that year (R. McPeak, pers.

comm.). In 1988, SRIJLNO had very large numbers of *Idotea resecata*, an isopod that feeds on the upper fronds of kelp. That outbreak apparently had no effect on the overall kelp bed however.

SMIHR had an algal assemblage very similar to SMIWL when it was established in 1982, but by 1983, most foliose algae had been much reduced or eliminated. By 1986 only eight types of algae were noted where once there had been at least twenty three. In 1984, the exposed substrate was temporarily colonized by rapid growing ephemeral algae; *Giffordia/Ectocarpus, Bryopsis corticulans, Ulva* sp*.* *Cladophora graminea* and *Codium fragile* were present as well. Since 1985, when green algae was added as an RPC category, percent cover has rarely risen above two percent at any other monitoring site, but in 1988, SMIHR had a uniquely high (8%) cover of green algae. The 1988 species list noted *Ulva sp*. as "common" and in addition to the ephemerals seen in 1984, *Colpomenia sp*., *Desmarestia ligulata* and fourteen species of foliose red algae species were noted. The algal density remained low (see RPC's and QUADRATS), but diversity greatly increased. The three primary factors which have led to kelp recovery at other sites are present at SMIHR: location within the boreal or transition zone; increased density and diversity of urchin-eating sea stars, especially *Pycnopodia helianthoides*; and reduced densities of the purple urchin, *Strongylocentrotus purpuratus* (from 44 m^{-2} in 1986 to 8.2 m^{-2} in 1988). But, this site has a unique, high density of the red urchin, *S. franciscanus* which has a marked preference for brown algae. The opaleye, *Girella nigricans*, which selectively grazes upon *Ulva* sp. (Leighton,1971) has not been seen at SMIHR. There was a curious appearance of *Pteropurpura trialata* in 1986 which coincided with the peak in percent cover of *Serpulorbis squamigerus* (see RPC's), one of it's food items (Morris et al.,1980).

At SRIJLNO and SRIJLSO, the kelp forests which had disappeared by 1987, had fully returned by 1988. These two sites and the third Santa Rosa Island site, SRIRR, seem to have come the closest to reaching species compositions similar to what they were in 1982. The diversity of understory algae at SRIJLNO was higher in 1988 than 1982 which is an indication of the nascence of this kelp forest. As these kelp forests mature, we could anticipate that the diversity of the understory algae would decrease. Carpeting the substrate at these three sites were small cucumbers, *Cucumaria spp*. and *Pachythione rubra*. In 1985, SRIJLNO had a massive, temporary colonization by *Phragmatopoma californica* (see RPC's), and a temporary disappearance of the carpeting cucumbers.

At SCIPB, where almost all foliose algae disappeared in 1985, a noticeable rise in the number of algal species occurred from 12 in 1987 to 25 in 1988. This approaches the 31 species identified in 1982. Once again, as with other sites where urchin densities recently declined, ephemeral algae were present, diversity of all algae increased, but density (judged from species list field ratings and RPC's) remained low. *Spirobranchus spinosus* was consistently present from 1982 to 1989. The increase in the miscellaneous invertebrate category (RPC's) in 1988 can be partly attributed to a settlement of the small white barnacle, *Tetraclita elegans*. Pelagic red crabs, *Pleuroncodes planipes*, (a southern, warm water species) were abundant in 1984 and noted in the mini-El Niño year of 1987.

At ANICC, where the decline in foliose algae following the El Niño event were more gradual than at most other sites, algal diversity gradually increased from 1983-1986, but by 1988, density was lowest of all years and diversity had declined below 1983 levels. In 1984, the peak in "miscellaneous invertebrates" was due to a settlement of *Tetraclita elegans*, which disappeared by 1986 and then reappeared in 1988. The spiny lobster, *Panulirus interruptus*, while present on band transects in varying numbers, has usually been rated "common" on species lists. Conversely, numbers and diversity of seastars were low at ANICC.

PHOTOGRAMMETRIC SAMPLING:

Photogrammetry is the process of surveying an area using photography. As used by the Kelp Forest Monitoring (KFM) project this technique means taking 80 underwater photographs of the same portion of the substrate at each of our 16 sites. The original purpose was to measure the densities of selected invertebrates and algae. Because of the relatively high accuracy and efficiency of the manual counts obtained by Quadrat sampling however, photogrammetry has become more of a visual backup for supporting conclusions or trends found in other data. It also continues to provide a permanent record of a part of each site.

In 1988 no photogrammetric samples were taken due to mechanical problems with the cameras.

In 1989, 11 of the 16 sites were sampled completely. At SBICC, the four permanent reference stakes could not be found. The other 4 sites (SMIHR, SMIWL, SCIFH, ANICC) were attempted but not completed because of various mechanical problems.

The data that were successfully collected do provide additional evidence for trends shown by the Quadrat sampling and Random Point Contacts.

In 1989, at Johnson's Lee North, *Macrocystis* or other macroalgae were present in all 80 plots; no urchins were visible in any. However, in 1987 and 1986 the opposite situation prevailed. No macroalgae were detectable in the grids, while urchins were in all of them in 1986 and in 63 out of

80 in 1987. This supports the Quadrat results as well as casual observation that this site, once an 'urchin barren', has recovered and is now a healthy Kelp Forest.

Scorpion Anchorage shows the continued dominance of urchins (mostly *Strongylocentrotus purpuratus*) and the absence of macroalgae through 1986, 1987, and 1989. This is additional support for the conclusion reached by other methods that this site has remained in the barren state.

The Photogrammetric sampling technique was originally devised for use in a Coral Reef habitat and certain characteristics encountered in our area make it more problematic here. Frequent swells often cause strong surge which can stir up sand and fine sediments, but more importantly can dramatically alter the amount of algae visible in any particular grid. Since this surge is not a constant unidirectional force there seems to be no way to balance out it's effects.

The desirability of having a chronological visual record of changes in benthic flora and fauna to examine makes the Photogrammetric approach worth continuing, but the problems mentioned above warrant a more limited use of it. Some sites have been historically troublesome, others have consistently given good, clear photos.

Based on this qualitative survey of past results it can be recommended that SMIWL, SCIYB, SCIPB, and SBICC be dropped from future photogrammetric data collections. The SRIJLNO site might also be dropped as slightly better results have been achieved at the SRIJLSO site and the northern site grid may therefore be redundant. Reducing the number of photogrid sites would increase efficiency by freeing up man hours, reduce the risk of equipment damage, and lower the quantity of film used.

Table 6. Photogrammetric Quality Ratings for all stations between 1983 and 1989.

Station	Year						
	1983	1984	1985	1986	1987	1988	1989
SMIWL	*	F-P,S	F-P(S)	G,A	F,S	*	I,P
SMIHR	G	G	*	G	G,D	*	I,P
SRIJLN	G,A(S)	*	F(S)	G	G-P,S	*	G,A
SRIJLS	P,A,S,I	G-F	P-F,S	G	G	*	G,A
SRIRR	G(D)	G	G	G	G	*	F-P,I
SCIGI	G(S)	G(S)	F(S)	F(D)	G(D)	*	G
SCIFH	D(B)	G(B)I	*	G,D,B	F,D,B(S)	*	G(B)I
SCIPB	P-F(S)	G,A	*	G	G-F(S,D)	*	*
SCISA	P,M	G	*	G	P-F(S)D	*	G(B)
SCIYB	*	*	*	*	F-P,A(S)	*	P
ANIAR	*	G(B)A	G,A	*	F,D	*	G,D(B)
ANICC	D	G	*	G-F(B)	G(D)B	*	*
ANILC	G,A	G,A,I	G,A	G,D,A	G,A(D)	*	G,D,A
SBISESL	G(D)	G	F(S)	G(D,B)	F,S	*	P(B)I
SBIAP	G(S)	G	P,S	G	G(D)	*	G
SBICC	*	*	*	G,D	G-F	*	*

KEY:
D=dark
B=boulders with shadows
M=murky
S=sand or sediment in water column
A=algae, thick understory
G=good visibility
F=fair visibility
P=poor visibility
I=incomplete, missing more than three slides
()=some slides show this condition
*=photos not available

OCEANOGRAPHIC DATA:

Data reduction of oceanographic data was performed under contract to the NPS by Marine Resource Consultants, of Santa Barbara, under the direction of L. E. Fausak. Lists of deployment dates and data recovered are presented in Appendix 7 along with a few example plots. Complete listings of the data along with dBase III+ data files on 5¼ inch floppy disks can be found in Fausak (1989).

CONCLUSION

Because data from this ongoing monitoring study date back to 1982, we have a fascinating record of the profound and unique impact that El Niño had on the kelp forest community species at each of the different sites. We can trace the reduction of lush forests to urchin barrens and then the re-establishment and recovery (or absence of recovery) of each target species. An explosive recovery of sea star populations from the devastating "wasting disease" of the early 1980's is now evident as well as a recent dramatic decline in subtidal abalone species numbers which coincides with the massive die-off of intertidal black abalone. The Kelp Forest Monitoring Program provides us with a priceless body of information which adds to and clarifies our understanding of kelp forest ecosystems.

The California Channel Islands are very complicated biogeographically. Though a relatively small area, wide biogeographic changes occur through the chain. Although the islands lie west-east, it is easier to think of them as a north south chain when relating them to the mainland. Distribution of fishes demonstrate this best. Rockfish and striped surfperch are abundant at San Miguel Island and Santa Rosa Island to the north and fade out to the south. *Paralabrax* (and *Semicossyphus*) are most abundant in the transition zone while garibaldi are most abundant in the south and rare or absent at San Miguel Island and Santa Rosa Island. Some invertebrates and algae also show these patterns. During climatic events, such as El Niño, the usual distributions may shift and species not usually seen in our area may appear at the edges.

Indirect effects of disturbance or community shifts may occur several years after the initial perturbation. For example kelp bass and señorita wrasse adults do not depend on kelp, however their juveniles do. Population changes are not immediately apparent as the adult population may remain at high levels before the effects of poor recruitment become obvious.

From the data we can see that there is considerable variability among years and between stations. Differences between years were most dramatic when a site shifted between urchin and kelp domination. The variation between sites is apparent in their response to the El Niño events of the mid-1980's. Many sites lost their kelp forest, becoming urchin dominated. Since then, for example, sites at Johnson's Lee, Santa Rosa Island have recovered while at Cat Canyon, Santa Barbara Island the community shifted from healthy kelp forest to urchin barren during the same time. Other sites at Anacapa Island and Wyckoff Ledge, San Miguel Island maintained kelp forests through the 1980's, while sites at Santa Cruz and Santa Barbara Islands shifted to urchin barrens and showed little sign of recovery. These examples show that we cannot afford to sample less.

In order for a long-term monitoring program to survive it must be able to adapt to make use of improved techniques and to follow biological changes not foreseen during the project design. When adding new techniques, considerations for meshing with the old data are important. When deciding to drop a technique or index species, considerations regarding the value of the data, reasons for original inclusion, and the possibility of changes where it will be needed in the future, need to be studied carefully. A recommendation made here is to convene a workshop of interested biologists (preferably including those involved with the project design) to evaluate the techniques and species selections. The goal of this workshop would be to evaluate the efficacy of the different monitoring techniques, discuss improvements in sampling, and the value of incomplete data, as in some size frequencies. (Note: this workshop was held in 1995, see Davis et al. 1996).

It has become apparent that our limited, annual sampling of size frequencies is not frequent enough, nor sample sizes large enough, to clearly follow growth and mortality of cohorts in some species. The value of these problematic species as target species for this sampling technique must be reassessed. Since increasing the frequency of sampling is not feasible, we recommend increasing the minimum sample sizes or dropping some species altogether (to devote more time to sampling other species). Those species dropped could be added again if population sizes allowed larger samples. The problem with eliminating a target species from any monitoring project is the possibility that population recovery cycles are long-term, the current data set has been obtained during the apogee in a particular species' cycle, and that the valuable detection of recruitment leading to a recovery on density surveys (i.e. abalone) will be missed.

We need new methods that will give better information on recruitment without destructive sampling of the bottom, and can be sampled in a fashion that is more repeatable than what is done in size frequencies now. Recruitment is important for understanding past events and for predicting future trends. There is still much to be learned about population dynamics. For example, it appears that successful recruitment does not occur every year in many species, and this may have important implications to fisheries management.

ACKNOWLEDGEMENTS

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Table 7. Kelp Forest Monitoring Project participating divers, 1982-1989.

PARTICIPANTS	AFFILIATION	YEARS
Anderson, Todd	Channel Islands National Park*	84,85
Barnett, Dale	Yosemite National Park	83
Barsky, Kristine	Calif. Fish & Game	83-89
Barsky, Steve	Diving Systems Intl./VIKING	83-89
Bessett, Bob	Channel Islands National Park	84,85
Bidwell, Randy	Channel Islands National Park	89
Bjork, Jennifer	Southwest Regional Office	86
Blanchard, Linda	Orange County Marine Institute	89
Brannen, Jim	Moss Landing Marine Lab	83
Bretz, Carrie	Moss Landing Marine Lab	89
Buckley, Ray	Washington Dept. of Natural Res.	84
Bullard, Kent	Channel Islands National Park	83,84
Buttolph, Phil	Humboldt State University	88
Canestro, Don	Channel Islands National Park*	85,86
Coehlo, Don	Yosemite National Park	83
Conlin, Mark	Channel Islands National Park*	82-84
Conway, Mike	Santa Barbara City College	89
Cox, Tom	Channel Islands National Park	85
Coyer, Jim	Marymont College	85
Damico, Ronnie	Calif. State Univ. Long Beach	83,86,87
Daley, John	Yosemite National Park	83
Danno, Rob	Channel Islands National Park	88
Davis, Gary	Channel Islands National Park*	82-89
De Silva, Federico	U C Santa Barbara	89
Denega, Mike	Placerville Junior College	87
Divins, Dennis	U C Santa Barbara	87,88
Dixon, Mike	Yosemite National Park	83,85
Dodd, Thom	Santa Cruz	87-89
Donnemeyer, Jeff	Carlton College	83
Dougler, Hugh	Yosemite National Park	87
Dow, Ron	Point Mugu Test Center	84
Doyle, Lucy	Channel Islands National Park*	84
Duffy, John	Calif. Fish & Game	85,86
Eichenhorst, Jay	Golden Gate Natl Rec. Area	86
Ehorn, William	Channel Islands National Park	83,87
Engle, Jack	Channel Island Research Program*	83-86,88
Even, Carla	U C Santa Cruz	87
Farley, Corky	Channel Islands National Park	87,88
Feser, Larry	Lassen Volcanic National Park	83,85
Forcucci, Dave	Channel Islands National Park*	86-88
Given, Pat	Channel Islands National Park	83,86
Golden, Marty	Minerals Management Service	85,87
Gotshall, Dan	Calif. Fish & Game	83-86
Gramlich, Constance	Channel Islands National Park*	88-89
Grimm, Brigit	Moss Landing Marine Lab	86
Green, Diane	Channel Islands National Park	89
Haaker, Pete	Calif. Fish & Game	83-89
Halvorson, Bill	Channel Islands National Park	84,85
Hansch, Susan	Calif. Coastal Comm.	85

Table 7. continued.

PARTICIPANTS	AFFILIATION	YEARS
Hardwick, Jim	Calif. Fish & Game	88
Heilprin, Daniel	Channel Islands National Park*	88,89
Heine, John	Moss Landing Marine Lab	85
Herrlinger, Tim	Channel Islands National Park*	82-83
Hill, Kevin	Moss Landing Marine Lab	83
Hill, Maurice	Mineral Management Service	85
Hocking, Richard	Seattle Aquarium	85,87
Hoffman, Bob	National Marine Fisheries Service	83
Inman, Bud	Lake Mead Natl. Rec. Area	86
Jackson, Annette	San Diego Zoo	89
Johnson, Craig	Channel Islands National Park	88,89
Johnston, Karen	Channel Islands National Park	83,84
Kelly, Dexter	Greater L A Council of Divers	87
Kelly, Steve	Lassen Volcanic National Park	83
Kim, Stacey	Channel Islands National Park*	85,86
Kunzman, Mike	University of Arizona-CPSU	
Lang, Mike	Calif. State Univ. San Diego	84,86
Laurendine, Waring	Moss Landing Marine Lab	86
Lind, Terry	Haleakala National Park	84
Laurent, Bud	Calif. Fish & Game	83,84,86-89
Lea, Bob	Calif. Fish & Game	83
Lesko, Russ	Lassen Volcanic National Park	84
Loach, Jim	Yosemite National Park	83
Lewis, Greg		85
Lewis, Jonathon	Channel Islands National Park*	82
Lewis, Robin	Calif. Fish & Game	86
Martin, Jim	Channel Islands National Park	86
Matthews, Feney	Univ. Washington	85,87
McAlister, Bob	Calif. Fish & Game	88
McAlary, Flo	Cypress College	83,84,89
McCluskey, Reed	Channel Islands National Park	84,85
McCullough, Jim	U C Santa Barbara	84
McNulty, Mike	Channel Islands National Park*	88-89
McPeak, Ron	KELCO	83-85,88
Menard, Yvonne	Channel Islands National Park	88
Meyer, Dave	San Gabriel Schoolteacher	88,89
Miller, Kathy-Ann	U C Berkeley	84,86
Miller, Roy	Lake Mead Natl. Rec. Area	85,87-89
Mitchell, Chuck	Marine Biological Consultants	85
Moreno, Guillermo	Moss Landing Marine Lab	89
Morris, Don	Channel Islands National Park	84,86
Moylan, Tom	Orange County Marine Institute	88,89
Neubacher, Don	Point Reyes National Seashore	84
Newbold, Robin	Saddleback College	87,88
Nikevich, Dan	Channel Islands Research Program	83
Nishimoto, Mary	Moss Landing Marine Lab	89
Owen, Sandy	Calif. Fish & Game	89
Patterson, Leslie	Channel Islands National Park	86,87
Peterson, Charlie	Yosemite National Park	83,85

Table 7. continued.

PARTICIPANTS	AFFILIATION	YEARS
Piombo, Heather	Santa Monica, school teacher	88
Platt, Jim	Channel Islands National Park	84
Provo, John	Channel Islands National Park	87-89
Quintero, Armando	Point Reyes National Seashore	84
Reid, Scott	Island Packers Company	89
Reilly, Paul	Calif. Fish & Game	83-87,89
Reynolds, J.T.	Albright Training Center	83,85
Richards, Daniel	Channel Islands National Park*	83-89
Richardson, Diane	Channel Islands National Park	88-89
Scott, Shannon	U C Santa Cruz	87
Schiff, Ken	Channel Islands National Park	87
Schmieder, Bob	Cordell Bank Expedition	85
Senning, Mark	Channel Islands National Park	87,88
Slinninger, Kim	Channel Islands National Park	89
Steicken, Dave	U C Santa Barbara	89
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Walchess, Lou	Scripps Inst. of Oceanography	88
Wendell, Fred	Calif. Fish & Game	87
Westgarth, Julie	Saddleback College	87,89
Weston, Jim	U C Santa Barbara	86
Whetzell, Earl	Channel Islands National Park	84,89
Willey, Dwight	Channel Islands National Park	89
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* = Kelp Forest Monitoring Project Biologist

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Appendix 1. Quadrat Data

Appendix 2. Band Transect Data

Appendix 3. Random Point Contact Data

Appendix 4. Fish Transect Data

Appendix 5. Size Frequency Data

Appendix 6. Species List

Appendix 7. Oceanographic Data

Appendix 1. 1982-1989 Kelp Forest Monitoring Data - Quadrats

Introduction.

Following are summaries of data gathered during quadrat counts from 1982-1989 for all kelp forest monitoring program sampling sites. Means, standard deviations and total number of samples (cases) are given. Data were summarized with SPSSPC+ programs from translated dBase III+ files. (Readers should be aware that the number of significant digits is an artifact of the database program and does not imply this level of precision.) For details of methods and data management, refer to the monitoring handbook (Davis 1988).

Notes on methods:

Quadrats were sampled non-invasively, that is no rocks were turned or urchins pulled off while making counts. Means represent average counts obtained from 20 stratified random 1m X 2m quadrats, each the sum of two individual divers' counts in 1m X 1m quadrats. In 1982, 30 independent random quadrats were counted for a smaller selection of species. In 1983 and 1984, 40 quadrats were independently chosen and entered in the database as such. We began counting three demersal fish (*Lythrypnus dalli*, *Coryphopterus nicholsii*, and *Alloclinus holderi*) in quadrats in 1985. *Macrocystis pyrifera* is reported as Adult (plants >1 m tall), Juvenile (plants < 1 m tall) and as All (the summation of the previous two categories after 1982). *Astraea gibberosa* was counted occasionally as encountered, but was not systematically looked for. *Lytechinus anamesus* (see appx. 2) was counted in quadrats when present in dense numbers (too high to count in band transects). At Rodes Reef and Gull Island South in 1986, and Southeast Anchorage in 1989, *L. anamesus* were counted in both quadrats and band transects.

Channel Islands National Park Kelp forest Monitoring 1982-1989
Quadrats

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	2002	Adult *Macrocystis pyrifera*	0.4358	1.2419	2720
LOCATION	1	SMI WYCKOFF LEDGE	0.6389	1.1212	180
YEAR	83		0.3500	0.6222	40
YEAR	84		0.3250	0.6155	40
YEAR	85		0.4000	0.5525	20
YEAR	86		1.9250	2.5250	20
YEAR	87		0.4500	0.5356	20
YEAR	88		1.1000	0.7182	20
YEAR	89		0.5250	0.5730	20
LOCATION	2	SMI HARE ROCK	0.0111	0.1491	180
YEAR	83		0.0500	0.3162	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	3	SRI JOHNSONS LEE NORTH	1.3889	2.1045	180
YEAR	83		1.3750	1.8072	40
YEAR	84		1.8500	2.1786	40
YEAR	85		0.1000	0.2052	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		4.1000	2.6685	20
YEAR	89		1.8500	1.9742	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.4389	0.8516	180
YEAR	83		0.7500	1.2558	40
YEAR	84		0.5000	0.9058	40
YEAR	85		0.1750	0.2936	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.9250	0.8156	20
YEAR	89		0.3500	0.4617	20
LOCATION	5	SRI RODES REEF	0.3861	0.8437	180
YEAR	83		0.0250	0.1581	40
YEAR	84		0.2750	0.7841	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		1.8750	1.1571	20
YEAR	89		1.0000	0.7434	20
LOCATION	6	SCI GULL ISLAND SOUTH	0.3417	1.2023	180
YEAR	83		1.0000	1.9612	40
YEAR	84		0.4500	1.4133	40
YEAR	85		0.0500	0.1539	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0750	0.3354	20
YEAR	89		0.0500	0.2236	20

Channel Islands National Park Kelp forest Monitoring 1982-1989

Quadrats

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	0.0167	0.1284	180
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0750	0.2667	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	8	SCI PELICAN BAY	0.0944	0.3457	180
YEAR	83		0.3250	0.6155	40
YEAR	84		0.1000	0.3038	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	9	SCI SCORPION ANCHORAGE	0.4806	1.2500	180
YEAR	83		0.2500	0.5883	40
YEAR	84		0.7000	1.0178	40
YEAR	85		2.4250	2.5919	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	10	SCI YELLOW BANKS	0.1813	0.4855	80
YEAR	86		0.1000	0.2616	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0500	0.2236	20
YEAR	89		0.5750	0.7993	20
LOCATION	11	ANI ADMIRALS REEF	0.9639	2.1875	180
YEAR	83		2.0000	4.1075	40
YEAR	84		0.8250	1.0350	40
YEAR	85		0.4250	0.6340	20
YEAR	86		0.3500	0.6091	20
YEAR	87		0.4250	0.6935	20
YEAR	88		0.2500	0.6177	20
YEAR	89		1.5750	1.5413	20
LOCATION	12	ANI CATHEDRAL COVE	0.5667	1.2332	180
YEAR	83		1.2500	1.4277	40
YEAR	84		0.9500	1.8390	40
YEAR	85		0.1750	0.3726	20
YEAR	86		0.0500	0.2236	20
YEAR	87		0.1750	0.5447	20
YEAR	88		0.0250	0.1118	20
YEAR	89		0.2750	0.6382	20
LOCATION	13	ANI LANDING COVE	1.0250	2.0099	180
YEAR	83		0.9000	1.6140	40
YEAR	84		1.4250	2.7909	40
YEAR	85		1.1500	1.2576	20
YEAR	86		1.6250	3.2561	20
YEAR	87		1.0500	1.4226	20
YEAR	88		0.4250	0.7122	20
YEAR	89		0.3250	0.5911	20

Channel Islands National Park Kelp forest Monitoring 1982-1989

Quadrats

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	0.0056	0.0745	180
YEAR	83		0.0250	0.1581	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	15	SBI ARCH POINT	0.0139	0.0979	180
YEAR	83		0.0250	0.1581	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0500	0.1539	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0250	0.1118	20
LOCATION	16	SBI CAT CANYON	0.2625	0.5567	80
YEAR	86		0.2500	0.4136	20
YEAR	87		0.3500	0.4617	20
YEAR	88		0.4250	0.8926	20
YEAR	89		0.0250	0.1118	20
SPECIES	2004	*Eisenia arborea*	0.1778	0.7084	3110
LOCATION	1	SMI WYCKOFF LEDGE	0.0024	0.0345	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0250	0.1118	20
LOCATION	2	SMI HARE ROCK	0.0381	0.2366	210
YEAR	82		0.2000	0.5509	30
YEAR	83		0.0500	0.2207	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0333	0.2270	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.1750	0.5006	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20

Channel Islands National Park Kelp forest Monitoring 1982-1989

Quadrats

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0000	0.0000	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	5	SRI RODES REEF	0.0194	0.1333	180
YEAR	83		0.0250	0.1581	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0250	0.1118	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0500	0.2236	20
YEAR	89		0.0000	0.0000	20
LOCATION	6	SCI GULL ISLAND SOUTH	0.1048	0.4303	210
YEAR	82		0.3000	0.5350	30
YEAR	83		0.1500	0.4267	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.3000	1.0052	20
LOCATION	7	SCI FRYS HARBOR	0.1476	0.5173	210
YEAR	82		0.4667	0.8996	30
YEAR	83		0.3000	0.7579	40
YEAR	84		0.1000	0.3038	40
YEAR	85		0.0500	0.1539	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	8	SCI PELICAN BAY	0.0524	0.2627	210
YEAR	82		0.1000	0.3051	30
YEAR	83		0.1250	0.4043	40
YEAR	84		0.0750	0.3499	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	9	SCI SCORPION ANCHORAGE	0.2500	0.6363	210
YEAR	82		0.9000	1.0619	30
YEAR	83		0.3750	0.7742	40
YEAR	84		0.2250	0.4797	40
YEAR	85		0.0750	0.1832	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	10	SCI YELLOW BANKS	0.1313	0.3535	80
YEAR	86		0.1500	0.2856	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.3000	0.5712	20
YEAR	89		0.0750	0.2447	20
LOCATION	11	ANI ADMIRALS REEF	0.7690	1.3279	210
YEAR	82		0.4333	0.8976	30
YEAR	83		1.9000	1.7365	40
YEAR	84		1.1500	1.5450	40
YEAR	85		0.2750	0.3796	20
YEAR	86		0.1000	0.2052	20
YEAR	87		0.0250	0.1118	20
YEAR	88		0.1750	0.3726	20
YEAR	89		0.7500	1.3717	20
LOCATION	12	ANI CATHEDRAL COVE	0.0286	0.2379	210
YEAR	82		0.0333	0.1826	30
YEAR	83		0.0250	0.1581	40
YEAR	84		0.1000	0.4961	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	13	ANI LANDING COVE	1.0976	1.7468	210
YEAR	82		1.0333	1.6078	30
YEAR	83		1.0250	1.2707	40
YEAR	84		1.1000	1.4987	40
YEAR	85		2.5000	3.3600	20
YEAR	86		0.7750	1.5259	20
YEAR	87		0.5500	0.8870	20
YEAR	88		0.8750	1.2863	20
YEAR	89		1.0250	1.7508	20
LOCATION	14	SBI SOUTHEAST SEALION	0.0095	0.1380	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0500	0.3162	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	15	SBI ARCH POINT	0.0333	0.1799	210
YEAR	82		0.1333	0.3457	30
YEAR	83		0.0750	0.2667	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	80
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
SPECIES	2005	*Pterygophora californica*	0.2487	1.8373	3140
LOCATION	1	SMI WYCKOFF LEDGE	0.1881	0.9237	210
YEAR	82		0.2667	0.6915	30

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Variable	Value	Label	Mean	Std Dev	Cases
YEAR	83		0.0750	0.2667	40
YEAR	84		0.2750	0.6400	40
YEAR	85		0.0500	0.1539	20
YEAR	86		0.7500	2.6680	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0500	0.1539	20
YEAR	89		0.0250	0.1118	20
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	3	SRI JOHNSONS LEE NORTH	1.7643	5.3327	210
YEAR	82		0.2000	0.6103	30
YEAR	83		7.3750	9.9632	40
YEAR	84		1.1750	3.3733	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.6750	0.9770	20
YEAR	89		0.4500	0.6469	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.5976	2.7679	210
YEAR	82		0.0333	0.1826	30
YEAR	83		0.3750	1.2748	40
YEAR	84		0.1250	0.5158	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		3.0750	8.0741	20
YEAR	89		2.1500	1.9875	20
LOCATION	5	SRI RODES REEF	0.1857	1.2135	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.1500	0.4007	20
YEAR	89		1.8000	3.6034	20
LOCATION	6	SCI GULL ISLAND SOUTH	0.0381	0.2740	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.1250	0.5633	40
YEAR	84		0.0750	0.2667	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	0.0000	0.0000	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	9	SCI SCORPION ANCHORAGE	0.0143	0.1189	210
YEAR	82		0.1000	0.3051	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	10	SCI YELLOW BANKS	0.5250	1.0759	80
YEAR	86		0.1000	0.2616	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.8000	1.3898	20
YEAR	89		1.2000	1.3318	20
LOCATION	11	ANI ADMIRALS REEF	0.4643	2.8520	210
YEAR	82		0.0333	0.1826	30
YEAR	83		2.3750	6.2376	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0500	0.2236	20
YEAR	88		0.0250	0.1118	20
YEAR	89		0.0000	0.0000	20
LOCATION	12	ANI CATHEDRAL COVE	0.0190	0.2179	210
YEAR	82		0.0333	0.1826	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0750	0.4743	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	13	ANI LANDING COVE	0.2429	0.7438	210
YEAR	82		0.2000	0.6103	30
YEAR	83		0.3000	1.2237	40
YEAR	84		0.1500	0.4267	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.5250	0.6973	20
YEAR	88		0.3750	0.7048	20
YEAR	89		0.4500	0.8870	20
LOCATION	14	SBI SOUTHEAST SEALION	0.0048	0.0690	210
YEAR	82		0.0333	0.1826	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	80
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
SPECIES	2006	*Laminaria farlowii*	0.3976	1.3334	3110
LOCATION	1	SMI WYCKOFF LEDGE	0.0143	0.0835	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0750	0.1832	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0750	0.1832	20
YEAR	89		0.0000	0.0000	20
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	3	SRI JOHNSONS LEE NORTH	0.1048	0.6551	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.3250	1.4392	40
YEAR	85		0.0250	0.1118	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.2500	0.3441	20
YEAR	89		0.1750	0.3726	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.2548	0.6746	210
YEAR	82		0.2667	0.7849	30
YEAR	83		0.2250	0.6197	40
YEAR	84		0.1500	0.4830	40
YEAR	85		0.1500	0.4617	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.9000	1.1877	20
YEAR	89		0.4750	0.7159	20
LOCATION	5	SRI RODES REEF	0.2778	0.8816	180
YEAR	83		0.2250	0.5768	40
YEAR	84		0.6250	1.3902	40
YEAR	85		0.0500	0.2236	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.7500	1.3524	20
LOCATION	6	SCI GULL ISLAND SOUTH	0.0857	0.5639	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.4500	1.2393	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	7	SCI FRYS HARBOR	0.1667	0.5584	210
YEAR	82		0.6000	0.9685	30
YEAR	83		0.1750	0.4465	40
YEAR	84		0.2500	0.7425	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	8	SCI PELICAN BAY	0.7952	1.7392	210
YEAR	82		2.9000	2.9636	30
YEAR	83		1.3250	1.5087	40
YEAR	84		0.6750	1.4392	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	9	SCI SCORPION ANCHORAGE	0.6405	1.7528	210
YEAR	82		3.0000	3.4441	30
YEAR	83		0.4000	0.7779	40
YEAR	84		0.6000	1.2969	40
YEAR	85		0.2250	0.4128	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	10	SCI YELLOW BANKS	0.6563	1.0299	80
YEAR	86		1.1500	1.3774	20
YEAR	87		0.2000	0.4974	20
YEAR	88		0.2500	0.4443	20
YEAR	89		1.0250	1.1295	20
LOCATION	11	ANI ADMIRALS REEF	0.6190	1.6695	210
YEAR	82		1.2000	2.1238	30
YEAR	83		1.2750	2.8822	40
YEAR	84		0.6500	1.2720	40
YEAR	85		0.2000	0.5477	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.2500	0.5257	20
YEAR	88		0.2000	0.4104	20
YEAR	89		0.1750	0.3354	20
LOCATION	12	ANI CATHEDRAL COVE	0.5976	1.5008	210
YEAR	82		2.1000	2.3831	30
YEAR	83		0.6250	0.8969	40
YEAR	84		0.2500	0.7071	40
YEAR	85		0.1750	0.3354	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.1500	0.3285	20
YEAR	88		0.0000	0.0000	20
YEAR	89		1.0500	2.8326	20
LOCATION	13	ANI LANDING COVE	1.9595	2.9224	210
YEAR	82		2.5667	3.4808	30
YEAR	83		1.3500	2.0575	40
YEAR	84		1.3500	3.6272	40
YEAR	85		1.5000	2.2243	20
YEAR	86		2.1000	1.9235	20
YEAR	87		3.3500	2.4500	20
YEAR	88		0.9750	0.8503	20
YEAR	89		3.4000	4.0930	20
LOCATION	14	SBI SOUTHEAST SEALION	0.1429	0.7112	210
YEAR	82		0.8333	1.5775	30
YEAR	83		0.1250	0.6480	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	15	SBI ARCH POINT	0.0095	0.0974	210
YEAR	82		0.0667	0.2537	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	16	SBI CAT CANYON	0.0125	0.0786	80
YEAR	86		0.0500	0.1539	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
SPECIES	2009	Juvenile *Macrocystis*	1.2608	4.1228	2720
LOCATION	1	SMI WYCKOFF LEDGE	0.8306	2.3153	180
YEAR	83		1.0750	3.7716	40
YEAR	84		0.9750	1.5104	40
YEAR	85		0.0250	0.1118	20
YEAR	86		2.4000	2.6238	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.2250	0.3796	20
YEAR	89		0.7250	2.2389	20
LOCATION	2	SMI HARE ROCK	0.0056	0.0745	180
YEAR	83		0.0250	0.1581	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	3	SRI JOHNSONS LEE NORTH	3.0222	5.2994	180
YEAR	83		7.8250	7.3864	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.1000	0.3479	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		3.1750	1.9007	20
YEAR	89		8.2750	4.8760	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.7278	1.5601	180
YEAR	83		1.0750	1.9921	40
YEAR	84		0.2250	0.7334	40
YEAR	85		0.2750	0.6973	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.0500	0.1539	20
YEAR	88		1.4500	1.0375	20
YEAR	89		2.1500	2.7198	20
LOCATION	5	SRI RODES REEF	0.5722	1.4884	180
YEAR	83		0.0250	0.1581	40
YEAR	84		0.1250	0.5158	40
YEAR	85		0.1000	0.3078	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.0000	0.0000	20
YEAR	88		4.0000	2.2478	20
YEAR	89		0.7250	0.8807	20

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	6	SCI GULL ISLAND SOUTH	0.1722	0.5749	180
YEAR	83		0.6500	1.0266	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.2000	0.4974	20
LOCATION	7	SCI FRYS HARBOR	0.0667	0.3441	180
YEAR	83		0.2500	0.6304	40
YEAR	84		0.0500	0.3162	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	8	SCI PELICAN BAY	0.0611	0.3200	180
YEAR	83		0.0250	0.1581	40
YEAR	84		0.2500	0.6304	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	9	SCI SCORPION ANCHORAGE	2.7500	5.7313	180
YEAR	83		10.1750	7.6456	40
YEAR	84		0.0000	0.0000	40
YEAR	85		4.4000	4.7727	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	10	SCI YELLOW BANKS	0.7313	1.6380	80
YEAR	86		0.8750	1.3657	20
YEAR	87		0.0000	0.0000	20
YEAR	88		1.2250	2.6131	20
YEAR	89		0.8250	1.2698	20
LOCATION	11	ANI ADMIRALS REEF	3.4556	7.6843	180
YEAR	83		13.5250	11.3114	40
YEAR	84		0.1500	0.5796	40
YEAR	85		1.3500	2.9429	20
YEAR	86		0.8250	0.9770	20
YEAR	87		0.0500	0.1539	20
YEAR	88		0.1500	0.4894	20
YEAR	89		1.3750	2.5333	20
LOCATION	12	ANI CATHEDRAL COVE	3.0611	6.6975	180
YEAR	83		11.3250	10.2066	40
YEAR	84		1.2500	2.3066	40
YEAR	85		0.2250	0.3432	20
YEAR	86		0.1000	0.4472	20
YEAR	87		0.7250	1.7657	20
YEAR	88		0.1000	0.3479	20
YEAR	89		1.2500	2.7362	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	13	ANI LANDING COVE	3.6139	7.1773	180
YEAR	83		3.8500	4.3356	40
YEAR	84		3.3250	6.4902	40
YEAR	85		1.0500	1.3659	20
YEAR	86		13.7750	14.4491	20
YEAR	87		1.2500	2.6383	20
YEAR	88		0.8000	1.2917	20
YEAR	89		1.3000	2.2907	20
LOCATION	14	SBI SOUTHEAST SEALION	0.0528	0.3565	180
YEAR	83		0.2000	0.7232	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	15	SBI ARCH POINT	0.0694	0.5007	180
YEAR	83		0.1500	0.6998	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.3250	1.1154	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	16	SBI CAT CANYON	0.5813	1.0834	80
YEAR	86		1.6750	1.5667	20
YEAR	87		0.3250	0.4375	20
YEAR	88		0.1250	0.3932	20
YEAR	89		0.2000	0.6156	20
SPECIES	2010	All *Macrocystis pyrifera*	1.6231	4.4499	3120
LOCATION	1	SMI WYCKOFF LEDGE	1.4690	2.4955	210
YEAR	82		1.4667	1.8144	30
YEAR	83		1.4250	3.7614	40
YEAR	84		1.3000	1.6204	40
YEAR	85		0.4250	0.5447	20
YEAR	86		4.3250	3.2698	20
YEAR	87		0.4500	0.5356	20
YEAR	88		1.3250	0.8777	20
YEAR	89		1.2500	2.4575	20
LOCATION	2	SMI HARE ROCK	0.0762	0.4079	210
YEAR	82		0.4333	0.8584	30
YEAR	83		0.0750	0.4743	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	3	SRI JOHNSONS LEE NORTH	3.7182	5.7672	220
YEAR	82		0.6000	1.1940	40
YEAR	83		9.2000	8.0135	40
YEAR	84		1.8500	2.1786	40
YEAR	85		0.2000	0.4974	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		7.2750	3.9118	20
YEAR	89		10.1250	5.7967	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	1.1143	1.8068	210
YEAR	82		0.8000	1.0954	30
YEAR	83		1.8250	2.3739	40
YEAR	84		0.7250	1.2401	40
YEAR	85		0.4500	0.7052	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.0500	0.1539	20
YEAR	88		2.3750	1.5634	20
YEAR	89		2.5000	2.8700	20
LOCATION	5	SRI RODES REEF	0.9583	2.0814	180
YEAR	83		0.0500	0.2207	40
YEAR	84		0.4000	0.9001	40
YEAR	85		0.1000	0.3078	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.0000	0.0000	20
YEAR	88		5.8750	2.6201	20
YEAR	89		1.7250	0.9797	20
LOCATION	6	SCI GULL ISLAND SOUTH	0.4881	1.4414	210
YEAR	82		0.3333	0.5467	30
YEAR	83		1.6500	2.5973	40
YEAR	84		0.4750	1.4140	40
YEAR	85		0.0500	0.1539	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0750	0.3354	20
YEAR	89		0.2500	0.6977	20
LOCATION	7	SCI FRYS HARBOR	0.1333	0.4497	210
YEAR	82		0.4333	0.7279	30
YEAR	83		0.2500	0.6304	40
YEAR	84		0.1250	0.4043	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	8	SCI PELICAN BAY	0.2286	0.5747	210
YEAR	82		0.6667	0.9223	30
YEAR	83		0.3500	0.6222	40
YEAR	84		0.3500	0.6622	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	9	SCI SCORPION ANCHORAGE	3.0357	5.6687	210
YEAR	82		1.8667	1.6965	30
YEAR	83		10.4250	7.7124	40
YEAR	84		0.7000	1.0178	40
YEAR	85		6.8250	6.5076	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	10	SCI YELLOW BANKS	0.9125	1.7462	80
YEAR	86		0.9750	1.4186	20
YEAR	87		0.0000	0.0000	20
YEAR	88		1.2750	2.6481	20
YEAR	89		1.4000	1.5441	20
LOCATION	11	ANI ADMIRALS REEF	3.8810	8.3912	210
YEAR	82		0.6667	1.3476	30
YEAR	83		15.5250	13.7430	40
YEAR	84		0.9750	1.1655	40
YEAR	85		1.7750	3.3383	20
YEAR	86		1.1500	1.2365	20
YEAR	87		0.4750	0.7518	20
YEAR	88		0.4000	0.7363	20
YEAR	89		2.9500	3.0946	20
LOCATION	12	ANI CATHEDRAL COVE	3.6381	6.8673	210
YEAR	82		3.7000	3.3337	30
YEAR	83		12.5750	10.7510	40
YEAR	84		2.2000	3.6599	40
YEAR	85		0.4000	0.6609	20
YEAR	86		0.1500	0.6708	20
YEAR	87		0.9000	1.9642	20
YEAR	88		0.1250	0.4552	20
YEAR	89		1.5250	3.1891	20
LOCATION	13	ANI LANDING COVE	4.3381	7.4510	210
YEAR	82		2.5333	2.4031	30
YEAR	83		4.7500	5.2416	40
YEAR	84		4.7500	8.6284	40
YEAR	85		2.2000	2.3586	20
YEAR	86		15.4000	14.2585	20
YEAR	87		2.3000	3.6034	20
YEAR	88		1.2250	1.8671	20
YEAR	89		1.6250	2.3501	20
LOCATION	14	SBI SOUTHEAST SEALION	0.1643	0.6132	210
YEAR	82		0.8000	1.1861	30
YEAR	83		0.2250	0.7334	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	15	SBI ARCH POINT	0.1476	0.5784	210
YEAR	82		0.5333	0.7761	30
YEAR	83		0.1750	0.7121	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.3750	1.1341	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0250	0.1118	20
LOCATION	16	SBI CAT CANYON	0.8250	1.2607	80
YEAR	86		1.9250	1.7417	20
YEAR	87		0.6750	0.6935	20
YEAR	88		0.4750	0.9525	20
YEAR	89		0.2250	0.6172	20
SPECIES	9005	*Cypraea spadicea*	0.1597	0.4819	2680
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	2	SMI HARE ROCK	0.5528	0.8514	180
YEAR	83		0.4750	0.9334	40
YEAR	84		0.5250	0.7506	40
YEAR	85		0.5750	0.7304	20
YEAR	86		0.6750	0.9770	20
YEAR	87		0.5000	0.5130	20
YEAR	88		0.5500	0.9854	20
YEAR	89		0.6750	1.0548	20
LOCATION	3	SRI JOHNSONS LEE NORTH	0.4833	0.6909	180
YEAR	83		0.2250	0.6197	40
YEAR	84		0.5750	0.8130	40
YEAR	85		0.8000	0.8491	20
YEAR	86		0.3500	0.5155	20
YEAR	87		0.3750	0.4552	20
YEAR	88		0.6750	0.6742	20
YEAR	89		0.5500	0.6048	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.3306	0.5913	180
YEAR	83		0.2000	0.5164	40
YEAR	84		0.2000	0.6076	40
YEAR	85		0.7000	0.8335	20
YEAR	86		0.6000	0.7182	20
YEAR	87		0.3250	0.4375	20
YEAR	88		0.2750	0.3796	20
YEAR	89		0.2750	0.3796	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	5	SRI RODES REEF	0.0375	0.1541	160
YEAR	82		0.0000	0.0000	20
YEAR	83		0.0000	0.0000	20
YEAR	84		0.0000	0.0000	20
YEAR	85		0.0750	0.1832	20
YEAR	86		0.1000	0.2616	20
YEAR	87		0.0750	0.2447	20
YEAR	88		0.0250	0.1118	20
YEAR	89		0.0250	0.1118	20
LOCATION	6	SCI GULL ISLAND SOUTH	0.4472	0.7081	180
YEAR	83		0.3500	0.6998	40
YEAR	84		0.2750	0.5986	40
YEAR	85		0.2500	0.4730	20
YEAR	86		1.0250	0.7860	20
YEAR	87		0.7500	0.7522	20
YEAR	88		0.3500	0.6509	20
YEAR	89		0.4000	0.7539	20
LOCATION	7	SCI FRYS HARBOR	0.1194	0.2864	180
YEAR	83		0.0750	0.2667	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.3250	0.4375	20
YEAR	86		0.2250	0.3432	20
YEAR	87		0.1250	0.2751	20
YEAR	88		0.1500	0.2351	20
YEAR	89		0.0500	0.2236	20
LOCATION	8	SCI PELICAN BAY	0.0306	0.1918	180
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.1500	0.4617	20
YEAR	87		0.0250	0.1118	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0500	0.2236	20
LOCATION	9	SCI SCORPION ANCHORAGE	0.0444	0.2321	180
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0250	0.1118	20
YEAR	86		0.0500	0.2236	20
YEAR	87		0.0250	0.1118	20
YEAR	88		0.0250	0.1118	20
YEAR	89		0.2750	0.5955	20
LOCATION	10	SCI YELLOW BANKS	0.0188	0.1677	80
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0750	0.3354	20
LOCATION	11	ANI ADMIRALS REEF	0.0381	0.2098	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0750	0.3499	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0250	0.1118	20
YEAR	88		0.2000	0.4104	20
YEAR	89		0.0250	0.1118	20

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	12	ANI CATHEDRAL COVE	0.1500	0.7703	100
YEAR	85		0.0750	0.1832	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.0250	0.1118	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.6250	1.6533	20
LOCATION	13	ANI LANDING COVE	0.0500	0.2121	180
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0500	0.3162	40
YEAR	85		0.0250	0.1118	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.1250	0.3193	20
YEAR	88		0.1250	0.2221	20
YEAR	89		0.0500	0.1539	20
LOCATION	14	SBI SOUTHEAST SEALION	0.0722	0.2122	180
YEAR	83		0.0250	0.1581	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0500	0.1539	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.1500	0.2856	20
YEAR	88		0.1750	0.2447	20
YEAR	89		0.1500	0.3285	20
LOCATION	15	SBI ARCH POINT	0.0611	0.4717	180
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.3000	1.3416	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.1250	0.3582	20
YEAR	88		0.1000	0.2616	20
YEAR	89		0.0250	0.1118	20
LOCATION	16	SBI CAT CANYON	0.0250	0.1097	80
YEAR	86		0.0250	0.1118	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0750	0.1832	20
YEAR	89		0.0000	0.0000	20
SPECIES	9007	*Astraea undosa*	0.9092	1.9217	3100
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	190
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	2	SMI HARE ROCK	0.0762	0.3743	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.1000	0.3789	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.2000	0.4702	20
YEAR	86		0.3250	0.9216	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0250	0.1118	20
YEAR	89		0.0000	0.0000	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0909	0.3681	220
YEAR	82		0.0000	0.0000	40
YEAR	83		0.0500	0.3162	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.5000	0.8885	20
YEAR	86		0.3250	0.4667	20
YEAR	87		0.0250	0.1118	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0000	0.0000	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	5	SRI RODES REEF	0.0222	0.1161	180
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.1250	0.2221	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0250	0.1118	20
YEAR	89		0.0000	0.0000	20
LOCATION	6	SCI GULL ISLAND SOUTH	0.2976	0.6095	210
YEAR	82		0.1667	0.4611	30
YEAR	83		0.3750	0.7048	40
YEAR	84		0.4000	0.8712	40
YEAR	85		0.3500	0.5155	20
YEAR	86		0.3000	0.3770	20
YEAR	87		0.5750	0.6340	20
YEAR	88		0.1000	0.3078	20
YEAR	89		0.0000	0.0000	20
LOCATION	7	SCI FRYS HARBOR	0.7810	1.2236	210
YEAR	82		0.3667	0.6687	30
YEAR	83		0.1750	0.3848	40
YEAR	84		0.7500	1.2760	40
YEAR	85		1.1250	1.2126	20
YEAR	86		2.2000	1.6575	20
YEAR	87		0.8500	0.9333	20
YEAR	88		1.1750	1.7492	20
YEAR	89		0.4500	0.6469	20
LOCATION	8	SCI PELICAN BAY	2.4619	2.1131	210
YEAR	82		0.6667	1.0933	30
YEAR	83		1.5000	1.1323	40
YEAR	84		2.4250	1.7815	40
YEAR	85		1.7500	1.1865	20
YEAR	86		4.2750	1.9227	20
YEAR	87		5.2250	2.3140	20
YEAR	88		3.2750	2.0931	20
YEAR	89		2.4750	1.8812	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	9	SCI SCORPION ANCHORAGE	2.3190	2.3418	210
YEAR	82		1.1667	1.7036	30
YEAR	83		0.5500	0.9858	40
YEAR	84		1.4750	1.3772	40
YEAR	85		2.4750	1.6422	20
YEAR	86		3.9500	1.8057	20
YEAR	87		4.0250	2.1913	20
YEAR	88		4.4000	3.0848	20
YEAR	89		3.7000	2.6626	20
LOCATION	10	SCI YELLOW BANKS	0.8500	1.2232	80
YEAR	86		1.4250	1.5155	20
YEAR	87		0.5250	0.6172	20
YEAR	88		0.5000	0.7255	20
YEAR	89		0.9500	1.5551	20
LOCATION	11	ANI ADMIRALS REEF	0.0571	0.2222	210
YEAR	82		0.1000	0.3051	30
YEAR	83		0.0500	0.2207	40
YEAR	84		0.0500	0.2207	40
YEAR	85		0.0750	0.2447	20
YEAR	86		0.0500	0.2236	20
YEAR	87		0.0750	0.1832	20
YEAR	88		0.0500	0.2236	20
YEAR	89		0.0000	0.0000	20
LOCATION	12	ANI CATHEDRAL COVE	1.9262	2.7405	210
YEAR	82		0.3000	0.5960	30
YEAR	83		0.2250	0.4229	40
YEAR	84		0.6250	1.0048	40
YEAR	85		0.8500	1.1482	20
YEAR	86		4.4500	2.9375	20
YEAR	87		5.0750	3.2374	20
YEAR	88		3.5250	2.8538	20
YEAR	89		4.1750	3.2938	20
LOCATION	13	ANI LANDING COVE	0.9357	1.5734	210
YEAR	82		0.3333	0.6065	30
YEAR	83		0.2000	0.5164	40
YEAR	84		0.4500	1.2393	40
YEAR	85		1.1000	2.1921	20
YEAR	86		1.2250	1.4000	20
YEAR	87		2.1250	2.4914	20
YEAR	88		2.3000	1.6654	20
YEAR	89		1.2750	1.1525	20
LOCATION	14	SBI SOUTHEAST SEALION	0.7524	1.6980	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.3250	0.6155	40
YEAR	85		3.8250	3.3728	20
YEAR	86		2.0000	2.0964	20
YEAR	87		0.6500	0.6304	20
YEAR	88		0.5250	0.4723	20
YEAR	89		0.2500	0.4136	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	15	SBI ARCH POINT	2.8786	3.7497	210
YEAR	82		1.8000	1.5177	30
YEAR	83		0.4500	1.1536	40
YEAR	84		3.9250	3.7306	40
YEAR	85		5.7250	3.2666	20
YEAR	86		5.3250	5.0322	20
YEAR	87		5.6000	5.8683	20
YEAR	88		1.2750	1.0321	20
YEAR	89		0.8500	1.4609	20
LOCATION	16	SBI CAT CANYON	1.0188	1.4462	80
YEAR	86		0.8750	0.8717	20
YEAR	87		1.5250	2.0422	20
YEAR	88		0.6000	0.6996	20
YEAR	89		1.0750	1.6723	20
SPECIES	9008	*Astraea gibberosa*	0.2295	0.4706	61
LOCATION	1	SMI WYCKOFF LEDGE	0.3000	0.5231	20
YEAR	85		0.3000	0.5231	20
LOCATION	2	SMI HARE ROCK	0.3250	0.5684	20
YEAR	86		0.3250	0.5684	20
LOCATION	5	SRI RODES REEF	0.0714	0.2390	21
YEAR	85		1.0000	0.0000	1
YEAR	86		0.0250	0.1118	20
SPECIES	11001	*Patiria miniata*	0.5880	1.7204	3119
LOCATION	1	SMI WYCKOFF LEDGE	1.1286	1.3387	210
YEAR	82		1.6000	2.2834	30
YEAR	83		1.4500	1.2598	40
YEAR	84		0.7000	1.1368	40
YEAR	85		0.7750	0.6584	20
YEAR	86		1.2750	1.2924	20
YEAR	87		0.9250	0.8926	20
YEAR	88		1.0750	1.0915	20
YEAR	89		1.1000	0.7712	20
LOCATION	2	SMI HARE ROCK	3.0262	4.1753	210
YEAR	82		8.4333	5.8113	30
YEAR	83		6.1250	4.1522	40
YEAR	84		0.3500	0.5796	40
YEAR	85		0.4500	0.6048	20
YEAR	86		1.1500	0.8288	20
YEAR	87		1.1500	0.8127	20
YEAR	88		1.5750	1.0548	20
YEAR	89		1.8500	1.3387	20
LOCATION	3	SRI JOHNSONS LEE NORTH	0.5614	1.2586	220
YEAR	82		2.6250	1.7641	40
YEAR	83		0.0750	0.2667	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0250	0.1118	20
YEAR	86		0.1250	0.5590	20
YEAR	87		0.1750	0.3726	20
YEAR	88		0.2000	0.2991	20
YEAR	89		0.2000	0.3403	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	4	SRI JOHNSONS LEE SOUTH	2.2119	2.9638	210
YEAR	82		6.1667	3.8871	30
YEAR	83		3.2000	3.4803	40
YEAR	84		0.4500	0.9594	40
YEAR	85		0.8750	0.7048	20
YEAR	86		0.8500	1.0400	20
YEAR	87		2.2750	1.2191	20
YEAR	88		1.0500	1.0501	20
YEAR	89		1.6250	1.9322	20
LOCATION	5	SRI RODES REEF	1.0391	1.3455	179
YEAR	83		0.9250	1.1851	40
YEAR	84		0.5750	1.5506	40
YEAR	85		0.2895	0.4508	19
YEAR	86		0.7500	0.8660	20
YEAR	87		0.9500	0.6863	20
YEAR	88		1.7750	1.4553	20
YEAR	89		2.5500	1.2237	20
LOCATION	6	SCI GULL ISLAND SOUTH	0.4429	0.8410	210
YEAR	82		0.7333	0.9444	30
YEAR	83		0.1250	0.3349	40
YEAR	84		0.0500	0.2207	40
YEAR	85		0.1750	0.2447	20
YEAR	86		0.3000	0.3770	20
YEAR	87		0.7000	0.6156	20
YEAR	88		0.5000	0.4588	20
YEAR	89		1.5250	1.7953	20
LOCATION	7	SCI FRYS HARBOR	0.1095	0.3014	210
YEAR	82		0.0667	0.2537	30
YEAR	83		0.0250	0.1581	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0250	0.1118	20
YEAR	86		0.1500	0.2351	20
YEAR	87		0.1000	0.2052	20
YEAR	88		0.2000	0.3770	20
YEAR	89		0.4750	0.5955	20
LOCATION	8	SCI PELICAN BAY	0.0286	0.1520	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.1500	0.3663	20
YEAR	88		0.0250	0.1118	20
YEAR	89		0.1000	0.2616	20
LOCATION	9	SCI SCORPION ANCHORAGE	0.0119	0.0764	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0250	0.1118	20
YEAR	88		0.0750	0.1832	20
YEAR	89		0.0250	0.1118	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	10	SCI YELLOW BANKS	0.0375	0.1546	80
YEAR	86		0.0250	0.1118	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0750	0.2447	20
YEAR	89		0.0500	0.1539	20
LOCATION	11	ANI ADMIRALS REEF	0.1619	0.4536	210
YEAR	82		0.0667	0.2537	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.1000	0.2052	20
YEAR	87		0.2250	0.3796	20
YEAR	88		0.8250	1.0166	20
YEAR	89		0.4000	0.4757	20
LOCATION	12	ANI CATHEDRAL COVE	0.0429	0.2357	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0250	0.1118	20
YEAR	88		0.1000	0.2616	20
YEAR	89		0.2750	0.6382	20
LOCATION	13	ANI LANDING COVE	0.0071	0.0770	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0250	0.1118	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	14	SBI SOUTHEAST SEALION	0.0310	0.2022	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.1750	0.5911	20
YEAR	89		0.1250	0.2221	20
LOCATION	15	SBI ARCH POINT	0.0381	0.2416	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.0250	0.1118	20
YEAR	88		0.3500	0.7090	20
YEAR	89		0.0000	0.0000	20
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	80
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20

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Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	11002	*Pisaster giganteus*	0.1670	0.4612	3120
LOCATION	1	SMI WYCKOFF LEDGE	0.2167	0.4959	210
YEAR	82		0.2333	0.5040	30
YEAR	83		0.2000	0.4641	40
YEAR	84		0.1250	0.3349	40
YEAR	85		0.1000	0.2616	20
YEAR	86		0.1750	0.4667	20
YEAR	87		0.2250	0.4435	20
YEAR	88		0.2750	0.7860	20
YEAR	89		0.5000	0.6489	20
LOCATION	2	SMI HARE ROCK	0.4095	0.7971	210
YEAR	82		0.1667	0.7466	30
YEAR	83		0.2000	0.5164	40
YEAR	84		0.2250	0.5305	40
YEAR	85		0.0750	0.1832	20
YEAR	86		0.5750	0.7122	20
YEAR	87		0.8250	1.0036	20
YEAR	88		0.5250	0.5730	20
YEAR	89		1.2000	1.3707	20
LOCATION	3	SRI JOHNSONS LEE NORTH	0.4091	0.6747	220
YEAR	82		0.5500	0.7143	40
YEAR	83		0.1000	0.3038	40
YEAR	84		0.1250	0.3349	40
YEAR	85		0.0500	0.1539	20
YEAR	86		0.0500	0.1539	20
YEAR	87		1.0000	0.8885	20
YEAR	88		0.6250	0.7048	20
YEAR	89		1.2250	0.8025	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.2500	0.4848	210
YEAR	82		0.1667	0.4611	30
YEAR	83		0.2000	0.4641	40
YEAR	84		0.1500	0.3616	40
YEAR	85		0.0750	0.3354	20
YEAR	86		0.5250	0.4993	20
YEAR	87		0.3250	0.6544	20
YEAR	88		0.4250	0.5684	20
YEAR	89		0.3250	0.4940	20
LOCATION	5	SRI RODES REEF	0.4306	0.8063	180
YEAR	83		0.2750	0.6400	40
YEAR	84		0.1250	0.3349	40
YEAR	85		0.1250	0.2751	20
YEAR	86		1.2750	1.4371	20
YEAR	87		0.5000	0.5620	20
YEAR	88		0.4750	0.6781	20
YEAR	89		0.7000	0.9787	20
LOCATION	6	SCI GULL ISLAND SOUTH	0.3452	0.5522	210
YEAR	82		0.2667	0.5208	30
YEAR	83		0.1750	0.3848	40
YEAR	84		0.2750	0.4522	40
YEAR	85		0.2250	0.3796	20
YEAR	86		0.4250	0.5447	20
YEAR	87		0.7000	0.5938	20
YEAR	88		0.5000	0.6882	20
YEAR	89		0.4750	0.8188	20

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	0.1452	0.3156	210
YEAR	82		0.1667	0.3790	30
YEAR	83		0.1000	0.3038	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.1000	0.2616	20
YEAR	86		0.1250	0.2221	20
YEAR	87		0.3500	0.4323	20
YEAR	88		0.3000	0.4104	20
YEAR	89		0.2000	0.2991	20
LOCATION	8	SCI PELICAN BAY	0.0214	0.1410	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0250	0.1118	20
YEAR	88		0.0250	0.1118	20
YEAR	89		0.1250	0.3582	20
LOCATION	9	SCI SCORPION ANCHORAGE	0.0310	0.1629	210
YEAR	82		0.0667	0.2537	30
YEAR	83		0.0750	0.2667	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0250	0.1118	20
YEAR	89		0.0250	0.1118	20
LOCATION	10	SCI YELLOW BANKS	0.1188	0.3106	80
YEAR	86		0.0750	0.2447	20
YEAR	87		0.0500	0.1539	20
YEAR	88		0.0500	0.1539	20
YEAR	89		0.3000	0.4974	20
LOCATION	11	ANI ADMIRALS REEF	0.0143	0.0968	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0500	0.1539	20
YEAR	88		0.0500	0.1539	20
YEAR	89		0.0000	0.0000	20
LOCATION	12	ANI CATHEDRAL COVE	0.0048	0.0690	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0500	0.2236	20
YEAR	89		0.0000	0.0000	20

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	13	ANI LANDING COVE	0.0071	0.0770	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0250	0.1581	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0250	0.1118	20
LOCATION	14	SBI SOUTHEAST SEALION	0.1024	0.3136	210
YEAR	82		0.1667	0.4611	30
YEAR	83		0.1250	0.4043	40
YEAR	84		0.0750	0.2667	40
YEAR	85		0.0750	0.2447	20
YEAR	86		0.0750	0.1832	20
YEAR	87		0.1000	0.2616	20
YEAR	88		0.0750	0.1832	20
YEAR	89		0.1000	0.2616	20
LOCATION	15	SBI ARCH POINT	0.0238	0.1363	210
YEAR	82		0.0333	0.1826	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0500	0.2207	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.0250	0.1118	20
YEAR	88		0.0500	0.1539	20
YEAR	89		0.0000	0.0000	20
LOCATION	16	SBI CAT CANYON	0.1000	0.2164	80
YEAR	86		0.0250	0.1118	20
YEAR	87		0.1750	0.2936	20
YEAR	88		0.0750	0.1832	20
YEAR	89		0.1250	0.2221	20
SPECIES	11004	*Lytechinus anamesus*	21.0317	35.0277	300
LOCATION	5	SRI RODES REEF	7.2000	11.8371	20
YEAR	86		7.2000	11.8371	20
LOCATION	6	SCI GULL ISLAND SOUTH	4.3750	7.2871	20
YEAR	86		4.3750	7.2871	20
LOCATION	8	SCI PELICAN BAY	9.8500	12.9778	20
YEAR	87		9.8500	12.9778	20
LOCATION	10	SCI YELLOW BANKS	30.7063	34.7276	80
YEAR	86		35.3250	39.7897	20
YEAR	87		39.9000	33.7793	20
YEAR	88		32.9750	39.6174	20
YEAR	89		14.6250	18.2092	20
LOCATION	11	ANI ADMIRALS REEF	29.6813	51.8563	80
YEAR	86		33.1250	58.6030	20
YEAR	87		32.5500	54.6510	20
YEAR	88		38.4000	62.9500	20
YEAR	89		14.6500	21.4047	20
LOCATION	14	SBI SOUTHEAST SEALION	12.2250	12.3496	40
YEAR	86		8.8750	6.8573	20
YEAR	89		15.5750	15.5693	20

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	11005	*S. franciscanus*	3.8429	4.8866	3120
LOCATION	1	SMI WYCKOFF LEDGE	1.3000	3.8076	210
YEAR	82		0.5667	2.3442	30
YEAR	83		0.7500	2.5090	40
YEAR	84		0.3000	1.0427	40
YEAR	85		1.4500	3.2032	20
YEAR	86		3.0500	5.2287	20
YEAR	87		1.7500	5.3644	20
YEAR	88		1.8250	4.1716	20
YEAR	89		2.6250	6.5552	20
LOCATION	2	SMI HARE ROCK	9.0524	7.6828	210
YEAR	82		8.1000	13.5605	30
YEAR	83		6.4500	5.8087	40
YEAR	84		6.3750	4.0553	40
YEAR	85		9.5250	3.9785	20
YEAR	86		14.6750	7.9955	20
YEAR	87		10.6000	5.7734	20
YEAR	88		10.6000	7.2956	20
YEAR	89		11.8500	4.6597	20
LOCATION	3	SRI JOHNSONS LEE NORTH	2.7386	4.1698	220
YEAR	82		4.5750	6.6867	40
YEAR	83		1.8250	4.4427	40
YEAR	84		2.3250	3.6260	40
YEAR	85		3.4000	2.0039	20
YEAR	86		2.7750	2.0292	20
YEAR	87		2.4250	2.3967	20
YEAR	88		1.5250	2.2796	20
YEAR	89		2.5500	3.2683	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	3.8286	5.5102	210
YEAR	82		2.2000	5.3717	30
YEAR	83		2.4500	5.7287	40
YEAR	84		3.9500	5.4676	40
YEAR	85		6.8750	5.5911	20
YEAR	86		9.1000	5.0487	20
YEAR	87		3.4250	3.6465	20
YEAR	88		2.7000	5.0975	20
YEAR	89		2.0000	3.5946	20
LOCATION	5	SRI RODES REEF	5.6722	5.6334	180
YEAR	83		3.5250	4.2122	40
YEAR	84		5.7000	6.3213	40
YEAR	85		8.3000	6.8890	20
YEAR	86		9.9500	4.4982	20
YEAR	87		5.9500	4.5909	20
YEAR	88		4.4500	4.4748	20
YEAR	89		3.9500	5.5438	20
LOCATION	6	SCI GULL ISLAND SOUTH	6.0119	6.0021	210
YEAR	82		5.8000	5.2941	30
YEAR	83		3.6500	3.9324	40
YEAR	84		6.7000	6.0941	40
YEAR	85		12.8750	7.5566	20
YEAR	86		11.0750	6.6060	20
YEAR	87		5.5250	3.8848	20
YEAR	88		2.5500	2.5335	20
YEAR	89		1.7000	1.2074	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	2.2333	2.0735	210
YEAR	82		1.9667	2.2967	30
YEAR	83		2.5250	2.3749	40
YEAR	84		1.7750	2.1302	40
YEAR	85		2.3250	1.2384	20
YEAR	86		3.3500	2.6112	20
YEAR	87		2.6500	1.8071	20
YEAR	88		1.8250	1.1840	20
YEAR	89		1.7500	1.6343	20
LOCATION	8	SCI PELICAN BAY	3.1214	3.4514	210
YEAR	82		3.0667	4.2825	30
YEAR	83		3.0250	3.7926	40
YEAR	84		3.9000	4.0307	40
YEAR	85		3.3250	2.2727	20
YEAR	86		4.9250	3.7776	20
YEAR	87		2.3500	1.8432	20
YEAR	88		1.2750	1.1525	20
YEAR	89		2.4500	2.5593	20
LOCATION	9	SCI SCORPION ANCHORAGE	2.5667	2.8821	210
YEAR	82		2.4333	3.6548	30
YEAR	83		2.3250	2.8138	40
YEAR	84		2.2250	2.5868	40
YEAR	85		2.6750	3.1717	20
YEAR	86		5.4500	3.4101	20
YEAR	87		3.2500	1.1180	20
YEAR	88		0.7000	0.5938	20
YEAR	89		2.1250	2.0447	20
LOCATION	10	SCI YELLOW BANKS	1.9000	3.3644	80
YEAR	86		3.9250	5.6272	20
YEAR	87		1.5000	1.7918	20
YEAR	88		1.4750	2.3366	20
YEAR	89		0.7000	0.7327	20
LOCATION	11	ANI ADMIRALS REEF	4.8190	3.8832	210
YEAR	82		3.3000	3.6213	30
YEAR	83		2.8750	2.7192	40
YEAR	84		4.5500	4.3733	40
YEAR	85		5.4750	2.7313	20
YEAR	86		5.7250	3.8712	20
YEAR	87		6.3000	2.7116	20
YEAR	88		6.7500	4.3905	20
YEAR	89		6.5500	4.4601	20
LOCATION	12	ANI CATHEDRAL COVE	4.4238	4.2605	210
YEAR	82		5.5000	4.7904	30
YEAR	83		4.1000	5.6831	40
YEAR	84		4.6750	5.4977	40
YEAR	85		4.9250	2.9347	20
YEAR	86		3.2500	1.8813	20
YEAR	87		3.8000	2.0417	20
YEAR	88		4.7000	3.1179	20
YEAR	89		3.9750	2.3813	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	13	ANI LANDING COVE	2.3048	2.9040	210
YEAR	82		1.7333	2.8276	30
YEAR	83		2.2750	3.2737	40
YEAR	84		2.2250	2.9395	40
YEAR	85		2.4250	2.9167	20
YEAR	86		1.9000	2.1497	20
YEAR	87		2.3750	2.9149	20
YEAR	88		3.0250	2.8399	20
YEAR	89		2.8750	3.0859	20
LOCATION	14	SBI SOUTHEAST SEALION	5.0024	5.3862	210
YEAR	82		5.5667	6.9465	30
YEAR	83		8.2500	6.6824	40
YEAR	84		5.5750	4.4715	40
YEAR	85		4.6750	3.2978	20
YEAR	86		5.4500	5.3702	20
YEAR	87		3.2000	3.2703	20
YEAR	88		1.7500	2.4198	20
YEAR	89		1.4500	2.2237	20
LOCATION	15	SBI ARCH POINT	2.7119	3.4380	210
YEAR	82		2.8667	5.4692	30
YEAR	83		2.3750	3.1678	40
YEAR	84		2.9250	3.5976	40
YEAR	85		3.3000	3.3380	20
YEAR	86		3.2500	3.3580	20
YEAR	87		3.1750	2.3242	20
YEAR	88		1.6750	1.4714	20
YEAR	89		2.1750	2.1230	20
LOCATION	16	SBI CAT CANYON	2.1625	1.9222	80
YEAR	86		1.4500	1.5295	20
YEAR	87		1.7500	1.8101	20
YEAR	88		2.6750	1.7112	20
YEAR	89		2.7750	2.3310	20
SPECIES	11006	*S. purpuratus*	16.8058	29.4495	3120
LOCATION	1	SMI WYCKOFF LEDGE	0.3643	1.2196	210
YEAR	82		0.1000	0.5477	30
YEAR	83		0.0500	0.3162	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.6000	1.1653	20
YEAR	86		1.8500	3.0092	20
YEAR	87		0.3500	0.7797	20
YEAR	88		0.3250	0.7122	20
YEAR	89		0.4500	1.0870	20
LOCATION	2	SMI HARE ROCK	12.5667	19.6355	210
YEAR	82		10.9333	19.6081	30
YEAR	83		5.4000	7.9994	40
YEAR	84		9.3000	11.1797	40
YEAR	85		13.4750	15.1314	20
YEAR	86		44.0000	34.4273	20
YEAR	87		15.5750	20.3038	20
YEAR	88		8.2000	10.9969	20
YEAR	89		4.9000	7.1958	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	3	SRI JOHNSONS LEE NORTH	23.1500	26.8673	220
YEAR	82		18.0500	16.7622	40
YEAR	83		21.0250	29.9773	40
YEAR	84		26.2250	38.5550	40
YEAR	85		43.8750	22.0053	20
YEAR	86		39.9000	11.5492	20
YEAR	87		35.3000	17.4404	20
YEAR	88		1.4250	3.9546	20
YEAR	89		3.5500	4.7041	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	8.7619	10.2310	210
YEAR	82		6.1667	7.4975	30
YEAR	83		4.5500	5.4347	40
YEAR	84		7.2750	5.1540	40
YEAR	85		14.6250	8.8850	20
YEAR	86		27.2000	13.9929	20
YEAR	87		7.1750	9.8452	20
YEAR	88		0.8000	1.7122	20
YEAR	89		9.3000	7.7126	20
LOCATION	5	SRI RODES REEF	5.8278	9.1917	180
YEAR	83		2.4750	4.2966	40
YEAR	84		4.3000	7.8518	40
YEAR	85		6.7250	8.1652	20
YEAR	86		21.0750	12.8322	20
YEAR	87		7.3750	5.1424	20
YEAR	88		0.4500	0.7416	20
YEAR	89		3.2750	7.6956	20
LOCATION	6	SCI GULL ISLAND SOUTH	30.0429	38.4459	210
YEAR	82		8.8000	14.1407	30
YEAR	83		9.8000	14.3852	40
YEAR	84		4.8750	8.6415	40
YEAR	85		27.1000	26.1778	20
YEAR	86		68.6750	62.7120	20
YEAR	87		54.0000	28.0052	20
YEAR	88		51.1750	39.4613	20
YEAR	89		71.9500	31.6938	20
LOCATION	7	SCI FRYS HARBOR	2.9214	5.8970	210
YEAR	82		1.3333	2.3829	30
YEAR	83		0.3500	0.8022	40
YEAR	84		0.5000	1.2403	40
YEAR	85		0.3500	0.6509	20
YEAR	86		5.6000	5.5265	20
YEAR	87		7.1500	12.2217	20
YEAR	88		5.9250	7.2444	20
YEAR	89		7.9500	6.0717	20
LOCATION	8	SCI PELICAN BAY	8.3786	9.6960	210
YEAR	82		3.9333	5.5952	30
YEAR	83		4.9000	7.0993	40
YEAR	84		6.4250	8.7819	40
YEAR	85		10.6750	9.4455	20
YEAR	86		15.7000	10.3890	20
YEAR	87		16.2000	14.9335	20
YEAR	88		8.5500	7.8033	20
YEAR	89		8.3000	7.2410	20

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	9	SCI SCORPION ANCHORAGE	25.7476	27.7304	210
YEAR	82		3.4667	3.7021	30
YEAR	83		8.6750	13.2033	40
YEAR	84		7.2000	8.9362	40
YEAR	85		8.2000	6.4531	20
YEAR	86		64.7000	24.4946	20
YEAR	87		57.9500	13.6564	20
YEAR	88		46.5500	15.5766	20
YEAR	89		56.0000	17.0842	20
LOCATION	10	SCI YELLOW BANKS	18.5813	18.2669	80
YEAR	86		21.7250	19.9727	20
YEAR	87		22.7250	19.4304	20
YEAR	88		9.3750	8.6646	20
YEAR	89		20.5000	20.3547	20
LOCATION	11	ANI ADMIRALS REEF	3.1857	3.8337	210
YEAR	82		3.3333	3.2835	30
YEAR	83		1.5250	2.2302	40
YEAR	84		1.4750	2.7362	40
YEAR	85		2.2000	3.0625	20
YEAR	86		4.4500	4.0062	20
YEAR	87		5.2500	5.4205	20
YEAR	88		4.9250	3.5254	20
YEAR	89		5.6250	4.8744	20
LOCATION	12	ANI CATHEDRAL COVE	2.3881	4.9520	210
YEAR	82		2.1000	3.1332	30
YEAR	83		0.8000	1.6672	40
YEAR	84		1.3750	2.3170	40
YEAR	85		2.2500	2.4089	20
YEAR	86		5.6000	8.4442	20
YEAR	87		1.9000	2.1374	20
YEAR	88		2.2500	3.6001	20
YEAR	89		5.5750	10.6750	20
LOCATION	13	ANI LANDING COVE	0.9310	1.7400	210
YEAR	82		0.6667	1.6678	30
YEAR	83		0.8750	2.1145	40
YEAR	84		0.2250	0.5305	40
YEAR	85		0.4000	0.5026	20
YEAR	86		0.9250	1.4534	20
YEAR	87		1.3000	2.2088	20
YEAR	88		2.0000	1.7396	20
YEAR	89		1.9500	2.2647	20
LOCATION	14	SBI SOUTHEAST SEALION	44.4143	46.8265	210
YEAR	82		15.9000	17.7809	30
YEAR	83		14.1250	15.2032	40
YEAR	84		10.0250	12.2506	40
YEAR	85		27.4250	13.8747	20
YEAR	86		96.7500	35.0163	20
YEAR	87		76.1000	46.7118	20
YEAR	88		98.5750	40.9596	20
YEAR	89		95.3500	42.5324	20

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	15	SBI ARCH POINT	50.1095	48.5532	210
YEAR	82		46.9667	38.7596	30
YEAR	83		36.2500	29.4512	40
YEAR	84		5.3500	8.5171	40
YEAR	85		30.6000	20.3377	20
YEAR	86		154.3000	39.0140	20
YEAR	87		70.6250	28.9845	20
YEAR	88		51.1000	23.3185	20
YEAR	89		65.8750	34.9081	20
LOCATION	16	SBI CAT CANYON	34.5000	24.9716	80
YEAR	86		11.9250	15.0624	20
YEAR	87		31.4750	26.2941	20
YEAR	88		50.7250	23.2019	20
YEAR	89		43.8750	14.8491	20
SPECIES	11007	*Parastichopus parvamensis*	0.6628	0.9965	3120
LOCATION	1	SMI WYCKOFF LEDGE	0.2048	0.4949	210
YEAR	82		0.0333	0.1826	30
YEAR	83		0.1750	0.4465	40
YEAR	84		0.3250	0.7642	40
YEAR	85		0.2250	0.4128	20
YEAR	86		0.2250	0.4128	20
YEAR	87		0.2250	0.4128	20
YEAR	88		0.2000	0.4413	20
YEAR	89		0.2250	0.4993	20
LOCATION	2	SMI HARE ROCK	0.1738	0.3521	210
YEAR	82		0.0333	0.1826	30
YEAR	83		0.1250	0.3349	40
YEAR	84		0.2000	0.4641	40
YEAR	85		0.2750	0.3432	20
YEAR	86		0.2750	0.4128	20
YEAR	87		0.0750	0.1832	20
YEAR	88		0.3000	0.3770	20
YEAR	89		0.2000	0.2991	20
LOCATION	3	SRI JOHNSONS LEE NORTH	0.4955	0.8290	220
YEAR	82		0.7250	1.0857	40
YEAR	83		0.3000	0.8829	40
YEAR	84		0.2000	0.4641	40
YEAR	85		0.4750	0.8188	20
YEAR	86		0.6250	0.7587	20
YEAR	87		0.6250	0.7587	20
YEAR	88		0.4000	0.5982	20
YEAR	89		0.8750	0.8410	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.1524	0.3501	210
YEAR	82		0.0667	0.2537	30
YEAR	83		0.0500	0.3162	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.3250	0.4064	20
YEAR	86		0.4250	0.4667	20
YEAR	87		0.2000	0.3770	20
YEAR	88		0.1750	0.4064	20
YEAR	89		0.2750	0.3796	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	5	SRI RODES REEF	0.0278	0.1469	180
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0500	0.2207	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0750	0.1832	20
YEAR	87		0.0500	0.2236	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0250	0.1118	20
LOCATION	6	SCI GULL ISLAND SOUTH	0.8667	0.9529	210
YEAR	82		0.4333	0.7739	30
YEAR	83		0.4750	0.7506	40
YEAR	84		0.5500	0.9044	40
YEAR	85		1.1250	0.7048	20
YEAR	86		1.1250	0.8410	20
YEAR	87		1.6000	1.0712	20
YEAR	88		1.3750	1.1107	20
YEAR	89		1.1750	0.8626	20
LOCATION	7	SCI FRYS HARBOR	2.1238	1.4130	210
YEAR	82		2.1667	1.5105	30
YEAR	83		2.4250	1.6929	40
YEAR	84		2.4250	1.6469	40
YEAR	85		1.8500	1.0650	20
YEAR	86		1.4500	0.7763	20
YEAR	87		1.9250	0.9770	20
YEAR	88		2.1500	1.1251	20
YEAR	89		1.9750	1.4371	20
LOCATION	8	SCI PELICAN BAY	0.8214	1.0085	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		1.2500	1.1712	40
YEAR	85		1.1000	0.9403	20
YEAR	86		0.9750	0.7860	20
YEAR	87		1.1500	0.9191	20
YEAR	88		1.2500	0.8351	20
YEAR	89		1.6500	1.1482	20
LOCATION	9	SCI SCORPION ANCHORAGE	0.6976	0.8655	210
YEAR	82		0.7667	1.2229	30
YEAR	83		0.6500	0.9213	40
YEAR	84		0.2250	0.5768	40
YEAR	85		0.7750	0.8347	20
YEAR	86		0.7000	0.6569	20
YEAR	87		0.7000	0.5938	20
YEAR	88		1.2750	0.7340	20
YEAR	89		0.9750	0.7691	20
LOCATION	10	SCI YELLOW BANKS	0.8875	1.0994	80
YEAR	86		0.6750	0.8315	20
YEAR	87		1.2000	0.9921	20
YEAR	88		1.2250	1.5600	20
YEAR	89		0.4500	0.6669	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	11	ANI ADMIRALS REEF	1.0643	1.1644	210
YEAR	82		1.1333	0.8604	30
YEAR	83		0.7750	1.1873	40
YEAR	84		1.0750	1.6546	40
YEAR	85		0.8500	0.9047	20
YEAR	86		1.6750	1.2277	20
YEAR	87		1.2250	0.9931	20
YEAR	88		1.1000	0.6996	20
YEAR	89		0.9250	0.8926	20
LOCATION	12	ANI CATHEDRAL COVE	1.1119	1.0852	210
YEAR	82		0.2333	0.5040	30
YEAR	83		0.9250	0.9167	40
YEAR	84		1.5000	1.4500	40
YEAR	85		1.6250	1.0622	20
YEAR	86		1.2250	0.7159	20
YEAR	87		1.3250	0.8472	20
YEAR	88		1.0250	0.9525	20
YEAR	89		1.2750	1.1295	20
LOCATION	13	ANI LANDING COVE	0.5548	0.9785	210
YEAR	82		0.7000	1.3933	30
YEAR	83		0.6750	1.3280	40
YEAR	84		0.2000	0.5164	40
YEAR	85		0.0500	0.1539	20
YEAR	86		0.7250	0.8347	20
YEAR	87		0.3000	0.4413	20
YEAR	88		0.8750	0.6664	20
YEAR	89		1.0750	0.9770	20
LOCATION	14	SBI SOUTHEAST SEALION	0.8524	0.8269	210
YEAR	82		0.6333	0.8087	30
YEAR	83		0.7500	0.8697	40
YEAR	84		0.9500	0.9594	40
YEAR	85		1.0500	0.9018	20
YEAR	86		1.0000	0.6070	20
YEAR	87		0.8000	0.6366	20
YEAR	88		1.0250	0.9244	20
YEAR	89		0.7250	0.6382	20
LOCATION	15	SBI ARCH POINT	0.1762	0.3352	210
YEAR	82		0.1667	0.3790	30
YEAR	83		0.0500	0.2207	40
YEAR	84		0.1250	0.3349	40
YEAR	85		0.2750	0.3432	20
YEAR	86		0.1500	0.2856	20
YEAR	87		0.3250	0.4375	20
YEAR	88		0.2250	0.3024	20
YEAR	89		0.2750	0.3432	20
LOCATION	16	SBI CAT CANYON	0.2813	0.3802	80
YEAR	86		0.4000	0.4472	20
YEAR	87		0.3000	0.3770	20
YEAR	88		0.2750	0.4128	20
YEAR	89		0.1500	0.2351	20

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Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	12002	*Styela montereyensis*	0.2622	1.6162	2920
LOCATION	1	SMI WYCKOFF LEDGE	0.2476	0.6133	210
YEAR	82		0.1333	0.3457	30
YEAR	83		0.0750	0.2667	40
YEAR	84		0.4500	1.0115	40
YEAR	85		0.3500	0.4894	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.2000	0.3403	20
YEAR	88		0.0500	0.2236	20
YEAR	89		0.7500	0.8660	20
LOCATION	2	SMI HARE ROCK	0.0762	0.3302	210
YEAR	82		0.5000	0.7311	30
YEAR	83		0.0250	0.1581	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	3	SRI JOHNSONS LEE NORTH	0.3205	0.8802	220
YEAR	82		0.4500	1.0365	40
YEAR	83		0.0000	0.0000	40
YEAR	84		0.1500	0.4267	40
YEAR	85		0.4500	1.0625	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.4500	0.6863	20
YEAR	89		1.4250	1.7035	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.4429	0.8252	210
YEAR	82		0.6333	0.8087	30
YEAR	83		0.1500	0.3616	40
YEAR	84		0.8000	1.3048	40
YEAR	85		0.8500	0.7797	20
YEAR	86		0.0500	0.1539	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.1750	0.2936	20
YEAR	89		0.7250	0.8955	20
LOCATION	5	SRI RODES REEF	2.6500	5.7555	180
YEAR	83		0.2750	0.8767	40
YEAR	84		10.0750	8.3709	40
YEAR	85		2.2500	3.5670	20
YEAR	86		0.0500	0.1539	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.1250	0.2751	20
YEAR	89		0.7250	0.7860	20
LOCATION	6	SCI GULL ISLAND SOUTH	0.0050	0.0500	100
YEAR	85		0.0250	0.1118	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	0.0000	0.0000	180
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	8	SCI PELICAN BAY	0.0095	0.1380	210
YEAR	82		0.0667	0.3651	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	9	SCI SCORPION ANCHORAGE	0.0000	0.0000	180
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	10	SCI YELLOW BANKS	0.0375	0.2487	80
YEAR	86		0.0000	0.0000	20
YEAR	87		0.1500	0.4894	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	11	ANI ADMIRALS REEF	0.0857	0.4715	210
YEAR	82		0.6000	1.1326	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	12	ANI CATHEDRAL COVE	0.0028	0.0373	180
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0250	0.1118	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	13	ANI LANDING COVE	0.1429	0.6019	210
YEAR	82		0.7333	1.2015	30
YEAR	83		0.1750	0.7121	40
YEAR	84		0.0250	0.1581	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	210
YEAR	82		0.0000	0.0000	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	15	SBI ARCH POINT	0.0143	0.1189	210
YEAR	82		0.1000	0.3051	30
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	40
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	80
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
SPECIES	14025	*Lythrypnus dalli*	0.2406	0.9058	1600
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	100
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	100
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0000	0.0000	100
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0000	0.0000	100
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	5	SRI RODES REEF	0.0000	0.0000	100
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	6	SCI GULL ISLAND SOUTH	0.6600	1.8462	100
YEAR	85		3.0000	3.2118	20
YEAR	86		0.2250	0.4128	20
YEAR	87		0.0750	0.1832	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	7	SCI FRYS HARBOR	1.8950	1.9750	100
YEAR	85		0.0000	0.0000	20
YEAR	86		2.5500	1.5122	20
YEAR	87		2.3750	1.7612	20
YEAR	88		3.2250	2.5878	20
YEAR	89		1.3250	1.2489	20
LOCATION	8	SCI PELICAN BAY	0.6950	1.1654	100
YEAR	85		0.0000	0.0000	20
YEAR	86		0.9250	1.8868	20
YEAR	87		1.1000	1.0712	20
YEAR	88		1.1000	1.0208	20
YEAR	89		0.3500	0.5405	20
LOCATION	9	SCI SCORPION ANCHORAGE	0.1650	0.5776	100
YEAR	85		0.6750	1.1387	20
YEAR	86		0.0500	0.1539	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.1000	0.2616	20
YEAR	89		0.0000	0.0000	20
LOCATION	10	SCI YELLOW BANKS	0.0063	0.0559	80
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0250	0.1118	20
YEAR	89		0.0000	0.0000	20
LOCATION	11	ANI ADMIRALS REEF	0.1900	0.4912	100
YEAR	85		0.6000	0.8974	20
YEAR	86		0.0500	0.1539	20
YEAR	87		0.2250	0.3432	20
YEAR	88		0.0750	0.2447	20
YEAR	89		0.0000	0.0000	20
LOCATION	12	ANI CATHEDRAL COVE	0.1100	0.3523	100
YEAR	85		0.2000	0.4974	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.3250	0.5447	20
YEAR	89		0.0250	0.1118	20
LOCATION	13	ANI LANDING COVE	0.1300	0.4121	100
YEAR	85		0.2250	0.5955	20
YEAR	86		0.1250	0.4552	20
YEAR	87		0.0500	0.2236	20
YEAR	88		0.1750	0.3726	20
YEAR	89		0.0750	0.3354	20

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	100
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	100
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	80
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
SPECIES	14026	*Coryphopterus nicholsii*	1.1000	2.7486	1600
LOCATION	1	SMI WYCKOFF LEDGE	0.0500	0.1946	100
YEAR	85		0.0250	0.1118	20
YEAR	86		0.0750	0.1832	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0500	0.2236	20
YEAR	89		0.1000	0.3078	20
LOCATION	2	SMI HARE ROCK	0.5950	1.2527	100
YEAR	85		0.0750	0.1832	20
YEAR	86		0.3250	0.6935	20
YEAR	87		0.6000	0.8675	20
YEAR	88		1.9500	2.0641	20
YEAR	89		0.0250	0.1118	20
LOCATION	3	SRI JOHNSONS LEE NORTH	0.1200	0.3701	100
YEAR	85		0.1000	0.2616	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.1750	0.4064	20
YEAR	88		0.2750	0.6382	20
YEAR	89		0.0250	0.1118	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.5400	1.3403	100
YEAR	85		0.0250	0.1118	20
YEAR	86		0.2500	0.4443	20
YEAR	87		0.4000	1.0079	20
YEAR	88		1.5250	2.4251	20
YEAR	89		0.5000	0.9177	20
LOCATION	5	SRI RODES REEF	0.0300	0.1193	100
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.1000	0.2052	20
YEAR	88		0.0500	0.1539	20
YEAR	89		0.0000	0.0000	20

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	6	SCI GULL ISLAND SOUTH	1.1050	1.4307	100
YEAR	85		0.2750	0.3432	20
YEAR	86		0.2750	0.4435	20
YEAR	87		0.5750	0.5200	20
YEAR	88		2.1750	1.6325	20
YEAR	89		2.2250	1.7732	20
LOCATION	7	SCI FRYS HARBOR	1.3750	1.8605	100
YEAR	85		0.1000	0.2616	20
YEAR	86		0.2750	0.5250	20
YEAR	87		0.5750	0.5447	20
YEAR	88		2.0750	1.5583	20
YEAR	89		3.8500	2.0844	20
LOCATION	8	SCI PELICAN BAY	7.4850	7.1292	100
YEAR	85		0.6750	0.5447	20
YEAR	86		3.0000	1.7622	20
YEAR	87		4.1750	2.0018	20
YEAR	88		17.4250	5.1485	20
YEAR	89		12.1500	4.7409	20
LOCATION	9	SCI SCORPION ANCHORAGE	0.6450	1.1039	100
YEAR	85		0.0500	0.1539	20
YEAR	86		0.1000	0.2616	20
YEAR	87		0.1000	0.2616	20
YEAR	88		1.0250	1.0939	20
YEAR	89		1.9500	1.4318	20
LOCATION	10	SCI YELLOW BANKS	1.2000	1.7185	80
YEAR	86		0.1750	0.3354	20
YEAR	87		0.9750	1.0192	20
YEAR	88		3.0000	2.4116	20
YEAR	89		0.6500	0.6509	20
LOCATION	11	ANI ADMIRALS REEF	1.3000	1.8816	100
YEAR	85		0.1000	0.2052	20
YEAR	86		0.1250	0.3193	20
YEAR	87		0.9250	0.9497	20
YEAR	88		3.7000	2.5464	20
YEAR	89		1.6500	1.2680	20
LOCATION	12	ANI CATHEDRAL COVE	1.4150	1.8803	100
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0500	0.1539	20
YEAR	87		0.5000	0.6070	20
YEAR	88		4.1250	1.9322	20
YEAR	89		2.4000	0.7712	20
LOCATION	13	ANI LANDING COVE	0.5700	1.1591	100
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.1000	0.2052	20
YEAR	88		1.5000	1.5131	20
YEAR	89		1.2500	1.5347	20
LOCATION	14	SBI SOUTHEAST SEALION	0.5150	0.9652	100
YEAR	85		0.0500	0.1539	20
YEAR	86		0.1000	0.3479	20
YEAR	87		0.1000	0.2052	20
YEAR	88		1.4500	1.4318	20
YEAR	89		0.8750	0.9851	20
LOCATION	15	SBI ARCH POINT	0.2100	0.6482	100
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0250	0.1118	20
YEAR	88		0.7500	1.2618	20
YEAR	89		0.2750	0.3796	20
LOCATION	16	SBI CAT CANYON	0.1813	0.4587	80
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.3750	0.7759	20
YEAR	89		0.3500	0.3663	20
SPECIES	14027	*Alloclinus holderi*	0.2153	0.4418	1600
LOCATION	1	SMI WYCKOFF LEDGE	0.0550	0.1866	100
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.1500	0.2856	20
YEAR	89		0.1250	0.2751	20
LOCATION	2	SMI HARE ROCK	0.0600	0.1917	100
YEAR	85		0.1000	0.3078	20
YEAR	86		0.0500	0.1539	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0750	0.1832	20
YEAR	89		0.0750	0.1832	20
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0250	0.1095	100
YEAR	85		0.0000	0.0000	20
YEAR	86		0.0250	0.1118	20
YEAR	87		0.0500	0.1539	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0500	0.1539	20
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0500	0.1667	100
YEAR	85		0.0250	0.1118	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.2250	0.3024	20
LOCATION	5	SRI RODES REEF	0.0400	0.1537	100
YEAR	85		0.1000	0.2616	20
YEAR	86		0.0000	0.0000	20
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.1000	0.2052	20
LOCATION	6	SCI GULL ISLAND SOUTH	0.3100	0.4191	100
YEAR	85		0.3250	0.4064	20
YEAR	86		0.2750	0.3796	20
YEAR	87		0.5250	0.5250	20
YEAR	88		0.1500	0.2351	20
YEAR	89		0.2750	0.4435	20

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	0.1700	0.3274	100
YEAR	85		0.2750	0.4993	20
YEAR	86		0.1250	0.2751	20
YEAR	87		0.3000	0.2991	20
YEAR	88		0.1500	0.2856	20
YEAR	89		0.0000	0.0000	20
LOCATION	8	SCI PELICAN BAY	0.1450	0.6447	100
YEAR	85		0.6000	1.3436	20
YEAR	86		0.0500	0.1539	20
YEAR	87		0.0750	0.2447	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0000	0.0000	20
LOCATION	9	SCI SCORPION ANCHORAGE	0.1750	0.3128	100
YEAR	85		0.3750	0.4253	20
YEAR	86		0.3250	0.3726	20
YEAR	87		0.1250	0.2221	20
YEAR	88		0.0500	0.1539	20
YEAR	89		0.0000	0.0000	20
LOCATION	10	SCI YELLOW BANKS	0.0313	0.1218	80
YEAR	86		0.0500	0.1539	20
YEAR	87		0.0250	0.1118	20
YEAR	88		0.0000	0.0000	20
YEAR	89		0.0500	0.1539	20
LOCATION	11	ANI ADMIRALS REEF	0.2350	0.3724	100
YEAR	85		0.4750	0.5250	20
YEAR	86		0.2500	0.3035	20
YEAR	87		0.2500	0.3035	20
YEAR	88		0.2000	0.3770	20
YEAR	89		0.0000	0.0000	20
LOCATION	12	ANI CATHEDRAL COVE	0.3300	0.4726	100
YEAR	85		0.6500	0.6304	20
YEAR	86		0.3750	0.3193	20
YEAR	87		0.3250	0.3354	20
YEAR	88		0.2250	0.5730	20
YEAR	89		0.0750	0.1832	20
LOCATION	13	ANI LANDING COVE	0.1300	0.2525	100
YEAR	85		0.3000	0.3403	20
YEAR	86		0.2000	0.2513	20
YEAR	87		0.1250	0.2751	20
YEAR	88		0.0250	0.1118	20
YEAR	89		0.0000	0.0000	20
LOCATION	14	SBI SOUTHEAST SEALION	0.5600	0.6000	100
YEAR	85		0.5500	0.6469	20
YEAR	86		0.4500	0.6048	20
YEAR	87		0.7500	0.5960	20
YEAR	88		0.5250	0.6584	20
YEAR	89		0.5250	0.4993	20
LOCATION	15	SBI ARCH POINT	0.5500	0.6798	100
YEAR	85		0.6250	0.7759	20
YEAR	86		0.5750	0.4940	20
YEAR	87		0.3750	0.4552	20
YEAR	88		0.3000	0.4413	20
YEAR	89		0.8750	0.9716	20
LOCATION	16	SBI CAT CANYON	0.5125	0.6263	80
YEAR	86		0.6000	0.6407	20
YEAR	87		0.7250	0.8955	20

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	88		0.2750	0.3024	20
YEAR	89		0.4500	0.4560	20

Appendix 2. 1982-1989 Kelp Forest Monitoring Data - Band Transects

Introduction.

Following are summaries of data gathered during band transect counts from 1982-1989 for all kelp forest monitoring program sampling sites. Band transect sampling as a standard procedure started in 1983. Means, standard deviations and total number of samples (cases) are given. Data were summarized with SPSSPC+ programs from translated dBase III+ files. (Readers should be aware that the number of significant digits is an artifact of the database program and does not imply this level of precision.) For details of methods and data management, refer to the monitoring handbook (Davis 1988).

Notes on methods:

BAND TRANSECTS. Means represent average counts obtained from 12 stratified random 3m X 20m transects, each the sum of two individual divers' counts on 3m X 10m quadrats. In 1983 and 1984, only 10 band transects were counted. In 1988, a second count was performed at two stations on Santa Barbara Island. Station 50 represents the second count at Southeast Sealion Rookery and Station 52 represents the second count at Arch Point.
Muricea californica was not regularly counted from 1982-1989. *Lytechinus anamesus* were not counted in band transects at several sites where they were too numerous to count. These sites are indicated with N/D and were counted in quadrats. At Rodes Reef and Gull Island South in 1986, and Southeast Anchorage in 1989*, L. anamesus* were counted in both quadrats and band transects.

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Band Transects

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	5002	*Tethya aurantia*	0.0431	0.0677	1240
LOCATION	1	SMI WYCKOFF LEDGE	0.0905	0.0760	80
YEAR	83		0.0800	0.0654	10
YEAR	84		0.0775	0.0740	10
YEAR	85		0.0542	0.0697	12
YEAR	86		0.1222	0.0604	12
YEAR	87		0.1014	0.0845	12
YEAR	88		0.1319	0.0970	12
YEAR	89		0.0625	0.0523	12
LOCATION	2	SMI HARE ROCK	0.0436	0.0449	80
YEAR	83		0.0725	0.0712	10
YEAR	84		0.0550	0.0369	10
YEAR	85		0.0417	0.0280	12
YEAR	86		0.0653	0.0548	12
YEAR	87		0.0444	0.0372	12
YEAR	88		0.0264	0.0261	12
YEAR	89		0.0069	0.0150	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0416	0.0463	80
YEAR	83		0.0775	0.0606	10
YEAR	84		0.0800	0.0550	10
YEAR	85		0.0681	0.0510	12
YEAR	86		0.0319	0.0219	12
YEAR	87		0.0069	0.0132	12
YEAR	88		0.0153	0.0194	12
YEAR	89		0.0236	0.0219	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0604	0.0568	80
YEAR	83		0.1475	0.0558	10
YEAR	84		0.0725	0.0432	10
YEAR	85		0.0514	0.0463	12
YEAR	86		0.0264	0.0241	12
YEAR	87		0.0306	0.0368	12
YEAR	88		0.0639	0.0674	12
YEAR	89		0.0472	0.0308	12
LOCATION	5	SRI RODES REEF	0.1299	0.0820	80
YEAR	83		0.2125	0.0690	10
YEAR	84		0.2500	0.1000	10
YEAR	85		0.0944	0.0489	12
YEAR	86		0.0917	0.0597	12
YEAR	87		0.1125	0.0370	12
YEAR	88		0.0889	0.0410	12
YEAR	89		0.0931	0.0366	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0747	0.1103	80
YEAR	83		0.2425	0.1886	10
YEAR	84		0.1700	0.0926	10
YEAR	85		0.0778	0.0434	12
YEAR	86		0.0306	0.0300	12
YEAR	87		0.0222	0.0164	12
YEAR	88		0.0181	0.0181	12
YEAR	89		0.0056	0.0109	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	0.0739	0.1002	80
YEAR	83		0.1550	0.1039	10
YEAR	84		0.2325	0.1302	10
YEAR	85		0.1028	0.0536	12
YEAR	86		0.0111	0.0179	12
YEAR	87		0.0208	0.0237	12
YEAR	88		0.0139	0.0255	12
YEAR	89		0.0208	0.0294	12
LOCATION	8	SCI PELICAN BAY	0.0067	0.0279	80
YEAR	83		0.0400	0.0699	10
YEAR	84		0.0050	0.0158	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0028	0.0096	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0042	0.0104	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0134	0.0231	80
YEAR	83		0.0225	0.0399	10
YEAR	84		0.0150	0.0269	10
YEAR	85		0.0111	0.0164	12
YEAR	86		0.0111	0.0239	12
YEAR	87		0.0097	0.0132	12
YEAR	88		0.0181	0.0251	12
YEAR	89		0.0083	0.0112	12
LOCATION	10	SCI YELLOWBANKS	0.0236	0.0303	48
YEAR	86		0.0292	0.0237	12
YEAR	87		0.0264	0.0313	12
YEAR	88		0.0125	0.0294	12
YEAR	89		0.0264	0.0366	12
LOCATION	11	ANI ADMIRALS REEF	0.0316	0.0522	80
YEAR	83		0.0350	0.0337	10
YEAR	84		0.1125	0.0981	10
YEAR	85		0.0250	0.0251	12
YEAR	86		0.0444	0.0343	12
YEAR	87		0.0056	0.0109	12
YEAR	88		0.0028	0.0065	12
YEAR	89		0.0097	0.0207	12
LOCATION	12	ANI CATHEDRAL COVE	0.0021	0.0072	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0050	0.0158	10
YEAR	85		0.0028	0.0065	12
YEAR	86		0.0028	0.0065	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0014	0.0048	12
YEAR	89		0.0028	0.0065	12
LOCATION	13	ANI LANDING COVE	0.0033	0.0090	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0111	0.0164	12
YEAR	86		0.0042	0.0075	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0028	0.0096	12
YEAR	89		0.0042	0.0075	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	0.0714	0.0529	80
YEAR	83		0.0675	0.0313	10
YEAR	84		0.0600	0.0412	10
YEAR	85		0.0653	0.0641	12
YEAR	86		0.0986	0.0625	12
YEAR	87		0.0500	0.0396	12
YEAR	88		0.0861	0.0647	12
YEAR	89		0.0694	0.0492	12
LOCATION	15	SBI ARCH POINT	0.0032	0.0155	80
YEAR	83		0.0225	0.0399	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0014	0.0048	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0021	0.0074	48
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0042	0.0104	12
YEAR	88		0.0028	0.0096	12
YEAR	89		0.0000	0.0000	12
SPECIES	6001	*Allopora californica*	0.0029	0.0190	1240
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0029	0.0115	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0194	0.0244	12
YEAR	89		0.0000	0.0000	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	5	SRI RODES REEF	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0408	0.0628	80
YEAR	83		0.0550	0.0599	10
YEAR	84		0.0300	0.0483	10
YEAR	85		0.0569	0.0833	12
YEAR	86		0.0222	0.0328	12
YEAR	87		0.0833	0.1018	12
YEAR	88		0.0194	0.0234	12
YEAR	89		0.0194	0.0255	12
LOCATION	7	SCI FRYS HARBOR	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	10	SCI YELLOWBANKS	0.0000	0.0000	48
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	11	ANI ADMIRALS REEF	0.0002	0.0019	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0014	0.0048	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	12	ANI CATHEDRAL COVE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	14	SBI SOUTHEAST SEALION	0.0003	0.0028	80
YEAR	83		0.0025	0.0079	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	48
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
SPECIES	6002	*Tealia lofotensis*	0.0273	0.0697	1240
LOCATION	1	SMI WYCKOFF LEDGE	0.2145	0.1440	80
YEAR	83		0.2050	0.2108	10
YEAR	84		0.1675	0.1219	10
YEAR	85		0.2611	0.1538	12
YEAR	86		0.1889	0.0848	12
YEAR	87		0.1944	0.1296	12
YEAR	88		0.2167	0.0782	12
YEAR	89		0.2583	0.1974	12
LOCATION	2	SMI HARE ROCK	0.0349	0.0365	80
YEAR	83		0.0300	0.0497	10
YEAR	84		0.0575	0.0487	10
YEAR	85		0.0292	0.0319	12
YEAR	86		0.0347	0.0366	12
YEAR	87		0.0389	0.0358	12
YEAR	88		0.0236	0.0207	12
YEAR	89		0.0333	0.0293	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0114	0.0174	80
YEAR	83		0.0225	0.0275	10
YEAR	84		0.0050	0.0105	10

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	85		0.0167	0.0256	12
YEAR	86		0.0056	0.0082	12
YEAR	87		0.0056	0.0082	12
YEAR	88		0.0083	0.0112	12
YEAR	89		0.0167	0.0159	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0794	0.0584	80
YEAR	83		0.0975	0.0571	10
YEAR	84		0.0475	0.0416	10
YEAR	85		0.1208	0.0935	12
YEAR	86		0.0694	0.0431	12
YEAR	87		0.0694	0.0517	12
YEAR	88		0.0486	0.0230	12
YEAR	89		0.1000	0.0420	12
LOCATION	5	SRI RODES REEF	0.0391	0.0331	80
YEAR	83		0.0225	0.0275	10
YEAR	84		0.0300	0.0197	10
YEAR	85		0.0194	0.0120	12
YEAR	86		0.0583	0.0525	12
YEAR	87		0.0569	0.0270	12
YEAR	88		0.0403	0.0305	12
YEAR	89		0.0417	0.0297	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0017	0.0068	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0042	0.0104	12
YEAR	87		0.0056	0.0130	12
YEAR	88		0.0014	0.0048	12
YEAR	89		0.0000	0.0000	12
LOCATION	7	SCI FRYS HARBOR	0.0317	0.0603	80
YEAR	83		0.0975	0.1096	10
YEAR	84		0.0875	0.0784	10
YEAR	85		0.0417	0.0261	12
YEAR	86		0.0111	0.0130	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0014	0.0048	12
YEAR	89		0.0028	0.0065	12
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0008	0.0037	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0042	0.0075	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0014	0.0048	12
YEAR	89		0.0000	0.0000	12
LOCATION	10	SCI YELLOWBANKS	0.0028	0.0072	48
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0097	0.0111	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	11	ANI ADMIRALS REEF	0.0047	0.0134	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0025	0.0079	10
YEAR	85		0.0069	0.0111	12
YEAR	86		0.0208	0.0267	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	12	ANI CATHEDRAL COVE	0.0002	0.0019	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0002	0.0019	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0014	0.0048	12
YEAR	89		0.0000	0.0000	12
LOCATION	14	SBI SOUTHEAST SEALION	0.0006	0.0041	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0042	0.0104	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0021	0.0134	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0139	0.0332	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0003	0.0024	48
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0014	0.0048	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	6006	*Lophogorgia chilensis*	0.0628	0.1321	1240
LOCATION	1	SMI WYCKOFF LEDGE	0.0021	0.0072	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0028	0.0065	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0042	0.0144	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0056	0.0082	12
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0302	0.0516	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0722	0.0740	12
YEAR	86		0.0667	0.0674	12
YEAR	87		0.0458	0.0456	12
YEAR	88		0.0125	0.0226	12
YEAR	89		0.0042	0.0104	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.2272	0.2169	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0175	0.0206	10
YEAR	85		0.3389	0.2947	12
YEAR	86		0.4069	0.2439	12
YEAR	87		0.3250	0.1368	12
YEAR	88		0.1708	0.0591	12
YEAR	89		0.2583	0.1359	12
LOCATION	5	SRI RODES REEF	0.0033	0.0090	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0056	0.0109	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0083	0.0151	12
YEAR	88		0.0028	0.0065	12
YEAR	89		0.0042	0.0104	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.1659	0.1329	80
YEAR	83		0.0450	0.0230	10
YEAR	84		0.0825	0.0426	10
YEAR	85		0.2194	0.1769	12
YEAR	86		0.2333	0.1823	12
YEAR	87		0.1583	0.0818	12
YEAR	88		0.2153	0.1338	12
YEAR	89		0.1736	0.0730	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	0.1189	0.1497	80
YEAR	83		0.0425	0.0487	10
YEAR	84		0.1050	0.1571	10
YEAR	85		0.0486	0.0429	12
YEAR	86		0.1403	0.1774	12
YEAR	87		0.1542	0.1875	12
YEAR	88		0.1708	0.1780	12
YEAR	89		0.1556	0.1469	12
LOCATION	8	SCI PELICAN BAY	0.0699	0.0810	80
YEAR	83		0.0575	0.0624	10
YEAR	84		0.0350	0.0568	10
YEAR	85		0.0736	0.0965	12
YEAR	86		0.0806	0.0926	12
YEAR	87		0.0653	0.0773	12
YEAR	88		0.0944	0.0908	12
YEAR	89		0.0750	0.0839	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	10	SCI YELLOWBANKS	0.1250	0.0956	48
YEAR	86		0.0875	0.0574	12
YEAR	87		0.1861	0.1222	12
YEAR	88		0.0972	0.0696	12
YEAR	89		0.1292	0.0975	12
LOCATION	11	ANI ADMIRALS REEF	0.1686	0.2781	80
YEAR	83		0.0825	0.0708	10
YEAR	84		0.0700	0.0350	10
YEAR	85		0.0667	0.0508	12
YEAR	86		0.0625	0.0215	12
YEAR	87		0.0611	0.0416	12
YEAR	88		0.1069	0.0392	12
YEAR	89		0.7000	0.4241	12
LOCATION	12	ANI CATHEDRAL COVE	0.0010	0.0041	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0014	0.0048	12
YEAR	89		0.0028	0.0065	12
LOCATION	13	ANI LANDING COVE	0.0015	0.0060	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0056	0.0109	12
YEAR	86		0.0028	0.0096	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0014	0.0048	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	0.0783	0.0697	80
YEAR	83		0.0600	0.0503	10
YEAR	84		0.0250	0.0471	10
YEAR	85		0.0292	0.0349	12
YEAR	86		0.0403	0.0251	12
YEAR	87		0.0875	0.0632	12
YEAR	88		0.1389	0.0509	12
YEAR	89		0.1556	0.0694	12
LOCATION	15	SBI ARCH POINT	0.0032	0.0101	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0025	0.0079	10
YEAR	85		0.0014	0.0048	12
YEAR	86		0.0028	0.0065	12
YEAR	87		0.0028	0.0065	12
YEAR	88		0.0083	0.0207	12
YEAR	89		0.0042	0.0104	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	48
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
SPECIES	6007	*Muricea fruticosa*	0.0029	0.0127	1228
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0006	0.0032	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0042	0.0075	12
YEAR	89		0.0000	0.0000	12
LOCATION	5	SRI RODES REEF	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0012	0.0052	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0014	0.0048	12
YEAR	89		0.0069	0.0111	12
LOCATION	7	SCI FRYS HARBOR	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0004	0.0026	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0014	0.0048	12
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	10	SCI YELLOWBANKS	0.0171	0.0362	36
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0403	0.0534	12
YEAR	89		0.0097	0.0194	12
LOCATION	11	ANI ADMIRALS REEF	0.0189	0.0292	80
YEAR	83		0.0100	0.0211	10
YEAR	84		0.0075	0.0121	10
YEAR	85		0.0306	0.0492	12
YEAR	86		0.0153	0.0166	12
YEAR	87		0.0292	0.0390	12
YEAR	88		0.0153	0.0194	12
YEAR	89		0.0208	0.0237	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	12	ANI CATHEDRAL COVE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0002	0.0019	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0014	0.0048	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	14	SBI SOUTHEAST SEALION	0.0113	0.0196	80
YEAR	83		0.0025	0.0079	10
YEAR	84		0.0025	0.0079	10
YEAR	85		0.0153	0.0241	12
YEAR	86		0.0194	0.0244	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0111	0.0130	12
YEAR	89		0.0250	0.0271	12
LOCATION	15	SBI ARCH POINT	0.0016	0.0074	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0075	0.0169	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0028	0.0096	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	48
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	50		0.0153	0.0166	12
YEAR	88		0.0153	0.0166	12
LOCATION	52		0.0014	0.0048	12
YEAR	88		0.0014	0.0048	12
SPECIES	6008	*Muricea californica*	0.0113	0.0224	130
LOCATION	8	SCI PELICAN BAY	0.0014	0.0048	12
YEAR	89		0.0014	0.0048	12
LOCATION	10	SCI YELLOWBANKS	0.0038	0.0079	48
YEAR	86		0.0056	0.0082	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0042	0.0075	12
YEAR	89		0.0042	0.0104	12
LOCATION	11	ANI ADMIRALS REEF	0.0319	0.0361	24
YEAR	88		0.0250	0.0241	12
YEAR	89		0.0389	0.0451	12
LOCATION	14	SBI SOUTHEAST SEALION	0.0148	0.0257	22
YEAR	84		0.0075	0.0237	10
YEAR	87		0.0208	0.0267	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	8001	*Panulirus interruptus*	0.0030	0.0145	1240
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	13
YEAR	88		0.0000	0.0000	11
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	5	SRI RODES REEF	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	0.0004	0.0026	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0028	0.0065	12
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0002	0.0019	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0014	0.0048	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0025	0.0092	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0050	0.0158	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0042	0.0104	12
YEAR	88		0.0056	0.0130	12
YEAR	89		0.0028	0.0096	12
LOCATION	10	SCI YELLOWBANKS	0.0007	0.0034	48
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0028	0.0065	12
LOCATION	11	ANI ADMIRALS REEF	0.0024	0.0092	80
YEAR	83		0.0100	0.0211	10
YEAR	84		0.0075	0.0121	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	12	ANI CATHEDRAL COVE	0.0130	0.0278	80
YEAR	83		0.0200	0.0329	10
YEAR	84		0.0225	0.0463	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0208	0.0377	12
YEAR	87		0.0153	0.0230	12
YEAR	88		0.0111	0.0205	12
YEAR	89		0.0042	0.0075	12
LOCATION	13	ANI LANDING COVE	0.0183	0.0373	80
YEAR	83		0.0150	0.0474	10
YEAR	84		0.0250	0.0471	10
YEAR	85		0.0069	0.0150	12
YEAR	86		0.0208	0.0294	12
YEAR	87		0.0208	0.0267	12
YEAR	88		0.0181	0.0321	12
YEAR	89		0.0222	0.0570	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0033	0.0093	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0028	0.0065	12
YEAR	87		0.0083	0.0112	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0111	0.0179	12
LOCATION	16	SBI CAT CANYON	0.0094	0.0268	48
YEAR	86		0.0069	0.0241	12
YEAR	87		0.0083	0.0195	12
YEAR	88		0.0028	0.0096	12
YEAR	89		0.0194	0.0431	12
SPECIES	9002	*Haliotis rufescens*	0.0090	0.0408	1240
LOCATION	1	SMI WYCKOFF LEDGE	0.0217	0.0345	80
YEAR	83		0.0200	0.0230	10
YEAR	84		0.0050	0.0158	10
YEAR	85		0.0153	0.0230	12
YEAR	86		0.0403	0.0617	12
YEAR	87		0.0056	0.0082	12
YEAR	88		0.0431	0.0351	12
YEAR	89		0.0194	0.0283	12
LOCATION	2	SMI HARE ROCK	0.0094	0.0211	80
YEAR	83		0.0075	0.0169	10
YEAR	84		0.0125	0.0132	10
YEAR	85		0.0014	0.0048	12
YEAR	86		0.0319	0.0423	12
YEAR	87		0.0069	0.0132	12
YEAR	88		0.0042	0.0075	12
YEAR	89		0.0014	0.0048	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0489	0.1079	80
YEAR	83		0.1900	0.1990	10
YEAR	84		0.1325	0.1297	10
YEAR	85		0.0361	0.0631	12
YEAR	86		0.0111	0.0164	12
YEAR	87		0.0083	0.0112	12
YEAR	88		0.0014	0.0048	12
YEAR	89		0.0000	0.0000	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0415	0.0868	80
YEAR	83		0.1225	0.1872	10
YEAR	84		0.0575	0.0764	10
YEAR	85		0.0708	0.0826	12
YEAR	86		0.0444	0.0416	12
YEAR	87		0.0056	0.0148	12
YEAR	88		0.0028	0.0065	12
YEAR	89		0.0028	0.0065	12
LOCATION	5	SRI RODES REEF	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0154	0.0391	80
YEAR	83		0.0675	0.0858	10
YEAR	84		0.0175	0.0237	10
YEAR	85		0.0167	0.0236	12
YEAR	86		0.0153	0.0261	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	7	SCI FRYS HARBOR	0.0004	0.0026	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0014	0.0048	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0003	0.0028	80
YEAR	83		0.0025	0.0079	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0006	0.0039	80
YEAR	83		0.0050	0.0105	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	10	SCI YELLOWBANKS	0.0007	0.0048	48
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0028	0.0096	12
YEAR	89		0.0000	0.0000	12
LOCATION	11	ANI ADMIRALS REEF	0.0005	0.0033	80
YEAR	83		0.0025	0.0079	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0014	0.0048	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	12	ANI CATHEDRAL COVE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0003	0.0024	48
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
SPECIES	9003	*Haliotis corrugata*	0.0138	0.0389	1240
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0002	0.0019	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0016	0.0058	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0025	0.0079	10

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	85		0.0042	0.0104	12
YEAR	86		0.0028	0.0065	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0014	0.0048	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	5	SRI RODES REEF	0.0002	0.0019	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0026	0.0121	80
YEAR	83		0.0125	0.0317	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0028	0.0065	12
YEAR	86		0.0028	0.0065	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	7	SCI FRYS HARBOR	0.0028	0.0095	80
YEAR	83		0.0150	0.0211	10
YEAR	84		0.0025	0.0079	10
YEAR	85		0.0028	0.0065	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0122	0.0277	80
YEAR	83		0.0450	0.0468	10
YEAR	84		0.0225	0.0299	10
YEAR	85		0.0222	0.0343	12
YEAR	86		0.0028	0.0065	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0354	0.0550	80
YEAR	83		0.0850	0.0603	10
YEAR	84		0.0400	0.0459	10
YEAR	85		0.0556	0.0514	12
YEAR	86		0.0667	0.0820	12
YEAR	87		0.0097	0.0207	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	10	SCI YELLOWBANKS	0.0135	0.0196	48
YEAR	86		0.0167	0.0284	12
YEAR	87		0.0194	0.0199	12
YEAR	88		0.0056	0.0109	12
YEAR	89		0.0125	0.0144	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	11	ANI ADMIRALS REEF	0.0918	0.0868	80
YEAR	83		0.1275	0.0989	10
YEAR	84		0.1800	0.1019	10
YEAR	85		0.1056	0.1083	12
YEAR	86		0.0778	0.0538	12
YEAR	87		0.0861	0.0778	12
YEAR	88		0.0278	0.0205	12
YEAR	89		0.0583	0.0463	12
LOCATION	12	ANI CATHEDRAL COVE	0.0173	0.0273	80
YEAR	83		0.0300	0.0350	10
YEAR	84		0.0300	0.0468	10
YEAR	85		0.0264	0.0261	12
YEAR	86		0.0181	0.0207	12
YEAR	87		0.0083	0.0112	12
YEAR	88		0.0069	0.0194	12
YEAR	89		0.0056	0.0148	12
LOCATION	13	ANI LANDING COVE	0.0343	0.0479	80
YEAR	83		0.0400	0.0503	10
YEAR	84		0.0125	0.0270	10
YEAR	85		0.0361	0.0437	12
YEAR	86		0.0208	0.0319	12
YEAR	87		0.0347	0.0452	12
YEAR	88		0.0472	0.0531	12
YEAR	89		0.0458	0.0711	12
LOCATION	14	SBI SOUTHEAST SEALION	0.0026	0.0078	80
YEAR	83		0.0075	0.0169	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0042	0.0075	12
YEAR	86		0.0042	0.0075	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0014	0.0048	12
LOCATION	15	SBI ARCH POINT	0.0006	0.0041	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0042	0.0104	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0069	0.0132	48
YEAR	86		0.0042	0.0075	12
YEAR	87		0.0042	0.0075	12
YEAR	88		0.0083	0.0133	12
YEAR	89		0.0111	0.0205	12

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Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	9004	*Haliotis fulgens*	0.0001	0.0015	1240
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0002	0.0019	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	5	SRI RODES REEF	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	10	SCI YELLOWBANKS	0.0000	0.0000	48
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	11	ANI ADMIRALS REEF	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	12	ANI CATHEDRAL COVE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0006	0.0032	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0028	0.0065	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0014	0.0048	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0021	0.0056	48
YEAR	86		0.0028	0.0065	12
YEAR	87		0.0056	0.0082	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
SPECIES	9006	*Kelletia kelletii*	0.0209	0.0525	1240
LOCATION	1	SMI WYCKOFF LEDGE	0.1153	0.1240	80
YEAR	83		0.0150	0.0337	10
YEAR	84		0.0625	0.1009	10
YEAR	85		0.1167	0.0927	12
YEAR	86		0.0806	0.0598	12
YEAR	87		0.2069	0.1769	12
YEAR	88		0.1806	0.1432	12
YEAR	89		0.1194	0.1020	12
LOCATION	2	SMI HARE ROCK	0.0010	0.0061	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0050	0.0158	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0014	0.0048	12
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0083	0.0147	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0050	0.0105	10
YEAR	85		0.0056	0.0082	12
YEAR	86		0.0056	0.0109	12
YEAR	87		0.0181	0.0166	12
YEAR	88		0.0111	0.0164	12
YEAR	89		0.0111	0.0228	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0494	0.0611	80
YEAR	83		0.1125	0.0748	10
YEAR	84		0.1025	0.0721	10
YEAR	85		0.0611	0.0733	12
YEAR	86		0.0236	0.0261	12
YEAR	87		0.0278	0.0228	12
YEAR	88		0.0056	0.0148	12
YEAR	89		0.0319	0.0344	12
LOCATION	5	SRI RODES REEF	0.0305	0.0656	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0225	0.0478	10

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	85		0.0778	0.1303	12
YEAR	86		0.0597	0.0645	12
YEAR	87		0.0306	0.0465	12
YEAR	88		0.0056	0.0109	12
YEAR	89		0.0111	0.0148	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0410	0.0531	80
YEAR	83		0.0400	0.0530	10
YEAR	84		0.0100	0.0129	10
YEAR	85		0.0208	0.0276	12
YEAR	86		0.0181	0.0194	12
YEAR	87		0.0472	0.0347	12
YEAR	88		0.0736	0.0740	12
YEAR	89		0.0722	0.0763	12
LOCATION	7	SCI FRYS HARBOR	0.0164	0.0242	80
YEAR	83		0.0175	0.0313	10
YEAR	84		0.0100	0.0175	10
YEAR	85		0.0028	0.0065	12
YEAR	86		0.0069	0.0111	12
YEAR	87		0.0292	0.0226	12
YEAR	88		0.0236	0.0372	12
YEAR	89		0.0236	0.0219	12
LOCATION	8	SCI PELICAN BAY	0.0193	0.0284	80
YEAR	83		0.0075	0.0121	10
YEAR	84		0.0250	0.0236	10
YEAR	85		0.0194	0.0172	12
YEAR	86		0.0097	0.0207	12
YEAR	87		0.0403	0.0520	12
YEAR	88		0.0167	0.0256	12
YEAR	89		0.0153	0.0194	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0004	0.0026	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0028	0.0065	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	10	SCI YELLOWBANKS	0.0160	0.0313	48
YEAR	86		0.0181	0.0219	12
YEAR	87		0.0222	0.0259	12
YEAR	88		0.0222	0.0519	12
YEAR	89		0.0014	0.0048	12
LOCATION	11	ANI ADMIRALS REEF	0.0168	0.0336	80
YEAR	83		0.0050	0.0105	10
YEAR	84		0.0275	0.0478	10
YEAR	85		0.0403	0.0625	12
YEAR	86		0.0028	0.0065	12
YEAR	87		0.0194	0.0244	12
YEAR	88		0.0181	0.0166	12
YEAR	89		0.0042	0.0104	12

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	12	ANI CATHEDRAL COVE	0.0006	0.0032	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0028	0.0065	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0114	0.0204	80
YEAR	83		0.0225	0.0416	10
YEAR	84		0.0150	0.0129	10
YEAR	85		0.0097	0.0181	12
YEAR	86		0.0083	0.0133	12
YEAR	87		0.0125	0.0126	12
YEAR	88		0.0069	0.0150	12
YEAR	89		0.0069	0.0194	12
LOCATION	14	SBI SOUTHEAST SEALION	0.0021	0.0081	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0083	0.0167	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0028	0.0096	12
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0025	0.0084	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0050	0.0158	10
YEAR	85		0.0056	0.0109	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0056	0.0109	12
YEAR	89		0.0014	0.0048	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	48
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
SPECIES	9009	*Megathura crenulata*	0.0615	0.1013	1240
LOCATION	1	SMI WYCKOFF LEDGE	0.0006	0.0032	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0014	0.0048	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0147	0.0226	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0075	0.0169	10
YEAR	85		0.0139	0.0120	12
YEAR	86		0.0278	0.0351	12
YEAR	87		0.0361	0.0264	12
YEAR	88		0.0111	0.0130	12
YEAR	89		0.0028	0.0096	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0376	0.0339	80
YEAR	83		0.0250	0.0236	10
YEAR	84		0.0475	0.0362	10

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	85		0.0444	0.0351	12
YEAR	86		0.0611	0.0434	12
YEAR	87		0.0431	0.0261	12
YEAR	88		0.0306	0.0324	12
YEAR	89		0.0111	0.0109	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0177	0.0249	80
YEAR	83		0.0050	0.0105	10
YEAR	84		0.0150	0.0242	10
YEAR	85		0.0250	0.0241	12
YEAR	86		0.0361	0.0368	12
YEAR	87		0.0208	0.0285	12
YEAR	88		0.0125	0.0161	12
YEAR	89		0.0069	0.0111	12
LOCATION	5	SRI RODES REEF	0.0356	0.0494	80
YEAR	83		0.0100	0.0242	10
YEAR	84		0.0200	0.0230	10
YEAR	85		0.0347	0.0641	12
YEAR	86		0.0417	0.0405	12
YEAR	87		0.0681	0.0821	12
YEAR	88		0.0319	0.0305	12
YEAR	89		0.0361	0.0340	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.2426	0.1200	80
YEAR	83		0.2275	0.1145	10
YEAR	84		0.2550	0.1195	10
YEAR	85		0.2694	0.0950	12
YEAR	86		0.2597	0.1296	12
YEAR	87		0.2458	0.1281	12
YEAR	88		0.1764	0.1043	12
YEAR	89		0.2639	0.1453	12
LOCATION	7	SCI FRYS HARBOR	0.1592	0.1032	80
YEAR	83		0.1550	0.0621	10
YEAR	84		0.1800	0.1123	10
YEAR	85		0.1639	0.1022	12
YEAR	86		0.1028	0.0748	12
YEAR	87		0.1750	0.1136	12
YEAR	88		0.1222	0.0922	12
YEAR	89		0.2181	0.1272	12
LOCATION	8	SCI PELICAN BAY	0.0174	0.0224	80
YEAR	83		0.0400	0.0242	10
YEAR	84		0.0175	0.0313	10
YEAR	85		0.0194	0.0300	12
YEAR	86		0.0125	0.0126	12
YEAR	87		0.0139	0.0139	12
YEAR	88		0.0083	0.0112	12
YEAR	89		0.0139	0.0186	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.1392	0.0625	80
YEAR	83		0.0975	0.0478	10
YEAR	84		0.1225	0.0506	10
YEAR	85		0.1361	0.0563	12
YEAR	86		0.1903	0.0687	12
YEAR	87		0.1833	0.0586	12
YEAR	88		0.1250	0.0474	12
YEAR	89		0.1097	0.0500	12
LOCATION	10	SCI YELLOWBANKS	0.0295	0.0258	48
YEAR	86		0.0194	0.0139	12
YEAR	87		0.0125	0.0126	12
YEAR	88		0.0306	0.0211	12
YEAR	89		0.0556	0.0296	12

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	11	ANI ADMIRALS REEF	0.1372	0.2042	80
YEAR	83		0.2900	0.1872	10
YEAR	84		0.5025	0.2284	10
YEAR	85		0.2097	0.0960	12
YEAR	86		0.0208	0.0161	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0125	0.0247	12
YEAR	89		0.0097	0.0111	12
LOCATION	12	ANI CATHEDRAL COVE	0.0257	0.0324	80
YEAR	83		0.0475	0.0492	10
YEAR	84		0.0450	0.0284	10
YEAR	85		0.0181	0.0241	12
YEAR	86		0.0403	0.0435	12
YEAR	87		0.0167	0.0174	12
YEAR	88		0.0083	0.0151	12
YEAR	89		0.0111	0.0130	12
LOCATION	13	ANI LANDING COVE	0.0903	0.0738	80
YEAR	83		0.1450	0.1274	10
YEAR	84		0.0875	0.0592	10
YEAR	85		0.0694	0.0521	12
YEAR	86		0.1181	0.0726	12
YEAR	87		0.0903	0.0468	12
YEAR	88		0.0722	0.0625	12
YEAR	89		0.0583	0.0580	12
LOCATION	14	SBI SOUTHEAST SEALION	0.0084	0.0193	80
YEAR	83		0.0425	0.0313	10
YEAR	84		0.0200	0.0197	10
YEAR	85		0.0042	0.0075	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0030	0.0106	80
YEAR	83		0.0225	0.0219	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0069	0.0123	48
YEAR	86		0.0111	0.0130	12
YEAR	87		0.0111	0.0164	12
YEAR	88		0.0042	0.0104	12
YEAR	89		0.0014	0.0048	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	9010	*Hinnites giganteus*	0.0756	0.1727	1240
LOCATION	1	SMI WYCKOFF LEDGE	0.0164	0.0272	80
YEAR	83		0.0600	0.0489	10
YEAR	84		0.0075	0.0121	10
YEAR	85		0.0181	0.0150	12
YEAR	86		0.0181	0.0194	12
YEAR	87		0.0083	0.0151	12
YEAR	88		0.0083	0.0133	12
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0275	0.0327	80
YEAR	83		0.0600	0.0489	10
YEAR	84		0.0550	0.0350	10
YEAR	85		0.0083	0.0112	12
YEAR	86		0.0389	0.0296	12
YEAR	87		0.0208	0.0203	12
YEAR	88		0.0181	0.0150	12
YEAR	89		0.0014	0.0048	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0099	0.0167	80
YEAR	83		0.0275	0.0219	10
YEAR	84		0.0050	0.0158	10
YEAR	85		0.0097	0.0111	12
YEAR	86		0.0139	0.0199	12
YEAR	87		0.0056	0.0130	12
YEAR	88		0.0014	0.0048	12
YEAR	89		0.0083	0.0167	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0155	0.0255	80
YEAR	83		0.0375	0.0270	10
YEAR	84		0.0150	0.0269	10
YEAR	85		0.0097	0.0111	12
YEAR	86		0.0181	0.0305	12
YEAR	87		0.0167	0.0284	12
YEAR	88		0.0097	0.0288	12
YEAR	89		0.0056	0.0130	12
LOCATION	5	SRI RODES REEF	0.0115	0.0209	80
YEAR	83		0.0225	0.0399	10
YEAR	84		0.0075	0.0169	10
YEAR	85		0.0111	0.0205	12
YEAR	86		0.0069	0.0111	12
YEAR	87		0.0208	0.0190	12
YEAR	88		0.0056	0.0130	12
YEAR	89		0.0069	0.0150	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0404	0.0494	80
YEAR	83		0.0950	0.0832	10
YEAR	84		0.0300	0.0524	10
YEAR	85		0.0264	0.0230	12
YEAR	86		0.0278	0.0312	12
YEAR	87		0.0611	0.0484	12
YEAR	88		0.0042	0.0075	12
YEAR	89		0.0458	0.0247	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	0.0746	0.1147	80
YEAR	83		0.2350	0.2447	10
YEAR	84		0.1000	0.0842	10
YEAR	85		0.0528	0.0443	12
YEAR	86		0.0375	0.0396	12
YEAR	87		0.0583	0.0520	12
YEAR	88		0.0528	0.0502	12
YEAR	89		0.0167	0.0201	12
LOCATION	8	SCI PELICAN BAY	0.2055	0.1654	80
YEAR	83		0.2250	0.1242	10
YEAR	84		0.2525	0.1762	10
YEAR	85		0.3611	0.2683	12
YEAR	86		0.2292	0.1343	12
YEAR	87		0.1958	0.0776	12
YEAR	88		0.0847	0.0429	12
YEAR	89		0.1014	0.0571	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0411	0.0424	80
YEAR	83		0.0425	0.0426	10
YEAR	84		0.0250	0.0264	10
YEAR	85		0.0250	0.0207	12
YEAR	86		0.0653	0.0543	12
YEAR	87		0.0764	0.0571	12
YEAR	88		0.0236	0.0230	12
YEAR	89		0.0278	0.0250	12
LOCATION	10	SCI YELLOWBANKS	0.0010	0.0053	48
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0028	0.0096	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0014	0.0048	12
LOCATION	11	ANI ADMIRALS REEF	0.2329	0.2713	80
YEAR	83		0.4275	0.3090	10
YEAR	84		0.7625	0.2657	10
YEAR	85		0.1486	0.0726	12
YEAR	86		0.1444	0.0494	12
YEAR	87		0.1181	0.0694	12
YEAR	88		0.0694	0.0347	12
YEAR	89		0.0806	0.0674	12
LOCATION	12	ANI CATHEDRAL COVE	0.0604	0.0856	80
YEAR	83		0.0350	0.0474	10
YEAR	84		0.0450	0.0665	10
YEAR	85		0.0306	0.0517	12
YEAR	86		0.0708	0.0742	12
YEAR	87		0.0708	0.0689	12
YEAR	88		0.0931	0.1598	12
YEAR	89		0.0708	0.0736	12
LOCATION	13	ANI LANDING COVE	0.4125	0.3787	80
YEAR	83		0.4450	0.4392	10
YEAR	84		0.1750	0.1359	10
YEAR	85		0.3194	0.3289	12
YEAR	86		0.3583	0.2700	12
YEAR	87		0.6111	0.5334	12
YEAR	88		0.3931	0.2744	12
YEAR	89		0.5514	0.4320	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	0.0055	0.0116	80
YEAR	83		0.0075	0.0169	10
YEAR	84		0.0050	0.0158	10
YEAR	85		0.0083	0.0133	12
YEAR	86		0.0083	0.0112	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0056	0.0109	12
YEAR	89		0.0042	0.0075	12
LOCATION	15	SBI ARCH POINT	0.0139	0.0248	80
YEAR	83		0.0075	0.0169	10
YEAR	84		0.0400	0.0543	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0153	0.0132	12
YEAR	87		0.0167	0.0159	12
YEAR	88		0.0028	0.0065	12
YEAR	89		0.0181	0.0166	12
LOCATION	16	SBI CAT CANYON	0.0021	0.0056	48
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0028	0.0065	12
YEAR	89		0.0028	0.0065	12
SPECIES	9011	*Aplysia californica*	0.0186	0.0548	1240
LOCATION	1	SMI WYCKOFF LEDGE	0.0027	0.0172	80
YEAR	83		0.0050	0.0105	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0125	0.0433	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0358	0.0746	80
YEAR	83		0.0250	0.0425	10
YEAR	84		0.0450	0.0230	10
YEAR	85		0.0028	0.0065	12
YEAR	86		0.0153	0.0194	12
YEAR	87		0.0444	0.0457	12
YEAR	88		0.0375	0.0467	12
YEAR	89		0.0806	0.1710	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0083	0.0139	80
YEAR	83		0.0125	0.0177	10
YEAR	84		0.0025	0.0079	10
YEAR	85		0.0181	0.0181	12
YEAR	86		0.0083	0.0133	12
YEAR	87		0.0097	0.0111	12
YEAR	88		0.0056	0.0148	12
YEAR	89		0.0014	0.0048	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0153	0.0966	80
YEAR	83		0.1125	0.2639	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0028	0.0065	12
YEAR	88		0.0056	0.0109	12
YEAR	89		0.0000	0.0000	12
LOCATION	5	SRI RODES REEF	0.0181	0.0489	80
YEAR	83		0.0200	0.0329	10
YEAR	84		0.0500	0.0540	10

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	85		0.0097	0.0166	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0028	0.0065	12
YEAR	88		0.0500	0.1025	12
YEAR	89		0.0000	0.0000	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0189	0.0360	80
YEAR	83		0.0025	0.0079	10
YEAR	84		0.0250	0.0289	10
YEAR	85		0.0083	0.0112	12
YEAR	86		0.0069	0.0241	12
YEAR	87		0.0236	0.0321	12
YEAR	88		0.0597	0.0645	12
YEAR	89		0.0042	0.0075	12
LOCATION	7	SCI FRYS HARBOR	0.0008	0.0043	80
YEAR	83		0.0050	0.0105	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0014	0.0048	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0039	0.0086	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0025	0.0079	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0028	0.0096	12
YEAR	88		0.0056	0.0082	12
YEAR	89		0.0153	0.0111	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0273	0.0705	80
YEAR	83		0.0050	0.0158	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.1556	0.1188	12
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0097	0.0086	12
YEAR	88		0.0069	0.0086	12
YEAR	89		0.0042	0.0075	12
LOCATION	10	SCI YELLOWBANKS	0.0007	0.0034	48
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0028	0.0065	12
YEAR	89		0.0000	0.0000	12
LOCATION	11	ANI ADMIRALS REEF	0.0055	0.0166	80
YEAR	83		0.0075	0.0169	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0194	0.0308	12
YEAR	86		0.0042	0.0104	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0056	0.0192	12
YEAR	89		0.0014	0.0048	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	12	ANI CATHEDRAL COVE	0.0121	0.0220	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0150	0.0394	10
YEAR	85		0.0125	0.0104	12
YEAR	86		0.0056	0.0148	12
YEAR	87		0.0153	0.0194	12
YEAR	88		0.0111	0.0148	12
YEAR	89		0.0236	0.0305	12
LOCATION	13	ANI LANDING COVE	0.0055	0.0166	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0025	0.0079	10
YEAR	85		0.0097	0.0230	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0111	0.0287	12
YEAR	88		0.0028	0.0065	12
YEAR	89		0.0111	0.0192	12
LOCATION	14	SBI SOUTHEAST SEALION	0.0418	0.0496	80
YEAR	83		0.0100	0.0242	10
YEAR	84		0.0075	0.0169	10
YEAR	85		0.0486	0.0760	12
YEAR	86		0.0458	0.0450	12
YEAR	87		0.0444	0.0278	12
YEAR	88		0.0708	0.0595	12
YEAR	89		0.0542	0.0409	12
LOCATION	15	SBI ARCH POINT	0.0715	0.1105	80
YEAR	83		0.0050	0.0158	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0097	0.0111	12
YEAR	86		0.0361	0.0300	12
YEAR	87		0.2542	0.1264	12
YEAR	88		0.1542	0.0940	12
YEAR	89		0.0181	0.0230	12
LOCATION	16	SBI CAT CANYON	0.0069	0.0128	48
YEAR	86		0.0056	0.0148	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0097	0.0111	12
YEAR	89		0.0125	0.0161	12
SPECIES	11003	*Pycnopodia helianthoides*	0.0142	0.0465	1240
LOCATION	1	SMI WYCKOFF LEDGE	0.0075	0.0135	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0028	0.0065	12
YEAR	86		0.0042	0.0075	12
YEAR	87		0.0069	0.0086	12
YEAR	88		0.0111	0.0148	12
YEAR	89		0.0250	0.0207	12
LOCATION	2	SMI HARE ROCK	0.0343	0.0354	80
YEAR	83		0.0500	0.0391	10
YEAR	84		0.0075	0.0121	10
YEAR	85		0.0083	0.0112	12
YEAR	86		0.0292	0.0363	12
YEAR	87		0.0542	0.0377	12
YEAR	88		0.0264	0.0241	12
YEAR	89		0.0625	0.0342	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0473	0.0722	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0028	0.0065	12
YEAR	87		0.0694	0.0948	12
YEAR	88		0.1444	0.0621	12
YEAR	89		0.0986	0.0468	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0593	0.0756	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0025	0.0079	10
YEAR	85		0.0042	0.0075	12
YEAR	86		0.0069	0.0086	12
YEAR	87		0.1347	0.0539	12
YEAR	88		0.1417	0.0793	12
YEAR	89		0.1056	0.0574	12
LOCATION	5	SRI RODES REEF	0.0708	0.1118	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0028	0.0065	12
YEAR	86		0.0042	0.0075	12
YEAR	87		0.0778	0.0372	12
YEAR	88		0.1042	0.0363	12
YEAR	89		0.2833	0.1320	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0005	0.0033	80
YEAR	83		0.0025	0.0079	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0014	0.0048	12
LOCATION	7	SCI FRYS HARBOR	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	10	SCI YELLOWBANKS	0.0007	0.0048	48
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0028	0.0096	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	11	ANI ADMIRALS REEF	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	12	ANI CATHEDRAL COVE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0002	0.0019	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0014	0.0048	12
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	48
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	11004	*Lytechinus anamesus*			1240
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0078	0.0282	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0175	0.0334	10
YEAR	85		0.0194	0.0382	12
YEAR	86		0.0167	0.0527	12
YEAR	87		0.0014	0.0048	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0964	0.2337	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0025	0.0079	10
YEAR	85		0.4778	0.4258	12
YEAR	86		0.1319	0.0839	12
YEAR	87		0.0306	0.0465	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0432	0.1141	80
YEAR	83		0.0025	0.0079	10
YEAR	84		0.0200	0.0329	10
YEAR	85		0.0972	0.1218	12
YEAR	86		0.1667	0.2239	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0056	0.0148	12
LOCATION	5	SRI RODES REEF	0.9013	1.2420	80
YEAR	83		1.1225	1.2224	10
YEAR	84		0.7825	0.8039	10
YEAR	85		1.3639	1.1369	12
YEAR	86		2.7028	1.4216	12
YEAR	87		0.3542	0.2881	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	6	SCI GULL ISLAND SOUTH	2.5910	2.3807	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		2.5167	2.6797	12
YEAR	86		4.0847	1.6293	12
YEAR	87		3.3139	1.5331	12
YEAR	88		4.7569	2.3307	12
YEAR	89		2.6014	1.6590	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	0.5704	1.3140	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.2000	0.4580	12
YEAR	86		0.4722	0.4405	12
YEAR	87		0.0028	0.0096	12
YEAR	88		1.0819	1.7534	12
YEAR	89		2.0458	2.2710	12
LOCATION	8	SCI PELICAN BAY			80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.3958	0.2324	12
YEAR	86		4.1417	1.1124	12
YEAR	87		N/D	0.0000	12
YEAR	88		0.4847	0.7740	12
YEAR	89		0.1056	0.1909	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0118	0.0425	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0025	0.0079	10
YEAR	85		0.0014	0.0048	12
YEAR	86		0.0500	0.0913	12
YEAR	87		0.0153	0.0479	12
YEAR	88		0.0097	0.0132	12
YEAR	89		0.0000	0.0000	12
LOCATION	10	SCI YELLOWBANKS	N/D	0.0000	48
YEAR	86		N/D	0.0000	12
YEAR	87		N/D	0.0000	12
YEAR	88		N/D	0.0000	12
YEAR	89		N/D	0.0000	12
LOCATION	11	ANI ADMIRALS REEF			80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.4097	1.3416	12
YEAR	86		N/D	0.0000	12
YEAR	87		N/D	0.0000	12
YEAR	88		N/D	0.0000	12
YEAR	89		N/D	0.0000	12
LOCATION	12	ANI CATHEDRAL COVE	0.0040	0.0201	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0264	0.0474	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0000	0.0000	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	1.6436	8.8628	80
YEAR	83		0.0825	0.1208	10
YEAR	84		0.1200	0.0949	10
YEAR	85		2.5347	1.9490	12
YEAR	86		N/D	0.0000	12
YEAR	87		7.4403	3.6288	12
YEAR	88		11.5028	2.5091	12
YEAR	89		5.9611	2.7471	12
LOCATION	15	SBI ARCH POINT	0.6904	1.7185	80
YEAR	83		0.0000	0.0000	10
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	12
YEAR	86		0.0528	0.0568	12
YEAR	87		3.3292	3.2090	12
YEAR	88		0.7986	1.0417	12
YEAR	89		0.4222	0.5532	12
LOCATION	16	SBI CAT CANYON	0.0003	0.0024	48
YEAR	86		0.0014	0.0048	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Appendix 3. 1982-1989 Kelp Forest Monitoring Data - Random Point Contact Quadrats

Introduction.
Following are summaries of data gathered during random point quadrat counts (RPCs) from 1982-1989 for all kelp forest monitoring program sampling sites. Means, standard deviations and total number of samples (cases) are given. Data were summarized with SPSSPC+ programs from translated dBase III+ files. (Readers should be aware that the number of significant digits is an artifact of the database program and does not imply this level of precision.) For details of methods and data management, refer to the monitoring handbook (Davis 1988).

Notes on methods:

RANDOM POINT CONTACTS. Means represent average percent cover for a given organism, or substrate, at 25 stratified random locations along the transect line. Forty points from each quadrat (1,000 points total) are used to determine percent cover of selected organisms and substrate within one meter of the bottom. Prior to 1985, sampling techniques varied somewhat. In 1982, 25 quadrats of 20 points each was used; in 1983, 40 quadrats of 10 points each was used; in 1984, 10 quadrats of 50 points each was used. During those three years, data were collected by SCUBA divers and quadrats were occasionally missed, giving inconsistent totals. Percent cover calculations were adjusted accordingly. The species list used was altered in the earlier years (see text). Bare substrate (not recorded before 1985) refers to a lack of visible encrusting organisms, and applies to any of the three substrate types. Percent cover may total greater than 100% because of layering.

Channel Islands National Park Kelp Forest Monitoring 1982-1989

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	1001	**Green algae**	0.7189	2.4855	2010
LOCATION	1	SMI WYCKOFF LEDGE	0.1600	0.6915	125
YEAR	85		0.1000	0.5000	25
YEAR	86		0.2000	1.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.2000	0.6922	25
YEAR	89		0.3000	0.8292	25
LOCATION	2	SMI HARE ROCK	2.3000	6.3309	125
YEAR	85		0.6000	2.1985	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		8.1000	10.5396	25
YEAR	89		2.8000	6.4679	25
LOCATION	3	SRI JOHNSONS LEE NORTH	0.6400	1.4516	125
YEAR	85		0.1000	0.5000	25
YEAR	86		1.2000	1.4649	25
YEAR	87		0.4000	1.5612	25
YEAR	88		1.3000	2.0565	25
YEAR	89		0.2000	0.6922	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.1400	0.5771	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.2000	0.6922	25
YEAR	87		0.2000	0.6922	25
YEAR	88		0.2000	0.6922	25
YEAR	89		0.1000	0.5000	25
LOCATION	5	SRI RODES REEF	0.0600	0.3842	125
YEAR	85		0.1000	0.5000	25
YEAR	86		0.2000	0.6922	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	6	SCI GULL ISLAND SOUTH	0.2800	0.9101	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.3000	1.0992	25
YEAR	88		0.2000	1.0000	25
YEAR	89		0.8000	1.1902	25
LOCATION	7	SCI FRYS HARBOR	1.2200	2.6491	125
YEAR	85		0.1000	0.5000	25
YEAR	86		0.8000	1.5679	25
YEAR	87		2.1000	3.3603	25
YEAR	88		1.1000	1.7795	25
YEAR	89		2.0000	4.0182	25
LOCATION	8	SCI PELICAN BAY	1.8000	4.3603	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.2000	0.6922	25
YEAR	88		1.8000	2.3408	25
YEAR	89		6.9000	7.4750	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	9	SCI SCORPION ANCHORAGE	0.4595	1.7460	185
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	25
YEAR	84		0.0000	0.0000	10
YEAR	85		2.0000	3.8864	25
YEAR	86		0.9000	1.8930	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.5000	1.0206	25
LOCATION	10	SCI YELLOWBANKS	0.2750	1.1729	100
YEAR	86		0.2000	0.6922	25
YEAR	87		0.6000	2.0767	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.2000	0.6922	25
LOCATION	11	ANI ADMIRALS REEF	1.0000	1.9828	125
YEAR	85		1.7000	2.5739	25
YEAR	86		1.0000	1.7678	25
YEAR	87		0.6000	1.4930	25
YEAR	88		1.0000	2.5000	25
YEAR	89		0.7000	1.1456	25
LOCATION	12	ANI CATHEDRAL COVE	0.7400	2.1304	125
YEAR	85		1.7000	3.7997	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.7000	1.6956	25
YEAR	88		0.5000	1.0206	25
YEAR	89		0.8000	1.8708	25
LOCATION	13	ANI LANDING COVE	0.4600	1.5021	125
YEAR	85		0.6000	2.0767	25
YEAR	86		0.3000	1.0992	25
YEAR	87		0.2000	1.0000	25
YEAR	88		0.5000	1.2500	25
YEAR	89		0.7000	1.8428	25
LOCATION	14	SBI SOUTHEAST SEALION	0.3400	1.0211	125
YEAR	85		0.4000	0.9354	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.3000	1.0992	25
YEAR	88		0.9000	1.5943	25
YEAR	89		0.1000	0.5000	25
LOCATION	15	SBI ARCH POINT	0.8600	2.0356	125
YEAR	85		0.2000	0.6922	25
YEAR	86		0.2000	0.6922	25
YEAR	87		0.2000	0.6922	25
YEAR	88		1.4000	3.3135	25
YEAR	89		2.3000	2.2730	25
LOCATION	16	SBI CAT CANYON	0.8250	1.8483	100
YEAR	86		1.8000	2.2267	25
YEAR	87		1.0000	2.3936	25
YEAR	88		0.3000	1.0992	25
YEAR	89		0.2000	0.6922	25

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Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	2001	**Misc. brown algae**	11.3564	22.5554	2959
LOCATION	1	SMI WYCKOFF LEDGE	15.3704	33.3601	189
YEAR	82		3.6000	5.1072	25
YEAR	83		90.3448	21.4614	29
YEAR	84		12.0000	11.7757	10
YEAR	85		0.2000	0.6922	25
YEAR	86		0.2000	0.6922	25
YEAR	87		0.6000	1.3070	25
YEAR	88		0.2000	0.6922	25
YEAR	89		1.8000	4.4206	25
LOCATION	2	SMI HARE ROCK	5.7526	15.1311	196
YEAR	82		6.0000	7.0711	25
YEAR	83		26.1111	26.3252	36
YEAR	84		0.0000	0.0000	10
YEAR	85		0.9000	2.2684	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.6000	1.8085	25
YEAR	89		0.0000	0.0000	25
LOCATION	3	SRI JOHNSONS LEE NORTH	18.3750	33.7259	200
YEAR	82		2.6000	4.8132	25
YEAR	83		81.7500	21.8254	40
YEAR	84		18.0000	9.9331	10
YEAR	85		1.3000	3.7583	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		4.8000	9.4626	25
YEAR	89		0.2000	0.6922	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	9.6225	20.1115	200
YEAR	82		8.8000	11.1131	25
YEAR	83		39.0000	28.7161	40
YEAR	84		6.2000	6.2858	10
YEAR	85		0.1000	0.5000	25
YEAR	86		0.8000	2.2500	25
YEAR	87		0.6000	1.4930	25
YEAR	88		0.6000	1.3070	25
YEAR	89		1.2000	1.7854	25
LOCATION	5	SRI RODES REEF	3.6229	10.9412	175
YEAR	83		13.7500	19.5707	40
YEAR	84		4.4000	5.4813	10
YEAR	85		0.2000	0.6922	25
YEAR	86		0.9000	1.5943	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.5000	1.6137	25
YEAR	89		0.0000	0.0000	25
LOCATION	6	SCI GULL ISLAND SOUTH	7.0879	16.1023	199
YEAR	82		2.4000	3.2660	25
YEAR	83		33.3333	21.3163	39
YEAR	84		3.8000	4.0497	10
YEAR	85		0.1000	0.5000	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.3000	1.0992	25
YEAR	89		0.0000	0.0000	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	11.1375	21.7255	200
YEAR	82		0.6000	3.0000	25
YEAR	83		47.7500	21.4222	40
YEAR	84		29.0000	10.3816	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.3000	0.8292	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
LOCATION	8	SCI PELICAN BAY	3.4410	7.7904	195
YEAR	82		3.4000	4.0104	25
YEAR	83		8.0000	11.5809	35
YEAR	84		23.6000	8.4222	10
YEAR	85		0.2000	0.6922	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.3000	0.8292	25
YEAR	89		2.3000	3.1391	25
LOCATION	9	SCI SCORPION ANCHORAGE	14.0850	23.4571	200
YEAR	82		9.8000	8.4755	25
YEAR	83		54.7500	21.6010	40
YEAR	84		9.2000	8.5997	10
YEAR	85		11.5000	9.4097	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.1000	0.5000	25
LOCATION	10	SCI YELLOWBANKS	5.1750	7.9316	100
YEAR	86		2.3000	3.6027	25
YEAR	87		1.4000	2.9826	25
YEAR	88		8.7000	11.3450	25
YEAR	89		8.3000	7.8965	25
LOCATION	11	ANI ADMIRALS REEF	24.8220	32.7573	205
YEAR	82		11.0000	12.7475	25
YEAR	83		82.6667	16.7060	45
YEAR	84		9.6000	8.5271	10
YEAR	85		6.1000	8.0390	25
YEAR	86		11.9000	11.4173	25
YEAR	87		7.3000	7.9359	25
YEAR	88		7.6000	6.8648	25
YEAR	89		7.0000	6.8084	25
LOCATION	12	ANI CATHEDRAL COVE	11.5375	13.5396	200
YEAR	82		8.8000	10.1325	25
YEAR	83		27.0000	17.1270	40
YEAR	84		7.0000	9.2496	10
YEAR	85		12.5000	8.5391	25
YEAR	86		7.0000	10.3582	25
YEAR	87		10.3000	10.6390	25
YEAR	88		1.5000	2.9756	25
YEAR	89		6.2000	5.7337	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	13	ANI LANDING COVE	15.1725	24.1119	200
YEAR	82		5.2000	6.0346	25
YEAR	83		50.2500	31.8238	40
YEAR	84		20.2000	19.4010	10
YEAR	85		2.6000	3.1024	25
YEAR	86		6.2000	6.9267	25
YEAR	87		10.6000	13.2736	25
YEAR	88		6.0000	7.2529	25
YEAR	89		2.3000	3.9476	25
LOCATION	14	SBI SOUTHEAST SEALION	13.4475	25.3943	200
YEAR	82		3.0000	3.8188	25
YEAR	83		59.2500	22.6894	40
YEAR	84		11.2000	9.3429	10
YEAR	85		3.5000	6.0810	25
YEAR	86		0.8000	1.5679	25
YEAR	87		0.3000	1.0992	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.6000	1.6583	25
LOCATION	15	SBI ARCH POINT	9.8450	15.2122	200
YEAR	82		3.6000	5.1072	25
YEAR	83		27.7500	22.7007	40
YEAR	84		15.4000	20.4841	10
YEAR	85		7.4000	7.6540	25
YEAR	86		8.2000	6.7515	25
YEAR	87		1.7000	2.7689	25
YEAR	88		1.9000	2.9119	25
YEAR	89		5.4000	5.0353	25
LOCATION	16	SBI CAT CANYON	6.0500	9.8421	100
YEAR	86		11.1000	7.6404	25
YEAR	87		6.2000	16.0585	25
YEAR	88		4.3000	3.2692	25
YEAR	89		2.6000	5.5189	25
SPECIES	2003	***Desmarestia* spp.**	3.5351	15.0347	2235
LOCATION	1	SMI WYCKOFF LEDGE	24.1000	35.9438	135
YEAR	84		1.6000	4.4020	10
YEAR	85		0.5000	1.6137	25
YEAR	86		53.7000	37.1940	25
YEAR	87		0.0000	0.0000	25
YEAR	88		73.0000	22.5809	25
YEAR	89		2.3000	3.9476	25
LOCATION	2	SMI HARE ROCK	0.0800	0.8944	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.4000	2.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	3	SRI JOHNSONS LEE NORTH	2.2857	8.3342	175
YEAR	83		7.7500	15.2732	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		2.1000	5.9809	25
YEAR	89		1.5000	4.4488	25

Channel Islands National Park Kelp Forest Monitoring 1982-1989

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	4	SRI JOHNSONS LEE SOUTH	11.9000	26.7209	175
YEAR	83		46.2500	38.6097	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		6.9000	12.2534	25
YEAR	87		0.0000	0.0000	25
YEAR	88		1.2000	3.4701	25
YEAR	89		1.2000	2.6141	25
LOCATION	5	SRI RODES REEF	9.1000	21.2422	175
YEAR	83		4.2500	10.0989	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		53.7000	25.0637	25
YEAR	89		3.2000	6.0605	25
LOCATION	6	SCI GULL ISLAND SOUTH	0.0000	0.0000	140
YEAR	83		0.0000	0.0000	15
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	7	SCI FRYS HARBOR	0.0000	0.0000	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	9	SCI SCORPION ANCHORAGE	0.0200	0.2236	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	10	SCI YELLOWBANKS	0.0500	0.3518	100
YEAR	86		0.0000	0.0000	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
LOCATION	11	ANI ADMIRALS REEF	0.0000	0.0000	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	12	ANI CATHEDRAL COVE	0.0270	0.2592	185
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	25
YEAR	84		0.0000	0.0000	10
YEAR	85		0.2000	0.6922	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	13	ANI LANDING COVE	0.0400	0.3150	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.2000	0.6922	25
LOCATION	14	SBI SOUTHEAST SEALION	3.0857	11.8743	175
YEAR	83		13.5000	22.0198	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	15	SBI ARCH POINT	0.0200	0.2236	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.1000	0.5000	25
LOCATION	16	SBI CAT CANYON	0.0250	0.2500	100
YEAR	86		0.0000	0.0000	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
SPECIES	2006	***Laminaria farlowii***	2.0991	7.4230	2751
LOCATION	1	SMI WYCKOFF LEDGE	0.0800	0.4418	125
YEAR	85		0.1000	0.5000	25
YEAR	86		0.3000	0.8292	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	3	SRI JOHNSONS LEE NORTH	0.2150	1.1857	200
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.8000	2.5298	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.4000	2.0000	25
YEAR	89		1.0000	2.0412	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	1.6025	8.4374	200
YEAR	82		1.2000	4.1533	25
YEAR	83		5.2500	17.8293	40

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Variable	Value	Label	Mean	Std Dev	Cases
YEAR	84		0.8000	1.3984	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.3000	0.8292	25
YEAR	89		2.6000	4.6480	25
LOCATION	5	SRI RODES REEF	1.0400	4.5234	175
YEAR	83		3.7500	8.6787	40
YEAR	84		2.2000	4.2635	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.3000	1.0992	25
LOCATION	6	SCI GULL ISLAND SOUTH	0.0000	0.0000	200
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	7	SCI FRYS HARBOR	0.5125	3.0930	200
YEAR	82		2.4000	5.7951	25
YEAR	83		1.0000	4.9614	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	8	SCI PELICAN BAY	4.2653	10.2427	196
YEAR	82		14.8000	12.6227	25
YEAR	83		11.1111	16.3494	36
YEAR	84		6.6000	7.3666	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	9	SCI SCORPION ANCHORAGE	0.9625	3.2539	200
YEAR	82		5.2000	6.0346	25
YEAR	83		1.2500	4.0430	40
YEAR	84		1.0000	1.6997	10
YEAR	85		0.1000	0.5000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	10	SCI YELLOWBANKS	7.9500	13.1156	100
YEAR	86		21.3000	15.1747	25
YEAR	87		2.3000	11.5000	25
YEAR	88		3.1000	7.0074	25
YEAR	89		5.1000	6.7885	25
LOCATION	11	ANI ADMIRALS REEF	2.2293	7.1865	205
YEAR	82		0.6000	1.6583	25
YEAR	83		4.2222	10.9729	45
YEAR	84		3.2000	8.7534	10
YEAR	85		3.7000	10.0809	25
YEAR	86		0.9000	1.8930	25
YEAR	87		1.2000	3.9607	25
YEAR	88		0.9000	2.4875	25
YEAR	89		2.1000	6.4823	25
LOCATION	12	ANI CATHEDRAL COVE	2.4250	7.0096	200
YEAR	82		11.0000	13.9940	25
YEAR	83		3.2500	6.1550	40
YEAR	84		5.0000	10.2956	10
YEAR	85		0.4000	1.1815	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.2000	0.6922	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.6000	1.6583	25
LOCATION	13	ANI LANDING COVE	11.1050	14.9197	200
YEAR	82		6.8000	11.4455	25
YEAR	83		9.5000	14.6672	40
YEAR	84		0.6000	1.8974	10
YEAR	85		10.8000	11.6530	25
YEAR	86		11.4000	15.0014	25
YEAR	87		15.3000	16.3031	25
YEAR	88		14.2000	17.3163	25
YEAR	89		14.9000	18.0058	25
LOCATION	14	SBI SOUTHEAST SEALION	0.4500	2.3074	200
YEAR	82		2.4000	5.2281	25
YEAR	83		0.7500	2.6675	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	16	SBI CAT CANYON	0.4000	2.6524	100
YEAR	86		1.2000	5.0580	25
YEAR	87		0.4000	1.5612	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25

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Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	2007	***Cystoseira* spp.**	2.2897	8.0781	2813
LOCATION	1	SMI WYCKOFF LEDGE	1.5582	3.9949	189
YEAR	82		0.4000	2.0000	25
YEAR	83		1.3793	4.4111	29
YEAR	84		2.2000	4.4672	10
YEAR	85		1.0000	1.9094	25
YEAR	86		4.6000	7.3485	25
YEAR	87		1.5000	3.2275	25
YEAR	88		0.6000	2.0767	25
YEAR	89		1.2000	2.4066	25
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	3	SRI JOHNSONS LEE NORTH	2.0950	6.7285	200
YEAR	82		3.2000	7.4833	25
YEAR	83		2.7500	7.1567	40
YEAR	84		4.4000	5.9479	10
YEAR	85		0.3000	1.0992	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.9000	1.8930	25
YEAR	89		6.2000	13.5039	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.2050	0.8420	200
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.6000	0.9661	10
YEAR	85		0.4000	0.9354	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.4000	1.3844	25
YEAR	89		0.6000	1.4930	25
LOCATION	5	SRI RODES REEF	2.3657	10.1122	175
YEAR	83		8.0000	18.1447	40
YEAR	84		9.4000	16.6280	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	6	SCI GULL ISLAND SOUTH	0.1759	1.5388	199
YEAR	82		0.6000	1.6583	25
YEAR	83		0.5128	3.2026	39
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	0.0200	0.2236	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	8	SCI PELICAN BAY	0.3744	2.2949	195
YEAR	82		0.6000	2.1985	25
YEAR	83		1.4286	4.9366	35
YEAR	84		0.8000	1.3984	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	9	SCI SCORPION ANCHORAGE	5.1150	12.8787	200
YEAR	82		23.4000	18.4684	25
YEAR	83		8.7500	17.2742	40
YEAR	84		8.8000	9.9421	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	10	SCI YELLOWBANKS	13.9750	18.4538	100
YEAR	86		17.0000	13.7878	25
YEAR	87		4.2000	9.9666	25
YEAR	88		14.3000	23.1562	25
YEAR	89		20.4000	20.6620	25
LOCATION	11	ANI ADMIRALS REEF	1.8000	4.7049	205
YEAR	82		3.0000	6.6144	25
YEAR	83		0.4444	2.0841	45
YEAR	84		2.4000	4.9710	10
YEAR	85		2.2000	4.8045	25
YEAR	86		1.5000	3.3072	25
YEAR	87		2.0000	4.8947	25
YEAR	88		1.1000	2.8940	25
YEAR	89		3.2000	7.2715	25
LOCATION	12	ANI CATHEDRAL COVE	0.6700	3.1349	200
YEAR	82		3.8000	6.9642	25
YEAR	83		0.7500	3.4991	40
YEAR	84		0.4000	0.8433	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.2000	0.6922	25
YEAR	89		0.0000	0.0000	25
LOCATION	13	ANI LANDING COVE	2.5475	6.1031	200
YEAR	82		3.0000	8.0364	25
YEAR	83		2.0000	6.4847	40
YEAR	84		0.2000	0.6325	10
YEAR	85		5.2000	7.4972	25
YEAR	86		0.1000	0.5000	25
YEAR	87		3.6000	7.5028	25
YEAR	88		4.1000	5.7228	25
YEAR	89		1.1000	2.8025	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	3.9450	13.1389	200
YEAR	82		15.6000	17.6376	25
YEAR	83		4.5000	14.6672	40
YEAR	84		2.4000	6.3105	10
YEAR	85		7.8000	23.0751	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	15	SBI ARCH POINT	2.0625	5.9649	200
YEAR	82		5.0000	8.5391	25
YEAR	83		1.0000	4.9614	40
YEAR	84		0.0000	0.0000	10
YEAR	85		8.1000	9.1367	25
YEAR	86		1.0000	4.5069	25
YEAR	87		0.8000	4.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	16	SBI CAT CANYON	5.2750	9.4541	100
YEAR	86		8.6000	10.3853	25
YEAR	87		10.9000	11.9434	25
YEAR	88		1.5000	5.5434	25
YEAR	89		0.1000	0.5000	25
SPECIES	2008	***Macrocystis, Eisenia, Pterygophora***	10.3575	22.7979	2070
LOCATION	1	SMI WYCKOFF LEDGE	20.6600	23.2971	125
YEAR	85		7.4000	12.3001	25
YEAR	86		40.2000	28.4945	25
YEAR	87		13.8000	17.6500	25
YEAR	88		21.7000	20.3193	25
YEAR	89		20.2000	22.0312	25
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	3	SRI JOHNSONS LEE NORTH	27.2400	34.3676	125
YEAR	85		8.1000	12.3381	25
YEAR	86		0.0000	0.0000	25
YEAR	87		1.3000	4.6278	25
YEAR	88		64.3000	30.4097	25
YEAR	89		62.5000	20.5649	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	23.2600	34.8010	125
YEAR	85		14.7000	11.2574	25
YEAR	86		0.0000	0.0000	25
YEAR	87		4.3000	8.7655	25
YEAR	88		37.8000	44.6591	25
YEAR	89		59.5000	38.1677	25
LOCATION	5	SRI RODES REEF	11.3400	17.3657	125
YEAR	85		1.5000	4.2081	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		33.8000	17.1713	25
YEAR	89		21.4000	15.6804	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	6	SCI GULL ISLAND SOUTH	1.2000	4.7264	125
YEAR	85		0.5000	1.4434	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.3000	1.0992	25
YEAR	88		0.4000	1.1815	25
YEAR	89		4.8000	9.6803	25
LOCATION	7	SCI FRYS HARBOR	0.1200	0.6235	125
YEAR	85		0.6000	1.3070	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	185
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	25
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	9	SCI SCORPION ANCHORAGE	0.6892	2.7764	185
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	25
YEAR	84		0.0000	0.0000	10
YEAR	85		5.1000	5.9722	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	10	SCI YELLOWBANKS	9.4500	17.4931	100
YEAR	86		5.0000	7.3598	25
YEAR	87		0.5000	1.6137	25
YEAR	88		4.4000	8.4865	25
YEAR	89		27.9000	25.4612	25
LOCATION	11	ANI ADMIRALS REEF	17.9000	23.3366	125
YEAR	85		13.5000	17.0477	25
YEAR	86		21.0000	24.3349	25
YEAR	87		9.7000	13.2351	25
YEAR	88		14.4000	23.2545	25
YEAR	89		30.9000	30.4299	25
LOCATION	12	ANI CATHEDRAL COVE	3.9200	11.4359	125
YEAR	85		2.4000	4.9728	25
YEAR	86		4.8000	14.4503	25
YEAR	87		7.9000	14.0253	25
YEAR	88		2.6000	12.4892	25
YEAR	89		1.9000	7.9804	25
LOCATION	13	ANI LANDING COVE	48.3600	36.5237	125
YEAR	85		67.4000	38.2459	25
YEAR	86		70.9000	36.0691	25
YEAR	87		44.2000	33.5311	25
YEAR	88		21.2000	18.9588	25
YEAR	89		38.1000	29.0140	25

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	0.1200	1.3416	125
YEAR	85		0.6000	3.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	15	SBI ARCH POINT	1.0400	4.7219	125
YEAR	85		4.2000	9.5667	25
YEAR	86		0.2000	1.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.8000	3.0380	25
LOCATION	16	SBI CAT CANYON	9.7250	16.3566	100
YEAR	86		13.9000	11.2750	25
YEAR	87		16.5000	20.0650	25
YEAR	88		0.5000	1.0206	25
YEAR	89		8.0000	20.3741	25
SPECIES	2011	***Sargassum spp.***	0.6568	3.2541	370
LOCATION	8	SCI PELICAN BAY	0.2143	1.0341	70
YEAR	82		0.2000	1.0000	25
YEAR	83		0.0000	0.0000	35
YEAR	84		1.0000	2.1602	10
LOCATION	9	SCI SCORPION ANCHORAGE	2.2000	6.4326	75
YEAR	82		0.2000	1.0000	25
YEAR	83		3.7500	8.3781	40
YEAR	84		1.0000	3.1623	10
LOCATION	12	ANI CATHEDRAL COVE	0.1067	0.7273	75
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.8000	1.9322	10
LOCATION	14	SBI SOUTHEAST SEALION	0.2000	1.2840	75
YEAR	82		0.2000	1.0000	25
YEAR	83		0.2500	1.5811	40
YEAR	84		0.0000	0.0000	10
LOCATION	15	SBI ARCH POINT	0.5333	2.2621	75
YEAR	82		1.6000	3.7417	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10
SPECIES	3001	**Misc. red algae**	13.7139	19.6160	2959
LOCATION	1	SMI WYCKOFF LEDGE	38.3095	30.7365	189
YEAR	82		52.6000	23.4130	25
YEAR	83		51.3793	33.0286	29
YEAR	84		29.8000	24.0453	10
YEAR	85		6.8000	10.9335	25
YEAR	86		39.3000	21.8723	25
YEAR	87		5.6000	6.2617	25
YEAR	88		37.4000	19.3714	25
YEAR	89		76.4000	15.4630	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	2	SMI HARE ROCK	9.3112	18.2166	196
YEAR	82		39.6000	19.3067	25
YEAR	83		14.1667	26.1179	36
YEAR	84		7.0000	3.9158	10
YEAR	85		0.8000	1.3919	25
YEAR	86		1.2000	2.1794	25
YEAR	87		2.8000	4.4088	25
YEAR	88		2.0000	3.3850	25
YEAR	89		3.4000	3.4521	25
LOCATION	3	SRI JOHNSONS LEE NORTH	13.9425	17.5809	200
YEAR	82		43.8000	18.3303	25
YEAR	83		17.5000	18.9128	40
YEAR	84		9.6000	6.0955	10
YEAR	85		4.3000	3.2692	25
YEAR	86		3.1000	3.4821	25
YEAR	87		2.9000	3.8649	25
YEAR	88		4.7000	5.3190	25
YEAR	89		20.9000	11.0604	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	22.3475	20.3097	200
YEAR	82		44.4000	17.8139	25
YEAR	83		41.0000	19.9743	40
YEAR	84		18.2000	10.2610	10
YEAR	85		9.5000	8.7202	25
YEAR	86		3.9000	4.0234	25
YEAR	87		7.3000	4.8905	25
YEAR	88		17.7000	13.8617	25
YEAR	89		23.1000	15.0914	25
LOCATION	5	SRI RODES REEF	21.8714	22.9009	175
YEAR	83		50.7500	25.1546	40
YEAR	84		32.0000	12.8927	10
YEAR	85		15.8000	10.3259	25
YEAR	86		8.5000	9.8160	25
YEAR	87		1.9000	2.1985	25
YEAR	88		7.4000	7.5512	25
YEAR	89		25.5000	11.9242	25
LOCATION	6	SCI GULL ISLAND SOUTH	11.4322	13.0106	199
YEAR	82		27.2000	15.4164	25
YEAR	83		14.1026	17.4292	39
YEAR	84		9.0000	5.6765	10
YEAR	85		6.9000	6.3852	25
YEAR	86		9.1000	7.2125	25
YEAR	87		4.6000	4.4884	25
YEAR	88		6.9000	8.2374	25
YEAR	89		10.7000	10.6927	25
LOCATION	7	SCI FRYS HARBOR	6.2650	11.7231	200
YEAR	82		28.6000	15.1052	25
YEAR	83		4.0000	11.9400	40
YEAR	84		5.8000	4.5656	10
YEAR	85		3.2000	3.5000	25
YEAR	86		1.8000	2.4495	25
YEAR	87		2.3000	2.6926	25
YEAR	88		0.7000	1.3540	25
YEAR	89		4.8000	5.9037	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	8	SCI PELICAN BAY	4.0641	7.5549	195
YEAR	82		10.2000	10.6536	25
YEAR	83		7.7143	12.1476	35
YEAR	84		4.0000	2.1082	10
YEAR	85		0.5000	1.2500	25
YEAR	86		0.5000	1.4434	25
YEAR	87		0.3000	0.8292	25
YEAR	88		2.5000	2.8868	25
YEAR	89		5.3000	4.5254	25
LOCATION	9	SCI SCORPION ANCHORAGE	3.9400	8.1685	200
YEAR	82		10.8000	7.4554	25
YEAR	83		10.0000	13.9596	40
YEAR	84		1.8000	2.8983	10
YEAR	85		0.5000	1.0206	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.2000	0.6922	25
YEAR	88		1.3000	2.0565	25
YEAR	89		2.0000	2.3936	25
LOCATION	10	SCI YELLOWBANKS	5.8250	8.8339	100
YEAR	86		15.2000	12.2457	25
YEAR	87		2.2000	2.8247	25
YEAR	88		2.9000	4.3708	25
YEAR	89		3.0000	4.7324	25
LOCATION	11	ANI ADMIRALS REEF	25.8390	19.0734	205
YEAR	82		33.2000	18.5338	25
YEAR	83		26.2222	21.9802	45
YEAR	84		12.2000	8.8669	10
YEAR	85		19.5000	10.8972	25
YEAR	86		31.3000	19.6204	25
YEAR	87		22.1000	13.1434	25
YEAR	88		27.0000	22.1265	25
YEAR	89		26.7000	21.0619	25
LOCATION	12	ANI CATHEDRAL COVE	8.9725	13.0651	200
YEAR	82		21.4000	11.6833	25
YEAR	83		19.7500	19.8051	40
YEAR	84		4.2000	3.3267	10
YEAR	85		7.6000	5.1781	25
YEAR	86		4.9000	6.0156	25
YEAR	87		1.8000	3.3479	25
YEAR	88		1.5000	2.0412	25
YEAR	89		1.3000	1.6330	25
LOCATION	13	ANI LANDING COVE	20.0275	27.1330	200
YEAR	82		17.8000	20.8706	25
YEAR	83		34.7500	35.0082	40
YEAR	84		26.8000	24.0037	10
YEAR	85		9.8000	15.3080	25
YEAR	86		30.6000	35.2246	25
YEAR	87		9.9000	15.5034	25
YEAR	88		12.7000	25.8090	25
YEAR	89		13.1000	15.9961	25

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	4.3100	5.7971	200
YEAR	82		6.4000	6.0415	25
YEAR	83		3.0000	5.6387	40
YEAR	84		16.2000	9.4493	10
YEAR	85		4.2000	4.5484	25
YEAR	86		1.6000	2.7839	25
YEAR	87		5.5000	4.5069	25
YEAR	88		3.6000	3.6856	25
YEAR	89		1.9000	3.5561	25
LOCATION	15	SBI ARCH POINT	11.5550	12.9599	200
YEAR	82		8.6000	8.2310	25
YEAR	83		23.7500	19.8310	40
YEAR	84		5.6000	3.7476	10
YEAR	85		5.6000	5.4141	25
YEAR	86		5.9000	3.5998	25
YEAR	87		6.4000	6.7346	25
YEAR	88		18.3000	10.6975	25
YEAR	89		7.4000	6.5939	25
LOCATION	16	SBI CAT CANYON	4.6750	6.0161	100
YEAR	86		4.9000	4.5346	25
YEAR	87		5.3000	9.7980	25
YEAR	88		1.5000	1.9094	25
YEAR	89		7.0000	3.5355	25
SPECIES	3002	**Articulated coralline algae**	8.5184	14.9402	2888
LOCATION	1	SMI WYCKOFF LEDGE	5.0317	7.9554	189
YEAR	82		2.6000	5.9722	25
YEAR	83		3.4483	8.5673	29
YEAR	84		3.6000	4.2999	10
YEAR	85		4.1000	6.1186	25
YEAR	86		5.4000	6.0673	25
YEAR	87		3.4000	3.9449	25
YEAR	88		6.8000	9.7767	25
YEAR	89		10.3000	11.6664	25
LOCATION	2	SMI HARE ROCK	0.3600	1.1317	125
YEAR	85		0.6000	1.3070	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.2000	0.6922	25
YEAR	88		0.5000	1.6137	25
YEAR	89		0.4000	1.1815	25
LOCATION	3	SRI JOHNSONS LEE NORTH	4.5950	6.6752	200
YEAR	82		7.4000	6.1441	25
YEAR	83		8.0000	9.9228	40
YEAR	84		6.4000	6.9154	10
YEAR	85		1.8000	2.6536	25
YEAR	86		3.1000	6.9702	25
YEAR	87		0.3000	0.8292	25
YEAR	88		3.3000	3.2048	25
YEAR	89		5.5000	5.1031	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	3.6575	5.7118	200
YEAR	82		4.0000	4.5644	25
YEAR	83		3.5000	7.6962	40
YEAR	84		4.4000	5.0596	10
YEAR	85		4.3000	5.9301	25
YEAR	86		0.8000	1.5679	25
YEAR	87		0.9000	1.7500	25
YEAR	88		5.4000	5.6679	25
YEAR	89		6.5000	6.4952	25
LOCATION	5	SRI RODES REEF	0.3400	1.2629	175
YEAR	83		0.2500	1.5811	40
YEAR	84		0.2000	0.6325	10

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Variable	Value	Label	Mean	Std Dev	Cases
YEAR	85		1.0000	2.0412	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.2000	0.6922	25
YEAR	89		0.6000	1.3070	25
LOCATION	6	SCI GULL ISLAND SOUTH	2.5779	9.3548	199
YEAR	82		2.2000	2.9155	25
YEAR	83		6.6667	20.1747	39
YEAR	84		2.8000	3.6757	10
YEAR	85		2.1000	2.9475	25
YEAR	86		1.3000	2.1794	25
YEAR	87		0.8000	1.7260	25
YEAR	88		1.4000	2.8025	25
YEAR	89		1.2000	1.9257	25
LOCATION	7	SCI FRYS HARBOR	1.5600	3.7176	200
YEAR	82		1.8000	4.5369	25
YEAR	83		3.0000	5.6387	40
YEAR	84		6.2000	5.0288	10
YEAR	85		1.8000	2.7500	25
YEAR	86		0.6000	2.0767	25
YEAR	87		0.6000	1.3070	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.4000	0.9354	25
LOCATION	8	SCI PELICAN BAY	5.3256	9.7103	195
YEAR	82		12.6000	10.3199	25
YEAR	83		14.8571	14.2192	35
YEAR	84		12.6000	9.5242	10
YEAR	85		0.7000	1.3540	25
YEAR	86		0.5000	1.2500	25
YEAR	87		0.5000	1.2500	25
YEAR	88		0.7000	1.3540	25
YEAR	89		0.7000	1.8428	25
LOCATION	9	SCI SCORPION ANCHORAGE	13.9425	16.0398	200
YEAR	82		25.4000	15.3379	25
YEAR	83		26.0000	18.3694	40
YEAR	84		23.6000	10.2762	10
YEAR	85		23.5000	14.4338	25
YEAR	86		7.0000	6.5749	25
YEAR	87		1.4000	2.0514	25
YEAR	88		1.4000	2.1747	25
YEAR	89		1.8000	2.2267	25
LOCATION	10	SCI YELLOWBANKS	8.9750	7.9383	100
YEAR	86		13.7000	8.3579	25
YEAR	87		5.6000	4.9096	25
YEAR	88		4.7000	6.4679	25
YEAR	89		11.9000	7.8156	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	11	ANI ADMIRALS REEF	3.6415	5.0105	205
YEAR	82		1.6000	3.4521	25
YEAR	83		2.8889	4.5837	45
YEAR	84		3.4000	2.9889	10
YEAR	85		5.9000	6.3689	25
YEAR	86		5.8000	6.1964	25
YEAR	87		2.7000	3.4551	25
YEAR	88		2.8000	4.8045	25
YEAR	89		4.5000	5.2540	25
LOCATION	12	ANI CATHEDRAL COVE	15.4850	13.3940	200
YEAR	82		31.8000	17.2530	25
YEAR	83		16.5000	14.0603	40
YEAR	84		14.2000	9.4493	10
YEAR	85		15.7000	10.9335	25
YEAR	86		7.3000	7.6689	25
YEAR	87		12.7000	7.8700	25
YEAR	88		8.1000	6.7423	25
YEAR	89		16.2000	11.5947	25
LOCATION	13	ANI LANDING COVE	21.1350	15.7166	200
YEAR	82		18.2000	15.8035	25
YEAR	83		17.7500	17.9011	40
YEAR	84		22.2000	13.0792	10
YEAR	85		23.7000	17.7822	25
YEAR	86		19.8000	12.0960	25
YEAR	87		23.5000	14.1237	25
YEAR	88		22.2000	15.9967	25
YEAR	89		24.4000	15.5000	25
LOCATION	14	SBI SOUTHEAST SEALION	1.9925	4.1065	200
YEAR	82		6.0000	8.2916	25
YEAR	83		0.7500	3.4991	40
YEAR	84		4.6000	4.0056	10
YEAR	85		1.5000	1.9094	25
YEAR	86		1.4000	2.2913	25
YEAR	87		2.3000	2.3848	25
YEAR	88		1.1000	1.7795	25
YEAR	89		0.6000	1.3070	25
LOCATION	15	SBI ARCH POINT	21.2700	24.7301	200
YEAR	82		37.6000	19.3175	25
YEAR	83		30.7500	34.5215	40
YEAR	84		59.4000	25.0342	10
YEAR	85		34.0000	13.5976	25
YEAR	86		6.4000	6.1695	25
YEAR	87		5.3000	4.6949	25
YEAR	88		8.2000	8.2133	25
YEAR	89		5.7000	9.2286	25
LOCATION	16	SBI CAT CANYON	36.2250	29.6305	100
YEAR	86		63.2000	16.4494	25
YEAR	87		59.0000	19.8694	25
YEAR	88		13.8000	11.3220	25
YEAR	89		8.9000	15.1052	25

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Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	3003	**Crustose coralline algae**	33.7775	20.1930	2959
LOCATION	1	SMI WYCKOFF LEDGE	31.8148	21.2405	189
YEAR	82		7.2000	11.2805	25
YEAR	83		33.4483	23.0335	29
YEAR	84		37.8000	18.0481	10
YEAR	85		44.5000	18.3144	25
YEAR	86		53.8000	16.3955	25
YEAR	87		28.7000	13.9217	25
YEAR	88		27.4000	13.2971	25
YEAR	89		25.0000	17.0783	25
LOCATION	2	SMI HARE ROCK	32.9337	20.1455	196
YEAR	82		18.6000	14.5430	25
YEAR	83		37.7778	26.5234	36
YEAR	84		39.0000	21.5458	10
YEAR	85		25.2000	17.3494	25
YEAR	86		28.6000	16.9109	25
YEAR	87		39.7000	17.5790	25
YEAR	88		40.4000	16.8739	25
YEAR	89		35.7000	15.6545	25
LOCATION	3	SRI JOHNSONS LEE NORTH	26.1000	18.2057	200
YEAR	82		26.4000	21.7715	25
YEAR	83		20.7500	18.4513	40
YEAR	84		28.0000	16.1933	10
YEAR	85		40.5000	23.1166	25
YEAR	86		21.1000	11.5488	25
YEAR	87		14.1000	8.4434	25
YEAR	88		39.0000	14.1421	25
YEAR	89		23.3000	7.7969	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	30.1225	20.9495	200
YEAR	82		17.6000	13.4722	25
YEAR	83		27.0000	26.7179	40
YEAR	84		26.2000	12.5945	10
YEAR	85		34.2000	13.8203	25
YEAR	86		43.3000	16.9362	25
YEAR	87		32.5000	11.2500	25
YEAR	88		46.9000	23.0972	25
YEAR	89		12.8000	10.2144	25
LOCATION	5	SRI RODES REEF	45.2400	20.7558	175
YEAR	83		39.7500	22.8133	40
YEAR	84		37.2000	18.1402	10
YEAR	85		50.0000	20.9040	25
YEAR	86		56.4000	23.1175	25
YEAR	87		58.2000	14.5509	25
YEAR	88		38.7000	15.6645	25
YEAR	89		34.9000	12.8184	25
LOCATION	6	SCI GULL ISLAND SOUTH	41.2513	18.1547	199
YEAR	82		46.2000	18.5562	25
YEAR	83		42.8205	24.9155	39
YEAR	84		37.4000	13.0316	10
YEAR	85		53.3000	15.4906	25
YEAR	86		46.0000	12.1407	25
YEAR	87		38.0000	12.7475	25
YEAR	88		34.7000	9.5011	25
YEAR	89		28.4000	15.8094	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	33.5300	16.6526	200
YEAR	82		28.0000	18.5966	25
YEAR	83		32.0000	19.3748	40
YEAR	84		40.6000	12.1491	10
YEAR	85		34.0000	10.0519	25
YEAR	86		46.5000	16.8480	25
YEAR	87		40.3000	10.7364	25
YEAR	88		36.1000	11.6833	25
YEAR	89		15.9000	6.4096	25
LOCATION	8	SCI PELICAN BAY	25.3256	15.8419	195
YEAR	82		20.4000	15.8061	25
YEAR	83		24.0000	21.9893	35
YEAR	84		39.6000	19.3861	10
YEAR	85		23.1000	7.7487	25
YEAR	86		25.2000	9.6264	25
YEAR	87		22.9000	10.1211	25
YEAR	88		26.1000	10.1827	25
YEAR	89		30.4000	21.0367	25
LOCATION	9	SCI SCORPION ANCHORAGE	29.3800	16.6545	200
YEAR	82		22.2000	17.0220	25
YEAR	83		24.2500	19.9856	40
YEAR	84		55.6000	9.8342	10
YEAR	85		30.4000	17.3157	25
YEAR	86		23.0000	10.6311	25
YEAR	87		39.5000	10.0260	25
YEAR	88		34.5000	12.7066	25
YEAR	89		24.4000	7.9149	25
LOCATION	10	SCI YELLOWBANKS	51.2000	13.2406	100
YEAR	86		49.8000	13.8052	25
YEAR	87		52.2000	13.5077	25
YEAR	88		49.3000	12.9808	25
YEAR	89		53.5000	13.0104	25
LOCATION	11	ANI ADMIRALS REEF	31.4488	19.9845	205
YEAR	82		25.2000	16.1038	25
YEAR	83		36.6667	27.3030	45
YEAR	84		38.2000	13.5138	10
YEAR	85		49.6000	18.4091	25
YEAR	86		25.9000	16.6596	25
YEAR	87		18.9000	10.9468	25
YEAR	88		27.5000	10.9924	25
YEAR	89		29.5000	13.1498	25
LOCATION	12	ANI CATHEDRAL COVE	29.6325	20.1953	200
YEAR	82		19.4000	14.2390	25
YEAR	83		15.2500	16.1702	40
YEAR	84		27.4000	17.7651	10
YEAR	85		19.6000	12.9639	25
YEAR	86		43.6000	18.1154	25
YEAR	87		46.4000	19.0679	25
YEAR	88		42.2000	17.3704	25
YEAR	89		30.5000	15.8771	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	13	ANI LANDING COVE	41.8800	24.5715	200
YEAR	82		34.2000	24.5238	25
YEAR	83		30.0000	21.8386	40
YEAR	84		48.6000	24.5864	10
YEAR	85		62.6000	20.1101	25
YEAR	86		33.1000	20.2880	25
YEAR	87		42.3000	20.8407	25
YEAR	88		47.3000	19.8158	25
YEAR	89		48.1000	29.0857	25
LOCATION	14	SBI SOUTHEAST SEALION	35.4500	19.5824	200
YEAR	82		41.8000	20.4573	25
YEAR	83		17.2500	17.3925	40
YEAR	84		17.0000	8.0691	10
YEAR	85		46.6000	16.1032	25
YEAR	86		41.4000	15.6804	25
YEAR	87		39.9000	19.4385	25
YEAR	88		39.5000	13.2091	25
YEAR	89		40.0000	15.0347	25
LOCATION	15	SBI ARCH POINT	35.6575	18.5885	200
YEAR	82		30.2000	12.9486	25
YEAR	83		20.5000	17.0895	40
YEAR	84		25.4000	15.0274	10
YEAR	85		43.0000	20.3101	25
YEAR	86		37.9000	10.0954	25
YEAR	87		37.2000	10.6878	25
YEAR	88		32.9000	13.8947	25
YEAR	89		61.1000	10.6086	25
LOCATION	16	SBI CAT CANYON	24.9750	14.2511	100
YEAR	86		13.2000	12.9003	25
YEAR	87		31.7000	11.4955	25
YEAR	88		26.8000	14.7817	25
YEAR	89		28.2000	10.7170	25
SPECIES	3004	***Gelidium* spp.**	1.2617	6.8368	2600
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0000	0.0000	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0000	0.0000	100
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	5	SRI RODES REEF	0.0000	0.0000	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	6	SCI GULL ISLAND SOUTH	0.2750	3.2561	200
YEAR	82		0.0000	0.0000	25
YEAR	83		0.2500	1.5811	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		1.8000	9.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	7	SCI FRYS HARBOR	0.2750	1.6202	200
YEAR	82		1.2000	3.6171	25
YEAR	83		0.2500	1.5811	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.6000	1.8085	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	8	SCI PELICAN BAY	2.0615	7.0299	195
YEAR	82		12.8000	12.9164	25
YEAR	83		0.0000	0.0000	35
YEAR	84		8.2000	13.5138	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	9	SCI SCORPION ANCHORAGE	2.0000	6.5846	200
YEAR	82		11.6000	12.8062	25
YEAR	83		2.0000	6.8687	40
YEAR	84		1.0000	1.4142	10
YEAR	85		0.8000	1.8708	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	10	SCI YELLOWBANKS	0.0000	0.0000	100
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	11	ANI ADMIRALS REEF	0.3756	1.5851	205
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	45
YEAR	84		0.2000	0.6325	10
YEAR	85		0.0000	0.0000	25
YEAR	86		2.6000	3.5707	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.4000	1.5612	25
YEAR	89		0.0000	0.0000	25
LOCATION	12	ANI CATHEDRAL COVE	1.2550	4.1695	200
YEAR	82		3.2000	7.6212	25
YEAR	83		2.2500	5.7679	40
YEAR	84		3.6000	4.5019	10
YEAR	85		1.7000	3.1225	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	13	ANI LANDING COVE	9.9525	19.8884	200
YEAR	82		11.6000	17.8372	25
YEAR	83		16.5000	22.4808	40
YEAR	84		7.8000	11.8303	10
YEAR	85		8.0000	16.5044	25
YEAR	86		0.3000	1.5000	25
YEAR	87		15.3000	27.3701	25
YEAR	88		0.0000	0.0000	25
YEAR	89		14.9000	26.9884	25
LOCATION	14	SBI SOUTHEAST SEALION	0.1000	0.8624	200
YEAR	82		0.8000	2.3629	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	15	SBI ARCH POINT	0.1250	0.7363	200
YEAR	82		0.6000	1.6583	25
YEAR	83		0.0000	0.0000	40
YEAR	84		1.0000	1.6997	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	16	SBI CAT CANYON	0.0500	0.3518	100
YEAR	86		0.0000	0.0000	25
YEAR	87		0.2000	0.6922	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25

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Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	3005	***Gigartina* spp.**	0.4872	3.3960	2610
LOCATION	1	SMI WYCKOFF LEDGE	0.5079	1.9140	189
YEAR	82		0.2000	1.0000	25
YEAR	83		0.0000	0.0000	29
YEAR	84		1.6000	4.4020	10
YEAR	85		1.1000	3.2339	25
YEAR	86		0.5000	1.4434	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		1.3000	2.2958	25
LOCATION	2	SMI HARE ROCK	0.7908	3.5100	196
YEAR	82		6.2000	8.0726	25
YEAR	83		0.0000	0.0000	36
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	3	SRI JOHNSONS LEE NORTH	0.6250	3.7068	200
YEAR	82		0.0000	0.0000	25
YEAR	83		3.0000	7.9097	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.1000	0.5000	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	3.3500	10.0515	200
YEAR	82		0.4000	1.3844	25
YEAR	83		14.0000	17.8023	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		1.7000	7.4903	25
YEAR	88		0.0000	0.0000	25
YEAR	89		2.3000	4.7828	25
LOCATION	5	SRI RODES REEF	0.0200	0.2236	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.1000	0.5000	25
LOCATION	6	SCI GULL ISLAND SOUTH	0.0000	0.0000	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	0.1125	1.0118	200
YEAR	82		0.0000	0.0000	25
YEAR	83		0.5000	2.2072	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	9	SCI SCORPION ANCHORAGE	0.0500	0.7071	200
YEAR	82		0.4000	2.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	10	SCI YELLOWBANKS	0.3000	1.7145	100
YEAR	86		1.1000	3.3135	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	11	ANI ADMIRALS REEF	0.0400	0.3150	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.2000	0.6922	25
LOCATION	12	ANI CATHEDRAL COVE	0.1350	1.0642	200
YEAR	82		0.0000	0.0000	25
YEAR	83		0.5000	2.2072	40
YEAR	84		0.2000	0.6325	10
YEAR	85		0.2000	1.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	13	ANI LANDING COVE	0.5550	2.4931	200
YEAR	82		0.8000	1.8708	25
YEAR	83		1.0000	4.4144	40
YEAR	84		1.6000	3.5024	10
YEAR	85		0.6000	1.8085	25
YEAR	86		0.6000	2.5290	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.2000	0.6922	25

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	0.0750	0.7890	200
YEAR	82		0.2000	1.0000	25
YEAR	83		0.2500	1.5811	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	15	SBI ARCH POINT	0.0200	0.2236	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	100
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
SPECIES	4001	**Misc. plants**	1.4577	4.8614	2010
LOCATION	1	SMI WYCKOFF LEDGE	6.7200	14.1543	125
YEAR	85		33.4000	10.3803	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
LOCATION	2	SMI HARE ROCK	0.3800	1.2722	125
YEAR	85		0.3000	1.5000	25
YEAR	86		0.2000	0.6922	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.7000	1.5343	25
YEAR	89		0.7000	1.6956	25
LOCATION	3	SRI JOHNSONS LEE NORTH	2.3800	4.0143	125
YEAR	85		6.8000	5.7064	25
YEAR	86		3.9000	3.2339	25
YEAR	87		0.7000	1.3540	25
YEAR	88		0.5000	1.7678	25
YEAR	89		0.0000	0.0000	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	1.5800	3.5146	125
YEAR	85		1.8000	2.7500	25
YEAR	86		4.5000	6.1237	25
YEAR	87		1.5000	2.1651	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
LOCATION	5	SRI RODES REEF	0.8400	2.2438	125
YEAR	85		2.9000	3.5119	25
YEAR	86		1.3000	2.6141	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	6	SCI GULL ISLAND SOUTH	1.6600	3.2057	125
YEAR	85		5.7000	4.6503	25
YEAR	86		0.6000	1.8085	25
YEAR	87		0.7000	1.3540	25
YEAR	88		0.0000	0.0000	25
YEAR	89		1.3000	2.0565	25
LOCATION	7	SCI FRYS HARBOR	0.3000	1.0814	125
YEAR	85		0.9000	2.0259	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.4000	0.9354	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
LOCATION	8	SCI PELICAN BAY	0.2600	0.8881	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.4000	0.9354	25
YEAR	87		0.7000	1.5343	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.1000	0.5000	25
LOCATION	9	SCI SCORPION ANCHORAGE	0.0405	0.3166	185
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	25
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.3000	0.8292	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	10	SCI YELLOWBANKS	2.3250	5.0032	100
YEAR	86		0.5000	2.0412	25
YEAR	87		7.9000	7.0961	25
YEAR	88		0.9000	2.2684	25
YEAR	89		0.0000	0.0000	25
LOCATION	11	ANI ADMIRALS REEF	2.4200	4.7300	125
YEAR	85		6.2000	4.8477	25
YEAR	86		0.0000	0.0000	25
YEAR	87		2.7000	4.7280	25
YEAR	88		3.2000	6.4759	25
YEAR	89		0.0000	0.0000	25
LOCATION	12	ANI CATHEDRAL COVE	1.7400	5.0424	125
YEAR	85		0.0000	0.0000	25
YEAR	86		8.4000	8.5049	25
YEAR	87		0.3000	1.0992	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	13	ANI LANDING COVE	0.3000	1.5424	125
YEAR	85		1.3000	3.2372	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	1.1400	3.1028	125
YEAR	85		1.4000	2.4023	25
YEAR	86		1.7000	3.2851	25
YEAR	87		2.3000	5.2994	25
YEAR	88		0.3000	1.0992	25
YEAR	89		0.0000	0.0000	25
LOCATION	15	SBI ARCH POINT	1.6200	3.7735	125
YEAR	85		2.1000	5.1377	25
YEAR	86		0.4000	1.1815	25
YEAR	87		4.7000	5.4160	25
YEAR	88		0.7000	1.1456	25
YEAR	89		0.2000	0.6922	25
LOCATION	16	SBI CAT CANYON	0.2250	0.8021	100
YEAR	86		0.3000	1.0992	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.5000	1.0206	25
SPECIES	5001	**Sponges**	0.8038	2.0833	1950
LOCATION	1	SMI WYCKOFF LEDGE	1.3200	2.6292	125
YEAR	85		2.2000	4.0389	25
YEAR	86		0.7000	2.1065	25
YEAR	87		1.5000	2.7003	25
YEAR	88		0.9000	1.5943	25
YEAR	89		1.3000	1.9257	25
LOCATION	2	SMI HARE ROCK	0.0600	0.3842	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.2000	0.6922	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	3	SRI JOHNSONS LEE NORTH	0.4200	1.0403	125
YEAR	85		0.9000	1.5943	25
YEAR	86		0.5000	1.0206	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.6000	1.0897	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	1.1200	2.3214	125
YEAR	85		2.9000	3.2819	25
YEAR	86		0.9000	2.2684	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.5000	1.2500	25
YEAR	89		1.3000	2.2958	25
LOCATION	5	SRI RODES REEF	1.0600	2.2953	125
YEAR	85		2.1000	3.2819	25
YEAR	86		2.0000	3.0619	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.2000	0.6922	25
YEAR	89		0.9000	1.5943	25
LOCATION	6	SCI GULL ISLAND SOUTH	0.4800	1.3356	125
YEAR	85		1.3000	2.4066	25
YEAR	86		0.6000	1.0897	25
YEAR	87		0.3000	0.8292	25
YEAR	88		0.2000	0.6922	25
YEAR	89		0.0000	0.0000	25
LOCATION	7	SCI FRYS HARBOR	0.3400	1.3599	125
YEAR	85		0.6000	2.5290	25
YEAR	86		0.3000	0.8292	25

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.4000	0.9354	25
YEAR	88		0.4000	1.1815	25
YEAR	89		0.0000	0.0000	25
LOCATION	8	SCI PELICAN BAY	0.1000	0.4919	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.3000	0.8292	25
YEAR	89		0.1000	0.5000	25
LOCATION	9	SCI SCORPION ANCHORAGE	0.0600	0.3842	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.2000	0.6922	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	10	SCI YELLOWBANKS	0.3500	1.0063	100
YEAR	86		0.3000	0.8292	25
YEAR	87		0.3000	0.8292	25
YEAR	88		0.3000	1.0992	25
YEAR	89		0.5000	1.2500	25
LOCATION	11	ANI ADMIRALS REEF	1.6600	2.3748	125
YEAR	85		0.5000	1.0206	25
YEAR	86		1.8000	3.0208	25
YEAR	87		1.2000	1.6330	25
YEAR	88		2.0000	2.3936	25
YEAR	89		2.8000	2.7310	25
LOCATION	12	ANI CATHEDRAL COVE	0.3400	1.1155	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.4000	1.1815	25
YEAR	87		0.8000	1.8708	25
YEAR	88		0.4000	0.9354	25
YEAR	89		0.1000	0.5000	25
LOCATION	13	ANI LANDING COVE	2.5200	4.0473	125
YEAR	85		1.7000	3.7997	25
YEAR	86		4.7000	4.6949	25
YEAR	87		1.6000	2.7839	25
YEAR	88		2.6000	4.6480	25
YEAR	89		2.0000	3.4611	25
LOCATION	14	SBI SOUTHEAST SEALION	0.7400	1.6197	125
YEAR	85		0.3000	1.0992	25
YEAR	86		0.8000	1.5679	25
YEAR	87		0.5000	1.7678	25
YEAR	88		1.0000	2.0412	25
YEAR	89		1.1000	1.4577	25
LOCATION	15	SBI ARCH POINT	0.1800	0.7223	125
YEAR	85		0.6000	1.3070	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.2000	0.6922	25

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	16	SBI CAT CANYON	2.3250	3.4130	100
YEAR	86		0.7000	1.3540	25
YEAR	87		4.9000	4.2377	25
YEAR	88		3.5000	3.4611	25
YEAR	89		0.2000	0.6922	25
SPECIES	5003	***Leucetta losangelensis***	0.2935	1.5678	736
LOCATION	1	SMI WYCKOFF LEDGE	0.2500	1.0235	64
YEAR	82		0.4000	1.3844	25
YEAR	83		0.0000	0.0000	29
YEAR	84		0.6000	1.3499	10
LOCATION	2	SMI HARE ROCK	0.2083	1.7678	72
YEAR	82		0.6000	3.0000	25
YEAR	83		0.0000	0.0000	37
YEAR	84		0.0000	0.0000	10
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.2000	1.2840	75
YEAR	82		0.6000	2.1985	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10
LOCATION	6	SCI GULL ISLAND SOUTH	0.2000	0.9864	75
YEAR	82		0.6000	1.6583	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10
LOCATION	7	SCI FRYS HARBOR	0.5333	1.7579	75
YEAR	82		1.6000	2.7839	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10
LOCATION	8	SCI PELICAN BAY	0.7143	2.7301	70
YEAR	82		2.0000	4.3301	25
YEAR	83		0.0000	0.0000	35
YEAR	84		0.0000	0.0000	10
LOCATION	9	SCI SCORPION ANCHORAGE	0.0667	0.5774	75
YEAR	82		0.2000	1.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10
LOCATION	11	ANI ADMIRALS REEF	0.1250	1.1180	80
YEAR	82		0.4000	2.0000	25
YEAR	83		0.0000	0.0000	45
YEAR	84		0.0000	0.0000	10
LOCATION	13	ANI LANDING COVE	0.6000	2.3191	75
YEAR	82		1.8000	3.7859	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10
LOCATION	14	SBI SOUTHEAST SEALION	0.0667	0.5774	75
YEAR	82		0.2000	1.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10
SPECIES	5004	***Polymastia pachymastia***	0.0667	0.5774	75
LOCATION	14	SBI SOUTHEAST SEALION	0.0667	0.5774	75
YEAR	82		0.2000	1.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10

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Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	6003	***Corynactis californica***	2.5559	6.6796	2745
LOCATION	1	SMI WYCKOFF LEDGE	0.3800	1.4219	125
YEAR	85		0.5000	2.0412	25
YEAR	86		0.4000	1.5612	25
YEAR	87		0.9000	1.7500	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
LOCATION	2	SMI HARE ROCK	6.9949	10.3425	196
YEAR	82		0.6000	1.6583	25
YEAR	83		0.5556	2.3231	36
YEAR	84		0.6000	1.8974	10
YEAR	85		4.1000	4.3827	25
YEAR	86		7.8000	7.1923	25
YEAR	87		10.2000	9.7873	25
YEAR	88		11.5000	13.3073	25
YEAR	89		19.6000	13.5915	25
LOCATION	3	SRI JOHNSONS LEE NORTH	2.0625	5.7614	200
YEAR	82		1.6000	2.3805	25
YEAR	83		0.5000	2.2072	40
YEAR	84		0.0000	0.0000	10
YEAR	85		1.4000	3.3912	25
YEAR	86		0.0000	0.0000	25
YEAR	87		5.3000	9.8774	25
YEAR	88		3.6000	9.7916	25
YEAR	89		3.8000	5.4064	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	4.3275	9.6485	200
YEAR	82		2.6000	7.0887	25
YEAR	83		1.2500	4.0430	40
YEAR	84		2.8000	4.2374	10
YEAR	85		1.7000	3.1225	25
YEAR	86		2.3000	4.9434	25
YEAR	87		6.6000	10.5050	25
YEAR	88		12.6000	19.3310	25
YEAR	89		5.7000	7.7567	25
LOCATION	5	SRI RODES REEF	0.4114	2.4115	175
YEAR	83		0.0000	0.0000	40
YEAR	84		0.2000	0.6325	10
YEAR	85		0.1000	0.5000	25
YEAR	86		0.7000	2.5536	25
YEAR	87		1.3000	5.5490	25
YEAR	88		0.4000	0.9354	25
YEAR	89		0.3000	1.5000	25
LOCATION	6	SCI GULL ISLAND SOUTH	11.0628	12.3296	199
YEAR	82		5.8000	7.5939	25
YEAR	83		4.6154	9.4162	39
YEAR	84		7.4000	8.7458	10
YEAR	85		6.9000	7.2987	25
YEAR	86		12.1000	11.0321	25
YEAR	87		15.4000	11.8075	25
YEAR	88		18.1000	13.8120	25
YEAR	89		19.6000	15.9374	25

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	1.8675	3.7882	200
YEAR	82		3.0000	5.9512	25
YEAR	83		1.0000	3.0382	40
YEAR	84		1.6000	2.2706	10
YEAR	85		1.5000	2.9756	25
YEAR	86		1.3000	3.3166	25
YEAR	87		2.1000	3.6572	25
YEAR	88		1.4000	2.4023	25
YEAR	89		3.4000	4.6704	25
LOCATION	8	SCI PELICAN BAY	0.5641	1.7593	195
YEAR	82		0.2000	1.0000	25
YEAR	83		0.2857	1.6903	35
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.2000	0.6922	25
YEAR	87		1.3000	2.0565	25
YEAR	88		0.3000	1.0992	25
YEAR	89		2.0000	3.2275	25
LOCATION	9	SCI SCORPION ANCHORAGE	0.1125	0.5769	200
YEAR	82		0.2000	1.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.2000	0.6922	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.4000	0.9354	25
LOCATION	10	SCI YELLOWBANKS	0.7750	1.8700	100
YEAR	86		0.3000	0.8292	25
YEAR	87		1.1000	1.9203	25
YEAR	88		1.2000	2.8062	25
YEAR	89		0.5000	1.2500	25
LOCATION	11	ANI ADMIRALS REEF	0.8976	2.2474	205
YEAR	82		1.8000	2.8431	25
YEAR	83		0.4444	2.0841	45
YEAR	84		0.4000	0.8433	10
YEAR	85		1.0000	2.5000	25
YEAR	86		1.2000	3.1557	25
YEAR	87		0.0000	0.0000	25
YEAR	88		1.5000	2.0412	25
YEAR	89		0.9000	1.8930	25
LOCATION	12	ANI CATHEDRAL COVE	0.0400	0.3150	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
LOCATION	13	ANI LANDING COVE	2.4375	6.2805	200
YEAR	82		3.8000	6.9642	25
YEAR	83		1.7500	3.8481	40
YEAR	84		2.0000	3.3993	10
YEAR	85		1.2000	2.8976	25
YEAR	86		1.1000	2.8025	25
YEAR	87		0.6000	1.8085	25
YEAR	88		3.2000	9.4240	25
YEAR	89		6.0000	10.8733	25
LOCATION	14	SBI SOUTHEAST SEALION	1.2800	2.1208	125
YEAR	85		0.6000	1.6583	25
YEAR	86		0.9000	1.5943	25

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.6000	1.0897	25
YEAR	88		2.0000	2.7003	25
YEAR	89		2.3000	2.5941	25
LOCATION	15	SBI ARCH POINT	3.1175	5.8327	200
YEAR	82		0.6000	1.6583	25
YEAR	83		0.7500	3.4991	40
YEAR	84		0.6000	1.3499	10
YEAR	85		0.5000	1.0206	25
YEAR	86		2.9000	3.6572	25
YEAR	87		2.4000	2.9297	25
YEAR	88		8.9000	8.8706	25
YEAR	89		8.2000	8.3079	25
LOCATION	16	SBI CAT CANYON	0.0250	0.2500	100
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
SPECIES	6004	***Balanophyllia elegans***	2.6505	5.1543	2944
LOCATION	1	SMI WYCKOFF LEDGE	3.4392	4.3018	189
YEAR	82		1.0000	2.0412	25
YEAR	83		1.0345	3.0993	29
YEAR	84		2.0000	3.5277	10
YEAR	85		4.4000	3.0856	25
YEAR	86		5.2000	5.4448	25
YEAR	87		3.4000	3.8784	25
YEAR	88		4.5000	4.0182	25
YEAR	89		5.5000	5.5434	25
LOCATION	2	SMI HARE ROCK	4.4898	5.5431	196
YEAR	82		2.8000	3.8406	25
YEAR	83		3.3333	7.9282	36
YEAR	84		3.0000	3.1623	10
YEAR	85		4.0000	3.8188	25
YEAR	86		6.3000	5.1092	25
YEAR	87		4.1000	2.8759	25
YEAR	88		5.5000	5.9948	25
YEAR	89		6.5000	6.2915	25
LOCATION	3	SRI JOHNSONS LEE NORTH	4.5875	4.7620	200
YEAR	82		5.4000	5.7591	25
YEAR	83		3.2500	5.7233	40
YEAR	84		7.0000	3.9158	10
YEAR	85		2.5000	2.6021	25
YEAR	86		4.8000	3.8810	25
YEAR	87		3.8000	3.5444	25
YEAR	88		6.9000	5.6954	25
YEAR	89		5.3000	3.4095	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	4	SRI JOHNSONS LEE SOUTH	9.2725	8.9546	200
YEAR	82		10.8000	11.0567	25
YEAR	83		6.0000	9.8189	40
YEAR	84		4.2000	3.4577	10
YEAR	85		5.5000	4.5644	25
YEAR	86		6.6000	3.8784	25
YEAR	87		13.9000	7.9739	25
YEAR	88		14.0000	9.6014	25
YEAR	89		12.1000	9.0910	25
LOCATION	5	SRI RODES REEF	5.4714	5.4144	175
YEAR	83		2.5000	4.9355	40
YEAR	84		2.0000	2.4944	10
YEAR	85		3.3000	3.1225	25
YEAR	86		6.1000	5.0559	25
YEAR	87		8.3000	5.4829	25
YEAR	88		5.2000	3.0551	25
YEAR	89		10.6000	5.9196	25
LOCATION	6	SCI GULL ISLAND SOUTH	6.5754	8.0547	199
YEAR	82		2.8000	4.8045	25
YEAR	83		5.3846	7.5555	39
YEAR	84		3.6000	3.7476	10
YEAR	85		2.9000	4.6592	25
YEAR	86		7.3000	6.4517	25
YEAR	87		8.4000	6.9552	25
YEAR	88		10.7000	11.4683	25
YEAR	89		10.4000	10.0695	25
LOCATION	7	SCI FRYS HARBOR	0.1475	0.7295	200
YEAR	82		0.2000	1.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.2000	0.6325	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.4000	1.1815	25
YEAR	87		0.2000	0.6922	25
YEAR	88		0.3000	1.0992	25
YEAR	89		0.0000	0.0000	25
LOCATION	8	SCI PELICAN BAY	0.5308	1.5454	195
YEAR	82		0.2000	1.0000	25
YEAR	83		0.0000	0.0000	35
YEAR	84		0.6000	0.9661	10
YEAR	85		0.4000	0.9354	25
YEAR	86		0.4000	0.9354	25
YEAR	87		0.5000	1.0206	25
YEAR	88		0.5000	1.2500	25
YEAR	89		1.9000	3.3292	25
LOCATION	9	SCI SCORPION ANCHORAGE	0.5850	1.6595	200
YEAR	82		0.4000	1.3844	25
YEAR	83		0.5000	2.2072	40
YEAR	84		0.2000	0.6325	10
YEAR	85		0.9000	1.7500	25
YEAR	86		1.1000	1.9203	25
YEAR	87		0.4000	0.9354	25
YEAR	88		0.4000	1.1815	25
YEAR	89		0.6000	1.8085	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	10	SCI YELLOWBANKS	0.7250	1.7150	100
YEAR	86		0.2000	0.6922	25
YEAR	87		0.4000	1.5612	25
YEAR	88		0.8000	2.0052	25
YEAR	89		1.5000	2.0412	25
LOCATION	11	ANI ADMIRALS REEF	0.8902	2.1792	205
YEAR	82		0.6000	1.6583	25
YEAR	83		0.4444	2.0841	45
YEAR	84		0.0000	0.0000	10
YEAR	85		1.3000	1.7854	25
YEAR	86		0.6000	1.3070	25
YEAR	87		0.5000	1.2500	25
YEAR	88		0.5000	1.2500	25
YEAR	89		3.0000	3.9528	25
LOCATION	12	ANI CATHEDRAL COVE	0.2703	1.1033	185
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	25
YEAR	84		0.0000	0.0000	10
YEAR	85		0.1000	0.5000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		1.7000	2.4707	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.1000	0.5000	25
LOCATION	13	ANI LANDING COVE	0.2075	1.0165	200
YEAR	82		0.6000	2.1985	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.4000	0.8433	10
YEAR	85		0.1000	0.5000	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.6000	1.4930	25
YEAR	89		0.0000	0.0000	25
LOCATION	14	SBI SOUTHEAST SEALION	2.6925	4.5866	200
YEAR	82		2.0000	4.5644	25
YEAR	83		1.0000	3.0382	40
YEAR	84		1.6000	2.4585	10
YEAR	85		1.5000	3.6084	25
YEAR	86		4.5000	5.4962	25
YEAR	87		1.6000	2.0259	25
YEAR	88		4.2000	3.7305	25
YEAR	89		5.5000	7.2529	25
LOCATION	15	SBI ARCH POINT	0.1875	1.1739	200
YEAR	82		0.2000	1.0000	25
YEAR	83		0.5000	2.2072	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.2000	1.0000	25
YEAR	89		0.2000	1.0000	25
LOCATION	16	SBI CAT CANYON	0.6250	2.0528	100
YEAR	86		0.9000	1.5943	25
YEAR	87		0.3000	0.8292	25
YEAR	88		0.1000	0.5000	25
YEAR	89		1.2000	3.6171	25

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	6005	***Astrangia lajollaensis***	4.7290	8.4158	2959
LOCATION	1	SMI WYCKOFF LEDGE	0.5688	1.5813	189
YEAR	82		0.2000	1.0000	25
YEAR	83		0.3448	1.8570	29
YEAR	84		0.0000	0.0000	10
YEAR	85		1.1000	2.1747	25
YEAR	86		0.3000	1.0992	25
YEAR	87		1.3000	2.0565	25
YEAR	88		0.6000	1.4930	25
YEAR	89		0.4000	0.9354	25
LOCATION	2	SMI HARE ROCK	3.3622	5.9742	196
YEAR	82		1.6000	3.1358	25
YEAR	83		3.3333	8.9443	36
YEAR	84		6.4000	7.2908	10
YEAR	85		1.5000	2.1651	25
YEAR	86		4.5000	6.6927	25
YEAR	87		4.3000	5.6605	25
YEAR	88		4.1000	5.6310	25
YEAR	89		3.0000	4.0825	25
LOCATION	3	SRI JOHNSONS LEE NORTH	2.5150	4.4030	200
YEAR	82		0.2000	1.0000	25
YEAR	83		2.0000	5.6387	40
YEAR	84		2.8000	4.3410	10
YEAR	85		1.6000	2.3805	25
YEAR	86		4.4000	5.0662	25
YEAR	87		2.6000	3.7137	25
YEAR	88		3.8000	5.2599	25
YEAR	89		3.2000	3.9211	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	1.4925	3.2184	200
YEAR	82		0.6000	1.6583	25
YEAR	83		1.2500	4.0430	40
YEAR	84		1.6000	2.6331	10
YEAR	85		1.0000	2.1651	25
YEAR	86		1.6000	2.4875	25
YEAR	87		3.8000	5.3092	25
YEAR	88		1.5000	2.1651	25
YEAR	89		0.8000	1.7260	25
LOCATION	5	SRI RODES REEF	9.4457	10.9654	175
YEAR	83		8.5000	10.5125	40
YEAR	84		8.8000	9.8522	10
YEAR	85		6.0000	5.9073	25
YEAR	86		11.2000	9.9247	25
YEAR	87		16.5000	15.9915	25
YEAR	88		6.0000	8.4471	25
YEAR	89		9.3000	10.6683	25
LOCATION	6	SCI GULL ISLAND SOUTH	2.8291	4.2839	199
YEAR	82		2.4000	5.7951	25
YEAR	83		3.3333	5.7735	39
YEAR	84		0.8000	2.5298	10
YEAR	85		1.2000	1.6330	25
YEAR	86		3.6000	4.1508	25
YEAR	87		4.1000	3.5998	25
YEAR	88		3.0000	3.8188	25
YEAR	89		2.7000	2.7876	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	21.9850	14.2273	200
YEAR	82		12.8000	9.3630	25
YEAR	83		28.2500	21.1087	40
YEAR	84		13.2000	9.8972	10
YEAR	85		11.3000	5.8683	25
YEAR	86		25.1000	10.2439	25
YEAR	87		22.4000	7.9215	25
YEAR	88		24.9000	12.7574	25
YEAR	89		28.9000	9.5764	25
LOCATION	8	SCI PELICAN BAY	13.5692	8.9130	195
YEAR	82		5.4000	5.1881	25
YEAR	83		12.0000	10.7922	35
YEAR	84		10.6000	6.6030	10
YEAR	85		11.3000	5.0062	25
YEAR	86		19.4000	8.6084	25
YEAR	87		18.6000	8.1035	25
YEAR	88		16.7000	6.2799	25
YEAR	89		13.4000	8.6867	25
LOCATION	9	SCI SCORPION ANCHORAGE	1.7500	3.1579	200
YEAR	82		0.2000	1.0000	25
YEAR	83		0.7500	2.6675	40
YEAR	84		2.0000	1.8856	10
YEAR	85		0.0000	0.0000	25
YEAR	86		2.8000	4.5254	25
YEAR	87		2.7000	3.9476	25
YEAR	88		3.0000	3.1458	25
YEAR	89		3.3000	3.0380	25
LOCATION	10	SCI YELLOWBANKS	2.7250	3.5904	100
YEAR	86		1.5000	2.3936	25
YEAR	87		4.1000	4.2007	25
YEAR	88		2.9000	3.9974	25
YEAR	89		2.4000	3.1853	25
LOCATION	11	ANI ADMIRALS REEF	4.9756	5.8284	205
YEAR	82		5.2000	6.0346	25
YEAR	83		4.2222	8.1153	45
YEAR	84		7.0000	5.6765	10
YEAR	85		4.0000	4.0825	25
YEAR	86		6.0000	4.7324	25
YEAR	87		4.2000	4.1282	25
YEAR	88		4.8000	5.1498	25
YEAR	89		6.2000	5.4544	25
LOCATION	12	ANI CATHEDRAL COVE	1.9525	3.2856	200
YEAR	82		1.0000	2.5000	25
YEAR	83		1.2500	3.3493	40
YEAR	84		1.8000	2.5734	10
YEAR	85		1.2000	2.0565	25
YEAR	86		2.8000	3.0035	25
YEAR	87		0.0000	0.0000	25
YEAR	88		4.0000	3.6084	25
YEAR	89		3.9000	4.5689	25

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	13	ANI LANDING COVE	2.1575	3.9318	200
YEAR	82		1.8000	2.8431	25
YEAR	83		1.0000	3.7893	40
YEAR	84		1.4000	2.5033	10
YEAR	85		2.6000	3.7137	25
YEAR	86		1.2000	3.2372	25
YEAR	87		2.1000	3.2016	25
YEAR	88		5.5000	6.2082	25
YEAR	89		1.9000	2.4238	25
LOCATION	14	SBI SOUTHEAST SEALION	2.0450	3.3163	200
YEAR	82		0.8000	1.8708	25
YEAR	83		1.0000	3.0382	40
YEAR	84		1.4000	2.9889	10
YEAR	85		1.6000	3.2977	25
YEAR	86		3.4000	3.7417	25
YEAR	87		1.5000	2.3936	25
YEAR	88		3.3000	3.5882	25
YEAR	89		3.6000	3.9581	25
LOCATION	15	SBI ARCH POINT	1.1875	2.4985	200
YEAR	82		2.0000	3.2275	25
YEAR	83		0.5000	2.2072	40
YEAR	84		1.0000	2.5386	10
YEAR	85		0.4000	1.1815	25
YEAR	86		2.0000	2.8868	25
YEAR	87		0.1000	0.5000	25
YEAR	88		2.7000	3.3789	25
YEAR	89		1.1000	1.7795	25
LOCATION	16	SBI CAT CANYON	0.5500	1.4026	100
YEAR	86		0.0000	0.0000	25
YEAR	87		0.4000	1.1815	25
YEAR	88		1.2000	2.0565	25
YEAR	89		0.6000	1.3070	25
SPECIES	6009	**Hydroids**	1.0333	2.3998	75
LOCATION	1	SMI WYCKOFF LEDGE	2.2000	3.2532	25
YEAR	85		2.2000	3.2532	25
LOCATION	2	SMI HARE ROCK	0.3000	0.8292	25
YEAR	85		0.3000	0.8292	25
LOCATION	7	SCI FRYS HARBOR	0.6000	2.0767	25
YEAR	85		0.6000	2.0767	25
SPECIES	7001	***Diopatra ornata***	1.8897	5.9224	2959
LOCATION	1	SMI WYCKOFF LEDGE	10.8280	11.9741	189
YEAR	82		4.6000	5.7591	25
YEAR	83		7.9310	10.1346	29
YEAR	84		9.4000	8.8969	10
YEAR	85		13.7000	13.8842	25
YEAR	86		9.9000	10.0385	25
YEAR	87		12.0000	12.8493	25
YEAR	88		15.2000	14.9638	25
YEAR	89		13.5000	12.9703	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	2	SMI HARE ROCK	2.3878	6.9147	196
YEAR	82		9.0000	14.4338	25
YEAR	83		3.6111	7.9831	36
YEAR	84		0.8000	1.0328	10
YEAR	85		2.0000	3.4611	25
YEAR	86		1.5000	2.6021	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.5000	1.7678	25
YEAR	89		0.1000	0.5000	25
LOCATION	3	SRI JOHNSONS LEE NORTH	0.6575	3.2795	200
YEAR	82		0.2000	1.0000	25
YEAR	83		1.5000	6.6216	40
YEAR	84		0.4000	0.8433	10
YEAR	85		0.9000	2.1506	25
YEAR	86		0.8000	2.4707	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.3000	1.0992	25
YEAR	89		0.5000	1.6137	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	5.4050	10.1849	200
YEAR	82		5.0000	8.7797	25
YEAR	83		9.0000	15.4919	40
YEAR	84		7.6000	12.7819	10
YEAR	85		7.2000	10.7607	25
YEAR	86		7.1000	9.1481	25
YEAR	87		1.2000	2.1794	25
YEAR	88		0.6000	1.4930	25
YEAR	89		4.7000	7.2284	25
LOCATION	5	SRI RODES REEF	2.2029	5.5157	175
YEAR	83		2.7500	8.1610	40
YEAR	84		0.8000	1.3984	10
YEAR	85		1.9000	4.3469	25
YEAR	86		0.5000	1.2500	25
YEAR	87		0.5000	1.0206	25
YEAR	88		1.1000	2.1747	25
YEAR	89		6.7000	7.4554	25
LOCATION	6	SCI GULL ISLAND SOUTH	2.2688	7.0639	199
YEAR	82		2.8000	7.5111	25
YEAR	83		4.1026	12.0782	39
YEAR	84		2.4000	4.5995	10
YEAR	85		2.4000	5.3268	25
YEAR	86		3.3000	7.7298	25
YEAR	87		2.1000	3.2819	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.1000	0.5000	25
LOCATION	7	SCI FRYS HARBOR	0.3750	1.6577	200
YEAR	82		0.8000	3.1225	25
YEAR	83		0.2500	1.5811	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.2000	0.6922	25
YEAR	86		0.4000	1.1815	25
YEAR	87		0.3000	1.0992	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.8000	2.2500	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	8	SCI PELICAN BAY	2.7359	4.4268	195
YEAR	82		1.6000	3.1358	25
YEAR	83		3.4286	6.3906	35
YEAR	84		1.6000	2.4585	10
YEAR	85		2.2000	3.2532	25
YEAR	86		1.3000	1.6330	25
YEAR	87		4.2000	5.1901	25
YEAR	88		0.0000	0.0000	25
YEAR	89		6.6000	4.2007	25
LOCATION	9	SCI SCORPION ANCHORAGE	0.2000	1.0137	200
YEAR	82		0.2000	1.0000	25
YEAR	83		0.2500	1.5811	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.2000	1.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.8000	1.3919	25
LOCATION	10	SCI YELLOWBANKS	0.3750	1.7180	100
YEAR	86		0.2000	0.6922	25
YEAR	87		1.2000	3.2372	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.1000	0.5000	25
LOCATION	11	ANI ADMIRALS REEF	0.2293	0.9081	205
YEAR	82		0.2000	1.0000	25
YEAR	83		0.0000	0.0000	45
YEAR	84		0.2000	0.6325	10
YEAR	85		0.4000	1.1815	25
YEAR	86		0.2000	0.6922	25
YEAR	87		0.8000	1.5679	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.2000	1.0000	25
LOCATION	12	ANI CATHEDRAL COVE	0.9275	2.8126	200
YEAR	82		1.2000	2.6141	25
YEAR	83		1.2500	5.1578	40
YEAR	84		0.8000	1.9322	10
YEAR	85		0.7000	1.5343	25
YEAR	86		0.8000	1.5679	25
YEAR	87		0.6000	1.3070	25
YEAR	88		0.5000	1.2500	25
YEAR	89		1.3000	2.2958	25
LOCATION	13	ANI LANDING COVE	0.1625	0.8710	200
YEAR	82		0.0000	0.0000	25
YEAR	83		0.2500	1.5811	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.3000	0.8292	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.3000	0.8292	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	0.3100	1.6005	200
YEAR	82		2.0000	4.0825	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.2000	0.6325	10
YEAR	85		0.2000	0.6922	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
LOCATION	15	SBI ARCH POINT	0.0350	0.2858	200
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.2000	0.6325	10
YEAR	85		0.1000	0.5000	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	16	SBI CAT CANYON	0.0750	0.4286	100
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.2000	0.6922	25
YEAR	89		0.1000	0.5000	25
SPECIES	7002	***Phragmatopoma californica***	0.0635	5.1091	2731
LOCATION	1	SMI WYCKOFF LEDGE	0.5200	1.7762	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.4000	1.1815	25
YEAR	88		0.2000	0.6922	25
YEAR	89		2.0000	3.3850	25
LOCATION	2	SMI HARE ROCK	0.1020	0.8335	196
YEAR	82		0.6000	2.1985	25
YEAR	83		0.0000	0.0000	36
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.2000	0.6922	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	3	SRI JOHNSONS LEE NORTH	5.3175	13.7633	200
YEAR	82		0.2000	1.0000	25
YEAR	83		1.2500	4.0430	40
YEAR	84		0.6000	1.3499	10
YEAR	85		27.1000	28.0409	25
YEAR	86		8.3000	10.2754	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		4.7000	4.8584	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	1.1375	4.1749	200
YEAR	82		1.2000	3.6171	25
YEAR	83		0.0000	0.0000	40
YEAR	84		3.0000	5.8310	10
YEAR	85		6.2000	8.9884	25
YEAR	86		0.5000	1.7678	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	5	SRI RODES REEF	0.9286	3.8884	175
YEAR	83		0.0000	0.0000	40
YEAR	84		3.0000	3.2998	10

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Variable	Value	Label	Mean	Std Dev	Cases
YEAR	85		3.3000	6.4840	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		2.0000	7.1078	25
LOCATION	6	SCI GULL ISLAND SOUTH	0.0400	0.3150	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.2000	0.6922	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	7	SCI FRYS HARBOR	0.1400	0.7972	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.7000	1.6956	25
YEAR	89		0.0000	0.0000	25
LOCATION	8	SCI PELICAN BAY	0.1103	0.6192	195
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	35
YEAR	84		0.4000	0.8433	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.7000	1.5343	25
LOCATION	9	SCI SCORPION ANCHORAGE	0.2825	1.7455	200
YEAR	82		0.2000	1.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.4000	1.2649	10
YEAR	85		0.1000	0.5000	25
YEAR	86		1.7000	4.5484	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
LOCATION	10	SCI YELLOWBANKS	0.0000	0.0000	100
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	11	ANI ADMIRALS REEF	0.0683	0.6380	205
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	45
YEAR	84		1.4000	2.6750	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	12	ANI CATHEDRAL COVE	0.2297	1.4209	185
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	25
YEAR	84		0.0000	0.0000	10
YEAR	85		1.0000	3.5355	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.3000	0.8292	25
YEAR	89		0.4000	1.1815	25
LOCATION	13	ANI LANDING COVE	0.3500	1.7371	200
YEAR	82		0.2000	1.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.2000	0.6922	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.6000	3.0000	25
YEAR	89		1.8000	3.4248	25
LOCATION	14	SBI SOUTHEAST SEALION	0.0500	0.4987	200
YEAR	82		0.4000	1.3844	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	15	SBI ARCH POINT	2.1575	6.3979	200
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.4000	0.8433	10
YEAR	85		13.2000	12.6968	25
YEAR	86		0.2000	0.6922	25
YEAR	87		0.0000	0.0000	25
YEAR	88		1.6000	2.9651	25
YEAR	89		2.1000	4.3108	25
LOCATION	16	SBI CAT CANYON	6.9750	9.0194	100
YEAR	86		1.8000	2.6536	25
YEAR	87		0.8000	1.8708	25
YEAR	88		14.1000	10.5050	25
YEAR	89		11.2000	8.6939	25
SPECIES	7003	***Spirobranchus*** *spinosus*	18.9000	16.5372	25
LOCATION	15	SBI ARCH POINT	18.9000	16.5372	25
YEAR	85		18.9000	16.5372	25
SPECIES	8002	***Balanus*** spp.	32.5000	13.4822	25
LOCATION	2	SMI HARE ROCK	32.5000	13.4822	25
YEAR	85		32.5000	13.4822	25

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Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	9001	***Serpulorbis squamigerus_***	1.7548	4.0853	2959
LOCATION	1	SMI WYCKOFF LEDGE	0.1429	0.6322	189
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	29
YEAR	84		0.2000	0.6325	10
YEAR	85		0.4000	0.9354	25
YEAR	86		0.2000	1.0000	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.2000	0.6922	25
YEAR	89		0.1000	0.5000	25
LOCATION	2	SMI HARE ROCK	1.0561	3.0457	196
YEAR	82		0.0000	0.0000	25
YEAR	83		1.3889	4.2445	36
YEAR	84		2.2000	3.1903	10
YEAR	85		1.7000	2.7689	25
YEAR	86		3.5000	5.0518	25
YEAR	87		0.2000	0.6922	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	3	SRI JOHNSONS LEE NORTH	4.2950	6.8309	200
YEAR	82		0.4000	1.3844	25
YEAR	83		4.7500	7.5064	40
YEAR	84		6.4000	4.5995	10
YEAR	85		10.2000	10.4563	25
YEAR	86		9.3000	7.1268	25
YEAR	87		2.9000	2.7651	25
YEAR	88		1.1000	2.7080	25
YEAR	89		0.3000	0.8292	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.2450	1.2451	200
YEAR	82		0.0000	0.0000	25
YEAR	83		0.5000	2.2072	40
YEAR	84		0.4000	0.8433	10
YEAR	85		0.8000	1.8708	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.1000	0.5000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	5	SRI RODES REEF	0.3457	1.2783	175
YEAR	83		0.0000	0.0000	40
YEAR	84		0.8000	1.3984	10
YEAR	85		0.7000	1.5343	25
YEAR	86		1.2000	2.6141	25
YEAR	87		0.2000	0.6922	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	6	SCI GULL ISLAND SOUTH	1.0955	3.2988	199
YEAR	82		0.6000	1.6583	25
YEAR	83		2.3077	6.2667	39
YEAR	84		2.8000	4.4422	10
YEAR	85		1.3000	1.9257	25
YEAR	86		1.5000	2.3936	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.4000	0.9354	25
YEAR	89		0.2000	0.6922	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	1.6400	3.4750	200
YEAR	82		1.0000	2.5000	25
YEAR	83		1.0000	3.7893	40
YEAR	84		7.8000	5.8462	10
YEAR	85		1.9000	3.1689	25
YEAR	86		1.5000	2.2822	25
YEAR	87		2.5000	3.8188	25
YEAR	88		0.4000	1.5612	25
YEAR	89		1.1000	2.4023	25
LOCATION	8	SCI PELICAN BAY	1.5282	2.6951	195
YEAR	82		1.0000	2.5000	25
YEAR	83		0.5714	2.3550	35
YEAR	84		2.8000	2.8597	10
YEAR	85		3.2000	3.9870	25
YEAR	86		2.4000	3.0173	25
YEAR	87		0.7000	1.3540	25
YEAR	88		1.0000	1.6137	25
YEAR	89		1.7000	2.2500	25
LOCATION	9	SCI SCORPION ANCHORAGE	7.3400	7.2947	200
YEAR	82		3.8000	3.3166	25
YEAR	83		1.7500	4.4650	40
YEAR	84		5.8000	3.5839	10
YEAR	85		5.4000	5.0353	25
YEAR	86		16.4000	7.9412	25
YEAR	87		9.3000	6.1880	25
YEAR	88		11.0000	7.1443	25
YEAR	89		7.7000	6.4517	25
LOCATION	10	SCI YELLOWBANKS	0.0000	0.0000	100
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	11	ANI ADMIRALS REEF	0.7561	1.8979	205
YEAR	82		0.6000	1.6583	25
YEAR	83		0.0000	0.0000	45
YEAR	84		1.0000	2.1602	10
YEAR	85		2.0000	3.3850	25
YEAR	86		1.1000	2.2913	25
YEAR	87		0.4000	1.1815	25
YEAR	88		0.8000	1.3919	25
YEAR	89		0.9000	1.7500	25
LOCATION	12	ANI CATHEDRAL COVE	3.0050	4.4704	200
YEAR	82		1.6000	3.4521	25
YEAR	83		0.7500	2.6675	40
YEAR	84		2.6000	2.1187	10
YEAR	85		3.0000	3.3072	25
YEAR	86		4.8000	5.2994	25
YEAR	87		2.4000	2.4452	25
YEAR	88		4.2000	5.7609	25
YEAR	89		5.8000	6.1964	25

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	13	ANI LANDING COVE	1.5800	3.2483	200
YEAR	82		1.4000	2.7080	25
YEAR	83		0.2500	1.5811	40
YEAR	84		2.6000	2.5033	10
YEAR	85		2.3000	3.2210	25
YEAR	86		1.6000	2.0259	25
YEAR	87		0.7000	1.3540	25
YEAR	88		1.8000	3.2692	25
YEAR	89		3.4000	6.2032	25
LOCATION	14	SBI SOUTHEAST SEALION	0.2800	1.2457	200
YEAR	82		0.4000	1.3844	25
YEAR	83		0.5000	2.2072	40
YEAR	84		0.6000	0.9661	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.5000	1.0206	25
YEAR	87		0.2000	1.0000	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
LOCATION	15	SBI ARCH POINT	0.5375	1.7160	200
YEAR	82		0.0000	0.0000	25
YEAR	83		0.2500	1.5811	40
YEAR	84		0.0000	0.0000	10
YEAR	85		1.0000	2.0412	25
YEAR	86		1.5000	3.0619	25
YEAR	87		0.4000	0.9354	25
YEAR	88		1.0000	1.9094	25
YEAR	89		0.0000	0.0000	25
LOCATION	16	SBI CAT CANYON	4.4250	4.5485	100
YEAR	86		2.6000	2.9297	25
YEAR	87		2.7000	2.4917	25
YEAR	88		6.7000	5.0374	25
YEAR	89		5.7000	5.6143	25
SPECIES	10001	**Bryozoans**	4.0821	7.5808	1950
LOCATION	1	SMI WYCKOFF LEDGE	11.3400	9.7837	125
YEAR	85		9.4000	6.2617	25
YEAR	86		5.5000	7.0711	25
YEAR	87		13.9000	11.4127	25
YEAR	88		10.2000	6.6895	25
YEAR	89		17.7000	11.8568	25
LOCATION	2	SMI HARE ROCK	1.8400	3.7720	125
YEAR	85		3.5000	6.1661	25
YEAR	86		0.2000	1.0000	25
YEAR	87		0.9000	1.7500	25
YEAR	88		2.2000	2.6339	25
YEAR	89		2.4000	4.1758	25
LOCATION	3	SRI JOHNSONS LEE NORTH	7.6400	10.6555	125
YEAR	85		8.4000	12.0087	25
YEAR	86		0.8000	1.5679	25
YEAR	87		0.3000	0.8292	25
YEAR	88		6.8000	6.1880	25
YEAR	89		21.9000	9.1081	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	4	SRI JOHNSONS LEE SOUTH	7.0600	13.3201	125
YEAR	85		26.8000	18.9918	25
YEAR	86		0.9000	2.0259	25
YEAR	87		0.1000	0.5000	25
YEAR	88		3.6000	3.8243	25
YEAR	89		3.9000	4.2744	25
LOCATION	5	SRI RODES REEF	2.6400	4.6803	125
YEAR	85		3.0000	4.7871	25
YEAR	86		2.9000	5.2381	25
YEAR	87		0.7000	1.3540	25
YEAR	88		1.8000	2.3408	25
YEAR	89		4.8000	6.7670	25
LOCATION	6	SCI GULL ISLAND SOUTH	2.4600	4.0534	125
YEAR	85		6.1000	6.1695	25
YEAR	86		1.1000	2.2913	25
YEAR	87		0.4000	1.1815	25
YEAR	88		2.5000	3.1458	25
YEAR	89		2.2000	3.1721	25
LOCATION	7	SCI FRYS HARBOR	6.6400	10.0708	125
YEAR	85		20.6000	15.2459	25
YEAR	86		3.7000	2.9861	25
YEAR	87		1.4000	2.2913	25
YEAR	88		4.1000	3.5998	25
YEAR	89		3.4000	2.4875	25
LOCATION	8	SCI PELICAN BAY	0.7600	2.3163	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.6000	1.3070	25
YEAR	88		2.9000	4.3708	25
YEAR	89		0.2000	0.6922	25
LOCATION	9	SCI SCORPION ANCHORAGE	0.2200	0.8989	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.4000	1.3844	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.3000	0.8292	25
YEAR	89		0.4000	1.1815	25
LOCATION	10	SCI YELLOWBANKS	2.7000	3.9196	100
YEAR	86		1.0000	2.8868	25
YEAR	87		1.2000	2.1794	25
YEAR	88		4.2000	4.2525	25
YEAR	89		4.4000	4.6368	25
LOCATION	11	ANI ADMIRALS REEF	5.2600	6.1469	125
YEAR	85		4.9000	5.7045	25
YEAR	86		4.7000	5.4160	25
YEAR	87		4.2000	3.9344	25
YEAR	88		8.9000	8.3877	25
YEAR	89		3.6000	5.4045	25
LOCATION	12	ANI CATHEDRAL COVE	0.9600	2.1717	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.6000	2.0767	25
YEAR	87		1.0000	1.7678	25
YEAR	88		1.9000	2.5290	25
YEAR	89		1.3000	2.8976	25

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	13	ANI LANDING COVE	7.5000	10.4245	125
YEAR	85		3.0000	4.9476	25
YEAR	86		8.7000	16.4905	25
YEAR	87		7.7000	7.6007	25
YEAR	88		6.9000	5.8754	25
YEAR	89		11.2000	11.6396	25
LOCATION	14	SBI SOUTHEAST SEALION	2.4600	3.0451	125
YEAR	85		1.8000	2.5536	25
YEAR	86		2.0000	3.3850	25
YEAR	87		1.6000	1.8930	25
YEAR	88		3.9000	3.6856	25
YEAR	89		3.0000	2.9756	25
LOCATION	15	SBI ARCH POINT	1.7200	3.1337	125
YEAR	85		5.0000	4.5069	25
YEAR	86		0.2000	0.6922	25
YEAR	87		0.7000	1.5343	25
YEAR	88		0.5000	1.2500	25
YEAR	89		2.2000	3.0890	25
LOCATION	16	SBI CAT CANYON	3.7750	5.4413	100
YEAR	86		0.1000	0.5000	25
YEAR	87		5.7000	6.0173	25
YEAR	88		7.0000	6.6144	25
YEAR	89		2.3000	3.3009	25
SPECIES	10002	***Diaperoecia californica***	1.1044	3.4223	2846
LOCATION	1	SMI WYCKOFF LEDGE	0.0333	0.4082	150
YEAR	85		0.0000	0.0000	50
YEAR	86		0.2000	1.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.0000	0.0000	25
LOCATION	2	SMI HARE ROCK	0.1250	0.8978	196
YEAR	82		0.8000	2.3629	25
YEAR	83		0.0000	0.0000	36
YEAR	84		0.2000	0.6325	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
LOCATION	3	SRI JOHNSONS LEE NORTH	0.1725	1.1023	200
YEAR	82		0.8000	2.7689	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.2000	0.6325	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.5000	1.2500	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.2200	0.8410	125
YEAR	85		0.1000	0.5000	25
YEAR	86		0.3000	0.8292	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.5000	1.4434	25
YEAR	89		0.2000	0.6922	25
LOCATION	5	SRI RODES REEF	0.6571	2.2577	175
YEAR	83		1.0000	3.0382	40
YEAR	84		0.0000	0.0000	10

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Variable	Value	Label	Mean	Std Dev	Cases
YEAR	85		0.0000	0.0000	25
YEAR	86		0.4000	0.9354	25
YEAR	87		0.3000	0.8292	25
YEAR	88		0.2000	0.6922	25
YEAR	89		2.1000	4.0620	25
LOCATION	6	SCI GULL ISLAND SOUTH	2.0675	4.2375	200
YEAR	82		1.6000	3.4521	25
YEAR	83		0.0000	0.0000	40
YEAR	84		3.6000	3.9777	10
YEAR	85		5.7000	7.3072	25
YEAR	86		3.1000	4.6368	25
YEAR	87		0.3000	0.8292	25
YEAR	88		1.8000	2.4495	25
YEAR	89		2.6000	4.7588	25
LOCATION	7	SCI FRYS HARBOR	4.0950	6.8040	200
YEAR	82		2.6000	4.1130	25
YEAR	83		0.5000	3.1623	40
YEAR	84		5.4000	5.8916	10
YEAR	85		0.0000	0.0000	25
YEAR	86		7.2000	10.6634	25
YEAR	87		5.9000	4.9413	25
YEAR	88		7.7000	6.1627	25
YEAR	89		6.4000	9.3285	25
LOCATION	8	SCI PELICAN BAY	1.6923	3.3487	195
YEAR	82		3.2000	3.5000	25
YEAR	83		2.0000	4.0584	35
YEAR	84		7.0000	6.6165	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.5000	1.4434	25
YEAR	87		0.7000	1.3540	25
YEAR	88		1.1000	1.9203	25
YEAR	89		2.1000	3.2819	25
LOCATION	9	SCI SCORPION ANCHORAGE	0.0475	0.3347	200
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.2000	0.6325	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.2000	0.6922	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
LOCATION	10	SCI YELLOWBANKS	0.5000	1.5489	100
YEAR	86		0.8000	2.2500	25
YEAR	87		0.3000	0.8292	25
YEAR	88		0.5000	1.6137	25
YEAR	89		0.4000	1.1815	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	11	ANI ADMIRALS REEF	2.1341	4.5981	205
YEAR	82		2.6000	5.4237	25
YEAR	83		0.0000	0.0000	45
YEAR	84		1.0000	1.4142	10
YEAR	85		2.1000	2.1262	25
YEAR	86		5.8000	8.1560	25
YEAR	87		2.3000	4.2032	25
YEAR	88		3.0000	5.5902	25
YEAR	89		1.3000	2.1794	25
LOCATION	12	ANI CATHEDRAL COVE	0.2375	1.0808	200
YEAR	82		0.0000	0.0000	25
YEAR	83		0.2500	1.5811	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.7000	1.6956	25
YEAR	87		0.6000	1.3070	25
YEAR	88		0.0000	0.0000	25
YEAR	89		0.2000	0.6922	25
LOCATION	13	ANI LANDING COVE	2.9600	5.1676	200
YEAR	82		4.0000	5.2042	25
YEAR	83		0.5000	2.2072	40
YEAR	84		0.2000	0.6325	10
YEAR	85		2.1000	4.8777	25
YEAR	86		4.9000	6.6724	25
YEAR	87		3.1000	4.7478	25
YEAR	88		3.1000	3.9051	25
YEAR	89		5.6000	7.3343	25
LOCATION	14	SBI SOUTHEAST SEALION	0.4750	3.0220	200
YEAR	82		3.2000	7.8899	25
YEAR	83		0.2500	1.5811	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.1000	0.5000	25
LOCATION	15	SBI ARCH POINT	0.1125	0.8789	200
YEAR	82		0.8000	2.3629	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.0000	0.0000	10
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
LOCATION	16	SBI CAT CANYON	1.2000	2.3963	100
YEAR	86		0.8000	2.2500	25
YEAR	87		0.7000	1.9791	25
YEAR	88		2.7000	2.2730	25
YEAR	89		0.6000	2.5290	25
SPECIES	11008	***Pachythyone rubra***	2.7478	8.1492	450
LOCATION	1	SMI WYCKOFF LEDGE	0.4000	2.0000	25
YEAR	89		0.4000	2.0000	25
LOCATION	2	SMI HARE ROCK	0.1000	0.5000	25
YEAR	88		0.1000	0.5000	25
LOCATION	3	SRI JOHNSONS LEE NORTH	2.4650	5.0758	100
YEAR	82		0.0000	0.0000	25
YEAR	83		0.2500	1.5811	40

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Variable	Value	Label	Mean	Std Dev	Cases
YEAR	84		1.4000	1.8974	10
YEAR	88		8.9000	6.5383	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	10.1000	9.4505	25
YEAR	88		10.1000	9.4505	25
LOCATION	5	SRI RODES REEF	0.0400	0.2828	50
YEAR	83		0.0000	0.0000	40
YEAR	84		0.2000	0.6325	10
LOCATION	6	SCI GULL ISLAND SOUTH	0.3000	1.5000	25
YEAR	89		0.3000	1.5000	25
LOCATION	7	SCI FRYS HARBOR	5.6040	13.0590	125
YEAR	82		0.6000	1.6583	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.8000	1.0328	10
YEAR	88		8.9000	13.4645	25
YEAR	89		18.2000	20.7856	25
LOCATION	8	SCI PELICAN BAY	0.2000	1.2840	75
YEAR	82		0.2000	1.0000	25
YEAR	83		0.2500	1.5811	40
YEAR	84		0.0000	0.0000	10
SPECIES	12001	**Tunicates**	1.2718	2.9606	1950
LOCATION	1	SMI WYCKOFF LEDGE	1.6000	2.5872	125
YEAR	85		0.3000	0.8292	25
YEAR	86		2.2000	3.1721	25
YEAR	87		1.7000	2.8614	25
YEAR	88		1.4000	2.5083	25
YEAR	89		2.4000	2.5495	25
LOCATION	2	SMI HARE ROCK	0.0800	0.5440	125
YEAR	85		0.1000	0.5000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.2000	1.0000	25
YEAR	88		0.1000	0.5000	25
YEAR	89		0.0000	0.0000	25
LOCATION	3	SRI JOHNSONS LEE NORTH	1.7800	3.3872	125
YEAR	85		0.7000	1.3540	25
YEAR	86		1.0000	1.9094	25
YEAR	87		0.0000	0.0000	25
YEAR	88		1.8000	2.8431	25
YEAR	89		5.4000	5.1881	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	1.8400	3.6910	125
YEAR	85		6.1000	5.7319	25
YEAR	86		0.1000	0.5000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.8000	1.7260	25
YEAR	89		2.2000	2.7310	25
LOCATION	5	SRI RODES REEF	1.9400	3.3730	125
YEAR	85		4.1000	4.9413	25
YEAR	86		1.4000	2.1747	25
YEAR	87		0.6000	1.0897	25
YEAR	88		0.2000	0.6922	25
YEAR	89		3.4000	3.9449	25
LOCATION	6	SCI GULL ISLAND SOUTH	0.9600	1.7616	125
YEAR	85		0.7000	1.5343	25
YEAR	86		2.2000	2.6339	25
YEAR	87		0.9000	1.4216	25
YEAR	88		0.7000	1.3540	25
YEAR	89		0.3000	0.8292	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	0.3200	0.9512	125
YEAR	85		0.6000	1.3070	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.6000	1.3070	25
YEAR	89		0.4000	0.9354	25
LOCATION	8	SCI PELICAN BAY	0.2600	0.8294	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.3000	1.0992	25
YEAR	87		0.3000	0.8292	25
YEAR	88		0.3000	0.8292	25
YEAR	89		0.4000	0.9354	25
LOCATION	9	SCI SCORPION ANCHORAGE	0.0600	0.4984	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.3000	1.0992	25
YEAR	89		0.0000	0.0000	25
LOCATION	10	SCI YELLOWBANKS	0.2250	0.7191	100
YEAR	86		0.0000	0.0000	25
YEAR	87		0.2000	0.6922	25
YEAR	88		0.2000	0.6922	25
YEAR	89		0.5000	1.0206	25
LOCATION	11	ANI ADMIRALS REEF	1.5200	2.8022	125
YEAR	85		0.8000	1.7260	25
YEAR	86		1.8000	3.3479	25
YEAR	87		1.9000	3.4065	25
YEAR	88		2.1000	3.1192	25
YEAR	89		1.0000	1.9094	25
LOCATION	12	ANI CATHEDRAL COVE	0.4000	1.3244	125
YEAR	85		0.0000	0.0000	25
YEAR	86		0.0000	0.0000	25
YEAR	87		0.2000	0.6922	25
YEAR	88		0.3000	0.8292	25
YEAR	89		1.5000	2.5000	25
LOCATION	13	ANI LANDING COVE	2.5400	4.3299	125
YEAR	85		0.9000	1.8930	25
YEAR	86		1.2000	1.9257	25
YEAR	87		1.7000	2.3629	25
YEAR	88		3.1000	4.6926	25
YEAR	89		5.8000	6.7206	25
LOCATION	14	SBI SOUTHEAST SEALION	2.7200	3.5783	125
YEAR	85		1.4000	2.1747	25
YEAR	86		1.7000	3.9344	25
YEAR	87		3.4000	3.7417	25
YEAR	88		3.7000	3.4701	25
YEAR	89		3.4000	3.8784	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	15	SBI ARCH POINT	0.2600	0.7662	125
YEAR	85		0.4000	0.9354	25
YEAR	86		0.3000	0.8292	25
YEAR	87		0.0000	0.0000	25
YEAR	88		0.5000	1.0206	25
YEAR	89		0.1000	0.5000	25
LOCATION	16	SBI CAT CANYON	4.2250	5.8786	100
YEAR	86		0.1000	0.5000	25
YEAR	87		4.9000	5.5189	25
YEAR	88		10.2000	5.9913	25
YEAR	89		1.7000	3.7305	25
SPECIES	13001	**Miscellaneous inverts**	11.1689	13.2393	2961
LOCATION	1	SMI WYCKOFF LEDGE	9.1243	9.5356	189
YEAR	82		2.6000	5.4237	25
YEAR	83		0.6897	2.5788	29
YEAR	84		14.2000	7.6855	10
YEAR	85		14.9000	9.2837	25
YEAR	86		5.8000	5.4829	25
YEAR	87		8.4000	6.0759	25
YEAR	88		11.5000	8.8682	25
YEAR	89		19.3000	10.9335	25
LOCATION	2	SMI HARE ROCK	4.6300	6.7370	200
YEAR	82		1.6000	2.3805	25
YEAR	83		0.0000	0.0000	40
YEAR	84		2.6000	2.6750	10
YEAR	85		1.4000	4.5689	25
YEAR	86		13.7000	7.8102	25
YEAR	87		6.0000	5.8630	25
YEAR	88		8.1000	7.7487	25
YEAR	89		5.2000	5.7699	25
LOCATION	3	SRI JOHNSONS LEE NORTH	15.4596	16.7449	198
YEAR	82		2.0833	4.8715	24
YEAR	83		5.8974	7.8532	39
YEAR	84		46.6000	19.9120	10
YEAR	85		5.6000	5.2678	25
YEAR	86		12.0000	9.4097	25
YEAR	87		38.6000	18.6397	25
YEAR	88		14.1000	8.3192	25
YEAR	89		22.3000	6.7670	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	18.3750	19.6827	200
YEAR	82		1.6000	2.3805	25
YEAR	83		5.2500	6.7889	40
YEAR	84		35.0000	13.3749	10
YEAR	85		15.3000	12.8558	25
YEAR	86		25.9000	12.7655	25
YEAR	87		17.5000	7.9713	25
YEAR	88		11.3000	9.6857	25
YEAR	89		53.0000	22.6500	25
LOCATION	5	SRI RODES REEF	12.2314	13.4957	175
YEAR	83		3.7500	7.7418	40
YEAR	84		26.8000	16.0610	10
YEAR	85		12.1000	9.4285	25
YEAR	86		10.9000	9.4890	25
YEAR	87		6.1000	4.9519	25
YEAR	88		32.6000	13.7022	25
YEAR	89		7.2000	5.2202	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	6	SCI GULL ISLAND SOUTH	7.2538	8.8919	199
YEAR	82		1.4000	3.0687	25
YEAR	83		3.5897	9.0284	39
YEAR	84		25.6000	17.8836	10
YEAR	85		8.1000	7.3697	25
YEAR	86		6.0000	4.3899	25
YEAR	87		10.6000	5.4620	25
YEAR	88		4.7000	4.5254	25
YEAR	89		11.1000	5.9983	25
LOCATION	7	SCI FRYS HARBOR	15.2475	15.4221	200
YEAR	82		0.0000	0.0000	25
YEAR	83		3.2500	6.5584	40
YEAR	84		14.2000	9.8184	10
YEAR	85		22.6000	9.8552	25
YEAR	86		35.1000	14.8864	25
YEAR	87		24.6000	13.8759	25
YEAR	88		10.1000	12.7574	25
YEAR	89		18.7000	10.5603	25
LOCATION	8	SCI PELICAN BAY	11.2359	9.7748	195
YEAR	82		12.0000	10.7044	25
YEAR	83		1.1429	3.2280	35
YEAR	84		18.6000	7.7775	10
YEAR	85		17.1000	8.8588	25
YEAR	86		10.5000	7.7392	25
YEAR	87		3.5000	3.3072	25
YEAR	88		15.3000	7.6825	25
YEAR	89		20.2000	6.3705	25
LOCATION	9	SCI SCORPION ANCHORAGE	8.9350	9.6635	200
YEAR	82		13.6000	9.5219	25
YEAR	83		1.2500	3.3493	40
YEAR	84		13.2000	5.3500	10
YEAR	85		16.1000	11.3899	25
YEAR	86		3.9000	4.4535	25
YEAR	87		8.3000	7.8965	25
YEAR	88		8.0000	10.2825	25
YEAR	89		14.3000	9.8563	25
LOCATION	10	SCI YELLOWBANKS	4.3250	4.6310	100
YEAR	86		3.0000	2.8868	25
YEAR	87		3.4000	3.0516	25
YEAR	88		6.3000	6.9642	25
YEAR	89		4.6000	3.9317	25
LOCATION	11	ANI ADMIRALS REEF	14.9317	15.8292	205
YEAR	82		1.6000	2.7839	25
YEAR	83		2.2222	5.1737	45
YEAR	84		29.6000	17.4305	10
YEAR	85		15.2000	10.2804	25
YEAR	86		14.2000	9.8351	25
YEAR	87		34.2000	20.9628	25
YEAR	88		27.7000	11.3862	25
YEAR	89		13.7000	7.1487	25

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	12	ANI CATHEDRAL COVE	15.1050	13.5194	200
YEAR	82		0.6000	2.1985	25
YEAR	83		9.2500	9.9711	40
YEAR	84		26.6000	13.8580	10
YEAR	85		25.4000	12.1338	25
YEAR	86		14.7000	9.8510	25
YEAR	87		7.3000	8.3516	25
YEAR	88		23.1000	9.7969	25
YEAR	89		24.3000	14.3889	25
LOCATION	13	ANI LANDING COVE	8.1325	10.5383	200
YEAR	82		7.8000	9.3630	25
YEAR	83		4.7500	8.1610	40
YEAR	84		12.4000	17.7839	10
YEAR	85		4.0000	6.4145	25
YEAR	86		4.4000	6.3852	25
YEAR	87		9.1000	9.0104	25
YEAR	88		13.3000	12.1775	25
YEAR	89		13.9000	13.1315	25
LOCATION	14	SBI SOUTHEAST SEALION	11.5650	13.1724	200
YEAR	82		0.8000	2.3629	25
YEAR	83		2.2500	5.3048	40
YEAR	84		9.8000	10.7683	10
YEAR	85		8.8000	9.6588	25
YEAR	86		18.1000	9.4174	25
YEAR	87		16.3000	11.4819	25
YEAR	88		33.2000	12.9406	25
YEAR	89		7.8000	4.2279	25
LOCATION	15	SBI ARCH POINT	6.5825	8.0628	200
YEAR	82		3.6000	4.6815	25
YEAR	83		1.0000	3.7893	40
YEAR	84		11.4000	12.4025	10
YEAR	85		4.8000	5.5396	25
YEAR	86		7.5000	5.5902	25
YEAR	87		9.0000	10.4083	25
YEAR	88		14.2000	10.3511	25
YEAR	89		7.4000	4.0492	25
LOCATION	16	SBI CAT CANYON	13.0250	14.6822	100
YEAR	86		6.0000	8.7500	25
YEAR	87		10.1000	6.7500	25
YEAR	88		27.2000	20.1856	25
YEAR	89		8.8000	8.4508	25
SPECIES	15001	**Bare substrate**	16.5956	17.9289	2250
LOCATION	1	SMI WYCKOFF LEDGE	11.2400	16.0695	125
YEAR	85		8.1000	10.4901	25
YEAR	86		1.1000	2.2913	25
YEAR	87		20.6000	18.9885	25
YEAR	88		14.7000	21.4491	25
YEAR	89		11.7000	13.3018	25
LOCATION	2	SMI HARE ROCK	28.3400	19.9140	125
YEAR	85		22.0000	23.8812	25
YEAR	86		39.6000	19.5746	25
YEAR	87		35.3000	21.7864	25
YEAR	88		21.3000	11.7065	25
YEAR	89		23.5000	13.5401	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	3	SRI JOHNSONS LEE NORTH	15.8400	14.3507	125
YEAR	85		8.6000	6.8496	25
YEAR	86		26.8000	9.0864	25
YEAR	87		32.2000	11.3266	25
YEAR	88		8.8000	9.8984	25
YEAR	89		2.8000	4.5826	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	9.9200	11.1213	125
YEAR	85		6.6000	9.2387	25
YEAR	86		9.6000	8.6205	25
YEAR	87		19.8000	12.0960	25
YEAR	88		9.0000	10.8733	25
YEAR	89		4.6000	8.4373	25
LOCATION	5	SRI RODES REEF	7.6600	11.0522	125
YEAR	85		5.3000	7.3711	25
YEAR	86		6.1000	7.0371	25
YEAR	87		7.6000	8.6446	25
YEAR	88		15.3000	18.7961	25
YEAR	89		4.0000	4.0182	25
LOCATION	6	SCI GULL ISLAND SOUTH	14.7400	11.5215	125
YEAR	85		8.9000	11.9913	25
YEAR	86		8.1000	7.2270	25
YEAR	87		15.3000	8.8188	25
YEAR	88		19.8000	12.8274	25
YEAR	89		21.6000	9.4890	25
LOCATION	7	SCI FRYS HARBOR	8.4189	11.0289	185
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	25
YEAR	84		0.0000	0.0000	10
YEAR	85		13.7000	11.0661	25
YEAR	86		6.0000	6.9970	25
YEAR	87		8.1000	9.2218	25
YEAR	88		18.2000	12.1089	25
YEAR	89		16.3000	12.3558	25
LOCATION	8	SCI PELICAN BAY	26.4459	21.9259	185
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	25
YEAR	84		0.0000	0.0000	10
YEAR	85		42.5000	12.8695	25
YEAR	86		40.3000	12.7949	25
YEAR	87		45.4000	15.3039	25
YEAR	88		43.2000	10.6927	25
YEAR	89		24.3000	10.9335	25
LOCATION	9	SCI SCORPION ANCHORAGE	24.3649	22.6647	185
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	25
YEAR	84		0.0000	0.0000	10
YEAR	85		13.1000	9.7168	25
YEAR	86		37.3000	15.3589	25
YEAR	87		43.7000	12.8720	25
YEAR	88		39.0000	17.5891	25
YEAR	89		47.2000	13.6611	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	10	SCI YELLOWBANKS	18.8750	15.3181	100
YEAR	86		11.0000	9.1856	25
YEAR	87		18.2000	13.1996	25
YEAR	88		22.9000	17.1191	25
YEAR	89		23.4000	17.6906	25
LOCATION	11	ANI ADMIRALS REEF	13.2200	18.3679	125
YEAR	85		6.8000	13.1601	25
YEAR	86		10.8000	14.8029	25
YEAR	87		20.6000	26.7442	25
YEAR	88		13.7000	16.5063	25
YEAR	89		14.2000	16.0033	25
LOCATION	12	ANI CATHEDRAL COVE	13.7432	15.9975	185
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	25
YEAR	84		0.0000	0.0000	10
YEAR	85		23.2000	15.4029	25
YEAR	86		18.6000	11.1822	25
YEAR	87		13.1000	11.9085	25
YEAR	88		24.3000	13.7598	25
YEAR	89		22.5000	21.9611	25
LOCATION	13	ANI LANDING COVE	4.3378	9.8804	185
YEAR	82		0.0000	0.0000	25
YEAR	83		0.0000	0.0000	25
YEAR	84		0.0000	0.0000	10
YEAR	85		4.2000	9.0058	25
YEAR	86		3.3000	5.4352	25
YEAR	87		6.9000	14.7775	25
YEAR	88		9.0000	9.7093	25
YEAR	89		8.7000	15.0886	25
LOCATION	14	SBI SOUTHEAST SEALION	27.8000	17.3890	125
YEAR	85		31.3000	19.4738	25
YEAR	86		24.9000	16.3376	25
YEAR	87		27.7000	17.0770	25
YEAR	88		20.9000	13.1672	25
YEAR	89		34.2000	18.3672	25
LOCATION	15	SBI ARCH POINT	24.1600	14.4487	125
YEAR	85		12.2000	8.3016	25
YEAR	86		22.7000	10.4563	25
YEAR	87		36.5000	11.2036	25
YEAR	88		27.8000	15.9151	25
YEAR	89		21.6000	13.8233	25
LOCATION	16	SBI CAT CANYON	20.3500	19.2111	100
YEAR	86		8.9000	7.9083	25
YEAR	87		7.4000	12.5308	25
YEAR	88		29.4000	18.5444	25
YEAR	89		35.7000	17.8027	25
SPECIES	15002	**Rock**	77.4473	25.1170	2911
LOCATION	1	SMI WYCKOFF LEDGE	77.6323	24.4885	189
YEAR	82		62.6000	33.9460	25
YEAR	83		79.6552	30.9934	29
YEAR	84		92.0000	13.7598	10
YEAR	85		84.0000	17.2904	25
YEAR	86		88.2000	11.6708	25
YEAR	87		70.7000	22.9642	25
YEAR	88		74.7000	22.7797	25
YEAR	89		77.5000	18.1142	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	2	SMI HARE ROCK	76.2538	30.3323	197
YEAR	82		70.2000	36.1847	25
YEAR	83		77.0270	34.6302	37
YEAR	84		65.2000	33.9175	10
YEAR	85		78.9000	30.6703	25
YEAR	86		76.8000	28.5000	25
YEAR	87		80.5000	26.5460	25
YEAR	88		75.6000	24.4872	25
YEAR	89		78.8000	28.1654	25
LOCATION	3	SRI JOHNSONS LEE NORTH	93.7663	10.0576	199
YEAR	82		95.4000	13.1434	25
YEAR	83		97.4359	5.9462	39
YEAR	84		97.2000	5.6725	10
YEAR	85		93.5000	7.6035	25
YEAR	86		87.5000	15.0520	25
YEAR	87		91.0000	10.7044	25
YEAR	88		94.9000	5.0765	25
YEAR	89		93.2000	9.4240	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	82.6375	20.7458	200
YEAR	82		80.6000	27.1692	25
YEAR	83		81.7500	25.3071	40
YEAR	84		79.0000	26.0811	10
YEAR	85		85.3000	18.6430	25
YEAR	86		82.0000	17.7071	25
YEAR	87		76.3000	18.0584	25
YEAR	88		87.0000	13.4048	25
YEAR	89		87.5000	16.2019	25
LOCATION	5	SRI RODES REEF	80.7229	21.0583	175
YEAR	83		77.5000	28.1707	40
YEAR	84		92.4000	12.7819	10
YEAR	85		84.9000	18.3496	25
YEAR	86		78.7000	20.5665	25
YEAR	87		78.4000	19.8416	25
YEAR	88		77.4000	19.1822	25
YEAR	89		84.7000	14.5831	25
LOCATION	6	SCI GULL ISLAND SOUTH	93.0779	11.6977	199
YEAR	82		94.2000	9.7553	25
YEAR	83		92.8205	17.0060	39
YEAR	84		89.0000	9.7183	10
YEAR	85		94.9000	8.2437	25
YEAR	86		91.6000	12.1381	25
YEAR	87		90.3000	11.9312	25
YEAR	88		92.6000	10.3702	25
YEAR	89		96.9000	6.1356	25
LOCATION	7	SCI FRYS HARBOR	79.3389	20.6277	180
YEAR	82		84.0000	12.9422	5
YEAR	83		70.7500	30.3304	40
YEAR	84		82.6000	12.8599	10
YEAR	85		83.4000	16.0546	25
YEAR	86		84.8000	13.2665	25
YEAR	87		86.4000	15.6804	25
YEAR	88		79.1000	16.6126	25
YEAR	89		74.5000	19.4052	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	8	SCI PELICAN BAY	59.9382	20.5599	170
YEAR	83		58.8571	27.5223	35
YEAR	84		66.2000	21.9788	10
YEAR	85		49.2000	14.0446	25
YEAR	86		56.5000	18.6246	25
YEAR	87		56.3000	18.4012	25
YEAR	88		63.7000	14.2544	25
YEAR	89		73.0000	16.7239	25
LOCATION	9	SCI SCORPION ANCHORAGE	80.0075	19.5738	200
YEAR	82		82.6000	14.0030	25
YEAR	83		71.2500	34.2081	40
YEAR	84		84.4000	8.9343	10
YEAR	85		82.4000	11.4218	25
YEAR	86		79.9000	11.6476	25
YEAR	87		76.6000	14.1767	25
YEAR	88		86.2000	14.8976	25
YEAR	89		84.6000	11.7189	25
LOCATION	10	SCI YELLOWBANKS	70.6750	28.2906	100
YEAR	86		75.2000	22.4179	25
YEAR	87		72.6000	30.6907	25
YEAR	88		63.6000	31.8205	25
YEAR	89		71.3000	27.6899	25
LOCATION	11	ANI ADMIRALS REEF	76.2000	28.8887	205
YEAR	82		81.6000	32.2981	25
YEAR	83		66.8889	34.8909	45
YEAR	84		70.6000	25.3342	10
YEAR	85		76.9000	31.8712	25
YEAR	86		80.5000	25.3825	25
YEAR	87		77.9000	22.6578	25
YEAR	88		72.4000	26.2151	25
YEAR	89		86.9000	18.8232	25
LOCATION	12	ANI CATHEDRAL COVE	57.9900	27.1892	200
YEAR	82		56.8000	26.3739	25
YEAR	83		61.5000	32.6245	40
YEAR	84		55.8000	26.3894	10
YEAR	85		46.1000	24.5806	25
YEAR	86		54.2000	20.8631	25
YEAR	87		57.0000	26.2500	25
YEAR	88		63.3000	26.7387	25
YEAR	89		65.8000	26.8262	25
LOCATION	13	ANI LANDING COVE	66.5404	32.9224	198
YEAR	82		72.1154	40.9188	26
YEAR	83		65.9459	40.6516	37
YEAR	84		72.0000	34.3058	10
YEAR	85		61.6000	29.0104	25
YEAR	86		63.3000	28.0413	25
YEAR	87		75.3000	25.3036	25
YEAR	88		63.1000	25.3443	25
YEAR	89		62.3000	33.5870	25

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	14	SBI SOUTHEAST SEALION	79.8970	23.4469	199
YEAR	82		72.4000	26.1454	25
YEAR	83		79.2308	32.0677	39
YEAR	84		82.2000	23.3324	10
YEAR	85		78.5000	20.9040	25
YEAR	86		78.8000	21.7361	25
YEAR	87		78.6000	15.9276	25
YEAR	88		86.1000	13.3088	25
YEAR	89		85.1000	23.3350	25
LOCATION	15	SBI ARCH POINT	79.0525	20.8281	200
YEAR	82		75.0000	17.7951	25
YEAR	83		72.5000	34.3250	40
YEAR	84		88.8000	11.0030	10
YEAR	85		79.0000	13.2877	25
YEAR	86		84.0000	14.5952	25
YEAR	87		77.7000	13.6344	25
YEAR	88		82.9000	14.9074	25
YEAR	89		82.3000	18.4549	25
LOCATION	16	SBI CAT CANYON	82.7500	17.9030	100
YEAR	86		79.1000	17.8226	25
YEAR	87		86.6000	14.6643	25
YEAR	88		76.2000	22.1984	25
YEAR	89		89.1000	13.4412	25
SPECIES	15003	**Cobble**	12.8143	19.1854	2910
LOCATION	1	SMI WYCKOFF LEDGE	6.8704	15.5521	189
YEAR	82		12.4000	22.8728	25
YEAR	83		16.5517	27.9382	29
YEAR	84		2.6000	6.3979	10
YEAR	85		4.9000	9.8816	25
YEAR	86		2.7000	3.8134	25
YEAR	87		4.8000	7.2858	25
YEAR	88		4.1000	6.8038	25
YEAR	89		2.8000	5.4160	25
LOCATION	2	SMI HARE ROCK	14.4107	22.6460	196
YEAR	82		7.4000	19.4786	25
YEAR	83		15.0000	25.8014	36
YEAR	84		31.2000	30.9867	10
YEAR	85		14.0000	20.7666	25
YEAR	86		11.7000	19.5352	25
YEAR	87		7.5000	13.8067	25
YEAR	88		21.5000	22.9810	25
YEAR	89		16.8000	25.2953	25
LOCATION	3	SRI JOHNSONS LEE NORTH	2.7025	5.9708	200
YEAR	82		3.8000	12.1861	25
YEAR	83		2.5000	5.8835	40
YEAR	84		0.8000	1.3984	10
YEAR	85		1.9000	2.5290	25
YEAR	86		1.7000	3.2851	25
YEAR	87		1.7000	2.8614	25
YEAR	88		3.7000	3.9607	25
YEAR	89		4.5000	6.2500	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	4	SRI JOHNSONS LEE SOUTH	2.6775	5.9345	200
YEAR	82		1.4000	6.0415	25
YEAR	83		3.7500	9.5239	40
YEAR	84		4.8000	5.8271	10
YEAR	85		2.5000	4.5644	25
YEAR	86		2.3000	4.3253	25
YEAR	87		2.6000	4.2377	25
YEAR	88		3.3000	4.8261	25
YEAR	89		1.4000	2.6101	25
LOCATION	5	SRI RODES REEF	12.3343	16.5687	175
YEAR	83		14.7500	23.3136	40
YEAR	84		5.6000	9.8342	10
YEAR	85		9.5000	14.5774	25
YEAR	86		14.7000	17.5642	25
YEAR	87		16.1000	15.6472	25
YEAR	88		10.2000	11.2944	25
YEAR	89		10.0000	10.4583	25
LOCATION	6	SCI GULL ISLAND SOUTH	2.4548	4.7389	199
YEAR	82		2.0000	4.0825	25
YEAR	83		2.3077	6.2667	39
YEAR	84		6.6000	4.9035	10
YEAR	85		1.2000	2.8062	25
YEAR	86		2.9000	5.0867	25
YEAR	87		3.2000	5.0785	25
YEAR	88		2.4000	3.7137	25
YEAR	89		1.6000	3.6714	25
LOCATION	7	SCI FRYS HARBOR	16.0944	17.9516	180
YEAR	82		4.0000	6.5192	5
YEAR	83		26.0000	28.1753	40
YEAR	84		17.2000	12.4793	10
YEAR	85		12.1000	10.1211	25
YEAR	86		11.5000	9.3541	25
YEAR	87		8.4000	10.4053	25
YEAR	88		16.4000	14.9143	25
YEAR	89		18.2000	15.0955	25
LOCATION	8	SCI PELICAN BAY	17.8618	15.1854	170
YEAR	83		15.1429	17.2134	35
YEAR	84		17.4000	23.1526	10
YEAR	85		21.5000	9.6285	25
YEAR	86		24.0000	16.0889	25
YEAR	87		22.5000	15.8114	25
YEAR	88		17.8000	12.3178	25
YEAR	89		7.5000	7.1807	25
LOCATION	9	SCI SCORPION ANCHORAGE	10.6775	17.1957	200
YEAR	82		2.8000	9.2511	25
YEAR	83		24.7500	30.8834	40
YEAR	84		9.8000	6.8928	10
YEAR	85		9.1000	9.1253	25
YEAR	86		6.9000	6.6254	25
YEAR	87		12.6000	9.9079	25
YEAR	88		3.1000	3.6286	25
YEAR	89		7.4000	8.5233	25

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	10	SCI YELLOWBANKS	17.3000	17.2536	100
YEAR	86		12.4000	10.9326	25
YEAR	87		16.0000	18.5826	25
YEAR	88		23.0000	21.6627	25
YEAR	89		17.8000	15.2637	25
LOCATION	11	ANI ADMIRALS REEF	17.2390	23.3451	205
YEAR	82		7.4000	18.4910	25
YEAR	83		30.6667	32.3616	45
YEAR	84		17.4000	13.5335	10
YEAR	85		14.4000	19.4358	25
YEAR	86		13.2000	19.6919	25
YEAR	87		15.8000	16.7662	25
YEAR	88		21.2000	23.2191	25
YEAR	89		7.2000	11.3266	25
LOCATION	12	ANI CATHEDRAL COVE	28.7425	22.1882	200
YEAR	82		31.6000	22.0189	25
YEAR	83		34.2500	31.6947	40
YEAR	84		25.6000	15.8549	10
YEAR	85		35.0000	16.5202	25
YEAR	86		29.3000	16.3701	25
YEAR	87		30.0000	18.4701	25
YEAR	88		22.7000	20.3603	25
YEAR	89		16.3000	16.3955	25
LOCATION	13	ANI LANDING COVE	26.2944	28.9093	197
YEAR	82		20.6000	33.7676	25
YEAR	83		32.9730	39.5717	37
YEAR	84		26.0000	33.1059	10
YEAR	85		31.8000	23.7776	25
YEAR	86		27.8000	21.7145	25
YEAR	87		14.0000	18.3286	25
YEAR	88		24.6000	19.8258	25
YEAR	89		29.2000	29.2147	25
LOCATION	14	SBI SOUTHEAST SEALION	8.8618	14.5358	199
YEAR	82		10.2000	10.7510	25
YEAR	83		13.5897	26.8021	39
YEAR	84		6.6000	7.4267	10
YEAR	85		8.7000	7.5388	25
YEAR	86		7.4000	8.1803	25
YEAR	87		6.9000	8.6987	25
YEAR	88		5.1000	6.1441	25
YEAR	89		8.4000	13.0679	25
LOCATION	15	SBI ARCH POINT	15.5800	19.1107	200
YEAR	82		13.4000	16.7531	25
YEAR	83		26.2500	32.4778	40
YEAR	84		8.6000	12.1856	10
YEAR	85		16.9000	12.9357	25
YEAR	86		12.6000	13.1395	25
YEAR	87		16.8000	12.7173	25
YEAR	88		8.2000	6.9041	25
YEAR	89		11.3000	11.1831	25
LOCATION	16	SBI CAT CANYON	3.0250	5.4737	100
YEAR	86		2.1000	3.9317	25
YEAR	87		3.5000	5.8184	25
YEAR	88		2.9000	4.7148	25
YEAR	89		3.6000	7.1107	25

Channel Islands National Park Kelp Forest Monitoring 1982-1989

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES	15004	**Sand**	9.2940	14.7012	2910
LOCATION	1	SMI WYCKOFF LEDGE	15.2328	19.0193	189
YEAR	82		25.0000	29.5099	25
YEAR	83		2.0690	5.5929	29
YEAR	84		5.4000	11.2763	10
YEAR	85		11.1000	12.1424	25
YEAR	86		9.1000	9.0680	25
YEAR	87		24.5000	19.3111	25
YEAR	88		21.2000	21.0421	25
YEAR	89		19.7000	16.7288	25
LOCATION	2	SMI HARE ROCK	9.3291	18.8691	196
YEAR	82		22.4000	27.0463	25
YEAR	83		8.6111	25.5402	36
YEAR	84		3.6000	7.8202	10
YEAR	85		6.1000	10.0281	25
YEAR	86		11.5000	14.8605	25
YEAR	87		12.0000	22.4304	25
YEAR	88		2.9000	5.3852	25
YEAR	89		4.4000	7.0445	25
LOCATION	3	SRI JOHNSONS LEE NORTH	3.4200	7.8918	200
YEAR	82		0.8000	2.3629	25
YEAR	83		0.0000	0.0000	40
YEAR	84		0.4000	0.8433	10
YEAR	85		4.6000	7.6947	25
YEAR	86		10.8000	14.5545	25
YEAR	87		7.3000	9.8668	25
YEAR	88		1.4000	3.3912	25
YEAR	89		2.3000	4.5598	25
LOCATION	4	SRI JOHNSONS LEE SOUTH	14.5850	19.8252	200
YEAR	82		17.6000	26.9691	25
YEAR	83		14.2500	23.5217	40
YEAR	84		16.2000	21.4673	10
YEAR	85		12.2000	19.2208	25
YEAR	86		15.7000	17.1014	25
YEAR	87		21.1000	17.1099	25
YEAR	88		9.7000	12.6927	25
YEAR	89		11.1000	15.6305	25
LOCATION	5	SRI RODES REEF	5.7714	9.5323	175
YEAR	83		3.0000	9.1147	40
YEAR	84		2.0000	3.5277	10
YEAR	85		5.6000	7.6130	25
YEAR	86		6.6000	6.5304	25
YEAR	87		4.9000	7.3414	25
YEAR	88		12.4000	16.0156	25
YEAR	89		5.3000	6.4679	25
LOCATION	6	SCI GULL ISLAND SOUTH	4.4171	10.1632	199
YEAR	82		3.8000	9.6047	25
YEAR	83		4.6154	15.0169	39
YEAR	84		4.4000	6.5862	10
YEAR	85		3.9000	6.8875	25
YEAR	86		5.5000	9.6014	25
YEAR	87		6.5000	11.2036	25
YEAR	88		5.0000	9.4097	25
YEAR	89		1.5000	4.1458	25

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	7	SCI FRYS HARBOR	4.2889	8.8494	180
YEAR	82		12.0000	14.4049	5
YEAR	83		2.0000	7.5786	40
YEAR	84		0.2000	0.6325	10
YEAR	85		4.5000	8.1968	25
YEAR	86		3.7000	6.8511	25
YEAR	87		5.2000	9.3240	25
YEAR	88		4.5000	7.7055	25
YEAR	89		7.3000	12.5192	25
LOCATION	8	SCI PELICAN BAY	21.7735	14.1283	170
YEAR	83		24.5714	19.3030	35
YEAR	84		14.4000	11.9555	10
YEAR	85		29.2000	12.7622	25
YEAR	86		19.5000	12.0977	25
YEAR	87		21.2000	13.5616	25
YEAR	88		18.5000	9.3263	25
YEAR	89		19.5000	11.4109	25
LOCATION	9	SCI SCORPION ANCHORAGE	8.9125	10.5433	200
YEAR	82		14.2000	12.8841	25
YEAR	83		3.2500	5.7233	40
YEAR	84		6.0000	8.8443	10
YEAR	85		9.5000	9.2983	25
YEAR	86		12.2000	11.2574	25
YEAR	87		10.8000	11.0567	25
YEAR	88		9.0000	12.8290	25
YEAR	89		8.0000	8.4163	25
LOCATION	10	SCI YELLOWBANKS	12.0250	15.3153	100
YEAR	86		12.4000	15.3853	25
YEAR	87		11.4000	18.3155	25
YEAR	88		13.4000	12.0520	25
YEAR	89		10.9000	15.6937	25
LOCATION	11	ANI ADMIRALS REEF	5.5854	12.7531	205
YEAR	82		3.0000	6.2915	25
YEAR	83		2.4444	12.2763	45
YEAR	84		12.0000	18.2087	10
YEAR	85		8.7000	17.4571	25
YEAR	86		6.3000	9.1606	25
YEAR	87		6.3000	13.2704	25
YEAR	88		6.4000	12.1852	25
YEAR	89		5.9000	13.2067	25
LOCATION	12	ANI CATHEDRAL COVE	13.2050	15.1242	200
YEAR	82		11.6000	12.4766	25
YEAR	83		4.2500	10.3497	40
YEAR	84		18.6000	17.5891	10
YEAR	85		18.9000	18.1010	25
YEAR	86		16.5000	10.0519	25
YEAR	87		15.4808	17.8888	26
YEAR	88		14.0000	14.7726	25
YEAR	89		14.8958	16.7215	24

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Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	13	ANI LANDING COVE	6.9289	12.6896	197
YEAR	82		7.8000	15.4164	25
YEAR	83		0.0000	0.0000	37
YEAR	84		2.0000	3.3993	10
YEAR	85		6.6000	11.4537	25
YEAR	86		7.9000	10.0177	25
YEAR	87		10.7000	14.4251	25
YEAR	88		12.3000	14.4684	25
YEAR	89		8.5000	17.0477	25
LOCATION	14	SBI SOUTHEAST SEALION	9.1332	14.8374	199
YEAR	82		17.4000	19.6914	25
YEAR	83		3.3333	8.9834	39
YEAR	84		11.0000	19.4651	10
YEAR	85		12.8000	18.9203	25
YEAR	86		3.2000	5.9301	25
YEAR	87		14.4000	15.3141	25
YEAR	88		8.8000	10.6341	25
YEAR	89		6.5000	14.2705	25
LOCATION	15	SBI ARCH POINT	5.1675	9.2329	200
YEAR	82		11.6000	13.1276	25
YEAR	83		0.0000	0.0000	40
YEAR	84		2.6000	4.3256	10
YEAR	85		4.7000	6.8966	25
YEAR	86		3.2000	5.9301	25
YEAR	87		5.5000	4.7324	25
YEAR	88		8.9000	13.5224	25
YEAR	89		6.4000	11.3441	25
LOCATION	16	SBI CAT CANYON	13.8750	17.4598	100
YEAR	86		17.4000	17.6405	25
YEAR	87		9.9000	12.6137	25
YEAR	88		20.9000	22.5564	25
YEAR	89		7.3000	12.3516	25

Appendix 4. 1982-1989 Kelp Forest Monitoring Data - Fish Transects

Introduction.

Following are summaries of data gathered during fish transects from 1985-1989 for all kelp forest monitoring program sampling sites. Means, standard deviations and total number of samples (cases) are given. Data were summarized with SPSSPC+ programs from translated dBase III+ files. (Readers should be aware that the number of significant digits is an artifact of the database program and does not imply this level of precision.) For details of methods and data management, refer to the monitoring handbook (Davis 1988).

Notes on methods:

FISH TRANSECTS. Means represent the average of counts obtained on each pass by divers swimming the entire 100m transect line and observing fishes passing within a 2m X 3m "window" centered on the line. Cases listed refer to the total number of passes made during fish surveys for the year. Generally four passes were made on each of two different dates. Additional cases (passes) were usually counts by a second diver at the same time. Adults and juveniles are presented here separately with all surveys for one year combined. Data are available by sample date but are not included here. Horizontal sechi and surge measurements were made on each dive. All counts were conducted between 0900 and 1500 hours.

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Fish Transects

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Chromis punctipinnis* adult**	**36.4572**	**60.4628**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	0.4318	1.2649	44
YEAR	85		2.2500	2.8723	4
YEAR	86		0.0000	0.0000	8
YEAR	87		0.8333	1.4668	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	17.4792	25.5551	48
YEAR	85		71.7500	41.8440	4
YEAR	86		12.3333	15.7037	12
YEAR	87		18.2500	14.5672	12
YEAR	88		22.6250	25.4779	8
YEAR	89		0.3333	0.6513	12
LOCATION	3	SRI JOHNSONS LEE NORTH	19.4643	25.5008	56
YEAR	85		42.3750	40.3447	8
YEAR	86		28.4167	15.9571	12
YEAR	87		28.5833	27.6388	12
YEAR	88		2.7500	5.2576	8
YEAR	89		2.8125	3.1031	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	17.1600	29.7831	50
YEAR	85		2.3750	3.4200	8
YEAR	86		18.6667	27.9003	12
YEAR	87		52.9000	39.9985	10
YEAR	88		9.2500	17.8306	8
YEAR	89		1.0000	1.0445	12
LOCATION	5	SRI RODES REEF	13.2500	14.4480	48
YEAR	85		15.0000	17.3973	4
YEAR	86		9.3333	9.4420	12
YEAR	87		16.5833	11.1229	12
YEAR	88		0.0000	0.0000	8
YEAR	89		22.0833	18.8074	12
LOCATION	6	SCI GULL ISLAND SOUTH	36.5833	46.6685	48
YEAR	85		111.0000	77.8674	4
YEAR	86		22.7500	33.3061	12
YEAR	87		32.2500	58.3487	12
YEAR	88		24.5000	21.1390	8
YEAR	89		38.0000	22.4175	12
LOCATION	7	SCI FRYS HARBOR	141.0227	139.9657	44
YEAR	86		256.5833	136.1767	12
YEAR	87		54.0833	30.2428	12
YEAR	88		204.2500	175.4209	8
YEAR	89		70.2500	79.7121	12
LOCATION	8	SCI PELICAN BAY	30.7500	33.7276	48
YEAR	85		0.7500	0.5000	4
YEAR	86		19.6667	28.7508	12
YEAR	87		39.5833	25.5573	12
YEAR	88		14.3750	15.0422	8
YEAR	89		53.9167	43.7003	12

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Fish Transects

Variable	Value	Label	Mean	Std Dev	Cases
LOCATION	9	SCI SCORPION ANCHORAGE	45.0833	53.5616	48
YEAR	85		64.0000	5.7735	4
YEAR	86		9.6667	9.3160	12
YEAR	87		57.0000	19.2684	12
YEAR	88		88.5833	82.7312	12
YEAR	89		5.6250	12.2933	8
LOCATION	10	SCI YELLOW BANKS	15.0909	32.2676	44
YEAR	86		55.2500	61.1690	8
YEAR	87		1.1667	0.8348	12
YEAR	88		8.1250	7.7724	8
YEAR	89		8.9375	11.3341	16
LOCATION	11	ANI ADMIRALS REEF	48.8393	64.0303	56
YEAR	85		182.7500	119.4526	4
YEAR	86		9.0000	9.5822	12
YEAR	87		34.5000	45.6897	12
YEAR	88		73.0000	60.9650	12
YEAR	89		37.8750	32.3107	16
LOCATION	12	ANI CATHEDRAL COVE	67.5962	83.4135	52
YEAR	85		175.0000	62.8331	4
YEAR	86		71.0833	40.3247	12
YEAR	87		6.2500	6.3978	12
YEAR	88		112.7500	130.9241	12
YEAR	89		44.5000	35.4183	12
LOCATION	13	ANI LANDING COVE	38.0833	46.7041	48
YEAR	85		79.5000	39.0598	4
YEAR	86		18.5000	17.9063	12
YEAR	87		15.0000	21.2475	12
YEAR	88		92.3333	47.3600	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	32.8036	37.6406	56
YEAR	85		12.5000	14.5258	4
YEAR	86		88.0833	38.7708	12
YEAR	87		17.1000	23.0101	20
YEAR	88		17.8750	4.6117	8
YEAR	89		20.4167	18.2730	12
LOCATION	15	SBI ARCH POINT	48.3269	43.2987	52
YEAR	85		87.2500	25.7213	4
YEAR	86		14.7500	16.7067	12
YEAR	87		49.8333	47.2360	12
YEAR	88		51.5833	40.9600	12
YEAR	89		64.1667	47.4875	12
LOCATION	16	SBI CAT CANYON	15.6154	16.4712	52
YEAR	86		23.0000	22.6127	16
YEAR	87		10.5833	10.2554	12
YEAR	88		13.2500	15.6503	12
YEAR	89		13.1667	9.5330	12

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Fish Transects

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Chromis punctipinnis* juvenile**	**32.6725**	**133.2086**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	44
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	8
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0208	0.1443	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	7.1964	19.4688	56
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		33.3333	30.7611	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.1875	0.5439	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	1.0000	7.0711	50
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	10
YEAR	88		6.2500	17.6777	8
YEAR	89		0.0000	0.0000	12
LOCATION	5	SRI RODES REEF	0.0417	0.2887	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.1667	0.5774	12
LOCATION	6	SCI GULL ISLAND SOUTH	6.6042	14.0739	48
YEAR	85		0.0000	0.0000	4
YEAR	86		6.0833	8.7226	12
YEAR	87		5.7500	10.9886	12
YEAR	88		21.7500	25.6668	8
YEAR	89		0.0833	0.2887	12
LOCATION	7	SCI FRYS HARBOR	29.5909	73.1206	44
YEAR	86		12.7500	25.5454	12
YEAR	87		2.5000	3.4772	12
YEAR	88		124.1250	138.2094	8
YEAR	89		10.5000	8.5440	12
LOCATION	8	SCI PELICAN BAY	7.6875	19.6113	48
YEAR	85		0.0000	0.0000	4
YEAR	86		21.5000	34.1561	12
YEAR	87		0.5000	0.6742	12
YEAR	88		0.7500	1.4880	8
YEAR	89		8.2500	12.3886	12
LOCATION	9	SCI SCORPION ANCHORAGE	5.2917	10.3697	48
YEAR	85		0.0000	0.0000	4
YEAR	86		3.1667	4.7065	12
YEAR	87		0.3333	0.7785	12
YEAR	88		12.1667	15.5671	12
YEAR	89		8.2500	12.1861	8
LOCATION	10	SCI YELLOW BANKS	0.6364	1.9421	44
YEAR	86		0.0000	0.0000	8
YEAR	87		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	88		3.1250	3.7201	8
YEAR	89		0.1875	0.5439	16
LOCATION	11	ANI ADMIRALS REEF	111.9464	288.6168	56
YEAR	85		0.0000	0.0000	4
YEAR	86		15.5000	24.0964	12
YEAR	87		447.4167	507.4807	12
YEAR	88		25.6667	31.8072	12
YEAR	89		25.3750	25.2768	16
LOCATION	12	ANI CATHEDRAL COVE	186.2115	314.5288	52
YEAR	85		0.0000	0.0000	4
YEAR	86		56.7500	31.5022	12
YEAR	87		585.4167	467.5138	12
YEAR	88		138.4167	56.4969	12
YEAR	89		26.3333	28.1468	12
LOCATION	13	ANI LANDING COVE	96.2917	194.6659	48
YEAR	85		0.0000	0.0000	4
YEAR	86		12.1667	21.5526	12
YEAR	87		350.0833	259.8347	12
YEAR	88		10.5833	6.9734	12
YEAR	89		18.5000	13.4058	8
LOCATION	14	SBI SOUTHEAST SEALION	8.4464	13.3033	56
YEAR	85		0.0000	0.0000	4
YEAR	86		12.9167	16.6758	12
YEAR	87		3.9000	7.9333	20
YEAR	88		26.8750	11.7405	8
YEAR	89		2.0833	5.8225	12
LOCATION	15	SBI ARCH POINT	34.4038	51.8078	52
YEAR	85		0.0000	0.0000	4
YEAR	86		1.3333	1.8257	12
YEAR	87		80.4167	76.7125	12
YEAR	88		26.2500	29.3633	12
YEAR	89		41.0833	40.4912	12
LOCATION	16	SBI CAT CANYON	7.3077	15.7512	52
YEAR	86		5.6250	15.7982	16
YEAR	87		14.2500	23.9170	12
YEAR	88		7.3333	11.4442	12
YEAR	89		2.5833	5.0894	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Oxyjulis californica* adult**	**7.0730**	**18.2777**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	16.5682	26.3636	44
YEAR	85		0.7500	1.5000	4
YEAR	86		1.8750	1.9594	8
YEAR	87		19.3333	33.5650	12
YEAR	88		8.7500	15.0024	8
YEAR	89		34.0833	28.4364	12
LOCATION	2	SMI HARE ROCK	0.3958	1.4103	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.7500	1.6026	12
YEAR	88		1.2500	2.7646	8
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	1.7679	4.0987	56
YEAR	85		1.8750	0.9910	8
YEAR	86		4.6667	7.9468	12
YEAR	87		0.5833	1.2401	12
YEAR	88		1.2500	2.0529	8
YEAR	89		0.6875	1.5798	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	2.5400	4.1904	50
YEAR	85		6.2500	6.0178	8
YEAR	86		0.1667	0.3892	12
YEAR	87		0.0000	0.0000	10
YEAR	88		2.1250	3.3568	8
YEAR	89		4.8333	4.4687	12
LOCATION	5	SRI RODES REEF	16.7500	41.0296	48
YEAR	85		57.0000	82.1219	4
YEAR	86		29.0000	51.0241	12
YEAR	87		0.0000	0.0000	12
YEAR	88		28.3750	45.0204	8
YEAR	89		0.0833	0.2887	12
LOCATION	6	SCI GULL ISLAND SOUTH	3.5208	7.2493	48
YEAR	85		10.2500	10.3722	4
YEAR	86		9.9167	10.0585	12
YEAR	87		0.3333	0.4924	12
YEAR	88		0.6250	1.7678	8
YEAR	89		0.0000	0.0000	12
LOCATION	7	SCI FRYS HARBOR	2.7500	4.8423	44
YEAR	86		3.1667	3.0699	12
YEAR	87		4.2500	5.2592	12
YEAR	88		3.3750	8.3484	8
YEAR	89		0.4167	1.1645	12
LOCATION	8	SCI PELICAN BAY	0.4167	1.2175	48
YEAR	85		4.0000	1.4142	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.1667	0.5774	12
YEAR	88		0.2500	0.7071	8
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	8.7292	6.9274	48
YEAR	85		15.2500	11.3541	4
YEAR	86		15.0000	5.9848	12
YEAR	87		4.7500	3.5194	12
YEAR	88		8.1667	4.2391	12
YEAR	89		2.8750	2.1002	8
LOCATION	10	SCI YELLOW BANKS	27.2727	43.6244	44
YEAR	86		76.0000	60.4460	8

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		36.5000	45.5482	12
YEAR	88		12.7500	15.9082	8
YEAR	89		3.2500	6.9618	16
LOCATION	11	ANI ADMIRALS REEF	15.8214	14.8154	56
YEAR	85		10.0000	4.5461	4
YEAR	86		23.0833	20.3803	12
YEAR	87		9.4167	5.2994	12
YEAR	88		22.3333	20.6456	12
YEAR	89		11.7500	5.2217	16
LOCATION	12	ANI CATHEDRAL COVE	2.1923	2.5823	52
YEAR	85		0.5000	1.0000	4
YEAR	86		1.7500	1.6583	12
YEAR	87		3.6667	3.4989	12
YEAR	88		1.9167	2.8110	12
YEAR	89		2.0000	2.0000	12
LOCATION	13	ANI LANDING COVE	3.3125	4.1110	48
YEAR	85		0.5000	0.5774	4
YEAR	86		4.0000	5.6084	12
YEAR	87		2.6667	3.3121	12
YEAR	88		6.0000	3.5162	12
YEAR	89		0.6250	0.7440	8
LOCATION	14	SBI SOUTHEAST SEALION	3.1071	7.7429	56
YEAR	85		20.2500	10.0789	4
YEAR	86		3.2500	2.6328	12
YEAR	87		0.2500	0.6387	20
YEAR	88		5.0000	14.1421	8
YEAR	89		0.7500	2.5981	12
LOCATION	15	SBI ARCH POINT	5.1538	9.2808	52
YEAR	85		14.7500	19.5171	4
YEAR	86		9.0833	13.6346	12
YEAR	87		1.8333	1.5275	12
YEAR	88		2.9167	5.5179	12
YEAR	89		3.5833	2.5030	12
LOCATION	16	SBI CAT CANYON	5.9231	8.0582	52
YEAR	86		8.0000	13.5351	16
YEAR	87		4.4167	2.5030	12
YEAR	88		4.7500	5.0475	12
YEAR	89		5.8333	3.0401	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Oxyjulis californica* juvenile**	**0.7242**	**8.2673**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	2.7273	7.1247	44
YEAR	85		0.0000	0.0000	4
YEAR	86		1.3750	1.9955	8
YEAR	87		0.5833	1.4434	12
YEAR	88		0.2500	0.7071	8
YEAR	89		8.3333	12.0705	12
LOCATION	2	SMI HARE ROCK	0.0833	0.4535	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.2500	0.8660	12
YEAR	88		0.1250	0.3536	8
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0179	0.1336	56
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0625	0.2500	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0000	0.0000	50
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	10
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	5	SRI RODES REEF	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	7	SCI FRYS HARBOR	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0417	0.2019	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.1667	0.3892	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	8

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	11	ANI ADMIRALS REEF	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	16
LOCATION	12	ANI CATHEDRAL COVE	1.0385	2.8073	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		1.8333	2.5879	12
YEAR	88		0.0000	0.0000	12
YEAR	89		2.6667	4.8492	12
LOCATION	13	ANI LANDING COVE	0.4792	1.7258	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.9167	2.8749	12
YEAR	87		0.4167	1.4434	12
YEAR	88		0.5833	1.3790	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0536	0.4009	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.3750	1.0607	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0192	0.1387	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0833	0.2887	12
LOCATION	16	SBI CAT CANYON	7.0577	30.9601	52
YEAR	86		21.6875	54.0798	16
YEAR	87		0.9167	1.7816	12
YEAR	88		0.2500	0.8660	12
YEAR	89		0.5000	1.4460	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Sebastes mystinus* adult**	**0.6058**	**1.8850**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	1.5227	2.5288	44
YEAR	85		0.2500	0.5000	4
YEAR	86		0.0000	0.0000	8
YEAR	87		4.3333	3.2845	12
YEAR	88		0.0000	0.0000	8
YEAR	89		1.1667	1.1934	12
LOCATION	2	SMI HARE ROCK	2.6875	3.8875	48
YEAR	85		1.0000	1.1547	4
YEAR	86		1.5833	1.6765	12
YEAR	87		5.9167	5.5834	12
YEAR	88		0.3750	0.5175	8
YEAR	89		2.6667	3.5248	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.6964	1.1587	56
YEAR	85		0.2500	0.4629	8
YEAR	86		2.1667	1.4668	12
YEAR	87		0.5000	0.9045	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.3125	0.6021	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	1.6000	2.3474	50
YEAR	85		1.5000	1.5119	8
YEAR	86		2.1667	3.0699	12
YEAR	87		3.1000	3.2128	10
YEAR	88		0.6250	0.7440	8
YEAR	89		0.5000	0.6742	12
LOCATION	5	SRI RODES REEF	2.3750	3.5826	48
YEAR	85		0.0000	0.0000	4
YEAR	86		3.0000	2.8920	12
YEAR	87		3.7500	5.1720	12
YEAR	88		0.0000	0.0000	8
YEAR	89		2.7500	3.3063	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.9792	2.3108	48
YEAR	85		0.2500	0.5000	4
YEAR	86		0.6667	2.3094	12
YEAR	87		0.1667	0.3892	12
YEAR	88		0.2500	0.4629	8
YEAR	89		2.8333	3.4597	12
LOCATION	7	SCI FRYS HARBOR	0.1136	0.3210	44
YEAR	86		0.0833	0.2887	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.3333	0.4924	12
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	8

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	11	ANI ADMIRALS REEF	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	16
LOCATION	12	ANI CATHEDRAL COVE	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	52
YEAR	86		0.0000	0.0000	16
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Sebastes mystinus* juvenile**	**1.6108**	**5.5145**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	1.1136	3.1639	44
YEAR	85		7.7500	7.8475	4
YEAR	86		0.0000	0.0000	8
YEAR	87		1.4167	1.7816	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0833	0.2887	12
LOCATION	2	SMI HARE ROCK	6.1667	10.3231	48
YEAR	85		32.0000	8.5245	4
YEAR	86		0.5000	1.1677	12
YEAR	87		8.5000	7.6574	12
YEAR	88		6.1250	9.6130	8
YEAR	89		0.9167	1.7299	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.1429	0.4835	56
YEAR	85		0.1250	0.3536	8
YEAR	86		0.3333	0.7785	12
YEAR	87		0.2500	0.6216	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	1.4200	3.2394	50
YEAR	85		0.6250	1.4079	8
YEAR	86		5.4167	4.7186	12
YEAR	87		0.0000	0.0000	10
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0833	0.2887	12
LOCATION	5	SRI RODES REEF	3.1875	4.5131	48
YEAR	85		12.2500	3.0957	4
YEAR	86		1.2500	1.2881	12
YEAR	87		6.5000	4.7386	12
YEAR	88		1.2500	1.2817	8
YEAR	89		0.0833	0.2887	12
LOCATION	6	SCI GULL ISLAND SOUTH	12.5000	13.4212	48
YEAR	85		10.2500	13.9134	4
YEAR	86		8.0000	5.9696	12
YEAR	87		29.7500	12.3150	12
YEAR	88		13.1250	4.4219	8
YEAR	89		0.0833	0.2887	12
LOCATION	7	SCI FRYS HARBOR	2.2045	3.7203	44
YEAR	86		0.0000	0.0000	12
YEAR	87		8.0833	1.5050	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.0227	0.1508	44
YEAR	86		0.0000	0.0000	8

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Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0833	0.2887	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	11	ANI ADMIRALS REEF	0.0179	0.1336	56
YEAR	85		0.2500	0.5000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	16
LOCATION	12	ANI CATHEDRAL COVE	0.0385	0.2774	52
YEAR	85		0.5000	1.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0179	0.1336	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0500	0.2236	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	52
YEAR	86		0.0000	0.0000	16
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Sebastes serrinoides* adult**	**0.3325**	**1.0391**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	0.4545	0.6973	44
YEAR	85		0.5000	0.5774	4
YEAR	86		0.0000	0.0000	8
YEAR	87		1.0833	0.9003	12
YEAR	88		0.2500	0.4629	8
YEAR	89		0.2500	0.4523	12
LOCATION	2	SMI HARE ROCK	2.2083	2.7363	48
YEAR	85		0.7500	1.5000	4
YEAR	86		1.5000	1.0871	12
YEAR	87		2.8333	3.2146	12
YEAR	88		3.2500	1.6690	8
YEAR	89		2.0833	3.9418	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.3214	0.6904	56
YEAR	85		0.2500	0.4629	8
YEAR	86		0.3333	0.4924	12
YEAR	87		0.4167	0.7930	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.4375	0.9639	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.6600	0.9817	50
YEAR	85		0.6250	1.1877	8
YEAR	86		0.1667	0.3892	12
YEAR	87		0.4000	0.6992	10
YEAR	88		0.3750	0.7440	8
YEAR	89		1.5833	1.0836	12
LOCATION	5	SRI RODES REEF	0.6875	1.4015	48
YEAR	85		0.0000	0.0000	4
YEAR	86		1.9167	2.2344	12
YEAR	87		0.1667	0.3892	12
YEAR	88		0.2500	0.7071	8
YEAR	89		0.5000	0.7977	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.1875	0.7339	48
YEAR	85		1.7500	2.0616	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.1667	0.3892	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	7	SCI FRYS HARBOR	0.4091	0.8161	44
YEAR	86		0.2500	0.4523	12
YEAR	87		0.5833	1.2401	12
YEAR	88		0.5000	0.9258	8
YEAR	89		0.3333	0.4924	12
LOCATION	8	SCI PELICAN BAY	0.2708	0.7068	48
YEAR	85		0.5000	0.5774	4
YEAR	86		0.5833	1.0836	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.3333	0.7785	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.1042	0.3087	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.1667	0.3892	12
YEAR	88		0.2500	0.4523	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.1364	0.5537	44
YEAR	86		0.0000	0.0000	8
YEAR	87		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	88		0.0000	0.0000	8
YEAR	89		0.3750	0.8851	16
LOCATION	11	ANI ADMIRALS REEF	0.0357	0.1873	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0625	0.2500	16
LOCATION	12	ANI CATHEDRAL COVE	0.0192	0.1387	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0833	0.2887	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	52
YEAR	86		0.0000	0.0000	16
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Sebastes serrinoides* juvenile**	**0.8854**	**4.8577**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	7.4318	17.0763	44
YEAR	85		0.0000	0.0000	4
YEAR	86		17.5000	24.0476	8
YEAR	87		0.9167	0.9003	12
YEAR	88		21.8750	25.6985	8
YEAR	89		0.0833	0.2887	12
LOCATION	2	SMI HARE ROCK	3.9792	5.7556	48
YEAR	85		0.0000	0.0000	4
YEAR	86		2.0000	1.6514	12
YEAR	87		6.1667	5.0061	12
YEAR	88		11.2500	8.3794	8
YEAR	89		0.2500	0.4523	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.5179	2.4120	56
YEAR	85		0.5000	1.0690	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		3.1250	5.9387	8
YEAR	89		0.0000	0.0000	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.1000	0.4165	50
YEAR	85		0.6250	0.9161	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	10
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	5	SRI RODES REEF	3.0417	5.1652	48
YEAR	85		6.7500	4.5000	4
YEAR	86		0.8333	1.7495	12
YEAR	87		0.3333	0.4924	12
YEAR	88		12.5000	4.6599	8
YEAR	89		0.4167	0.6686	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	7	SCI FRYS HARBOR	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0625	0.3200	48
YEAR	85		0.7500	0.9574	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	8

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	11	ANI ADMIRALS REEF	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	16
LOCATION	12	ANI CATHEDRAL COVE	0.0385	0.1942	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0833	0.2887	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0833	0.2887	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	52
YEAR	86		0.0000	0.0000	16
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

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Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Sebastes atrovirens* adult**	**0.6322**	**1.4109**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	1.3864	1.6735	44
YEAR	85		0.2500	0.5000	4
YEAR	86		0.5000	1.0690	8
YEAR	87		2.1667	1.6422	12
YEAR	88		1.8750	2.3566	8
YEAR	89		1.2500	1.4222	12
LOCATION	2	SMI HARE ROCK	2.7083	2.7441	48
YEAR	85		0.2500	0.5000	4
YEAR	86		2.5000	1.0000	12
YEAR	87		3.8333	2.0817	12
YEAR	88		5.3750	4.4701	8
YEAR	89		0.8333	1.1934	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.6250	1.0882	56
YEAR	85		0.1250	0.3536	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.7500	1.1650	8
YEAR	89		1.6875	1.3022	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	1.0200	1.5713	50
YEAR	85		0.8750	1.6421	8
YEAR	86		0.1667	0.5774	12
YEAR	87		0.3000	0.4830	10
YEAR	88		0.5000	0.7559	8
YEAR	89		2.9167	1.7299	12
LOCATION	5	SRI RODES REEF	0.6042	1.2504	48
YEAR	85		1.2500	0.5000	4
YEAR	86		0.1667	0.3892	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.6250	1.1877	8
YEAR	89		1.4167	2.0207	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.2500	0.4838	48
YEAR	85		0.7500	0.9574	4
YEAR	86		0.0833	0.2887	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.2500	0.4629	8
YEAR	89		0.5000	0.5222	12
LOCATION	7	SCI FRYS HARBOR	2.5682	2.2557	44
YEAR	86		1.6667	1.8749	12
YEAR	87		1.5833	2.3916	12
YEAR	88		4.1250	2.5877	8
YEAR	89		3.4167	1.3790	12
LOCATION	8	SCI PELICAN BAY	0.6458	0.9338	48
YEAR	85		0.5000	1.0000	4
YEAR	86		0.3333	0.7785	12
YEAR	87		1.0000	0.9535	12
YEAR	88		1.5000	1.0690	8
YEAR	89		0.0833	0.2887	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0833	0.2793	48
YEAR	85		0.5000	0.5774	4
YEAR	86		0.0833	0.2887	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0833	0.2887	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.0227	0.1508	44
YEAR	86		0.0000	0.0000	8
YEAR	87		0.0833	0.2887	12

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	11	ANI ADMIRALS REEF	0.4286	0.6566	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.1667	0.3892	12
YEAR	88		0.8333	0.8348	12
YEAR	89		0.7500	0.6831	16
LOCATION	12	ANI CATHEDRAL COVE	0.0962	0.2977	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.1667	0.3892	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.2500	0.4523	12
LOCATION	13	ANI LANDING COVE	0.1250	0.3342	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.3333	0.4924	12
YEAR	88		0.1667	0.3892	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	52
YEAR	86		0.0000	0.0000	16
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Sebastes atrovirens* juvenile**	**0.2683**	**1.7221**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	1.6818	4.3710	44
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	8
YEAR	87		1.0833	1.6765	12
YEAR	88		7.6250	7.8910	8
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	1.0625	2.4356	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0833	0.2887	12
YEAR	87		2.6667	3.8218	12
YEAR	88		1.2500	1.1650	8
YEAR	89		0.6667	2.3094	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.1429	1.0690	56
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.5000	2.0000	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0000	0.0000	50
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	10
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	5	SRI RODES REEF	1.6458	4.4602	48
YEAR	85		3.2500	4.0311	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		8.0000	8.0888	8
YEAR	89		0.1667	0.5774	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	7	SCI FRYS HARBOR	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	8

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	11	ANI ADMIRALS REEF	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	16
LOCATION	12	ANI CATHEDRAL COVE	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0192	0.1387	52
YEAR	85		0.2500	0.5000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	52
YEAR	86		0.0000	0.0000	16
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Paralabrax clathratus* adult**	**3.4043**	**6.0714**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	0.0455	0.2107	44
YEAR	85		0.0000	0.0000	4
YEAR	86		0.2500	0.4629	8
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	1.8393	2.3647	56
YEAR	85		3.3750	2.9731	8
YEAR	86		4.0833	2.8749	12
YEAR	87		1.4167	1.2401	12
YEAR	88		0.5000	0.7559	8
YEAR	89		0.3750	0.5000	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	1.6000	1.8070	50
YEAR	85		1.0000	0.9258	8
YEAR	86		2.2500	1.4222	12
YEAR	87		3.9000	1.8529	10
YEAR	88		0.2500	0.7071	8
YEAR	89		0.3333	0.4924	12
LOCATION	5	SRI RODES REEF	1.8542	2.1927	48
YEAR	85		0.0000	0.0000	4
YEAR	86		2.6667	2.0597	12
YEAR	87		3.6667	2.6054	12
YEAR	88		0.0000	0.0000	8
YEAR	89		1.0833	0.9003	12
LOCATION	6	SCI GULL ISLAND SOUTH	2.6250	2.1989	48
YEAR	85		6.7500	2.5000	4
YEAR	86		3.1667	1.8990	12
YEAR	87		3.3333	1.4355	12
YEAR	88		1.3750	1.1877	8
YEAR	89		0.8333	0.8348	12
LOCATION	7	SCI FRYS HARBOR	13.3636	18.5649	44
YEAR	86		8.7500	9.9464	12
YEAR	87		30.9167	27.5267	12
YEAR	88		6.7500	2.7124	8
YEAR	89		4.8333	3.9274	12
LOCATION	8	SCI PELICAN BAY	8.9167	5.8340	48
YEAR	85		1.2500	1.5000	4
YEAR	86		6.3333	2.4246	12
YEAR	87		10.5833	5.8692	12
YEAR	88		7.7500	4.8033	8
YEAR	89		13.1667	6.1175	12
LOCATION	9	SCI SCORPION ANCHORAGE	1.9167	1.5957	48
YEAR	85		1.0000	1.4142	4
YEAR	86		2.5833	1.2401	12
YEAR	87		2.2500	2.0057	12
YEAR	88		1.5000	1.3143	12
YEAR	89		1.5000	1.6903	8
LOCATION	10	SCI YELLOW BANKS	3.9773	3.5074	44
YEAR	86		9.6250	2.8253	8

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		4.4167	2.5030	12
YEAR	88		2.6250	1.5059	8
YEAR	89		1.5000	1.0954	16
LOCATION	11	ANI ADMIRALS REEF	2.3214	2.1583	56
YEAR	85		2.0000	1.8257	4
YEAR	86		2.1667	1.4035	12
YEAR	87		2.0000	1.4771	12
YEAR	88		1.0000	1.0445	12
YEAR	89		3.7500	2.9777	16
LOCATION	12	ANI CATHEDRAL COVE	6.0192	4.9645	52
YEAR	85		0.5000	0.5774	4
YEAR	86		4.1667	2.3677	12
YEAR	87		10.1667	4.1524	12
YEAR	88		5.4167	4.1661	12
YEAR	89		6.1667	6.3222	12
LOCATION	13	ANI LANDING COVE	3.6667	2.8608	48
YEAR	85		5.2500	2.2174	4
YEAR	86		3.2500	1.9598	12
YEAR	87		5.5833	3.9648	12
YEAR	88		2.7500	2.2613	12
YEAR	89		2.0000	1.1952	8
LOCATION	14	SBI SOUTHEAST SEALION	2.0893	3.1811	56
YEAR	85		1.2500	1.5000	4
YEAR	86		2.2500	1.7123	12
YEAR	87		0.3500	0.4894	20
YEAR	88		2.1250	2.6424	8
YEAR	89		5.0833	5.1603	12
LOCATION	15	SBI ARCH POINT	2.3077	2.0247	52
YEAR	85		0.7500	0.9574	4
YEAR	86		2.4167	2.4664	12
YEAR	87		1.9167	1.5050	12
YEAR	88		3.3333	2.4985	12
YEAR	89		2.0833	1.3790	12
LOCATION	16	SBI CAT CANYON	3.1538	3.2803	52
YEAR	86		1.1875	1.2230	16
YEAR	87		6.5833	4.6015	12
YEAR	88		2.2500	1.4848	12
YEAR	89		3.2500	2.2613	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Paralabrax clathratus* juvenile**	**0.3287**	**1.8395**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	0.0455	0.2107	44
YEAR	85		0.0000	0.0000	4
YEAR	86		0.1250	0.3536	8
YEAR	87		0.0833	0.2887	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.1607	0.6260	56
YEAR	85		1.1250	1.3562	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0600	0.3136	50
YEAR	85		0.2500	0.7071	8
YEAR	86		0.0833	0.2887	12
YEAR	87		0.0000	0.0000	10
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	5	SRI RODES REEF	0.1042	0.3713	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.3333	0.6513	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0833	0.2887	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0833	0.4535	48
YEAR	85		0.7500	1.5000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	7	SCI FRYS HARBOR	0.0455	0.2107	44
YEAR	86		0.1667	0.3892	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	1.9792	5.6172	48
YEAR	85		19.5000	6.2450	4
YEAR	86		0.4167	0.9962	12
YEAR	87		0.1667	0.5774	12
YEAR	88		0.8750	0.9910	8
YEAR	89		0.2500	0.4523	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.1042	0.5153	48
YEAR	85		1.2500	1.5000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.2045	0.5937	44
YEAR	86		0.0000	0.0000	8
YEAR	87		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	88		0.0000	0.0000	8
YEAR	89		0.5625	0.8921	16
LOCATION	11	ANI ADMIRALS REEF	0.1607	0.6816	56
YEAR	85		2.0000	1.8257	4
YEAR	86		0.0833	0.2887	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	16
LOCATION	12	ANI CATHEDRAL COVE	0.6923	1.4625	52
YEAR	85		0.7500	0.9574	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.3333	0.4924	12
YEAR	88		1.6667	2.5702	12
YEAR	89		0.7500	1.0553	12
LOCATION	13	ANI LANDING COVE	0.0417	0.2019	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.1667	0.3892	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	0.5714	3.4528	56
YEAR	85		8.0000	11.8040	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.4231	1.0165	52
YEAR	85		2.2500	2.6300	4
YEAR	86		0.6667	0.8876	12
YEAR	87		0.2500	0.6216	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.1667	0.3892	12
LOCATION	16	SBI CAT CANYON	0.5000	1.4485	52
YEAR	86		0.4375	0.8139	16
YEAR	87		1.5000	2.6799	12
YEAR	88		0.0833	0.2887	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Semicossyphus pulcher* male**	**0.2368**	**0.6307**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	0.0455	0.2107	44
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	8
YEAR	87		0.0000	0.0000	12
YEAR	88		0.1250	0.3536	8
YEAR	89		0.0833	0.2887	12
LOCATION	2	SMI HARE ROCK	0.0625	0.3200	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.2500	0.7071	8
YEAR	89		0.0833	0.2887	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0179	0.1336	56
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.4600	0.8855	50
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.7000	1.0593	10
YEAR	88		1.0000	1.4142	8
YEAR	89		0.6667	0.7785	12
LOCATION	5	SRI RODES REEF	0.2708	0.5739	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.3333	0.6513	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.6250	0.9161	8
YEAR	89		0.2500	0.4523	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.7500	1.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0833	0.2887	12
YEAR	87		0.6667	0.7785	12
YEAR	88		1.0000	1.3093	8
YEAR	89		1.5833	0.9962	12
LOCATION	7	SCI FRYS HARBOR	0.4773	0.7921	44
YEAR	86		0.2500	0.6216	12
YEAR	87		0.9167	0.7930	12
YEAR	88		0.7500	1.1650	8
YEAR	89		0.0833	0.2887	12
LOCATION	8	SCI PELICAN BAY	0.2083	0.4593	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.2500	0.7071	8
YEAR	89		0.6667	0.4924	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0208	0.1443	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0833	0.2887	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.2045	0.4615	44
YEAR	86		0.0000	0.0000	8

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.5625	0.6292	16
LOCATION	11	ANI ADMIRALS REEF	0.0893	0.3944	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.2500	0.6831	16
LOCATION	12	ANI CATHEDRAL COVE	0.4808	0.8042	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.2500	0.4523	12
YEAR	87		0.4167	0.6686	12
YEAR	88		1.1667	1.1934	12
YEAR	89		0.2500	0.4523	12
LOCATION	13	ANI LANDING COVE	0.5417	1.1291	48
YEAR	85		3.0000	2.7080	4
YEAR	86		0.2500	0.6216	12
YEAR	87		0.1667	0.3892	12
YEAR	88		0.4167	0.5149	12
YEAR	89		0.5000	0.5345	8
LOCATION	14	SBI SOUTHEAST SEALION	0.1071	0.4928	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.4167	0.9962	12
YEAR	87		0.0500	0.2236	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0962	0.2977	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.1667	0.3892	12
YEAR	88		0.0833	0.2887	12
YEAR	89		0.1667	0.3892	12
LOCATION	16	SBI CAT CANYON	0.0385	0.1942	52
YEAR	86		0.0000	0.0000	16
YEAR	87		0.0000	0.0000	12
YEAR	88		0.1667	0.3892	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Semicossyphus pulcher* female**	**3.7003**	**4.0902**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	0.3182	0.5613	44
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	8
YEAR	87		0.5000	0.5222	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.6667	0.7785	12
LOCATION	2	SMI HARE ROCK	1.8750	3.4618	48
YEAR	85		2.5000	1.0000	4
YEAR	86		0.5000	0.5222	12
YEAR	87		2.1667	2.3677	12
YEAR	88		5.8750	6.5778	8
YEAR	89		0.0833	0.2887	12
LOCATION	3	SRI JOHNSONS LEE NORTH	3.2857	2.2051	56
YEAR	85		4.7500	2.2520	8
YEAR	86		3.7500	1.5448	12
YEAR	87		4.4167	2.3143	12
YEAR	88		3.0000	1.4142	8
YEAR	89		1.5000	1.7512	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	5.3000	3.5871	50
YEAR	85		2.6250	1.5059	8
YEAR	86		8.5000	3.1479	12
YEAR	87		8.1000	2.8848	10
YEAR	88		2.6250	1.8468	8
YEAR	89		3.3333	2.0151	12
LOCATION	5	SRI RODES REEF	2.7708	2.1659	48
YEAR	85		1.2500	0.9574	4
YEAR	86		2.5833	1.8320	12
YEAR	87		3.6667	1.6697	12
YEAR	88		0.5000	0.5345	8
YEAR	89		4.0833	2.4664	12
LOCATION	6	SCI GULL ISLAND SOUTH	4.2708	2.8415	48
YEAR	85		6.0000	1.8257	4
YEAR	86		6.8333	3.6139	12
YEAR	87		3.0833	1.3114	12
YEAR	88		4.2500	2.0529	8
YEAR	89		2.3333	1.4975	12
LOCATION	7	SCI FRYS HARBOR	11.0455	6.8606	44
YEAR	86		11.0000	5.1698	12
YEAR	87		17.4167	8.4257	12
YEAR	88		6.5000	1.8516	8
YEAR	89		7.7500	3.5961	12
LOCATION	8	SCI PELICAN BAY	5.7708	3.4656	48
YEAR	85		3.0000	1.6330	4
YEAR	86		5.1667	1.8990	12
YEAR	87		6.7500	4.1588	12
YEAR	88		8.3750	4.3732	8
YEAR	89		4.5833	2.6097	12
LOCATION	9	SCI SCORPION ANCHORAGE	2.3333	2.4086	48
YEAR	85		0.5000	0.5774	4
YEAR	86		2.5000	1.9306	12
YEAR	87		4.4167	2.9064	12
YEAR	88		1.9167	1.8809	12
YEAR	89		0.5000	0.7559	8
LOCATION	10	SCI YELLOW BANKS	3.1818	2.1051	44
YEAR	86		4.6250	1.7678	8
YEAR	87		3.0833	1.8809	12

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Variable	Value	Label	Mean	Std Dev	Cases
YEAR	88		1.7500	1.6690	8
YEAR	89		3.2500	2.2657	16
LOCATION	11	ANI ADMIRALS REEF	7.9107	5.6545	56
YEAR	85		6.7500	2.2174	4
YEAR	86		13.8333	9.5139	12
YEAR	87		6.2500	2.1373	12
YEAR	88		5.3333	1.3027	12
YEAR	89		6.9375	2.8860	16
LOCATION	12	ANI CATHEDRAL COVE	2.2885	2.0989	52
YEAR	85		1.0000	1.4142	4
YEAR	86		1.0833	0.7930	12
YEAR	87		2.2500	1.4848	12
YEAR	88		3.7500	2.9580	12
YEAR	89		2.5000	1.9306	12
LOCATION	13	ANI LANDING COVE	1.3958	1.2332	48
YEAR	85		0.0000	0.0000	4
YEAR	86		1.8333	1.1934	12
YEAR	87		0.8333	0.8348	12
YEAR	88		1.6667	1.3707	12
YEAR	89		1.8750	1.2464	8
LOCATION	14	SBI SOUTHEAST SEALION	2.5000	2.9045	56
YEAR	85		4.0000	1.8257	4
YEAR	86		5.4167	4.5619	12
YEAR	87		1.8500	1.0400	20
YEAR	88		1.7500	2.3146	8
YEAR	89		0.6667	0.4924	12
LOCATION	15	SBI ARCH POINT	2.1538	1.8827	52
YEAR	85		3.7500	2.3629	4
YEAR	86		3.4167	1.4434	12
YEAR	87		1.7500	1.2154	12
YEAR	88		2.6667	2.0151	12
YEAR	89		0.2500	0.4523	12
LOCATION	16	SBI CAT CANYON	2.9038	2.4754	52
YEAR	86		2.7500	1.6125	16
YEAR	87		3.5833	3.0883	12
YEAR	88		2.2500	3.1659	12
YEAR	89		3.0833	2.0652	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Embiotica jacksoni* adult**	**2.8678**	**4.9320**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	0.2955	0.6317	44
YEAR	85		0.7500	0.9574	4
YEAR	86		0.5000	0.5345	8
YEAR	87		0.4167	0.9003	12
YEAR	88		0.1250	0.3536	8
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.7292	1.1059	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.3333	0.4924	12
YEAR	87		1.5000	1.6787	12
YEAR	88		0.7500	0.8864	8
YEAR	89		0.5833	0.7930	12
LOCATION	3	SRI JOHNSONS LEE NORTH	13.0000	10.3045	56
YEAR	85		20.6250	13.5745	8
YEAR	86		24.0833	9.1200	12
YEAR	87		12.5833	2.6097	12
YEAR	88		6.8750	2.4749	8
YEAR	89		4.2500	1.8439	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	6.7800	4.8162	50
YEAR	85		11.2500	4.2342	8
YEAR	86		10.8333	4.1304	12
YEAR	87		6.7000	2.6687	10
YEAR	88		2.1250	1.6421	8
YEAR	89		2.9167	1.6765	12
LOCATION	5	SRI RODES REEF	2.7708	2.8676	48
YEAR	85		7.5000	5.5076	4
YEAR	86		3.5000	2.4309	12
YEAR	87		3.0000	2.2962	12
YEAR	88		1.6250	1.1877	8
YEAR	89		1.0000	1.2792	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.7500	0.9340	48
YEAR	85		2.0000	1.4142	4
YEAR	86		1.1667	1.0299	12
YEAR	87		0.5833	0.5149	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.5833	0.7930	12
LOCATION	7	SCI FRYS HARBOR	4.7500	3.5967	44
YEAR	86		4.9167	3.6546	12
YEAR	87		5.5833	4.7186	12
YEAR	88		5.2500	3.6154	8
YEAR	89		3.4167	1.9287	12
LOCATION	8	SCI PELICAN BAY	5.8125	3.1935	48
YEAR	85		4.0000	2.8284	4
YEAR	86		6.0833	2.2344	12
YEAR	87		4.6667	2.7414	12
YEAR	88		5.2500	1.5811	8
YEAR	89		7.6667	4.5394	12
LOCATION	9	SCI SCORPION ANCHORAGE	2.6875	2.1749	48
YEAR	85		2.5000	2.3805	4
YEAR	86		5.0000	1.8586	12
YEAR	87		2.5833	2.0652	12
YEAR	88		1.5000	1.1677	12
YEAR	89		1.2500	1.0351	8
LOCATION	10	SCI YELLOW BANKS	0.4318	0.8183	44
YEAR	86		1.2500	1.2817	8

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.5000	0.6742	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.1875	0.5439	16
LOCATION	11	ANI ADMIRALS REEF	2.3571	2.8568	56
YEAR	85		8.0000	1.8257	4
YEAR	86		5.0000	3.3303	12
YEAR	87		0.8333	0.7177	12
YEAR	88		1.0833	0.7930	12
YEAR	89		1.0625	1.1236	16
LOCATION	12	ANI CATHEDRAL COVE	1.6923	2.1832	52
YEAR	85		1.0000	0.8165	4
YEAR	86		2.7500	2.0944	12
YEAR	87		0.9167	0.9962	12
YEAR	88		2.6667	3.2845	12
YEAR	89		0.6667	1.2309	12
LOCATION	13	ANI LANDING COVE	1.5000	1.6759	48
YEAR	85		4.0000	2.9439	4
YEAR	86		1.5833	0.9003	12
YEAR	87		0.7500	1.2881	12
YEAR	88		1.5833	1.7299	12
YEAR	89		1.1250	1.3562	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.7500	2.9096	52
YEAR	85		9.2500	6.2383	4
YEAR	86		0.0833	0.2887	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.5000	0.7796	52
YEAR	86		1.1875	0.9811	16
YEAR	87		0.1667	0.3892	12
YEAR	88		0.1667	0.3892	12
YEAR	89		0.2500	0.4523	12

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Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Embiotica jacksoni* juvenile**	**0.2683**	**1.0967**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	1.4545	3.3023	44
YEAR	85		0.0000	0.0000	4
YEAR	86		0.1250	0.3536	8
YEAR	87		5.2500	4.5751	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.3333	1.0383	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		1.1667	1.8505	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.1667	0.3892	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.3214	0.9167	56
YEAR	85		0.0000	0.0000	8
YEAR	86		0.2500	0.8660	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.9375	1.3889	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.1600	0.5841	50
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	10
YEAR	88		0.0000	0.0000	8
YEAR	89		0.6667	1.0731	12
LOCATION	5	SRI RODES REEF	0.4375	0.8970	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.1667	0.3892	12
YEAR	87		1.5000	1.2432	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0833	0.2887	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	7	SCI FRYS HARBOR	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.3542	1.3446	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		1.4167	2.4664	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.0227	0.1508	44
YEAR	86		0.0000	0.0000	8

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Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0625	0.2500	16
LOCATION	11	ANI ADMIRALS REEF	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	16
LOCATION	12	ANI CATHEDRAL COVE	0.3462	0.9050	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.2500	0.6216	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.8333	1.5275	12
YEAR	89		0.4167	0.7930	12
LOCATION	13	ANI LANDING COVE	0.7292	1.3486	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.5833	0.6686	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.7500	1.5448	12
YEAR	89		2.3750	1.8468	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.2500	0.6223	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		1.0833	0.9003	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0385	0.1942	52
YEAR	86		0.0000	0.0000	16
YEAR	87		0.0000	0.0000	12
YEAR	88		0.1667	0.3892	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Embiotica lateralis* adult**	**0.4484**	**1.1629**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	1.4318	1.4043	44
YEAR	85		2.0000	0.8165	4
YEAR	86		2.6250	1.9226	8
YEAR	87		1.2500	1.0553	12
YEAR	88		0.8750	1.3562	8
YEAR	89		1.0000	1.1282	12
LOCATION	2	SMI HARE ROCK	1.5208	1.7982	48
YEAR	85		2.5000	2.6458	4
YEAR	86		1.5833	1.3790	12
YEAR	87		1.0833	2.0652	12
YEAR	88		2.5000	1.3093	8
YEAR	89		0.9167	1.7299	12
LOCATION	3	SRI JOHNSONS LEE NORTH	1.2143	1.6372	56
YEAR	85		0.7500	0.8864	8
YEAR	86		0.3333	0.6513	12
YEAR	87		0.0000	0.0000	12
YEAR	88		3.5000	2.4495	8
YEAR	89		1.8750	1.0878	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	1.0000	1.1952	50
YEAR	85		2.2500	1.7525	8
YEAR	86		0.5000	0.7977	12
YEAR	87		0.3000	0.4830	10
YEAR	88		0.5000	0.7559	8
YEAR	89		1.5833	0.9003	12
LOCATION	5	SRI RODES REEF	1.6042	2.4818	48
YEAR	85		8.7500	2.0616	4
YEAR	86		1.1667	1.0299	12
YEAR	87		0.5000	0.7977	12
YEAR	88		0.0000	0.0000	8
YEAR	89		1.8333	1.1934	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.2083	0.4104	48
YEAR	85		0.7500	0.5000	4
YEAR	86		0.0833	0.2887	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.4167	0.5149	12
LOCATION	7	SCI FRYS HARBOR	0.1591	0.5258	44
YEAR	86		0.1667	0.3892	12
YEAR	87		0.4167	0.9003	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.0227	0.1508	44
YEAR	86		0.0000	0.0000	8

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0625	0.2500	16
LOCATION	11	ANI ADMIRALS REEF	0.0893	0.2877	56
YEAR	85		0.2500	0.5000	4
YEAR	86		0.1667	0.3892	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0625	0.2500	16
LOCATION	12	ANI CATHEDRAL COVE	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0417	0.2019	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.1667	0.3892	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	52
YEAR	86		0.0000	0.0000	16
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Embiotica lateralis* juvenile**	**0.1196**	**0.5766**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	0.0682	0.2550	44
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	8
YEAR	87		0.0000	0.0000	12
YEAR	88		0.1250	0.3536	8
YEAR	89		0.1667	0.3892	12
LOCATION	2	SMI HARE ROCK	0.9583	1.5973	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.9167	1.1645	12
YEAR	87		0.6667	1.2309	12
YEAR	88		2.5000	2.5635	8
YEAR	89		0.5833	1.2401	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.2679	0.6740	56
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.9375	0.9979	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.2000	0.5345	50
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	10
YEAR	88		0.0000	0.0000	8
YEAR	89		0.8333	0.8348	12
LOCATION	5	SRI RODES REEF	0.3125	0.9927	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		1.2500	1.7123	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0208	0.1443	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.1250	0.3536	8
YEAR	89		0.0000	0.0000	12
LOCATION	7	SCI FRYS HARBOR	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.0227	0.1508	44
YEAR	86		0.0000	0.0000	8

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0625	0.2500	16
LOCATION	11	ANI ADMIRALS REEF	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	16
LOCATION	12	ANI CATHEDRAL COVE	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0833	0.4535	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.3333	0.8876	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	52
YEAR	86		0.0000	0.0000	16
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Damalichthys vacca* adult**	**0.9458**	**1.7479**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	1.0682	2.1502	44
YEAR	85		3.0000	4.0825	4
YEAR	86		3.7500	2.5495	8
YEAR	87		0.3333	0.4924	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0833	0.2887	12
LOCATION	2	SMI HARE ROCK	1.4167	2.2582	48
YEAR	85		0.7500	1.5000	4
YEAR	86		2.5833	3.5792	12
YEAR	87		0.9167	1.1645	12
YEAR	88		2.2500	2.0529	8
YEAR	89		0.4167	0.9003	12
LOCATION	3	SRI JOHNSONS LEE NORTH	2.0714	1.8572	56
YEAR	85		2.8750	2.3566	8
YEAR	86		3.8333	2.0375	12
YEAR	87		1.4167	0.6686	12
YEAR	88		2.1250	1.6421	8
YEAR	89		0.8125	0.7500	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	3.4400	2.4341	50
YEAR	85		4.8750	1.6421	8
YEAR	86		5.9167	2.0207	12
YEAR	87		2.6000	1.8974	10
YEAR	88		0.6250	0.7440	8
YEAR	89		2.5833	1.3790	12
LOCATION	5	SRI RODES REEF	0.7708	1.2588	48
YEAR	85		2.5000	3.7859	4
YEAR	86		0.5833	0.7930	12
YEAR	87		0.9167	0.2887	12
YEAR	88		0.1250	0.3536	8
YEAR	89		0.6667	0.7785	12
LOCATION	6	SCI GULL ISLAND SOUTH	1.1875	1.4389	48
YEAR	85		1.0000	0.8165	4
YEAR	86		0.7500	0.7538	12
YEAR	87		2.3333	2.1034	12
YEAR	88		1.6250	1.0607	8
YEAR	89		0.2500	0.4523	12
LOCATION	7	SCI FRYS HARBOR	2.6136	2.7971	44
YEAR	86		5.5833	3.4234	12
YEAR	87		2.0833	1.3790	12
YEAR	88		0.2500	0.7071	8
YEAR	89		1.7500	1.3568	12
LOCATION	8	SCI PELICAN BAY	1.6042	1.3951	48
YEAR	85		2.5000	2.5166	4
YEAR	86		2.1667	1.5275	12
YEAR	87		1.5000	1.2432	12
YEAR	88		0.2500	0.4629	8
YEAR	89		1.7500	0.7538	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.2708	0.4942	48
YEAR	85		0.2500	0.5000	4
YEAR	86		0.3333	0.4924	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.3333	0.6513	12
YEAR	89		0.3750	0.5175	8
LOCATION	10	SCI YELLOW BANKS	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	8

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	11	ANI ADMIRALS REEF	0.6429	1.0690	56
YEAR	85		1.0000	1.4142	4
YEAR	86		0.3333	0.4924	12
YEAR	87		0.1667	0.3892	12
YEAR	88		0.0833	0.2887	12
YEAR	89		1.5625	1.4127	16
LOCATION	12	ANI CATHEDRAL COVE	0.1731	0.4303	52
YEAR	85		0.2500	0.5000	4
YEAR	86		0.4167	0.5149	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.2500	0.6216	12
LOCATION	13	ANI LANDING COVE	0.0208	0.1443	48
YEAR	85		0.2500	0.5000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0577	0.2354	52
YEAR	85		0.5000	0.5774	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	52
YEAR	86		0.0000	0.0000	16
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Damalichthys vacca* juvenile**	**0.0378**	**0.4828**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	0.1136	0.4428	44
YEAR	85		0.0000	0.0000	4
YEAR	86		0.5000	0.9258	8
YEAR	87		0.0833	0.2887	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0208	0.1443	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.1964	1.4699	56
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		1.3750	3.8891	8
YEAR	89		0.0000	0.0000	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0000	0.0000	50
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	10
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	5	SRI RODES REEF	0.2292	1.0364	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		1.3750	2.3261	8
YEAR	89		0.0000	0.0000	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	7	SCI FRYS HARBOR	0.0455	0.2107	44
YEAR	86		0.1667	0.3892	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	8

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	11	ANI ADMIRALS REEF	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	16
LOCATION	12	ANI CATHEDRAL COVE	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	52
YEAR	86		0.0000	0.0000	16
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

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Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Hypsypops rubicundus* adult**	**2.1398**	**3.2938**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	44
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	8
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.6071	0.8879	56
YEAR	85		0.1250	0.3536	8
YEAR	86		0.1667	0.3892	12
YEAR	87		1.0000	1.0445	12
YEAR	88		0.2500	0.4629	8
YEAR	89		1.0625	1.0626	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0000	0.0000	50
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	10
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	5	SRI RODES REEF	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.3542	0.5645	48
YEAR	85		0.2500	0.5000	4
YEAR	86		0.5833	0.7930	12
YEAR	87		0.5000	0.5222	12
YEAR	88		0.2500	0.4629	8
YEAR	89		0.0833	0.2887	12
LOCATION	7	SCI FRYS HARBOR	1.1136	1.0391	44
YEAR	86		0.4167	0.6686	12
YEAR	87		1.8333	1.2673	12
YEAR	88		1.0000	0.9258	8
YEAR	89		1.1667	0.7177	12
LOCATION	8	SCI PELICAN BAY	4.1042	3.2956	48
YEAR	85		1.0000	0.8165	4
YEAR	86		3.2500	1.7645	12
YEAR	87		6.2500	5.4125	12
YEAR	88		4.8750	1.3562	8
YEAR	89		3.3333	1.4975	12
LOCATION	9	SCI SCORPION ANCHORAGE	1.5833	1.2688	48
YEAR	85		1.2500	1.5000	4
YEAR	86		1.5833	0.9003	12
YEAR	87		2.0833	1.6765	12
YEAR	88		1.9167	1.0836	12
YEAR	89		0.5000	0.5345	8
LOCATION	10	SCI YELLOW BANKS	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	8
YEAR	87		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	11	ANI ADMIRALS REEF	1.7143	1.1711	56
YEAR	85		1.7500	1.5000	4
YEAR	86		1.2500	0.6216	12
YEAR	87		1.6667	1.1547	12
YEAR	88		1.7500	1.0553	12
YEAR	89		2.0625	1.4818	16
LOCATION	12	ANI CATHEDRAL COVE	5.1923	2.8218	52
YEAR	85		2.0000	1.8257	4
YEAR	86		3.9167	2.1515	12
YEAR	87		7.8333	2.3290	12
YEAR	88		5.8333	2.3677	12
YEAR	89		4.2500	2.4168	12
LOCATION	13	ANI LANDING COVE	4.2917	2.1533	48
YEAR	85		4.7500	0.5000	4
YEAR	86		3.8333	1.2673	12
YEAR	87		4.5000	3.0000	12
YEAR	88		4.4167	2.4664	12
YEAR	89		4.2500	2.0529	8
LOCATION	14	SBI SOUTHEAST SEALION	0.6786	0.7887	56
YEAR	85		0.5000	0.5774	4
YEAR	86		0.5000	0.6742	12
YEAR	87		0.8500	0.9333	20
YEAR	88		0.5000	0.7559	8
YEAR	89		0.7500	0.7538	12
LOCATION	15	SBI ARCH POINT	10.6538	3.8901	52
YEAR	85		9.7500	3.7749	4
YEAR	86		12.1667	5.8284	12
YEAR	87		11.1667	3.4859	12
YEAR	88		10.6667	2.2697	12
YEAR	89		8.9167	2.9375	12
LOCATION	16	SBI CAT CANYON	3.1154	1.7110	52
YEAR	86		2.7500	1.6931	16
YEAR	87		4.5000	2.1106	12
YEAR	88		2.6667	1.3707	12
YEAR	89		2.6667	0.7785	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Hypsypops rubicundus* juveniles**	**0.0919**	**0.3927**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	44
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	8
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0000	0.0000	50
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	10
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	5	SRI RODES REEF	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	7	SCI FRYS HARBOR	0.1591	0.5258	44
YEAR	86		0.0000	0.0000	12
YEAR	87		0.5833	0.9003	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.4375	0.7411	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.9167	0.7930	12
YEAR	87		0.8333	0.9374	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0208	0.1443	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0833	0.2887	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	8

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Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	11	ANI ADMIRALS REEF	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	16
LOCATION	12	ANI CATHEDRAL COVE	0.2885	0.8004	52
YEAR	85		0.0000	0.0000	4
YEAR	86		1.0000	1.3484	12
YEAR	87		0.2500	0.6216	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.2917	0.6174	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.9167	0.7930	12
YEAR	87		0.2500	0.6216	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.2692	0.5641	52
YEAR	85		1.2500	1.2583	4
YEAR	86		0.1667	0.3892	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.2500	0.4523	12
YEAR	89		0.2500	0.4523	12
LOCATION	16	SBI CAT CANYON	0.0192	0.1387	52
YEAR	86		0.0625	0.2500	16
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Girella nigricans* adult**	**0.7670**	**1.8649**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	44
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	8
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.1964	0.4832	56
YEAR	85		0.2500	0.4629	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0833	0.2887	12
YEAR	88		0.5000	0.9258	8
YEAR	89		0.2500	0.4472	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.1600	0.3703	50
YEAR	85		0.1250	0.3536	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.3000	0.4830	10
YEAR	88		0.0000	0.0000	8
YEAR	89		0.3333	0.4924	12
LOCATION	5	SRI RODES REEF	0.0417	0.2019	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.1667	0.3892	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	6	SCI GULL ISLAND SOUTH	0.9583	1.0711	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.7500	0.6216	12
YEAR	87		1.9167	1.3790	12
YEAR	88		0.5000	0.7559	8
YEAR	89		0.8333	0.8348	12
LOCATION	7	SCI FRYS HARBOR	0.3182	0.6388	44
YEAR	86		0.0833	0.2887	12
YEAR	87		0.7500	0.9653	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.3333	0.4924	12
LOCATION	8	SCI PELICAN BAY	0.2083	0.5035	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0833	0.2887	12
YEAR	87		0.3333	0.6513	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.4167	0.6686	12
LOCATION	9	SCI SCORPION ANCHORAGE	1.0000	1.6503	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.4167	0.6686	12
YEAR	87		2.0000	2.3355	12
YEAR	88		1.5000	1.7321	12
YEAR	89		0.1250	0.3536	8
LOCATION	10	SCI YELLOW BANKS	0.0682	0.3339	44
YEAR	86		0.0000	0.0000	8

Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0833	0.2887	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.1250	0.5000	16
LOCATION	11	ANI ADMIRALS REEF	1.5357	2.1823	56
YEAR	85		1.7500	2.0616	4
YEAR	86		0.4167	0.6686	12
YEAR	87		1.1667	1.3371	12
YEAR	88		1.0000	1.0445	12
YEAR	89		3.0000	3.2455	16
LOCATION	12	ANI CATHEDRAL COVE	0.8654	1.5846	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0833	0.2887	12
YEAR	87		0.4167	1.1645	12
YEAR	88		1.4167	1.3790	12
YEAR	89		1.8333	2.4058	12
LOCATION	13	ANI LANDING COVE	3.4167	4.5092	48
YEAR	85		3.5000	2.6458	4
YEAR	86		0.7500	0.9653	12
YEAR	87		1.0000	0.8528	12
YEAR	88		9.1667	5.5405	12
YEAR	89		2.3750	1.5980	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	2.7115	2.6072	52
YEAR	85		2.2500	2.2174	4
YEAR	86		1.7500	1.9598	12
YEAR	87		3.0000	2.4121	12
YEAR	88		3.4167	3.1467	12
YEAR	89		2.8333	2.9797	12
LOCATION	16	SBI CAT CANYON	0.5962	1.0893	52
YEAR	86		0.1250	0.3416	16
YEAR	87		1.0000	0.8528	12
YEAR	88		0.0833	0.2887	12
YEAR	89		1.3333	1.7753	12

Variable	Value	Label	Mean	Std Dev	Cases
SPECIES		***Girella nigricans* juvenile**	**0.0013**	**0.0355**	**794**
LOCATION	1	SMI WYCKOFF LEDGE	0.0000	0.0000	44
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	8
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	2	SMI HARE ROCK	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	3	SRI JOHNSONS LEE NORTH	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	4	SRI JOHNSONS LEE SOUTH	0.0000	0.0000	51
YEAR	85		0.0000	0.0000	8
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	10
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	13
LOCATION	5	SRI RODES REEF	0.0000	0.0000	47
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	11
LOCATION	6	SCI GULL ISLAND SOUTH	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	7	SCI FRYS HARBOR	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	8	SCI PELICAN BAY	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	9	SCI SCORPION ANCHORAGE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	10	SCI YELLOW BANKS	0.0000	0.0000	44
YEAR	86		0.0000	0.0000	8

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Variable	Value	Label	Mean	Std Dev	Cases
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	16
LOCATION	11	ANI ADMIRALS REEF	0.0179	0.1336	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0833	0.2887	12
YEAR	89		0.0000	0.0000	16
LOCATION	12	ANI CATHEDRAL COVE	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	13	ANI LANDING COVE	0.0000	0.0000	48
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	8
LOCATION	14	SBI SOUTHEAST SEALION	0.0000	0.0000	56
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	20
YEAR	88		0.0000	0.0000	8
YEAR	89		0.0000	0.0000	12
LOCATION	15	SBI ARCH POINT	0.0000	0.0000	52
YEAR	85		0.0000	0.0000	4
YEAR	86		0.0000	0.0000	12
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12
LOCATION	16	SBI CAT CANYON	0.0000	0.0000	52
YEAR	86		0.0000	0.0000	16
YEAR	87		0.0000	0.0000	12
YEAR	88		0.0000	0.0000	12
YEAR	89		0.0000	0.0000	12

Appendix 5. 1982-1989 Kelp Forest Monitoring Data - Size Frequency Measurements

Introduction.
Following are summaries of data gathered during size frequency measurements from 1982-1989 for all kelp forest monitoring program sampling sites. Data were summarized with SPSSPC+ programs from translated dBase III+ files. SIZE FREQUENCY data are presented as percentiles falling within indicated size classes and total number of samples (cases) are given.
For details of methods and data management, refer to the monitoring handbook (Davis 1988).

Notes on methods:

SIZE FREQUENCY MEASUREMENTS. Cases (N) represent the number of organisms measured. The fraction of cases falling within given size classes are given as percentiles. Specific dimensions: *Tethya*- diameter in mm; *Haliotis*, and *Kelletia*- maximum shell length in mm; *Astraea*- maximum diameter of shell at base in mm; *Megathura*- estimated shell length between outside ends of shell under mantle in mm; Sea stars- maximum radius in mm; Urchins- test diameter in mm; *Macrocystis*- number of stipes (counted 1m above the substrate) and maximum holdfast-base diameters in cm. Gorgonians- maximum width and height in cm. Raw data will allow correlation between stipe number and holdfast diameter for individual kelp plants and between width and height for individual gorgonians.

LOCATION 1 SAN MIGUEL ISLAND - WYCKOFF LEDGE

1986
Tethya aurantia

(cases) N=	37
< 10 mm	0.0
10 - 19	2.7%
20 - 29	16.2%
30 - 39	18.9%
40 - 49	27.0%
50 - 59	18.9%
60 - 69	13.5%
70 - 79	2.7%
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	12
max size (mm)	71
mean	44
mode	63

1987
Tethya aurantia

(cases) N=	31
< 10 mm	0.0
10 - 19	3.2%
20 - 29	16.1%
30 - 39	3.2%
40 - 49	19.4%
50 - 59	25.8%
60 - 69	6.5%
70 - 79	12.9%
80 - 89	3.2%
90 - 99	0.0
>99 mm	6.5%
min size (mm)	17
max size (mm)	122
mean	55
mode	25

1989
Tethya aurantia

(cases) N=	33
< 10 mm	0.0
10 - 19	0.0
20 - 29	6.1%
30 - 39	15.2%
40 - 49	9.1%
50 - 59	12.1%
60 - 69	21.2%
70 - 79	12.1%
80 - 89	18.2%
90 - 99	3.0%
>99 mm	3.0%
min size (mm)	26
max size (mm)	119
mean	62
mode	39

1989
Tethya aurantia

(cases) N=	31
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	3.2%
40 - 49	16.1%
50 - 59	12.9%
60 - 69	25.8%
70 - 79	29.0%
80 - 89	9.7%
90 - 99	3.2%
>99 mm	0.0
min size (mm)	30
max size (mm)	90
mean	65
mode	73

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Size Frequencies

LOCATION 1 SAN MIGUEL ISLAND - WYCKOFF LEDGE

1984
Haliotis rufescens

(cases) N=	5
< 20 mm	0.0
20 - 89	0.0
90 - 99	20.0%
100 - 109	0.0
110 - 119	0.0
120 - 129	20.0%
130 - 139	0.0
140 - 149	0.0
150 - 159	0.0
160 - 169	20.0%
170 - 179	20.0%
180 - 189	20.0%
190 - 199	0.0
>199 mm	0.0
min size (mm)	93
max size (mm)	181
mean	147
mode	93

1985
Haliotis rufescens

(cases) N=	13
< 20 mm	0.0
20 - 69	0.0
70 - 79	7.7%
80 - 89	0.0
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
120 - 129	7.7%
130 - 139	0.0
140 - 149	7.7%
150 - 159	7.7%
160 - 169	30.8%
170 - 179	23.1%
180 - 189	7.7%
>199 mm	7.7%
min size (mm)	75
max size (mm)	210
mean	158
mode	160

1986
Haliotis rufescens

(cases) N=	14
< 20 mm	0.0
20 - 59	0.0
60 - 69	7.1%
70 - 79	7.1%
80 - 89	0.0
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
120 - 129	0.0
130 - 139	7.1%
140 - 149	0.0
150 - 154	7.1%
155 - 159	14.3%
160 - 164	14.3%
165 - 169	14.3%
170 - 174	14.3%
175 - 179	0.0
180 - 184	0.0
185 - 189	7.1%
190 - 194	0.0
195 - 199	0.0
>199 mm	7.1%
min size (mm)	65
max size (mm)	212
mean	153
mode	165

1987
Haliotis rufescens

(cases) N=	12
< 20 mm	0.0
20 - 69	0.0
70 - 79	8.3%
80 - 89	0.0
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
120 - 129	8.3%
130 - 139	0.0
140 - 149	16.7%
150 - 154	0.0
155 - 159	8.3%
160 - 164	8.3%
165 - 169	8.3%
170 - 174	16.7%
175 - 179	0.0
180 - 184	16.7%
185 - 189	8.3%
190 - 199	0.0
>199 mm	0.0
min size (mm)	78
max size (mm)	188
mean	156
mode	78

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 1 SAN MIGUEL ISLAND - WYCKOFF LEDGE

1988
Haliotis rufescens

(cases) N=	30
< 20 mm	0.0
20 - 59	0.0
60 - 69	3.3%
70 - 79	0.0
80 - 89	3.3%
90 - 99	0.0
100 - 109	3.3%
110 - 119	3.3%
120 - 129	0.0
130 - 139	10.0%
140 - 149	3.3%
150 - 154	6.7%
155 - 159	16.7%
160 - 164	13.3%
165 - 169	10.0%
170 - 174	6.7%
175 - 179	3.3%
180 - 184	13.3%
185 - 189	0.0
190 - 194	10.0%
195 - 199	0.0
>199 mm	3.3%
min size (mm)	60
max size (mm)	201
mean	156
mode	130

1989
Haliotis rufescens

(cases) N=	22
< 20 mm	0.0
20 - 99	0.0
100 - 109	0.0
110 - 119	0.0
120 - 129	0.0
130 - 134	9.1%
135 - 139	9.1%
140 - 144	0.0
145 - 149	9.1%
150 - 154	0.0
155 - 159	4.5%
160 - 164	4.5%
165 - 169	4.5%
170 - 174	0.0
175 - 179	4.5%
180 - 184	18.2%
185 - 189	22.7%
190 - 194	9.1%
195 - 199	0.0
>199 mm	4.5%
min size (mm)	132
max size (mm)	215
mean	171
mode	189

LOCATION 1 SAN MIGUEL ISLAND - WYCKOFF LEDGE

1984
Kelletia kelletii

(cases) N=	31
< 40 mm	0.0
40 - 49	0.0
50 - 59	3.2%
60 - 69	9.7%
70 - 79	6.5%
80 - 89	6.5%
90 - 99	38.7%
100 - 109	19.4%
110 - 119	16.1%
120 - 129	0.0%
>129 mm	0.0
min size (mm)	58
max size (mm)	117
mean	94
mode	96

1985
Kelletia kelletii

(cases) N=	36
< 40 mm	0.0
40 - 79	0.0
80 - 89	22.2%
90 - 99	13.9%
100 - 109	27.8%
110 - 119	22.2%
120 - 129	13.9%
130 - 139	0.0
>139 mm	0.0
min size (mm)	80
max size (mm)	125
mean	103
mode	80

1986
Kelletia kelletii

(cases) N=	40
< 40 mm	0.0
40 - 49	2.5%
50 - 59	0.0
60 - 69	7.5%
70 - 79	22.5%
80 - 89	2.5%
90 - 99	27.5%
100 - 109	25.0%
110 - 119	10.0%
120 - 129	2.5%
130 - 139	0.0
>139 mm	0.0
min size (mm)	47
max size (mm)	120
mean	92
mode	97

1987
Kelletia kelletii

(cases) N=	39
< 40 mm	2.6%
40 - 49m	0.0%
50 - 59	0.0
60 - 69	0.0
70 - 79	10.3%
80 - 89	23.1%
90 - 99	30.8%
100 - 109	15.4%
110 - 119	17.9%
120 - 129	0.0
>129 mm	0.0
min size (mm)	20
max size (mm)	118
mean	93
mode	86

1988
Kelletia kelletii

(cases) N=	30
< 40 mm	0.0
40 - 49	0.0
50 - 59	20.0%
60 - 69	23.3%
70 - 79	20.0%
80 - 89	26.7%
90 - 99	3.3%
100 - 109	6.7%
110 - 119	0.0
120 - 129	0.0
>129 mm	0.0
min size (mm)	55
max size (mm)	108
mean	74
mode	59

1989
Kelletia kelletii

(cases) N=	35
< 40 mm	0.0
40 - 49	0.0
50 - 59	11.4%
60 - 69	14.3%
70 - 79	25.7%
80 - 89	17.1%
90 - 99	22.9%
100 - 109	5.7%
110 - 119	2.9%
120 - 129	0.0
>129 mm	0.0
min size (mm)	56
max size (mm)	119
mean	80
mode	73

LOCATION 1 SAN MIGUEL ISLAND - WYCKOFF LEDGE

1985
Tethya aurantia

(cases) N=	30
< 19 mm	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	3.3%
50 - 59	30.0%
60 - 69	53.3%
70 - 79	13.3%
80 - 89	0.0
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	47
max size (mm)	76
mean	62
mode	62

1986
Tethya aurantia

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	6.7%
50 - 59	33.3%
60 - 69	46.7%
70 - 79	13.3%
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	48
max size (mm)	74
mean	62
mode	57

1987
Tethya aurantia

(cases) N=	24
< 30 mm	0.0
30 - 39	0.0
40 - 49	8.3%
50 - 59	29.2%
60 - 69	62.5%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	48
max size (mm)	69
mean	60
mode	61

1988
Tethya aurantia

(cases) N=	11
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	9.1%
50 - 59	27.3%
60 - 69	54.5%
70 - 79	0.0
80 - 89	9.1%
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	49
max size (mm)	81
mean	62
mode	67

1989
Tethya aurantia

(cases) N=	23
< 19 mm	0.0
20 - 29	0.0
30 - 39	4.3%
40 - 49	26.1%
50 - 59	43.5%
60 - 69	21.7%
70 - 79	4.3%
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	35
max size (mm)	72
mean	53
mode	42

LOCATION 1 SAN MIGUEL ISLAND - WYCKOFF LEDGE

1984
Patiria miniata

(cases) N=	52
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	1.9%
40 - 49	11.5%
50 - 59	28.8%
60 - 69	46.2%
70 - 79	9.6%
80 - 89	1.9%
90 - 99	0.0
>100 mm	0.0
min size (mm)	31
max size (mm)	80
mean	61
mode	64

1985
Patiria miniata

(cases) N=	40
< 10 mm	0.0
10 - 19	0.0
20 - 29	2.5%
30 - 39	5.0%
40 - 49	12.5%
50 - 59	25.0%
60 - 69	40.0%
70 - 79	15.0%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	29
max size (mm)	78
mean	59
mode	68

1986
Patiria miniata

(cases) N=	50
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	2.0%
40 - 49	14.0%
50 - 59	38.0%
60 - 69	32.0%
70 - 79	14.0%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	39
max size (mm	77
mean	58
mode	56

1987
Patiria miniata

(cases) N=	50
< 10 mm	0.0
10 - 19	2.0%
20 - 29	0.0
30 - 39	2.0%
40 - 49	2.0%
50 - 59	10.0%
60 - 69	44.0%
70 - 79	32.0%
80 - 89	8.0%
90 - 99	0.0
>100 mm	0.0
min size (mm)	14
max size (mm)	87
mean	67
mode	62

1988
Patiria miniata

(cases) N=	54
< 10 mm	0.0
10 - 19	1.9%
20 - 29	7.4%
30 - 39	7.4%
40 - 49	29.6%
50 - 59	16.7%
60 - 69	24.1%
70 - 79	3.7%
80 - 89	7.4%
90 - 99	1.9%
>100 mm	0.0
min size (mm)	16
max size (mm)	92
mean	52
mode	65

1989
Patiria miniata

(cases) N=	55
< 10 mm	0.0
10 - 19	3.6%
20 - 29	1.8%
30 - 39	7.3%
40 - 49	0.0
50 - 59	18.2%
60 - 69	40.0%
70 - 79	20.0%
80 - 89	5.5%
90 - 99	1.8%
>100 mm	1.8%
min size (mm)	11
max size (mm)	103
mean	61
mode	60

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LOCATION 1 SAN MIGUEL ISLAND - WYCKOFF LEDGE

1986
Pisaster giganteus

(cases) N=	30
< 20 mm	0.0
20 - 39	10.0%
40 - 59	16.7%
60 - 79	30.0%
80 - 99	26.7%
100 - 119	10.0%
120 - 139	3.3%
140 - 159	0.0
160 - 179	0.0
180 - 199	3.3%
200 - 219	0.0
220 - 239	0.0
>239 mm	0.0
min size (mm)	33
max size (mm)	185
mean	78
mode	59

1987
Pisaster giganteus

(cases) N=	30
< 20 mm	0.0
20 - 39	3.3%
40 - 59	36.7%
60 - 79	46.7%
80 - 99	10.0%
100 - 119	3.3%
120 - 139	0.0
140 - 159	0.0
>159 mm	0.0
min size (mm)	32
max size (mm)	104
mean	66
mode	68

1988
Pisaster giganteus

(cases) N=	32
< 20 mm	0.0
20 - 39	40.6%
40 - 59	21.9%
60 - 79	25.0%
80 - 99	0.0
100 - 119	6.3%
120 - 139	6.3%
140 - 159	0.0
>159 mm	0.0
min size (mm)	25
max size (mm)	130
mean	54
mode	26

1989
Pisaster giganteus

(cases) N=	46
< 20 mm	4.3%
20 - 39	17.4%
40 - 59	34.8%
60 - 79	23.9%
80 - 99	8.7%
100 - 119	4.3%
120 - 139	4.3%
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	2.2%
min size (mm)	3
max size (mm)	309
mean	65
mode	50

LOCATION 1 SAN MIGUEL ISLAND - WYCKOFF LEDGE

1987

Pycnopodia helianthoides

(cases) N=	4
< 20 mm	0.0
20 - 39	25.0%
40 - 59	0.0
60 - 79	0.0
80 - 99	25.0%
100 - 119	25.0%
120 - 139	25.0%
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
>199 mm	0.0
min size (mm)	20
max size (mm)	132
mean	85
mode	20

1989

Pycnopodia helianthoides

(cases) N=	33
< 20 mm	3.0%
20 - 39	42.4%
40 - 59	27.3%
60 - 79	12.1%
80 - 99	0.0
100 - 119	6.1%
120 - 139	0.0
140 - 159	0.0
160 - 179	3.0%
180 - 199	3.0%
200 - 219	0.0
220 - 239	3.0%
240 - 259	0.0
260 - 279	0.0
>279 mm	0.0
min size (mm)	10
max size (mm)	230
mean	57
mode	20

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LOCATION 1 SAN MIGUEL ISLAND - WYCKOFF LEDGE

1984
Strongylocentrotus franciscanus

(cases) N=	68
< 9 mm	0.0
10 - 14	4.4%
15 - 19	4.4%
20 - 24	0.0
25 - 29	1.5%
30 - 34	1.5%
35 - 39	0.0
40 - 44	0.0
45 - 49	2.9%
50 - 54	1.5%
55 - 59	1.5%
60 - 64	1.5%
65 - 69	0.0
70 - 74	2.9%
75 - 79	2.9%
80 - 84	7.4%
85 - 89	8.8%
90 - 94	11.8%
95 - 99	10.3%
100 - 104	11.8%
104 - 109	7.4%
>109 mm	13.2%
min size (mm)	11
max size (mm)	132
mean	86
mode	83

1985
Strongylocentrotus franciscanus

(cases) N=	113
< 9 mm	0.0
10 - 14	0.0
15 - 19	1.8%
20 - 24	4.4%
25 - 29	2.7%
30 - 34	0.9%
35 - 39	1.8%
40 - 44	3.5%
45 - 49	8.8%
50 - 54	11.5%
55 - 59	16.8%
60 - 64	14.2%
65 - 69	8.8%
70 - 74	4.4%
75 - 79	3.5%
80 - 84	5.3%
85 - 89	0.9%
90 - 94	1.8%
95 - 99	0.9%
100 - 104	3.5%
105 - 109	1.8%
>109 mm	1.8%
min size (mm)	19
max size (mm)	121
mean	61
mode	57

1986
Strongylocentrotus franciscanus

(cases) N=	100
< 9 mm	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	0.0
25 - 29	3.0%
30 - 34	3.0%
35 - 39	4.0%
40 - 44	5.0%
45 - 49	10.0%
50 - 54	8.0%
55 - 59	5.0%
60 - 64	8.0%
65 - 69	14.0%
70 - 74	14.0%
75 - 79	14.0%
80 - 84	4.0%
85 - 89	3.0%
90 - 94	1.0%
95 - 99	1.0%
100 - 104	1.0%
105 - 109	1.0%
>109 mm	0.0
min size (mm)	25
max size (mm)	110
mean	63
mode	71

1987
Strongylocentrotus franciscanus

(cases) N=	100
< 9 mm	0.0
10 - 14	0.0
15 - 19	1.0%
20 - 24	0.0
25 - 29	2.0%
30 - 34	5.0%
35 - 39	3.0%
40 - 44	2.0%
45 - 49	17.0%
50 - 54	12.0%
55 - 59	7.0%
60 - 64	10.0%
65 - 69	11.0%
70 - 74	8.0%
75 - 79	11.0%
80 - 84	4.0%
85 - 89	2.0%
90 - 94	1.0%
95 - 99	2.0%
100 - 104	0.0
105 - 109	1.0%
>109 mm	1.0%
min size (mm)	15
max size (mm)	122
mean	60
mode	49

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 1 SAN MIGUEL ISLAND - WYCKOFF LEDGE

1988		1989	
Strongylocentrotus franciscanus		*Strongylocentrotus franciscanus*	
(cases) N=	103	(cases) N=	118
< 9 mm	0.0	< 9 mm	0.0
10 - 14	1.0%	10 - 14	0.0
15 - 19	1.0%	15 - 19	3.4%
20 - 24	0.0	20 - 24	6.8%
25 - 29	1.9%	25 - 29	7.6%
30 - 34	1.9%	30 - 34	7.6%
35 - 39	2.9%	35 - 39	1.7%
40 - 44	2.9%	40 - 44	0.8%
45 - 49	1.0%	45 - 49	4.2%
50 - 54	1.9%	50 - 54	6.8%
55 - 59	2.9%	55 - 59	5.1%
60 - 64	6.8%	60 - 64	7.6%
65 - 69	6.8%	65 - 69	13.6%
70 - 74	6.8%	70 - 74	5.1%
75 - 79	15.5%	75 - 79	6.8%
80 - 84	20.4%	80 - 84	7.6%
85 - 89	15.5%	85 - 89	7.6%
90 - 94	1.9%	90 - 94	2.5%
95 - 99	3.9%	95 - 99	1.7%
100 - 104	1.0%	100 - 104	2.5%
105 - 109	1.9%	105 - 109	0.8%
>109 mm	1.0%	>109 mm	0.0
min size (mm)	13	min size (mm)	16
max size (mm)	131	max size (mm)	108
mean	74	mean	59
mode	77	mode	66

LOCATION 1 SAN MIGUEL ISLAND - WYCKOFF LEDGE

1985
Srongylocentrotus purpuratus

(cases) N=	106
< 9 mm	0.9%
10 - 14	4.7%
15 - 19	10.4%
20 - 24	18.9%
25 - 29	22.6%
30 - 34	7.5%
35 - 39	6.6%
40 - 44	9.4%
45 - 49	9.4%
50 - 54	5.7%
55 - 59	2.8%
60 - 64	0.9%
>64 mm	0.0
min size (mm)	7
max size (mm)	63
mean	31
mode	21

1986
Srongylocentrotus purpuratus

(cases) N=	132
< 9 mm	0.0
10 - 14	5.3%
15 - 19	10.6%
20 - 24	7.6%
25 - 29	9.8%
30 - 34	15.2%
35 - 39	17.4%
40 - 44	12.1%
45 - 49	9.1%
50 - 54	5.3%
55 - 59	6.1%
60 - 64	0.0
65 - 69	1.5%
> 69 mm	0.0
min size (mm)	11
max size (mm)	65
mean	35
mode	35

1987
Srongylocentrotus purpuratus

(cases) N=	76
< 9 mm	0.0
10 - 14	5.3%
15 - 19	0.0
20 - 24	9.2%
25 - 29	21.1%
30 - 34	13.2%
35 - 39	13.2%
40 - 44	9.2%
45 - 49	10.5%
50 - 54	5.3%
55 - 59	6.6%
60 - 64	3.9%
65 - 69	1.3%
70 - 74	1.3%
>74 mm	0.0
min size (mm)	12
max size (mm)	71
mean	37
mode	25

1988
Srongylocentrotus purpuratus

(cases) N=	66
< 9 mm	0.0
10 - 14	0.0
15 - 19	1.5%
20 - 24	6.1%
25 - 29	9.1%
30 - 34	10.6%
35 - 39	19.7%
40 - 44	10.6%
45 - 49	13.6%
50 - 54	7.6%
55 - 59	13.6%
60 - 64	7.6%
65 - 69	0.0
>69 mm	0.0
min size (mm)	15
max size (mm)	64
mean	42
mode	59

1989
Srongylocentrotus purpuratus

(cases) N=	66
< 9 mm	0.0
10 - 14	6.1%
15 - 19	12.1%
20 - 24	10.6%
25 - 29	9.1%
30 - 34	7.6%
35 - 39	10.6%
40 - 44	13.6%
45 - 49	10.6%
50 - 54	7.6%
55 - 59	9.1%
60 - 64	3.0%
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
>99 mm	0.0
min size (mm)	12
max size (mm)	60
mean	35
mode	42

LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

1986
Tethya aurantia

(cases) N=	17
< 10 mm	0.0
10 - 19	5.9%
20 - 29	5.9%
30 - 39	11.8%
40 - 49	29.4%
50 - 59	41.2%
60 - 69	0.0
70 - 79	5.9%
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	13
max size (mm)	75
mean	46
mode	50

1987
Tethya aurantia

(cases) N=	36
< 10 mm	0.0
10 - 19	0.0
20 - 29	13.9%
30 - 39	8.3%
40 - 49	25.0%
50 - 59	27.8%
60 - 69	13.9%
70 - 79	5.6%
80 - 89	5.6%
90 - 99	0.0
>99 mm	0.0
min size (mm)	24
max size (mm)	88
mean	51
mode	59

1988
Tethya aurantia

(cases) N=	30
< 10 mm	0.0
10 - 19	6.7%
20 - 29	10.0%
30 - 39	6.7%
40 - 49	16.7%
50 - 59	36.7%
60 - 69	16.7%
70 - 79	0.0
80 - 89	6.7%
90 - 99	0.0
>99 mm	0.0
min size (mm)	17
max size (mm)	88
mean	50
mode	52

1989
Tethya aurantia

(cases) N=	27
< 10 mm	0.0
10 - 19	0.0
20 - 29	11.1%
30 - 39	7.4%
40 - 49	11.1%
50 - 59	18.5%
60 - 69	18.5%
70 - 79	18.5%
80 - 89	14.8%
90 - 99	0.0
>99 mm	0.0
min size (mm)	24
max size (mm)	86
mean	59
mode	50

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

	1986 *Haliotis rufescens*		1987 *Haliotis rufescens*
(cases) N=	10	(cases) N=	6
<25 mm	0.0	<25 mm	0.0
25 - 29	10.0%	25 - 29	0.0
30 - 34	0.0	30 - 34	0.0
35 - 39	10.0%	35 - 39	0.0
40 - 44	0.0	40 - 44	0.0
45 - 49	20.0%	45 - 49	0.0
50 - 54	0.0	50 - 54	0.0
55 - 59	10.0%	55 - 59	0.0
60 - 64	0.0	60 - 64	0.0
65 - 69	0.0	65 - 69	0.0
70 - 74	0.0	70 - 74	0.0
75 - 79	0.0	75 - 79	0.0
80 - 84	0.0	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	0.0
95 - 99	0.0	95 - 99	0.0
100 - 104	0.0	100 - 104	0.0
105 - 109	0.0	105 - 109	16.7%
110 - 114	0.0	110 - 114	16.7%
115 - 119	0.0	115 - 119	0.0
120 - 124	0.0	120 - 124	0.0
125 - 129	0.0	125 - 129	0.0
130 - 134	0.0	130 - 134	0.0
135 - 139	10.0%	135 - 139	0.0
140 - 144	0.0	140 - 144	33.3%
145 - 149	0.0	145 - 149	0.0
150 - 154	20.0%	150 - 154	0.0
155 - 159	0.0	155 - 159	16.7%
160 - 164	0.0	160 - 164	0.0
165 - 169	0.0	165 - 169	0.0
170 - 174	0.0	170 - 174	16.7%
175 - 179	0.0	175 - 179	0.0
180 - 184	0.0	180 - 184	0.0
185 - 189	20.0%	185 - 189	0.0
190 - 194	0.0	190 - 194	0.0
195 - 199	0.0	195 - 199	0.0
>199 mm	0.0	>199 mm	0.0
min size (mm)	26	min size (mm)	109
max size (mm)	188	max size (mm)	171
mean	103	mean	139
mode	46	mode	109

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

1988 *Haliotis rufescens*		1989 *Haliotis rufescens*	
(cases) N=	39	(cases) N=	6
<25 mm	2.6%	<25 mm	33.3%
25 - 29	0.0	25 - 29	0.0
30 - 34	2.6%	30 - 34	0.0
35 - 39	2.6%	35 - 39	0.0
40 - 44	5.1%	40 - 44	0.0
45 - 49	5.1%	45 - 49	0.0
50 - 54	2.6%	50 - 54	0.0
55 - 59	7.7%	55 - 59	0.0
60 - 64	15.4%	60 - 64	0.0
65 - 69	10.3%	65 - 69	0.0
70 - 74	2.6%	70 - 74	0.0
75 - 79	7.7%	75 - 79	0.0
80 - 84	2.6%	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	16.7%
95 - 99	0.0	95 - 99	0.0
100 - 104	0.0	100 - 104	0.0
105 - 109	0.0	105 - 109	0.0
110 - 114	0.0	110 - 114	0.0
115 - 119	0.0	115 - 119	16.7%
120 - 124	0.0	120 - 124	0.0
125 - 129	2.6%	125 - 129	0.0
130 - 134	2.6%	130 - 134	0.0
135 - 139	0.0	135 - 139	0.0
140 - 144	0.0	140 - 144	0.0
145 - 149	0.0	145 - 149	0.0
150 - 154	10.3%	150 - 154	16.7%
155 - 159	7.7%	155 - 159	0.0
160 - 164	5.1%	160 - 164	0.0
165 - 169	2.6%	165 - 169	0.0
170 - 174	2.6%	170 - 174	16.7%
175 - 179	0.0	175 - 179	0.0
180 - 184	0.0	180 - 184	0.0
185 - 189	0.0	185 - 189	0.0
190 - 194	0.0	190 - 194	0.0
195 - 199	0.0	195 - 199	0.0
>199 mm	0.0	>199 mm	0.0
min size (mm)	23	min size (mm)	15
max size (mm)	170	max size (mm)	173
mean	90	mean	95
mode	61	mode	15

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

1984
Cypraea spadicea

(cases) N=	34
< 30 mm	0.0
30 - 34	0.0
35 - 39	14.7%
40 - 44	44.1%
45 - 49	35.3%
50 - 54	5.9%
55 - 59	0.0
>59 mm	0.0
min size (mm)	36
max size (mm)	51
mean	44
mode	44

1985
Cypraea spadicea

(cases) N=	30
< 30 mm	0.0
30 - 34	0.0
35 - 39	6.7%
40 - 44	30.0%
45 - 49	36.7%
50 - 54	20.0%
55 - 59	3.3%
>59 mm	3.3%
min size (mm)	38
max size (mm)	61
mean	47
mode	40

1986
Cypraea spadicea

(cases) N=	30
< 30 mm	0.0
30 - 34	0.0
35 - 39	13.3%
40 - 44	36.7%
45 - 49	40.0%
50 - 54	10.0%
55 - 59	0.0
>59 mm	0.0
min size (mm)	37
max size (mm)	52
mean	45
mode	47

1987
Cypraea spadicea

(cases) N=	30
< 30 mm	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	26.7%
45 - 49	46.7%
50 - 54	26.7%
55 - 59	0.0
>59 mm	0.0
min size (mm)	40
max size (mm)	53
mean	47
mode	49

1988
Cypraea spadicea

(cases) N=	30
< 30 mm	0.0
30 - 34	3.3%
35 - 39	10.0%
40 - 44	43.3%
45 - 49	40.0%
50 - 54	3.3%
55 - 59	0.0
>59 mm	0.0
min size (mm)	34
max size (mm)	50
mean	44
mode	43

1989
Cypraea spadicea

(cases) N=	30
< 30 mm	0.0
30 - 34	0.0
35 - 39	6.7%
40 - 44	23.3%
45 - 49	43.3%
50 - 54	10.0%
55 - 59	16.7%
>59 mm	0.0
min size (mm)	39
max size (mm)	58
mean	47
mode	46

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
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LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

1985
Astraea undosa

(cases) N=	15
< 10 mm	0
10 - 19	0.0
20 - 29	6.7%
30 - 39	20.0%
40 - 49	13.3%
50 - 59	26.7%
60 - 69	13.3%
70 - 79	13.3%
80 - 89	6.7%
90 - 99	0.0
% >99 & <110 mm	0.0
% >109 & <120 mm	0.0
% >119 mm	0.0
min size (mm)	26
max size (mm)	82
mean	52
mode	54

1987
Astraea undosa

(cases) N=	12
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	33.3%
80 - 89	58.3%
90 - 99	8.3%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	76
max size (mm)	90
mean	82
mode	85

1987
Tethya aurantia

(cases) N=	16
< 10 mm	0.0
10 - 19	6.3%
20 - 29	12.5%
30 - 39	12.5%
40 - 49	25.0%
50 - 59	37.5%
60 - 69	0.0
70 - 79	0.0
80 - 89	6.3%
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	18
max size (mm)	80
mean	45
mode	44

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
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LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

1985
Megathura crenulata

(cases) N=	26
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	7.7%
40 - 49	15.4%
50 - 59	19.2%
60 - 69	15.4%
70 - 79	23.1%
80 - 89	15.4%
90 - 99	0.0
100 - 109	3.8%
110 - 119	0.0
>119 mm	0.0
min size (mm)	30
max size (mm)	102
mean	64
mode	78

1986
Megathura crenulata

(cases) N=	14
< 10 mm	0.0
10 - 19	7.1%
20 - 29	0.0
30 - 39	14.3%
40 - 49	28.6%
50 - 59	14.3%
60 - 69	7.1%
70 - 79	7.1%
80 - 89	14.3%
90 - 99	7.1%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	14
max size (mm)	98
mean	54
mode	40

1987
Megathura crenulata

(cases) N=	8
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	12.5%
40 - 49	12.5%
50 - 59	25.0%
60 - 69	50.0%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119	0.0
min size (mm)	39
max size (mm)	67
mean	56
mode	39

1988
Megathura crenulata

(cases) N=	32
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	3.1%
50 - 59	9.4%
60 - 69	12.5%
70 - 79	21.9%
80 - 89	21.9%
90 - 99	18.8%
100 - 109	6.3%
110 - 119	6.3%
>119 mm	0.0
min size (mm)	46
max size (mm)	118
mean	80
mode	82

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

1984
Hinnites giganteus

(cases) N=	25
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	4.0%
60 - 69	20.0%
70 - 79	12.0%
80 - 89	12.0%
90 - 99	8.0%
100 - 109	20.0%
110 - 119	12.0%
120 - 129	4.0%
130 - 139	4.0%
140 - 149	4.0%
>149 mm	0.0
min size (mm)	52
max size (mm)	146
mean	93
mode	109

1985
Hinnites giganteus

(cases) N=	25
< 10 mm	0.0
10 - 19	0.0
20 - 29	4.0%
30 - 39	4.0%
40 - 49	8.0%
50 - 59	8.0%
60 - 69	8.0%
70 - 79	12.0%
80 - 89	12.0%
90 - 99	12.0%
100 - 109	20.0%
110 - 119	4.0%
120 - 129	8.0%
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	29
max size (mm)	127
mean	82
mode	79

1986
Hinnites giganteus

(cases) N=	22
< 10 mm	0.0
10 - 19	0.0
20 - 29	4.5%
30 - 39	18.2%
40 - 49	22.7%
50 - 59	4.5%
60 - 69	22.7%
70 - 79	4.5%
80 - 89	0.0
90 - 99	9.1%
100 - 109	9.1%
110 - 119	0.0
120 - 129	4.5%
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	26
max size (mm)	123
mean	61
mode	32

1987
Hinnites giganteus

(cases) N=	24
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	4.2%
40 - 49	0.0
50 - 59	12.5%
60 - 69	16.7%
70 - 79	8.3%
80 - 89	8.3%
90 - 99	4.2%
100 - 109	4.2%
110 - 119	8.3%
120 - 129	20.8%
130 - 139	8.3%
140 - 149	4.2%
>149 mm	0.0
min size (mm)	35
max size (mm)	147
mean	93
mode	52

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

1988
Hinnites giganteus

(cases) N=	12
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	16.7%
50 - 59	0.0
60 - 69	0.0
70 - 79	0.0
80 - 89	16.7%
90 - 99	8.3%
100 - 109	25.0%
110 - 119	0.0
120 - 129	8.3%
130 - 139	0.0
140 - 149	25.0%
>149 mm	0.0
min size (mm)	40
max size (mm)	148
mean	101
mode	100

1989
Hinnites giganteus

(cases) N=	11
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	9.1%
40 - 49	9.1%
50 - 59	9.1%
60 - 69	9.1%
70 - 79	9.1%
80 - 89	0.0
90 - 99	0.0
100 - 109	9.1%
110 - 119	18.2%
120 - 129	9.1%
130 - 139	18.2%
140 - 149	0.0
>149 mm	0.0
min size (mm)	33
max size (mm)	132
mean	90
mode	33

LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

1984
Patiria miniata

(cases) N=	54
< 10 mm	0.0
10 - 19	1.9%
20 - 29	9.3%
30 - 39	5.6%
40 - 49	14.8%
50 - 59	37.0%
60 - 69	25.9%
70 - 79	5.6%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	18
max size (mm)	77
mean	52
mode	55

1985
Patiria miniata

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	3.3%
40 - 49	16.7%
50 - 59	23.3%
60 - 69	30.0%
70 - 79	23.3%
80 - 89	3.3%
90 - 99	0.0
>100 mm	0.0
min size (mm)	38
max size (mm)	82
mean	61
mode	53

1986
Patiria miniata

(cases) N=	51
< 10 mm	0.0
10 - 19	2.0%
20 - 29	2.0%
30 - 39	13.7%
40 - 49	11.8%
50 - 59	27.5%
60 - 69	33.3%
70 - 79	9.8%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	15
max size (mm)	77
mean	55
mode	67

1987
Patiria miniata

(cases) N=	54
< 10 mm	0.0
10 - 19	0.0
20 - 29	9.3%
30 - 39	7.4%
40 - 49	14.8%
50 - 59	31.5%
60 - 69	29.6%
70 - 79	7.4%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	25
max size (mm)	79
mean	53
mode	60

1988
Patiria miniata

(cases) N=	50
< 10 mm	0.0
10 - 19	2.0%
20 - 29	4.0%
30 - 39	4.0%
40 - 49	20.0%
50 - 59	30.0%
60 - 69	24.0%
70 - 79	16.0%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	16
max size (mm)	78
mean	56
mode	48

1989
Patiria miniata

(cases) N=	48
< 10 mm	0.0
10 - 19	0.0
20 - 29	2.1%
30 - 39	4.2%
40 - 49	0.0
50 - 59	16.7%
60 - 69	27.1%
70 - 79	33.3%
80 - 89	12.5%
90 - 99	4.2%
>100 mm	0.0
min size (mm)	27
max size (mm)	90
mean	66
mode	70

LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

1986
Pisaster giganteus

(cases) N=	30
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	3.3%
80 - 99	26.7%
100 - 119	20.0%
120 - 139	16.7%
140 - 159	13.3%
160 - 179	16.7%
180 - 199	3.3%
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	75
max size (mm)	181
mean	124
mode	86

1987
Pisaster giganteus

(cases) N=	33
<20 mm	0.0
20 - 39	0.0
40 - 59	12.1%
60 - 79	36.4%
80 - 99	33.3%
100 - 119	6.1%
120 - 139	6.1%
140 - 159	3.0%
160 - 179	3.0%
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	44
max size (mm)	165
mean	84
mode	80

1988
Pisaster giganteus

(cases) N=	31
<20 mm	0.0
20 - 39	0.0
40 - 59	6.5%
60 - 79	29.0%
80 - 99	38.7%
100 - 119	22.6%
120 - 139	3.2%
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	50
max size (mm)	120
mean	82
mode	80

1989
Pisaster giganteus

(cases) N=	42
<20 mm	0.0
20 - 39	11.9%
40 - 59	26.2%
60 - 79	21.4%
80 - 99	26.2%
100 - 119	9.5%
120 - 139	2.4%
140 - 159	2.4%
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	32
max size (mm)	156
mean	69
mode	60

LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

1986
Pycnopodia helianthoides

(cases) N=	20
<20 mm	0.0
20 - 39	10.0%
40 - 59	10.0%
60 - 79	5.0%
80 - 99	0.0
100 - 119	5.0%
120 - 139	0.0
140 - 159	5.0%
160 - 179	10.0%
180 - 199	25.0%
200 - 219	20.0%
220 - 239	0.0
240 - 259	5.0%
260 - 279	0.0
280 - 299	5.0%
>299 mm	0.0
min size (mm)	28
max size (mm)	282
mean	157
mode	178

1987
Pycnopodia helianthoides

(cases) N=	26
<20 mm	0.0
20 - 39	0.0
40 - 59	3.8%
60 - 79	7.7%
80 - 99	0.0
100 - 119	30.8%
120 - 139	7.7%
140 - 159	3.8%
160 - 179	3.8%
180 - 199	0.0
200 - 219	19.2%
220 - 239	15.4%
240 - 259	3.8%
260 - 279	0.0
280 - 299	0.0
>299 mm	3.8%
min size (mm)	56
max size (mm)	325
mean	162
mode	111

1988
Pycnopodia helianthoides

(cases) N=	20
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	0.0
80 - 99	5.0%
100 - 119	0.0
120 - 139	15.0%
140 - 159	10.0%
160 - 179	10.0%
180 - 199	20.0%
200 - 219	25.0%
220 - 239	5.0%
240 - 259	10.0%
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	85
max size (mm)	258
mean	182
mode	180

1989
Pycnopodia helianthoides

(cases) N=	31
<20 mm	0.0
20 - 39	12.9%
40 - 59	9.7%
60 - 79	12.9%
80 - 99	16.1%
100 - 119	9.7%
120 - 139	3.2%
140 - 159	16.1%
160 - 179	3.2%
180 - 199	3.2%
200 - 219	6.5%
220 - 239	6.5%
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	24
max size (mm)	230
mean	110
mode	45

LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

1984
Strongylocentrotus franciscanus

(cases) N=	103
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	0.0
25 - 29	1.0%
30 - 34	0.0
35 - 39	2.9%
40 - 44	4.9%
45 - 49	4.9%
50 - 54	8.7%
55 - 59	15.5%
60 - 64	16.5%
65 - 69	11.7%
70 - 74	7.8%
75 - 79	7.8%
80 - 84	4.9%
85 - 89	4.9%
90 - 94	2.9%
95 - 99	3.9%
100 - 104	1.0%
105 - 109	0.0
> 109 mm	1.0%
min size (mm)	25
max size (mm)	120
mean	65
mode	61

1985
Strongylocentrotus franciscanus

(cases) N=	115
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.9%
20 - 24	1.7%
25 - 29	16.5%
30 - 34	14.8%
35 - 39	1.7%
40 - 44	1.7%
45 - 49	9.6%
50 - 54	12.2%
55 - 59	19.1%
60 - 64	7.8%
65 - 69	6.1%
70 - 74	2.6%
75 - 79	1.7%
80 - 84	2.6%
85 - 89	0.9%
90 - 94	0.0
> 94 mm	0.0
min size (mm)	19
max size (mm)	85
mean	48
mode	29

1986
Strongylocentrotus franciscanus

(cases) N=	100
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	4.0%
20 - 24	16.0%
25 - 29	6.0%
30 - 34	8.0%
35 - 39	24.0%
40 - 44	15.0%
45 - 49	4.0%
50 - 54	6.0%
55 - 59	5.0%
60 - 64	4.0%
65 - 69	2.0%
70 - 74	5.0%
75 - 79	0.0
80 - 84	1.0%
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
> 104 mm	0.0
min size (mm)	16
max size (mm)	81
mean	40
mode	38

1987
Strongylocentrotus franciscanus

(cases) N=	98
< 14 mm	0.0
15 - 19	0.0
20 - 24	6.1%
25 - 29	6.1%
30 - 34	15.3%
35 - 39	14.3%
40 - 44	16.3%
45 - 49	14.3%
50 - 54	7.1%
55 - 59	3.1%
60 - 64	4.1%
65 - 69	5.1%
70 - 74	4.1%
75 - 79	2.0%
80 - 84	0.0
85 - 89	0.0
90 - 94	1.0%
95 - 99	0.0
100 - 104	0.0
105 - 109	1.0%
> 109 mm	0.0
min size (mm)	20
max size (mm)	107
mean	45
mode	32

LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

1988 *Strongylocentrotus franciscanus*		1989 *Strongylocentrotus franciscanus*	
(cases) N=	104	(cases) N=	100
< 5 mm	0.0	< 5 mm	0.0
5 - 9	0.0	5 - 9	2.0%
10 - 14	1.0%	10 - 14	0.0
15 - 19	0.0	15 - 19	5.0%
20 - 24	1.9%	20 - 24	2.0%
25 - 29	3.8%	25 - 29	10.0%
30 - 34	3.8%	30 - 34	5.0%
35 - 39	4.8%	35 - 39	2.0%
40 - 44	5.8%	40 - 44	2.0%
45 - 49	13.5%	45 - 49	7.0%
50 - 54	24.0%	50 - 54	10.0%
55 - 59	9.6%	55 - 59	15.0%
60 - 64	9.6%	60 - 64	12.0%
65 - 69	7.7%	65 - 69	10.0%
70 - 74	11.5%	70 - 74	8.0%
75 - 79	2.9%	75 - 79	6.0%
80 - 84	0.0	80 - 84	1.0%
85 - 89	0.0	85 - 89	1.0%
90 - 94	0.0	90 - 94	0.0
95 - 99	0.0	95 - 99	2.0%
100 - 104	0.0	100 - 104	0.0
105 - 109	0.0	105 - 109	0.0
> 109 mm	0.0	> 109 mm	0.0
min size (mm)	11	min size (mm)	5
max size (mm)	79	max size (mm)	98
mean	53	mean	52
mode	50	mode	26

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

1984
Srongylocentrotus purpuratus

(cases) N=	114
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	4.4%
25 - 29	7.0%
30 - 34	21.9%
35 - 39	30.7%
40 - 44	22.8%
45 - 49	7.9%
50 - 54	3.5%
55 - 59	1.8%
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	22
max size (mm)	56
mean	37
mode	38

1985
Srongylocentrotus purpuratus

(cases) N=	107
< 5 mm	0.0
5 - 9	0.0
10 - 14	21.5%
15 - 19	44.9%
20 - 24	11.2%
25 - 29	3.7%
30 - 34	5.6%
35 - 39	8.4%
40 - 44	2.8%
45 - 49	0.9%
50 - 54	0.9%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
> 95 mm	0.0
min size (mm)	10
max size (mm)	50
mean	21
mode	17

1986
Srongylocentrotus purpuratus

(cases) N=	103
< 5 mm	0.0
5 - 9	0.0
10 - 14	2.9%
15 - 19	5.8%
20 - 24	31.1%
25 - 29	28.2%
30 - 34	11.7%
35 - 39	9.7%
40 - 44	4.9%
45 - 49	2.9%
50 - 54	2.9%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	13
max size (mm)	52
mean	28
mode	23

1987
Srongylocentrotus purpuratus

(cases) N=	102
< 5 mm	2.0%
5 - 9	0.0
10 - 14	2.9%
15 - 19	19.6%
20 - 24	56.9%
25 - 29	10.8%
30 - 34	1.0%
35 - 39	2.0%
40 - 44	3.9%
45 - 49	0.0
50 - 54	0.0
55 - 59	1.0%
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
> 95 mm	0.0
min size (mm)	3
max size (mm)	56
mean	22
mode	23

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 2 SAN MIGUEL ISLAND - HARE ROCK

1988 *Srongylocentrotus purpuratus*		1989 *Srongylocentrotus purpuratus*	
(cases) N=	176	(cases) N=	117
< 5 mm	0.0	< 5 mm	0.0
5 - 9	0.6%	5 - 9	1.7%
10 - 14	1.1%	10 - 14	1.7%
15 - 19	1.1%	15 - 19	7.7%
20 - 24	4.5%	20 - 24	10.3%
25 - 29	22.2%	25 - 29	15.4%
30 - 34	45.5%	30 - 34	27.4%
35 - 39	16.5%	35 - 39	16.2%
40 - 44	2.8%	40 - 44	9.4%
45 - 49	1.1%	45 - 49	6.0%
50 - 54	2.8%	50 - 54	3.4%
55 - 59	1.7%	55 - 59	0.9%
60 - 64	0.0	60 - 64	0.0
65 - 69	0.0	65 - 69	0.0
70 - 74	0.0	70 - 74	0.0
75 - 79	0.0	75 - 79	0.0
80 - 84	0.0	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	0.0
95 - 99	0.0	95 - 99	0.0
100 - 104	0.0	100 - 104	0.0
105 - 109	0.0	105 - 109	0.0
> 109 mm	0.0	> 109 mm	0.0
min size (mm)	8	min size (mm)	6
max size (mm)	59	max size (mm)	56
mean	32	mean	32
mode	31	mode	31

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 3 SANTA ROSA ISLAND - JOHNSONS'S LEE NORTH

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1986
Tethya aurantia

(cases) N=	36
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	5.6%
40 - 49	11.1%
50 - 59	33.3%
60 - 69	27.8%
70 - 79	5.6%
80 - 89	0.0
90 - 99	5.6%
>99 mm	8.3%
min size (mm)	30
max size (mm)	111
mean	65
mode	59

1988
Tethya aurantia

(cases) N=	44
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	2.3%
40 - 49	6.8%
50 - 59	9.1%
60 - 69	22.7%
70 - 79	18.2%
80 - 89	6.8%
90 - 99	9.1%
>99 mm	22.7%
min size (mm)	35
max size (mm)	124
mean	78
mode	41

1989
Tethya aurantia

(cases) N=	18
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	5.6%
40 - 49	5.6%
50 - 59	11.1%
60 - 69	5.6%
70 - 79	16.7%
80 - 89	22.2%
90 - 99	5.6%
>99 mm	27.8%
min size (mm)	36
max size (mm)	122
mean	82
mode	82

LOCATION 3 SANTA ROSA ISLAND - JOHNSONS'S LEE NORTH

1984
Haliotis rufescens

(cases) N=	43
< 34 mm	0.0
35 - 39	0.0
40 - 44	2.3%
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	2.3%
75 - 79	2.3%
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
110 - 114	9.3%
115 - 119	7.0%
120 - 124	7.0%
125 - 129	2.3%
130 - 134	14.0%
135 - 139	2.3%
140 - 144	9.3%
145 - 149	2.3%
150 - 154	4.7%
155 - 159	4.7%
160 - 164	4.7%
165 - 169	4.7%
170 - 174	4.7%
175 - 179	4.7%
180 - 184	7.0%
185 - 189	4.7%
190 - 194	0.0
> 194 mm	0.0
min size (mm)	42
max size (mm)	189
mean	139
mode	112

1985
Haliotis rufescens

(cases) N=	31
< 45 mm	0.0
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	3.2%
70 - 74	0.0
75 - 79	0.0
80 - 84	3.2%
85 - 89	0.0
90 - 94	3.2%
95 - 99	0.0
100 - 104	3.2%
105 - 109	3.2%
110 - 114	3.2%
115 - 119	3.2%
120 - 124	3.2%
125 - 129	0.0
130 - 134	3.2%
135 - 139	9.7%
140 - 144	9.7%
145 - 149	3.2%
150 - 154	3.2%
155 - 159	9.7%
160 - 164	9.7%
165 - 169	16.1%
170 - 174	3.2%
175 - 179	3.2%
180 - 184	3.2%
185 - 189	0.0
190 - 194	0.0
195 - 199	0.0
> 199 mm	0.0
min size (mm)	66
max size (mm)	181
mean	142
mode	164

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 3 SANTA ROSA ISLAND - JOHNSONS'S LEE NORTH

1986 *Haliotis rufescens*		1987 *Haliotis rufescens*	
(cases) N=	10	(cases) N=	13
< 25 mm	20.0%	< 25 mm	0.0
25 - 29	10.0%	25 - 29	0.0
30 - 34	0.0	30 - 34	0.0
35 - 39	0.0	35 - 39	0.0
40 - 44	0.0	40 - 44	0.0
45 - 49	0.0	45 - 49	0.0
50 - 54	0.0	50 - 54	0.0
55 - 59	0.0	55 - 59	0.0
60 - 64	0.0	60 - 64	0.0
65 - 69	0.0	65 - 69	0.0
70 - 74	0.0	70 - 74	0.0
75 - 79	0.0	75 - 79	0.0
80 - 84	0.0	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	0.0
95 - 99	0.0	95 - 99	0.0
100 - 104	0.0	100 - 104	0.0
105 - 109	10.0%	105 - 109	7.7%
110 - 114	0.0	110 - 114	0.0
115 - 119	0.0	115 - 119	0.0
120 - 124	0.0	120 - 124	0.0
125 - 129	0.0	125 - 129	0.0
130 - 134	0.0	130 - 134	0.0
135 - 139	0.0	135 - 139	7.7%
140 - 144	20.0%	140 - 144	15.4%
145 - 149	10.0%	145 - 149	0.0
150 - 154	10.0%	150 - 154	7.7%
155 - 159	0.0	155 - 159	7.7%
160 - 164	0.0	160 - 164	23.1%
165 - 169	0.0	165 - 169	7.7%
170 - 174	20.0%	170 - 174	0.0
175 - 179	0.0	175 - 179	0.0
180 - 184	0.0	180 - 184	23.1%
185 - 189	0.0	185 - 189	0.0
190 - 194	0.0	190 - 194	0.0
195 - 199	0.0	195 - 199	0.0
> 199 mm	0.0	> 199 mm	0.0
min size (mm)	11	min size (mm)	107
max size (mm)	173	max size (mm)	180
mean	109	mean	155
mode	11	mode	160

LOCATION 3 SANTA ROSA ISLAND - JOHNSONS'S LEE NORTH

1984
Cypraea spadicea

(cases) N=	41
< 30 mm	0.0
30 - 34	0.0
35 - 39	4.9%
40 - 44	24.4%
45 - 49	39.0%
50 - 54	26.8%
55 - 59	4.9%
>59 mm	0.0
min size (mm)	37
max size (mm)	59
mean	47
mode	45

1985
Cypraea spadicea

(cases) N=	48
< 30 mm	0.0
30 - 34	0.0
35 - 39	18.8%
40 - 44	33.3%
45 - 49	33.3%
50 - 54	10.4%
55 - 59	2.1%
>59 mm	2.1%
min size (mm)	36
max size (mm)	67
mean	45
mode	41

1986
Cypraea spadicea

(cases) N=	31
< 30 mm	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	6.5%
45 - 49	51.6%
50 - 54	32.3%
55 - 59	9.7%
>59 mm	0.0
min size (mm)	42
max size (mm)	56
mean	49
mode	48

1987
Cypraea spadicea

(cases) N=	33
< 30 mm	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	18.2%
45 - 49	51.5%
50 - 54	24.2%
55 - 59	6.1%
>59 mm	0.0
min size (mm)	42
max size (mm)	59
mean	48
mode	46

1988
Cypraea spadicea

(cases) N=	35
< 30 mm	0.0
30 - 34	0.0
35 - 39	8.6%
40 - 44	34.3%
45 - 49	28.6%
50 - 54	28.6%
55 - 59	0.0
>59 mm	0.0
min size (mm)	39
max size (mm)	54
mean	46
mode	44

1989
Cypraea spadicea

(cases) N=	30
< 30 mm	0.0
30 - 34	3.3%
35 - 39	16.7%
40 - 44	40.0%
45 - 49	23.3%
50 - 54	13.3%
55 - 59	0.0
>59 mm	0.0
min size (mm)	34
max size (mm)	60
mean	44
mode	39

LOCATION 3 SANTA ROSA ISLAND - JOHNSONS'S LEE NORTH

1987
Kelletia kelletii

(cases) N=	16
< 40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	0.0
80 - 89	12.5%
90 - 99	25.0%
100 - 109	25.0%
110 - 119	18.8%
120 - 129	18.8%
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	85
max size (mm)	124
mean	106
mode	97

1989
Kelletia kelletii

(cases) N=	15
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	0.0
80 - 89	0.0
90 - 99	6.7%
100 - 109	46.7%
110 - 119	33.3%
120 - 129	13.3%
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	98
max size (mm)	122
mean	110
mode	104

1985
Astraea undosa

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	3.3%
50 - 59	50.0%
60 - 69	30.0%
70 - 79	13.3%
80 - 89	3.3%
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	46
max size (mm)	80
mean	61
mode	55

1986
Astraea undosa

(cases) N=	35
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	34.3%
40 - 49	20.0%
50 - 59	37.1%
60 - 69	8.6%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	30
max size (mm)	66
mean	46
mode	30

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 3 SANTA ROSA ISLAND - JOHNSONS'S LEE NORTH

1984
Megathura crenulata

(cases) N=	21
< 29 m	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	4.8%
60 - 69	0.0
70 - 79	52.4%
80 - 89	38.1%
90 - 99	4.8%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	51
max size (mm)	94
mean	79
mode	79

1985
Megathura crenulata

(cases) N=	34
< 29 mm	0.0
30 - 39	0.0
40 - 49	2.9%
50 - 59	5.9%
60 - 69	8.8%
70 - 79	47.1%
80 - 89	29.4%
90 - 99	5.9%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	48
max size (mm)	95
mean	75
mode	76

1986
Megathura crenulata

(cases) N=	38
< 29 mm	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	2.6%
60 - 69	15.8%
70 - 79	44.7%
80 - 89	34.2%
90 - 99	2.6%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	53
max size (mm)	94
mean	76
mode	78

1987
Megathura crenulata

(cases) N=	26
< 29 mm	0.0
30 - 39	0.0
40 - 49	3.8%
50 - 59	11.5%
60 - 69	19.2%
70 - 79	15.4%
80 - 89	30.8%
90 - 99	7.7%
100 - 109	7.7%
110 - 119	3.8%
>119 mm	0.0
min size (mm)	49
max size (mm)	110
mean	76
mode	72

1988
Megathura crenulata

(cases) N	33
< 29 mm	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	6.1%
70 - 79	39.4%
80 - 89	39.4%
90 - 99	15.2%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	60
max size (mm)	99
mean	81
mode	79

1989
Megathura crenulata

(cases) N=	23
< 29 mm	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	8.7%
70 - 79	17.4%
80 - 89	30.4%
90 - 99	26.1%
100 - 109	0.0
110 - 119	13.0%
>119 mm	4.3%
min size (mm)	62
max size (mm)	122
mean	90
mode	87

LOCATION 3 SANTA ROSA ISLAND - JOHNSONS'S LEE NORTH

1989
Hinnites giganteus

(cases) N=	19
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	5.3%
40 - 49	0.0
50 - 59	10.5%
60 - 69	15.8%
70 - 79	10.5%
80 - 89	10.5%
90 - 99	15.8%
100 - 109	10.5%
110 - 119	21.1%
120 - 129	0.0
130 - 139	0.0
>139 mm	0.0
min size (mm)	38
max size (mm)	117
mean	84
mode	65

1985
Patiria miniata

(cases) N=	60
< 10 mm	0.0
10 - 19	0.0
20 - 29	3.3%
30 - 39	8.3%
40 - 49	10.0%
50 - 59	38.3%
60 - 69	25.0%
70 - 79	13.3%
80 - 89	1.7%
>89 mm	0.0
min size (mm)	25
max size (mm)	81
mean	57
mode	59

1986
Patiria miniata

(cases) N=	12
< 10 mm	0.0
10 - 19	8.3%
20 - 29	25.0%
30 - 39	8.3%
40 - 49	8.3%
50 - 59	8.3%
60 - 69	41.7%
70 - 79	0.0
>79 mm	0.0
min size (mm)	18
max size (mm)	68
mean	45
mode	22

1987
Patiria miniata

(cases) N=	35
< 10 mm	0.0
10 - 19	0.0
20 - 29	5.7%
30 - 39	8.6%
40 - 49	20.0%
50 - 59	20.0%
60 - 69	28.6%
70 - 79	17.1%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	22
max size (mm)	77
mean	55
mode	60

1988
Patiria miniata

(cases) N=	46
< 10 mm	0.0
10 - 19	2.2%
20 - 29	0.0
30 - 39	6.5%
40 - 49	26.1%
50 - 59	17.4%
60 - 69	26.1%
70 - 79	17.4%
80 - 89	4.3%
90 - 99	0.0
>100 mm	0.0
min size (mm)	18
max size (mm)	82
mean	57
mode	40

1989
Patiria miniata

(cases) N=	34
< 10 mm	0.0
10 - 19	2.9%
20 - 29	2.9%
30 - 39	2.9%
40 - 49	17.6%
50 - 59	38.2%
60 - 69	32.4%
70 - 79	2.9%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	19
max size (mm)	74
mean	54
mode	50

LOCATION 3 SANTA ROSA ISLAND - JOHNSONS'S LEE NORTH

1986
Pisaster giganteus

(cases) N=	30
<20 mm	0.0
20 - 39	0.0
40 - 59	3.3%
60 - 79	23.3%
80 - 99	20.0%
100 - 119	26.7%
120 - 139	23.3%
140 - 159	3.3%
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	54
max size (mm)	145
mean	100
mode	71

1987
Pisaster giganteus

(cases) N=	35
<20 mm	0.0
20 - 39	2.9%
40 - 59	31.4%
60 - 79	28.6%
80 - 99	28.6%
100 - 119	8.6%
120 - 139	0.0
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	36
max size (mm)	104
mean	70
mode	81

1988
Pisaster giganteus

(cases) N=	36
<20 mm	5.6%
20 - 39	2.8%
40 - 59	19.4%
60 - 79	36.1%
80 - 99	16.7%
100 - 119	16.7%
120 - 139	0.0
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	2.8%
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	7
max size (mm)	203
mean	75
mode	58

1989
Pisaster giganteus

(cases) N=	38
<20 mm	13.2%
20 - 39	5.3%
40 - 59	44.7%
60 - 79	23.7%
80 - 99	5.3%
100 - 119	5.3%
120 - 139	0.0
140 - 159	2.6%
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	8
max size (mm)	158
mean	57
mode	52

LOCATION 3 SANTA ROSA ISLAND - JOHNSONS'S LEE NORTH

1987
Pycnopodia helianthoides

(cases) N=	28
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	0.0
80 - 99	0.0
100 - 119	3.6%
120 - 139	7.1%
140 - 159	25.0%
160 - 179	42.9%
180 - 199	10.7%
200 - 219	7.1%
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	3.6%
>299 mm	0.0
min size (mm)	119
max size (mm)	285
mean	167
mode	143

1988
Pycnopodia helianthoides

(cases) N=	30
<20 mm	0.0
20 - 39	0.0
40 - 59	3.3%
60 - 79	0.0
80 - 99	3.3%
100 - 119	10.0%
120 - 139	20.0%
140 - 159	16.7%
160 - 179	26.7%
180 - 199	3.3%
200 - 219	6.7%
220 - 239	0.0
240 - 259	3.3%
260 - 279	3.3%
280 - 299	0.0
>299 mm	0.0
min size (mm)	53
max size (mm)	300
mean	158
mode	130

1989
Pycnopodia helianthoides

(cases) N=	31
<20 mm	0.0
20 - 39	12.9%
40 - 59	32.3%
60 - 79	9.7%
80 - 99	6.5%
100 - 119	3.2%
120 - 139	12.9%
140 - 159	6.5%
160 - 179	6.5%
180 - 199	3.2%
200 - 219	3.2%
220 - 239	0.0
240 - 259	0.0
260 - 279	3.2%
280 - 299	0.0
>299 mm	0.0
min size (mm)	35
max size (mm)	260
mean	95
mode	35

1986
LYTECHINUS ANAMESUS

(cases) N=	131
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.8%
20 - 24	25.2%
25 - 29	38.9%
30 - 34	27.5%
35 - 39	7.6%
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	15
max size (mm)	37
mean	28
mode	24

LOCATION 3 SANTA ROSA ISLAND - JOHNSONS'S LEE NORTH

1984
Strongylocentrotus franciscanus

(cases) N=	98
< 5 mm	0.0
5 - 9	0.0
10 - 14	2.0%
15 - 19	5.1%
20 - 24	6.1%
25 - 29	6.1%
30 - 34	1.0%
35 - 39	2.0%
40 - 44	1.0%
45 - 49	3.1%
50 - 54	2.0%
55 - 59	6.1%
60 - 64	8.2%
65 - 69	8.2%
70 - 74	12.2%
75 - 79	17.3%
80 - 84	6.1%
85 - 89	7.1%
90 - 94	3.1%
95 - 99	1.0%
100 - 104	1.0%
105 - 109	0.0
> 109 mm	1.0%
min size (mm)	13
max size (mm)	121
mean	62
mode	78

1985
Strongylocentrotus franciscanus

(cases) N=	106
< 19 mm	0.0
20 - 24	0.0
25 - 29	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	1.9%
45 - 49	3.8%
50 - 54	9.4%
55 - 59	7.5%
60 - 64	18.9%
65 - 69	10.4%
70 - 74	17.9%
75 - 79	11.3%
80 - 84	9.4%
85 - 89	4.7%
90 - 94	1.9%
95 - 99	1.9%
100 - 104	0.9%
105 - 109	0.0
> 109 mm	0.0
min size (mm)	41
max size (mm)	104
mean	69
mode	78

1986
Strongylocentrotus franciscanus

(cases) N=	99
< 14 mm	0.0
15 - 19	0.0
20 - 24	1.0%
25 - 29	2.0%
30 - 34	0.0
35 - 39	1.0%
40 - 44	7.1%
45 - 49	7.1%
50 - 54	7.1%
55 - 59	17.2%
60 - 64	9.1%
65 - 69	6.1%
70 - 74	12.1%
75 - 79	11.1%
80 - 84	7.1%
85 - 89	9.1%
90 - 94	2.0%
95 - 99	1.0%
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	20
max size (mm)	96
mean	64
mode	59

1987
Strongylocentrotus franciscanus

(cases) N=	105
< 9 mm	0.0
10 - 14	0.0
15 - 19	1.0%
20 - 24	1.0%
25 - 29	1.0%
30 - 34	1.0%
35 - 39	6.7%
40 - 44	5.7%
45 - 49	12.4%
50 - 54	10.5%
55 - 59	9.5%
60 - 64	13.3%
65 - 69	13.3%
70 - 74	10.5%
75 - 79	3.8%
80 - 84	7.6%
85 - 89	1.0%
90 - 94	1.0%
95 - 99	1.0%
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	18
max size (mm)	95
mean	59
mode	48

Channel Islands National Park   Kelp Forest Monitoring 1982-1989

Size Frequencies

LOCATION 3 SANTA ROSA ISLAND - JOHNSONS'S LEE NORTH

1988 *Strongylocentrotus franciscanus*		1989 *Strongylocentrotus franciscanus*	
(cases) N=	115	(cases) N=	112
< 5 mm	0.0	< 5 mm	0.0
5 - 9	0.9%	5 - 9	0.0
10 - 14	0.9%	10 - 14	1.8%
15 - 19	0.0	15 - 19	1.8%
20 - 24	0.0	20 - 24	2.7%
25 - 29	0.0	25 - 29	4.5%
30 - 34	0.0	30 - 34	3.6%
35 - 39	1.7%	35 - 39	1.8%
40 - 44	0.0	40 - 44	4.5%
45 - 49	1.7%	45 - 49	0.9%
50 - 54	2.6%	50 - 54	1.8%
55 - 59	2.6%	55 - 59	0.0
60 - 64	5.2%	60 - 64	1.8%
65 - 69	14.8%	65 - 69	1.8%
70 - 74	18.3%	70 - 74	4.5%
75 - 79	18.3%	75 - 79	3.6%
80 - 84	18.3%	80 - 84	8.9%
85 - 89	10.4%	85 - 89	13.4%
90 - 94	2.6%	90 - 94	20.5%
95 - 99	1.7%	95 - 99	13.4%
100 - 104	0.0	100 - 104	4.5%
105 - 109	0.0	105 - 109	3.6%
> 109 mm	0.0	> 109 mm	0.0
min size (mm)	9	min size (mm)	11
max size (mm)	95	max size (mm)	110
mean	73	mean	76
mode	69	mode	92

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Size Frequencies
LOCATION 3 SANTA ROSA ISLAND - JOHNSONS'S LEE NORTH

1984
Srongylocentrotus purpuratus

(cases) N=	138
< 5 mm	0.0
5 - 9	0.0
10 - 14	2.2%
15 - 19	3.6%
20 - 24	4.3%
25 - 29	10.1%
30 - 34	11.6%
35 - 39	20.3%
40 - 44	17.4%
45 - 49	15.2%
50 - 54	10.9%
55 - 59	3.6%
60 - 64	0.7%
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	11
max size (mm)	62
mean	38
mode	35

1985
Srongylocentrotus purpuratus

(cases) N=	101
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	1.0%
20 - 24	1.0%
25 - 29	2.0%
30 - 34	6.9%
35 - 39	6.9%
40 - 44	14.9%
45 - 49	24.8%
50 - 54	19.8%
55 - 59	15.8%
60 - 64	5.0%
65 - 69	2.0%
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
> 89 mm	0.0
min size (mm)	18
max size (mm)	69
mean	47
mode	52

1986
Srongylocentrotus purpuratus

(cases) N=	102
< 5 mm	0.0
5 - 9	0.0
10 - 14	2.0%
15 - 19	2.9%
20 - 24	8.8%
25 - 29	9.8%
30 - 34	13.7%
35 - 39	17.6%
40 - 44	19.6%
45 - 49	14.7%
50 - 54	9.8%
55 - 59	1.0%
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	14
max size (mm)	59
mean	37
mode	43

1987
Srongylocentrotus purpuratus

(cases) N=	118
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	2.5%
20 - 24	17.8%
25 - 29	37.3%
30 - 34	19.5%
35 - 39	11.9%
40 - 44	5.9%
45 - 49	5.1%
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
> 89 mm	0.0
min size (mm)	17
max size (mm)	48
mean	30
mode	25

Channel Islands National Park   Kelp Forest Monitoring 1982-1989

Size Frequencies

LOCATION 3 SANTA ROSA ISLAND - JOHNSONS'S LEE NORTH

1988 *Srongylocentrotus purpuratus*		1989 *Srongylocentrotus purpuratus*	
(cases) N=	102	(cases) N=	189
< 5 mm	0.0	< 5 mm	0.0
5 - 9	0.0	5 - 9	1.6%
10 - 14	0.0	10 - 14	5.3%
15 - 19	0.0	15 - 19	11.6%
20 - 24	0.0	20 - 24	5.8%
25 - 29	0.0	25 - 29	5.8%
30 - 34	14.7%	30 - 34	14.8%
35 - 39	13.7%	35 - 39	11.6%
40 - 44	23.5%	40 - 44	20.1%
45 - 49	22.5%	45 - 49	14.3%
50 - 54	16.7%	50 - 54	4.8%
55 - 59	2.9%	55 - 59	3.7%
60 - 64	4.9%	60 - 64	0.5%
65 - 69	0.0	65 - 69	0.0
70 - 74	1.0%	70 - 74	0.0
75 - 79	0.0	75 - 79	0.0
80 - 84	0.0	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	0.0
95 - 99	0.0	95 - 99	0.0
100 - 104	0.0	100 - 104	0.0
105 - 109	0.0	105 - 109	0.0
> 109 mm	0.0	> 109 mm	0.0
min size (mm)	30	min size (mm)	6
max size (mm)	70	max size (mm)	60
mean	44	mean	35
mode	48	mode	44

LOCATION 4 SANTA ROSA ISLAND - JOHNSON'S LEE SOUTH

1986
Tethya aurantia

(cases) N=	11
< 10 mm	0.0
10 - 19	0.0
20 - 29	9.1%
30 - 39	27.3%
40 - 49	27.3%
50 - 59	27.3%
60 - 69	9.1%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	20
max size (mm)	66
mean	44
mode	20

1987
Tethya aurantia

(cases) N=	13
< 10 mm	0.0
10 - 19	0.0
20 - 29	7.7%
30 - 39	0.0
40 - 49	7.7%
50 - 59	23.1%
60 - 69	7.7%
70 - 79	7.7%
80 - 89	7.7%
90 - 99	15.4%
>99 mm	23.1%
min size (mm)	26
max size (mm)	149
mean	81
mode	97

1988
Tethya aurantia

(cases) N=	14
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	14.3%
50 - 59	21.4%
60 - 69	28.6%
70 - 79	28.6%
80 - 89	0.0
90 - 99	7.1%
>99 mm	0.0
min size (mm)	46
max size (mm)	97
mean	65
mode	68

1989
Tethya aurantia

(cases) N=	24
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	4.2%
50 - 59	12.5%
60 - 69	4.2%
70 - 79	29.2%
80 - 89	33.3%
90 - 99	16.7%
>99 mm	0.0
min size (mm)	44
max size (mm)	98
mean	77
mode	76

LOCATION 4 SANTA ROSA ISLAND - JOHNSON'S LEE SOUTH

1984 *Haliotis rufescens*		1985 *Haliotis rufescens*	
(cases) N=	43	(cases) N=	32
< 25 mm	0.0	< 25 mm	0.0
25 - 29	2.3%	25 - 29	0.0
30 - 34	7.0%	30 - 34	0.0
35 - 39	0.0	35 - 39	0.0
40 - 44	0.0	40 - 44	0.0
45 - 49	0.0	45 - 49	3.1%
50 - 54	0.0	50 - 54	0.0
55 - 59	4.7%	55 - 59	0.0
60 - 64	4.7%	60 - 64	3.1%
65 - 69	0.0	65 - 69	0.0
70 - 74	4.7%	70 - 74	9.4%
75 - 79	0.0	75 - 79	3.1%
80 - 84	7.0%	80 - 84	15.6%
85 - 89	11.6%	85 - 89	3.1%
90 - 94	0.0	90 - 94	0.0
95 - 99	7.0%	95 - 99	0.0
100 - 104	4.7%	100 - 104	3.1%
105 - 109	7.0%	105 - 109	0.0
110 - 114	2.3%	110 - 114	3.1%
115 - 119	2.3%	115 - 119	6.3%
120 - 124	0.0	120 - 124	0.0
125 - 129	4.7%	125 - 129	0.0
130 - 134	2.3%	130 - 134	3.1%
135 - 139	0.0	135 - 139	0.0
140 - 144	4.7%	140 - 144	3.1%
145 - 149	0.0	145 - 149	12.5%
150 - 154	4.7%	150 - 154	3.1%
155 - 159	4.7%	155 - 159	6.3%
160 - 164	7.0%	160 - 164	3.1%
165 - 169	0.0	165 - 169	0.0
170 - 174	0.0	170 - 174	3.1%
175 - 179	2.3%	175 - 179	6.3%
180 - 184	0.0	180 - 184	3.1%
185 - 189	2.3%	185 - 189	3.1%
190 - 194	0.0	190 - 194	3.1%
195 - 199	0.0	195 - 199	0.0
> 199 mm	2.3%	> 199 mm	0.0
min size (mm)	29	min size (mm)	49
max size (mm)	216	max size (mm)	191
mean	107	mean	123
mode	30	mode	71

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 4 SANTA ROSA ISLAND - JOHNSON'S LEE SOUTH

1986
Haliotis rufescens

(cases) N=	26
< 25 mm	0.0
25 - 29	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	3.8%
50 - 54	0.0
55 - 59	0.0
60 - 64	3.8%
65 - 69	0.0
70 - 74	3.8%
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	7.7%
110 - 114	7.7%
115 - 119	3.8%
120 - 124	0.0
125 - 129	11.5%
130 - 134	3.8%
135 - 139	0.0
140 - 144	3.8%
145 - 149	3.8%
150 - 154	0.0
155 - 159	7.7%
160 - 164	11.5%
165 - 169	0.0
170 - 174	7.7%
175 - 179	0.0
180 - 184	15.4%
185 - 189	0.0
190 - 194	3.8%
195 - 199	0.0
> 199 mm	0.0
min size (mm)	48
max size (mm)	191
mean	139
mode	164

1987
Haliotis rufescens

(cases) N=	8
< 104 mm	0.0
105 - 109	0.0
110 - 114	0.0
115 - 119	12.5%
120 - 124	12.5%
125 - 129	0.0
130 - 134	0.0
135 - 139	12.5%
140 - 144	12.5%
145 - 149	0.0
150 - 154	0.0
155 - 159	0.0
160 - 164	12.5%
165 - 169	0.0
170 - 174	25.0%
175 - 179	0.0
180 - 184	0.0
185 - 189	12.5%
190 - 194	0.0
195 - 199	0.0
> 199 mm	0.0
min size (mm)	119
max size (mm)	189
mean	152
mode	119

1988
Haliotis rufescens

(cases) N=	2
< 104 mm	0.0
105 - 109	0.0
110 - 114	0.0
115 - 119	0.0
120 - 124	0.0
125 - 129	0.0
130 - 134	0.0
135 - 139	0.0
140 - 144	50.0%
145 - 149	0.0
150 - 154	50.0%
155 - 159	0.0
160 - 164	0.0
165 - 169	0.0
170 - 174	0.0
175 - 179	0.0
180 - 184	0.0
185 - 189	0.0
190 - 194	0.0
195 - 199	0.0
> 199 mm	0.0
min size (mm)	140
max size (mm)	152
mean	146
mode	140

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 4 SANTA ROSA ISLAND - JOHNSON'S LEE SOUTH

1984
Cypraea spadicea

(cases) N=	46
< 30 mm	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	15.2%
45 - 49	43.5%
50 - 54	41.3%
55 - 59	0.0
>59 mm	0.0
min size (mm)	40
max size (mm)	53
mean	48
mode	51

1985
Cypraea spadicea

(cases) N=	30
< 30 mm	0.0
30 - 34	0.0
35 - 39	6.7%
40 - 44	33.3%
45 - 49	30.0%
50 - 54	26.7%
55 - 59	3.3%
>59 mm	0.0
min size (mm)	37
max size (mm)	56
mean	46
mode	51

1986
Cypraea spadicea

(cases) N=	30
< 30 mm	0.0
30 - 34	0.0
35 - 39	3.3%
40 - 44	20.0%
45 - 49	60.0%
50 - 54	16.7%
55 - 59	0.0
>59 mm	0.0
min size (mm)	36
max size (mm)	53
mean	47
mode	46

1987
Cypraea spadicea

(cases) N=	30
< 30 mm	0.0
30 - 34	0.0
35 - 39	3.3%
40 - 44	30.0%
45 - 49	50.0%
50 - 54	16.7%
H55 - 59	0.0
>59 mm	0.0
min size (mm)	38
max size (mm)	52
mean	46
mode	48

1988
Cypraea spadicea

(cases) N=	31
< 30 mm	0.0
30 - 34	0.0
35 - 39	3.2%
40 - 44	16.1%
45 - 49	41.9%
50 - 54	35.5%
55 - 59	3.2%
>59 mm	0.0
min size (mm)	39
max size (mm)	56
mean	48
mode	48

1989
Cypraea spadicea

(cases) N=	30
< 30 mm	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	33.3%
45 - 49	43.3%
50 - 54	23.3%
55 - 59	0.0
>59 mm	0.0
min size (mm)	40
max size (mm)	52
mean	46
mode	46

LOCATION 4 SANTA ROSA ISLAND - JOHNSON'S LEE SOUTH

1984
Kelletia kelletii

(cases) N=	46
<40 mm	0.0
40 - 49	0.0
50 - 59	4.3%
60 - 69	13.0%
70 - 79	10.9%
80 - 89	15.2%
90 - 99	26.1%
100 - 109	17.4%
110 - 119	8.7%
120 - 129	0.0
130 - 139	4.3%
140 - 149	0.0
>149 mm	0.0
min size (mm)	54
max size (mm)	130
mean	90
mode	90

1985
Kelletia kelletii

(cases) N=	32
<40 mm	0.0
40 - 49	0.0
50 - 59	3.1%
60 - 69	18.8%
70 - 79	12.5%
80 - 89	25.0%
90 - 99	18.8%
100 - 109	6.3%
110 - 119	9.4%
120 - 129	0.0
130 - 139	3.1%
140 - 149	3.1%
>149 mm	3.1%
min size (mm)	59
max size (mm)	144
mean	88
mode	91

1987
Kelletia kelletii

(cases) N=	18
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	11.1%
80 - 89	27.8%
90 - 99	22.2%
100 - 109	27.8%
110 - 119	5.6%
120 - 129	5.6%
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	76
max size (mm)	129
mean	96
mode	93

LOCATION 4 SANTA ROSA ISLAND - JOHNSON'S LEE SOUTH

1984
Megathura crenulata

(cases) N=	17
< 49 mm	0.0
50 - 59	0.0
60 - 69	11.8%
70 - 79	17.6%
80 - 89	23.5%
90 - 99	41.2%
100 - 109	5.9%
110 - 119	0.0
>119 mm	0.0
min size (mm)	67
max size (mm)	106
mean	86
mode	88

1985
Megathura crenulata

(cases) N=	30
< 49 mm	0.0
50 - 59	0.0
60 - 69	3.3%
70 - 79	30.0%
80 - 89	23.3%
90 - 99	33.3%
100 - 109	6.7%
110 - 119	3.3%
>119 mm	0.0
min size (mm)	60
max size (mm)	110
mean	86
mode	79

1986
Megathura crenulata

(cases) N=	21
< 10 mm	0.0
10 - 19	0.0
20 - 29	4.8%
30 - 39	0.0
40 - 49	0.0
50 - 59	4.8%
60 - 69	0.0
70 - 79	14.3%
80 - 89	4.8%
90 - 99	19.0%
100 - 109	14.3%
110 - 119	23.8%
>119 mm	9.5%
min size (mm)	27
max size (mm)	129
mean	97
mode	115

1987
Megathura crenulata

(cases) N=	28
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	10.7%
60 - 69	7.1%
70 - 79	32.1%
80 - 89	32.1%
90 - 99	14.3%
100 - 109	3.6%
110 - 119	0.0
>119 mm	0.0
min size (mm)	50
max size (mm)	102
mean	79
mode	74

1988
Megathura crenulata

(cases) N=	12
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	8.3%
60 - 69	8.3%
70 - 79	66.7%
80 - 89	8.3%
90 - 99	8.3%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	56
max size (mm)	92
mean	73
mode	72

LOCATION 4 SANTA ROSA ISLAND - JOHNSON'S LEE SOUTH

1984
Hinnites giganteus

(cases) N=	12
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	16.7%
40 - 49	0.0
50 - 59	16.7%
60 - 69	16.7%
70 - 79	16.7%
80 - 89	0.0
90 - 99	0.0
100 - 109	0.0
110 - 119	8.3%
120 - 129	0.0
130 - 139	8.3%
140 - 149	0.0
>149 mm	8.3%
min size (mm)	35
max size (mm)	184
mean	86
mode	35

1988
Hinnites giganteus

(cases) N=	16
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	6.3%
60 - 69	25.0%
70 - 79	31.3%
80 - 89	18.8%
90 - 99	6.3%
100 - 109	0.0
110 - 119	12.5%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	53
max size (mm)	115
mean	78
mode	53

LOCATION 4 SANTA ROSA ISLAND - JOHNSON'S LEE SOUTH

1984
Patiria miniata

(cases) N=	73
< 10 mm	0.0
10 - 19	1.4%
20 - 29	4.1%
30 - 39	9.6%
40 - 49	30.1%
50 - 59	30.1%
60 - 69	21.9%
70 - 79	2.7%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	19
max size (mm)	74
mean	51
mode	48

1985
Patiria miniata

(cases) N=	51
< 10 mm	0.0
10 - 19	2.0%
20 - 29	2.0%
30 - 39	15.7%
40 - 49	11.8%
50 - 59	23.5%
60 - 69	33.3%
70 - 79	7.8%
80 - 89	3.9%
90 - 99	0.0
>100 mm	0.0
min size (mm)	19
max size (mm)	89
mean	55
mode	43

1986
Patiria miniata

(cases) N=	78
< 10 mm	1.3%
10 - 19	0.0
20 - 29	10.3%
30 - 39	17.9%
40 - 49	3.8%
50 - 59	14.1%
60 - 69	26.9%
70 - 79	19.2%
80 - 89	6.4%
90 - 99	0.0
>100 mm	0.0
min size (mm)	6
max size (mm)	87
mean	55
mode	25

1987
Patiria miniata

(cases) N=	53
< 10 mm	0.0
10 - 19	1.9%
20 - 29	5.7%
30 - 39	9.4%
40 - 49	11.3%
50 - 59	18.9%
60 - 69	34.0%
70 - 79	17.0%
80 - 89	1.9%
90 - 99	0.0
>100 mm	0.0
min size (mm)	14
max size (mm)	84
mean	56
mode	61

1988
Patiria miniata

(cases) N=	54
< 10 mm	0.0
10 - 19	0.0
20 - 29	1.9%
30 - 39	5.6%
40 - 49	16.7%
50 - 59	20.4%
60 - 69	14.8%
70 - 79	24.1%
80 - 89	13.0%
90 - 99	1.9%
>100 mm	1.9%
min size (mm)	29
max size (mm)	101
mean	63
mode	52

1989
Patiria miniata

(cases) N=	62
< 10 mm	0.0
10 - 19	0.0
20 - 29	8.1%
30 - 39	12.9%
40 - 49	19.4%
50 - 59	17.7%
60 - 69	27.4%
70 - 79	9.7%
80 - 89	4.8%
90 - 99	0.0
>100 mm	0.0
min size (mm)	21
max size (mm)	81
mean	54
mode	38

LOCATION 4 SANTA ROSA ISLAND - JOHNSON'S LEE SOUTH

1986
Pisaster giganteus

(cases) N=	50
<20 mm	0.0
20 - 39	0.0
40 - 59	32.0%
60 - 79	22.0%
80 - 99	36.0%
100 - 119	10.0%
120 - 139	0.0
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	47
max size (mm)	112
mean	75
mode	49

1987
Pisaster giganteus

(cases) N=	29
<20 mm	0.0
20 - 39	0.0
40 - 59	48.3%
60 - 79	34.5%
80 - 99	6.9%
100 - 119	6.9%
120 - 139	0.0
140 - 159	3.4%
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	43
max size (mm)	142
mean	66
mode	69

1988
Pisaster giganteus

(cases) N=	54
<20 mm	0.0
20 - 39	0.0
40 - 59	20.4%
60 - 79	48.1%
80 - 99	18.5%
100 - 119	11.1%
120 - 139	0.0
140 - 159	0.0
160 - 179	1.9%
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	48
max size (mm)	165
mean	75
mode	63

1989
Pisaster giganteus

(cases) N=	37
<20 mm	10.8%
20 - 39	2.7%
40 - 59	32.4%
60 - 79	54.1%
80 - 99	0.0
100 - 119	0.0
120 - 139	0.0
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	4
max size (mm)	78
mean	56
mode	59

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 4 SANTA ROSA ISLAND - JOHNSON'S LEE SOUTH

1987
Pycnopodia helianthoides

(cases) N=	32
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	6.3%
80 - 99	0.0
100 - 119	12.5%
120 - 139	34.4%
140 - 159	12.5%
160 - 179	12.5%
180 - 199	3.1%
200 - 219	0.0
220 - 239	6.3%
240 - 259	3.1%
260 - 279	3.1%
280 - 299	3.1%
>299 mm	3.1%
min size (mm)	62
max size (mm)	310
mean	156
mode	130

1988
Pycnopodia helianthoides

(cases) N=	30
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	0.0
80 - 99	0.0
100 - 119	10.0%
120 - 139	33.3%
140 - 159	13.3%
160 - 179	30.0%
180 - 199	6.7%
200 - 219	6.7%
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	112
max size (mm)	210
mean	152
mode	128

1989
Pycnopodia helianthoides

(cases) N=	31
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	0.0
80 - 99	0.0
100 - 119	3.2%
120 - 139	12.9%
140 - 159	41.9%
160 - 179	29.0%
180 - 199	9.7%
200 - 219	3.2%
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	117
max size (mm)	206
mean	158
mode	145

1986
LYTECHINUS ANAMESUS

(cases) N=	27
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	18.5%
20 - 24	33.3%
25 - 29	25.9%
30 - 34	14.8%
35 - 39	7.4%
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	16
max size (mm)	35
mean	25
mode	21

LOCATION 4 SANTA ROSA ISLAND - JOHNSON'S LEE SOUTH

1984
Strongylocentrotus franciscanus

(cases) N=	110
< 9 mm	0.0
10 - 14	0.9%
15 - 19	0.0
20 - 24	7.3%
25 - 29	5.5%
30 - 34	4.5%
35 - 39	0.9%
40 - 44	8.2%
45 - 49	5.5%
50 - 54	5.5%
55 - 59	2.7%
60 - 64	9.1%
65 - 69	11.8%
70 - 74	9.1%
75 - 79	6.4%
80 - 84	3.6%
85 - 89	7.3%
90 - 94	4.5%
95 - 99	4.5%
100 - 104	0.0
105 - 109	0.9%
> 109 mm	1.8%
min size (mm)	14
max size (mm)	130
mean	61
mode	66

1985
Strongylocentrotus franciscanus

(cases) N=	195
< 5 mm	0.0
5 - 9	0.5%
10 - 14	7.7%
15 - 19	9.7%
20 - 24	12.8%
25 - 29	6.7%
30 - 34	6.7%
35 - 39	6.2%
40 - 44	2.6%
45 - 49	6.7%
50 - 54	4.1%
55 - 59	2.1%
60 - 64	3.1%
65 - 69	4.1%
70 - 74	2.1%
75 - 79	5.1%
80 - 84	4.1%
85 - 89	5.6%
90 - 94	3.6%
95 - 99	4.1%
100 - 104	1.5%
105 - 109	0.5%
> 109 mm	0.5%
min size (mm)	9
max size (mm)	122
mean	47
mode	14

1986
Strongylocentrotus franciscanus

(cases) N=	104
< 5 mm	0.0
5 - 9	1.0%
10 - 14	0.0
15 - 19	0.0
20 - 24	1.0%
25 - 29	1.9%
30 - 34	8.7%
35 - 39	6.7%
40 - 44	4.8%
45 - 49	7.7%
50 - 54	10.6%
55 - 59	6.7%
60 - 64	5.8%
65 - 69	11.5%
70 - 74	5.8%
75 - 79	3.8%
80 - 84	6.7%
85 - 89	6.7%
90 - 94	4.8%
95 - 99	2.9%
100 - 104	1.9%
105 - 109	1.0%
> 109 mm	0.0
min size (mm)	9
max size (mm)	105
mean	61
mode	52

1987
Strongylocentrotus franciscanus

(cases) N=	102
< 5 mm	1.0%
5 - 9	0.0
10 - 14	0.0
15 - 19	1.0%
20 - 24	1.0%
25 - 29	1.0%
30 - 34	2.0%
35 - 39	6.9%
40 - 44	18.6%
45 - 49	21.6%
50 - 54	10.8%
55 - 59	9.8%
60 - 64	5.9%
65 - 69	2.9%
70 - 74	4.9%
75 - 79	6.9%
80 - 84	3.9%
85 - 89	0.0
90 - 94	0.0
95 - 104	0.0
105 - 109	2.0%
> 109 mm	0.0
min size (mm)	0
max size (mm)	105
mean	53
mode	44

LOCATION 4 SANTA ROSA ISLAND - JOHNSON'S LEE SOUTH

	1988 *Strongylocentrotus franciscanus*	1989 *Strongylocentrotus franciscanus*
(cases) N=	119	85
< 5 mm	0.0	0.0
5 - 9	0.0	0.0
10 - 14	2.5%	1.2%
15 - 19	0.8%	7.1%
20 - 24	0.0	10.6%
25 - 29	0.8%	9.4%
30 - 34	0.8%	11.8%
35 - 39	0.8%	9.4%
40 - 44	5.0%	16.5%
45 - 49	5.0%	7.1%
50 - 54	1.7%	4.7%
55 - 59	13.4%	0.0
60 - 64	10.9%	1.2%
65 - 69	13.4%	2.4%
70 - 74	14.3%	1.2%
75 - 79	5.0%	1.2%
80 - 84	7.6%	3.5%
85 - 89	5.0%	4.7%
90 - 94	3.4%	2.4%
95 - 99	4.2%	2.4%
100 - 104	0.8%	1.2%
105 - 109	1.7%	2.4%
> 109 mm	1.7%	0.0
min size (mm)	12	13
max size (mm)	118	108
mean	67	45
mode	59	22

LOCATION 4 SANTA ROSA ISLAND - JOHNSON'S LEE SOUTH

1984
Srongylocentrotus purpuratus

(cases) N=	100
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	1.0%
25 - 29	5.0%
30 - 34	16.0%
35 - 39	16.0%
40 - 44	20.0%
45 - 49	16.0%
50 - 54	15.0%
55 - 59	8.0%
60 - 64	2.0%
65 - 69	1.0%
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	23
max size (mm)	65
mean	43
mode	45

1985
Srongylocentrotus purpuratus

(cases) N=	198
< 5 mm	0.0
5 - 9	2.5%
10 - 14	8.6%
15 - 19	12.6%
20 - 24	18.7%
25 - 29	7.6%
30 - 34	4.0%
35 - 39	5.1%
40 - 44	6.6%
45 - 49	8.1%
50 - 54	12.1%
55 - 59	7.1%
60 - 64	3.0%
65 - 69	3.0%
70 - 74	1.0%
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	5
max size (mm)	73
mean	34
mode	20

1986
Srongylocentrotus purpuratus

(cases) N=	108
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.9%
15 - 19	1.9%
20 - 24	8.3%
25 - 29	38.0%
30 - 34	26.9%
35 - 39	11.1%
40 - 44	7.4%
45 - 49	0.9%
50 - 54	2.8%
55 - 59	0.9%
60 - 64	0.9%
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
>99 mm	0.0
min size (mm)	14
max size (mm)	61
mean	31
mode	28

1987
Srongylocentrotus purpuratus

(cases) N=	109
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	1.8%
20 - 24	9.2%
25 - 29	43.1%
30 - 34	28.4%
35 - 39	12.8%
40 - 44	2.8%
45 - 49	0.9%
50 - 54	0.9%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	16
max size (mm)	54
mean	30
mode	29

LOCATION 4 SANTA ROSA ISLAND - JOHNSON'S LEE SOUTH

1988

Srongylocentrotus purpuratus

(cases) N=	102
< 5 mm	0.0
5 - 9	1.0%
10 - 14	2.9%
15 - 19	2.9%
20 - 24	1.0%
25 - 29	16.7%
30 - 34	31.4%
35 - 39	28.4%
40 - 44	12.7%
45 - 49	1.0%
50 - 54	2.0%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	6
max size (mm)	54
mean	33
mode	33

1989

Srongylocentrotus purpuratus

(cases) N=	144
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.7%
15 - 19	6.3%
20 - 24	15.3%
25 - 29	12.5%
30 - 34	16.0%
35 - 39	20.1%
40 - 44	18.8%
45 - 49	4.2%
50 - 54	4.9%
55 - 59	1.4%
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	11
max size (mm)	59
mean	34
mode	38

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Size Frequencies

LOCATION 5 SANTA ROSA ISLAND - RODES REEF

1986
Tethya aurantia

(cases) N=	26
< 10 mm	0.0
10 - 19	7.7%
20 - 29	7.7%
30 - 39	19.2%
40 - 49	30.8%
50 - 59	23.1%
60 - 69	3.8%
70 - 79	3.8%
80 - 89	3.8%
90 - 99	0.0
>99 mm	0.0
min size (mm)	13
max size (mm)	86
mean	46
mode	38

1987
Tethya aurantia

(cases) N=	26
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	11.5%
40 - 49	7.7%
50 - 59	15.4%
60 - 69	30.8%
70 - 79	11.5%
80 - 89	15.4%
90 - 99	7.7%
>99 mm	0.0
min size (mm)	35
max size (mm)	99
mean	65
mode	36

1988
Tethya aurantia

(cases) N=	10
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	30.0%
50 - 59	30.0%
60 - 69	40.0%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	43
max size (mm)	69
mean	56
mode	63

1989
Tethya aurantia

(cases) N=	31
< 10 mm	0.0
10 - 19	0.0
20 - 29	9.7%
30 - 39	12.9%
40 - 49	9.7%
50 - 59	19.4%
60 - 69	16.1%
70 - 79	16.1%
80 - 89	6.5%
90 - 99	6.5%
>99 mm	3.2%
min size (mm)	20
max size (mm)	112
mean	59
mode	56

LOCATION 5 SANTA ROSA ISLAND - RODES REEF

1985
Cypraea spadicea

(cases) N=	20
< 30 mm	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	5.0%
45 - 49	25.0%
50 - 54	40.0%
55 - 59	20.0%
>59 mm	10.0%
min size (mm)	44
max size (mm)	63
mean	52
mode	53

1986
Cypraea spadicea

(cases) N=	30
< 30 mm	0.0
30 - 34	0.0
35 - 39	6.7%
40 - 44	20.0%
45 - 49	26.7%
50 - 54	30.0%
55 - 59	13.3%
>59 mm	0.0
min size (mm)	35
max size (mm)	60
mean	49
mode	53

1987
Cypraea spadicea

(cases) N=	23
< 30 mm	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	21.7%
45 - 49	39.1%
50 - 54	30.4%
55 - 59	8.7%
>59 mm	0.0
min size (mm)	40
max size (mm)	58
mean	48
mode	43

1988
Cypraea spadicea

(cases) N=	16
< 30 mm	0.0
30 - 34	0.0
35 - 39	6.3%
40 - 44	25.0%
45 - 49	37.5%
50 - 54	25.0%
55 - 59	6.3%
>59 mm	0.0
min size (mm)	38
max size (mm)	56
mean	47
mode	46

1989
Cypraea spadicea

(cases) N=	17
< 30 mm	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	11.8%
45 - 49	52.9%
50 - 54	29.4%
55 - 59	5.9%
>59 mm	0.0
min size (mm)	42
max size (mm)	57
mean	49
mode	47

LOCATION 5 SANTA ROSA ISLAND - RODES REEF

1984
Kelletia kelletii

(cases) N=	14
<50 mm	0.0
50 - 59	14.3%
60 - 69	7.1%
70 - 79	7.1%
80 - 89	7.1%
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
120 - 129	21.4%
130 - 139	14.3%
140 - 149	21.4%
>149 mm	28.6%
min size (mm)	58
max size (mm)	151
mean	111
mode	127

1985
Kelletia kelletii

(cases) N=	34
<50 mm	0.0
50 - 59	0.0
60 - 69	11.8%
70 - 79	26.5%
80 - 89	17.6%
90 - 99	17.6%
100 - 109	5.9%
110 - 119	11.8%
120 - 129	5.9%
130 - 139	2.9%
140 - 149	0.0
>149 mm	0.0
min size (mm)	66
max size (mm)	131
mean	90
mode	66

1987
Kelletia kelletii

(cases) N=	13
<60 mm	0.0
60 - 69	0.0
70 - 79	15.4%
80 - 89	23.1%
90 - 99	30.8%
100 - 109	15.4%
110 - 119	7.7%
120 - 129	0.0
130 - 139	7.7%
>139 mm	0.0
min size (mm)	77
max size (mm)	138
mean	96
mode	92

1988
Kelletia kelletii

(cases) N=	14
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	7.1%
70 - 79	28.6%
80 - 89	28.6%
90 - 99	28.6%
100 - 109	7.1%
110 - 119	0.0
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	69
max size (mm)	103
mean	85
mode	69

1989
Kelletia kelletii

(cases) N=	11
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	0.0
80 - 89	0.0
90 - 99	45.5%
100 - 109	36.4%
110 - 119	18.2%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	94
max size (mm)	113
mean	101
mode	94

LOCATION 5 SANTA ROSA ISLAND - RODES REEF

1984
Megathura crenulata

(cases) N=	34
< 10 mm	0.0
10 - 19	2.9%
20 - 29	0.0
30 - 39	0.0
40 - 49	2.9%
50 - 59	2.9%
60 - 69	5.9%
70 - 79	8.8%
80 - 89	14.7%
90 - 99	44.1%
100 - 109	17.6%
110 - 119	0.0
>119 mm	0.0
min size (mm)	18
max size (mm)	108
mean	86
mode	90

1985
Megathura crenulata

(cases) N=	32
< 40 mm	0.0
40 - 49	0.0
50 - 59	6.3%
60 - 69	6.3%
70 - 79	9.4%
80 - 89	15.6%
90 - 99	21.9%
100 - 109	12.5%
110 - 119	15.6%
>119 mm	9.4%
min size (mm)	52
max size (mm)	145
mean	96
mode	93

1986
Megathura crenulata

(cases) N=	25
< 30 mm	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	4.0%
60 - 69	20.0%
70 - 79	32.0%
80 - 89	24.0%
90 - 99	8.0%
100 - 109	12.0%
110 - 119	4.0%
>119 mm	0.0
min size (mm)	57
max size (mm)	109
mean	80
mode	70

1987
Megathura crenulata

(cases) N=	32
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	3.1%
60 - 69	3.1%
70 - 79	28.1%
80 - 89	21.9%
90 - 99	15.6%
100 - 109	18.8%
110 - 119	6.3%
>119 mm	6.3%
min size (mm)	50
max size (mm)	132
mean	90
mode	79

1988
Megathura crenulata

(cases) N=	41
< 40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	19.5%
70 - 79	24.4%
80 - 89	46.3%
90 - 99	9.8%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	60
max size (mm)	98
mean	79
mode	83

1989
Megathura crenulata

(cases) N=	10
< 30 mm	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	10.0%
80 - 89	30.0%
90 - 99	30.0%
100 - 109	30.0%
110 - 119	0.0
>119 mm	0.0
min size (mm)	76
max size (mm)	108
mean	94
mode	76

LOCATION 5 SANTA ROSA ISLAND - RODES REEF

	1984 *Hinnites giganteus*	1985 *Hinnites giganteus*
(cases) N=	31	13
< 10 mm	0.0	0.0
10 - 19	0.0	0.0
20 - 29	16.1%	0.0
30 - 39	25.8%	7.7%
40 - 49	22.6%	7.7%
50 - 59	12.9%	7.7%
60 - 69	9.7%	7.7%
70 - 79	6.5%	15.4%
80 - 89	0.0	38.5%
90 - 99	3.2%	7.7%
100 - 109	3.2%	7.7%
110 - 119	0.0	0.0
120 - 129	0.0	0.0
130 - 139	0.0	0.0
140 - 149	0.0	0.0
>149 mm	0.0	0.0
min size (mm)	24	35
max size (mm)	109	103
mean	49	72
mode	39	80

LOCATION 5 SANTA ROSA ISLAND - RODES REEF

1984
Patiria miniata

(cases) N=	63
< 10 mm	0.0
10 - 19	1.6%
20 - 29	1.6%
30 - 39	17.5%
40 - 49	28.6%
50 - 59	34.9%
60 - 69	14.3%
70 - 79	1.6%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	18
max size (mm)	71
mean	49
mode	50

1985
Patiria miniata

(cases) N=	50
< 10 mm	0.0
10 - 19	2.0%
20 - 29	8.0%
30 - 39	20.0%
40 - 49	14.0%
50 - 59	26.0%
60 - 69	30.0%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	14
max size (mm)	69
mean	49
mode	62

1986
Patiria miniata

(cases) N=	55
< 10 mm	0.0
10 - 19	0.0
20 - 29	9.1%
30 - 39	16.4%
40 - 49	18.2%
50 - 59	40.0%
60 - 69	14.5%
70 - 79	0.0
80 - 89	1.8%
90 - 99	0.0
>100 mm	0.0
min size (mm)	20
max size (mm)	82
mean	49
mode	57

1987
Patiria miniata

(cases) N=	51
< 10 mm	0.0
10 - 19	0.0
20 - 29	5.9%
30 - 39	19.6%
40 - 49	21.6%
50 - 59	31.4%
60 - 69	17.6%
70 - 79	3.9%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	27
max size (mm)	72
mean	49
mode	38

1988
Patiria miniata

(cases) N=	58
< 10 mm	0.0
10 - 19	1.7%
20 - 29	17.2%
30 - 39	39.7%
40 - 49	27.6%
50 - 59	8.6%
60 - 69	5.2%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	18
max size (mm)	64
mean	38
mode	35

1989
Patiria miniata

(cases) N=	50
< 10 mm	0.0
10 - 19	2.0%
20 - 29	6.0%
30 - 39	18.0%
40 - 49	22.0%
50 - 59	32.0%
60 - 69	16.0%
70 - 79	2.0%
80 - 89	2.0%
90 - 99	0.0
>100 mm	0.0
min size (mm)	18
max size (mm)	89
mean	49
mode	51

LOCATION 5 SANTA ROSA ISLAND - RODES REEF

1986
Pisaster giganteus

(cases) N=	30
<20 mm	3.3%
20 - 39	0.0
40 - 59	43.3%
60 - 79	33.3%
80 - 99	16.7%
100 - 119	0.0
120 - 139	3.3%
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	17
max size (mm)	124
mean	65
mode	58

1987
Pisaster giganteus

(cases) N=	31
<20 mm	0.0
20 - 39	0.0
40 - 59	25.8%
60 - 79	48.4%
80 - 99	16.1%
100 - 119	3.2%
120 - 139	3.2%
140 - 159	0.0
160 - 179	3.2%
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	50
max size (mm)	162
mean	72
mode	50

1988
Pisaster giganteus

(cases) N=	37
<20 mm	0.0
20 - 39	13.5%
40 - 59	37.8%
60 - 79	37.8%
80 - 99	10.8%
100 - 119	0.0
120 - 139	0.0
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	26
max size (mm)	92
mean	58
mode	60

1989
Pisaster giganteus

(cases) N=	30
<20 mm	0.0
20 - 39	23.3%
40 - 59	40.0%
60 - 79	30.0%
80 - 99	0.0
100 - 119	6.7%
120 - 139	0.0
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	35
max size (mm)	109
mean	56
mode	37

LOCATION 5 SANTA ROSA ISLAND - RODES REEF

1987
Pycnopodia helianthoides

(cases) N=	26
<20 mm	0.0
20 - 39	3.8%
40 - 59	3.8%
60 - 79	7.7%
80 - 99	15.4%
100 - 119	26.9%
120 - 139	26.9%
140 - 159	3.8%
160 - 179	0.0
180 - 199	0.0
200 - 219	3.8%
220 - 239	3.8%
240 - 259	0.0
260 - 279	0.0
280 - 299	3.8%
>299 mm	0.0
min size (mm)	27
max size (mm)	290
mean	119
mode	109

1988
Pycnopodia helianthoides

(cases) N=	39
<20 mm	0.0
20 - 39	43.6%
40 - 59	35.9%
60 - 79	10.3%
80 - 99	5.1%
100 - 119	2.6%
120 - 139	0.0
140 - 159	0.0
160 - 179	0.0
180 - 199	2.6%
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	23
max size (mm)	195
mean	51
mode	23

1989
Pycnopodia helianthoides

(cases) N=	24
<20 mm	0.0
20 - 39	0.0
40 - 59	16.7%
60 - 79	41.7%
80 - 99	37.5%
100 - 119	0.0
120 - 139	0.0
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	4.2%
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	47
max size (mm)	212
mean	80
mode	58

LOCATION 5 SANTA ROSA ISLAND - RODES REEF

1986
Lytechinus anamesus

(cases) N=	95
< 5 mm	1.1%
5 - 9	0.0
10 - 14	0.0
15 - 19	1.1%
20 - 24	18.9%
25 - 29	50.5%
30 - 34	21.1%
35 - 39	7.4%
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	3
max size (mm)	39
mean	27
mode	26

1987
Lytechinus anamesus

(cases) N=	104
< 5 mm	1.0%
5 - 9	3.8%
10 - 14	21.2%
15 - 19	52.9%
20 - 24	18.3%
25 - 29	2.9%
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	3
max size (mm)	29
mean	17
mode	19

LOCATION 5 SANTA ROSA ISLAND - RODES REEF

1984
Strongylocentrotus franciscanus

(cases) N=	112
< 14 mm	0.0
15 - 19	1.8%
20 - 24	7.1%
25 - 29	17.0%
30 - 34	17.0%
35 - 39	1.8%
40 - 44	8.0%
45 - 49	7.1%
50 - 54	6.3%
55 - 59	4.5%
60 - 64	1.8%
65 - 69	5.4%
70 - 74	3.6%
75 - 79	2.7%
80 - 84	2.7%
85 - 89	2.7%
90 - 94	3.6%
95 - 99	0.9%
100 - 104	2.7%
105 - 109	2.7%
> 109 mm	0.9%
min size (mm)	15
max size (mm)	115
mean	50
mode	29

1985
Strongylocentrotus franciscanus

(cases) N=	171
< 9 mm	0.0
10 - 14	2.9%
15 - 19	11.1%
20 - 24	8.8%
25 - 29	7.0%
30 - 34	6.4%
35 - 39	7.6%
40 - 44	8.2%
45 - 49	9.4%
50 - 54	11.7%
55 - 59	5.8%
60 - 64	3.5%
65 - 69	2.9%
70 - 74	1.8%
75 - 79	1.8%
80 - 84	2.3%
85 - 89	2.3%
90 - 94	0.6%
95 - 99	1.2%
100 - 104	1.2%
105 - 109	1.2%
> 109 mm	1.8%
min size (mm)	10
max size (mm)	132
mean	46
mode	44

LOCATION 5 SANTA ROSA ISLAND - RODES REEF

1986
Strongylocentrotus franciscanus

(cases) N=	105
< 5 mm	1.0%
5 - 9	0.0
10 - 14	4.8%
15 - 19	4.8%
20 - 24	1.9%
25 - 29	4.8%
30 - 34	2.9%
35 - 39	7.6%
40 - 44	5.7%
45 - 49	3.8%
50 - 54	13.3%
55 - 59	6.7%
60 - 64	12.4%
65 - 69	7.6%
70 - 74	10.5%
75 - 79	4.8%
80 - 84	1.9%
85 - 89	1.0%
90 - 94	1.9%
95 - 99	1.9%
100 - 104	1.0%
> 104 mm	0.0
min size (mm)	3
max size (mm)	100
mean	53
mode	54

1987
Strongylocentrotus franciscanus

(cases) N=	102
< 5 mm	0.0
5 - 9	1.0%
10 - 14	1.0%
15 - 19	1.0%
20 - 24	4.9%
25 - 29	17.6%
30 - 34	4.9%
35 - 39	2.9%
40 - 44	6.9%
45 - 49	11.8%
50 - 54	7.8%
55 - 59	4.9%
60 - 64	12.7%
65 - 69	4.9%
70 - 74	4.9%
75 - 79	3.9%
80 - 84	2.9%
85 - 89	2.0%
90 - 94	2.0%
95 - 99	2.0%
> 100 mm	0.0
min size (mm)	6
max size (mm)	95
mean	49
mode	26

1988
Strongylocentrotus franciscanus

(cases) N=	176
< 5 mm	0.0
5 - 9	2.3%
10 - 14	2.8%
15 - 19	4.0%
20 - 24	5.1%
25 - 29	3.4%
30 - 34	0.6%
35 - 39	0.6%
40 - 44	3.4%
45 - 49	9.1%
50 - 54	20.5%
55 - 59	15.3%
60 - 64	9.1%
65 - 69	13.1%
70 - 74	5.1%
75 - 79	2.8%
80 - 84	1.1%
85 - 89	1.1%
90 - 94	0.6%
95 - 99	0.0
> 100 mm	0.0
min size (mm)	6
max size (mm)	94
mean	51
mode	54

1989
Strongylocentrotus franciscanus

(cases) N=	99
< 5 mm	0.0
5 - 9	0.0
10 - 14	1.0%
15 - 19	1.0%
20 - 24	3.0%
25 - 29	6.1%
30 - 34	5.1%
35 - 39	3.0%
40 - 44	6.1%
45 - 49	3.0%
50 - 54	0.0
55 - 59	0.0
60 - 64	6.1%
65 - 69	7.1%
70 - 74	10.1%
75 - 79	18.2%
80 - 84	14.1%
85 - 89	7.1%
90 - 94	6.1%
95 - 99	2.0%
100 - 104	1.0%
105 - 109	0.0
> 109 mm	0.0
min size (mm)	14
max size (mm)	104
mean	65
mode	80

LOCATION 5 SANTA ROSA ISLAND - RODES REEF

1984
Srongylocentrotus purpuratus

(cases) N=	173
< 15 mm	0.0
15 - 19	0.0
20 - 24	5.2%
25 - 29	20.2%
30 - 34	18.5%
35 - 39	24.9%
40 - 44	15.6%
45 - 49	6.9%
50 - 54	8.1%
55 - 59	0.6%
> 59 mm	0.0
min size (mm)	21
max size (mm)	55
mean	36
mode	35

1985
Srongylocentrotus purpuratus

(cases) N=	176
< 10 mm	0.0
10 - 14	1.1%
15 - 19	2.3%
20 - 24	4.0%
25 - 29	7.4%
30 - 34	15.3%
35 - 39	30.7%
40 - 44	28.4%
45 - 49	7.4%
50 - 54	2.3%
55 - 59	1.1%
> 59 mm	0.0
min size (mm)	13
max size (mm)	55
mean	37
mode	40

1986
Srongylocentrotus purpuratus

(cases) N=	124
< 5 mm	0.0
5 - 9	2.4%
10 - 14	4.8%
15 - 19	0.8%
20 - 24	3.2%
25 - 29	16.1%
30 - 34	12.9%
35 - 39	21.0%
40 - 44	25.0%
45 - 49	8.9%
50 - 54	3.2%
55 - 59	0.8%
60 - 64	0.8%
> 64 mm	0.0
min size (mm)	7
max size (mm)	62
mean	35
mode	37

1987
Srongylocentrotus purpuratus

(cases) N=	133
< 5 mm	4.5%
5 - 9	11.3%
10 - 14	6.0%
15 - 19	0.8%
20 - 24	9.8%
25 - 29	9.0%
30 - 34	21.8%
35 - 39	21.8%
40 - 44	12.0%
45 - 49	2.3%
50 - 54	0.8%
55 - 59	0.0
> 59 mm	0.0
min size (mm)	3
max size (mm)	51
mean	28
mode	30

1988
Srongylocentrotus purpuratus

(cases) N=	37
< 15 mm	0.0
15 - 19	8.1%
20 - 24	10.8%
25 - 29	0.0
30 - 34	5.4%
35 - 39	27.0%
40 - 44	24.3%
45 - 49	16.2%
50 - 54	2.7%
55 - 59	2.7%
60 - 64	2.7%
> 64 mm	0.0
min size (mm)	15
max size (mm)	60
mean	38
mode	44

1989
Srongylocentrotus purpuratus

(cases) N=	99
< 5 mm	0.0
5 - 9	1.0%
10 - 14	1.0%
15 - 19	8.1%
20 - 24	11.1%
25 - 29	9.1%
30 - 34	16.2%
35 - 39	13.1%
40 - 44	14.1%
45 - 49	10.1%
50 - 54	9.1%
55 - 59	6.1%
60 - 64	1.0%
> 64 mm	0.0
min size (mm)	8
max size (mm)	63
mean	36
mode	32

LOCATION 5 SANTA ROSA ISLAND - RODES REEF

1986
Tethya aurantia

(cases) N=	29
< 10 mm	0.0
10 - 19	0.0
20 - 29	6.9%
30 - 39	10.3%
40 - 49	10.3%
50 - 59	24.1%
60 - 69	20.7%
70 - 79	20.7%
80 - 89	3.4%
90 - 99	3.4%
>99 mm	0.0
min size (mm)	22
max size (mm)	97
mean	57
mode	70

1988
Tethya aurantia

(cases) N=	17
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	5.9%
40 - 49	17.6%
50 - 59	5.9%
60 - 69	23.5%
70 - 79	23.5%
80 - 89	5.9%
90 - 99	5.9%
>99 mm	5.9%
min size (mm)	30
max size (mm)	119
mean	69
mode	64

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

1984 *Haliotis rufescens*		1985 *Haliotis rufescens*	
(cases) N=	36	(cases) N=	45
< 40 mm	0.0	< 40 mm	0.0
40 - 44	4.4%	40 - 44	4.4%
45 - 49	0.0	45 - 49	0.0
50 - 54	0.0	50 - 54	0.0
55 - 59	2.8%	55 - 59	0.0
60 - 64	0.0	60 - 64	0.0
65 - 69	0.0	65 - 69	0.0
70 - 74	0.0	70 - 74	0.0
75 - 79	0.0	75 - 79	0.0
80 - 84	2.8%	80 - 84	0.0
85 - 89	0.0	85 - 89	4.4%
90 - 94	2.8%	90 - 94	2.2%
95 - 99	0.0	95 - 99	0.0
100 - 104	2.8%	100 - 104	2.2%
105 - 109	0.0	105 - 109	0.0
110 - 114	0.0	110 - 114	0.0
115 - 119	0.0	115 - 119	2.2%
120 - 124	0.0	120 - 124	2.2%
125 - 129	0.0	125 - 129	0.0
130 - 134	2.8%	130 - 134	2.2%
135 - 139	2.8%	135 - 139	0.0
140 - 144	2.8%	140 - 144	4.4%
145 - 149	2.8%	145 - 149	2.2%
150 - 154	5.6%	150 - 154	4.4%
155 - 159	8.3%	155 - 159	2.2%
160 - 164	8.3%	160 - 164	13.3%
165 - 169	11.1%	165 - 169	6.7%
170 - 174	19.4%	170 - 174	8.9%
175 - 179	5.6%	175 - 179	8.9%
180 - 184	5.6%	180 - 184	13.3%
185 - 189	0.0	185 - 189	6.7%
190 - 194	8.3%	190 - 194	8.9%
195 - 199	0.0	195 - 199	0.0
> 199 mm	5.6%	> 199 mm	0.0
min size (mm)	57	min size (mm)	43
max size (mm)	204	max size (mm)	192
mean	159	mean	155
mode	172	mode	160

LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

1986

Haliotis rufescens

(cases) N=	8
< 75 mm	0.0
75 - 79	12.5%
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
110 - 114	0.0
115 - 119	12.5%
120 - 124	0.0
125 - 129	0.0
130 - 134	0.0
135 - 139	0.0
140 - 144	0.0
145 - 149	0.0
150 - 154	0.0
155 - 159	0.0
160 - 164	12.5%
165 - 169	12.5%
170 - 174	25.0%
175 - 179	12.5%
180 - 184	0.0
185 - 189	0.0
190 - 194	12.5%
195 - 199	0.0
> 199 mm	0.0
min size (mm)	77
max size (mm)	194
mean	155
mode	77

LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

1984
Haliotis corrugata

(cases) N=	1
< 100 mm	0.0
100 - 104	0.0
105 - 109	0.0
110 - 114	0.0
115 - 119	0.0
120 - 124	0.0
125 - 129	0.0
130 - 134	0.0
135 - 139	0.0
140 - 144	100.0%
145 - 149	0.0
150 - 154	0.0
155 - 159	0.0
> 159 mm	0.0
min size (mm)	143
max size (mm)	143
mean	143
mode	143

1985
Haliotis corrugata

(cases) N=	17
< 50 mm	0.0
50 - 54	0.0
55 - 59	5.9%
60 - 64	5.9%
65 - 69	5.9%
70 - 74	5.9%
75 - 79	0.0
80 - 84	11.8%
85 - 89	5.9%
90 - 94	0.0
95 - 99	5.9%
100 - 104	0.0
105 - 109	0.0
110 - 114	5.9%
115 - 119	0.0
120 - 124	5.9%
125 - 129	0.0
130 - 134	5.9%
135 - 139	5.9%
140 - 144	5.9%
145 - 149	17.6%
150 - 154	5.9%
155 - 159	0.0
160 - 164	0.0
165 - 169	0.0
> 169 mm	0.0
min size (mm)	55
max size (mm)	150
mean	108
mode	55

1988
Haliotis corrugata

(cases) N=	1
< 25 mm	0.0
25 - 29	0.0
30 - 34	100.0%
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
> 49 mm	0.0
min size (mm)	33
max size (mm)	33
mean	33
mode	33

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies
LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

1984
Cypraea spadicea

(cases) N=	35
< 30 mm	0.0
30 - 34	0.0
35 - 39	2.9%
40 - 44	8.6%
45 - 49	54.3%
50 - 54	28.6%
55 - 59	5.7%
>59 mm	0.0
min size (mm)	39
max size (mm)	56
mean	48
mode	49

1985
Cypraea spadicea

(cases) N=	28
< 30 mm	0.0
30 - 34	0.0
35 - 39	3.6%
40 - 44	10.7%
45 - 49	57.1%
50 - 54	21.4%
55 - 59	7.1%
>59 mm	0.0
min size (mm)	39
max size (mm)	56
mean	48
mode	49

1986
Cypraea spadicea

(cases) N=	34
< 30 mm	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	14.7%
45 - 49	41.2%
50 - 54	41.2%
55 - 59	2.9%
>59 mm	0.0
min size (mm)	42
max size (mm)	58
mean	49
mode	52

1987
Cypraea spadicea

(cases) N=	62
< 30 mm	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	3.2%
45 - 49	48.4%
50 - 54	40.3%
55 - 59	8.1%
>59 mm	0.0
min size (mm)	41
max size (mm)	57
mean	50
mode	47

1988
Cypraea spadicea

(cases) N=	34
< 30 mm	0.0
30 - 34	0.0
35 - 39	8.8%
40 - 44	8.8%
45 - 49	70.6%
50 - 54	11.8%
55 - 59	0.0
>59 mm	0.0
min size (mm)	35
max size (mm)	52
mean	46
mode	46

1989
Cypraea spadicea

(cases) N=	30
< 30 mm	0.0
30 - 34	3.3%
35 - 39	3.3%
40 - 44	20.0%
45 - 49	30.0%
50 - 54	30.0%
55 - 59	3.3%
>59 mm	10.0%
min size (mm)	30
max size (mm)	91
mean	50
mode	50

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

1985
Kelletia kelletii

(cases) N=	15
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	6.7%
70 - 79	6.7%
80 - 89	6.7%
90 - 99	20.0%
100 - 109	20.0%
110 - 119	40.0%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	60
max size (mm)	115
mean	98
mode	110

1987
Kelletia kelletii

(cases) N=	13
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	0.0
80 - 89	7.7%
90 - 99	61.5%
100 - 109	23.1%
110 - 119	0.0
120 - 129	0.0
130 - 139	7.7%
140 - 149	0.0
>149 mm	0.0
min size (mm)	82
max size (mm)	130
mean	98
mode	90

1988
Kelletia kelletii

(cases) N=	35
<40 mm	0.0
40 - 49	2.9%
50 - 59	0.0
60 - 69	0.0
70 - 79	5.7%
80 - 89	14.3%
90 - 99	34.3%
100 - 109	34.3%
110 - 119	5.7%
120 - 129	2.9%
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	47
max size (mm)	122
mean	96
mode	101

1989
Kelletia kelletii

(cases) N=	19
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	5.3%
80 - 89	10.5%
90 - 99	42.1%
100 - 109	31.6%
110 - 119	10.5%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	76
max size (mm)	115
mean	97
mode	91

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

1984
Astraea undosa

(cases) N=	29
< 10 mm	3.4%
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	0.0
80 - 89	20.7%
90 - 99	51.7%
100 - 109	24.1%
110 - 119	3.4%
>119 mm	0.0
min size (mm)	5
max size (mm)	109
mean	92
mode	93

1985
Astraea undosa

(cases) N=	31
< 30	0.0
30 - 39	3.2%
40 - 49	16.1%
50 - 59	22.6%
60 - 69	25.8%
70 - 79	6.5%
80 - 89	16.1%
90 - 99	3.2%
100 - 109	6.5%
>109 mm	0.0
min size (mm)	30
max size (mm)	104
mean	65
mode	51

1986
Astraea undosa

(cases) N=	44
< 30	0.0
30 - 39	2.3%
40 - 49	4.5%
50 - 59	18.2%
60 - 69	13.6%
70 - 79	38.6%
80 - 89	6.8%
90 - 99	11.4%
100 - 109	2.3%
110 - 119	2.3%
>119 mm	0.0
min size (mm)	38
max size (mm)	110
mean	70
mode	71

1987
Astraea undosa

(cases) N=	35
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	14.3%
60 - 69	40.0%
70 - 79	37.1%
80 - 89	8.6%
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	52
max size (mm)	89
mean	68
mode	78

1988
Astraea undosa

(cases) N=	43
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	4.7%
50 - 59	4.7%
60 - 69	51.2%
70 - 79	32.6%
80 - 89	4.7%
90 - 99	2.3%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	46
max size (mm)	90
mean	67
mode	70

LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

1984
Megathura crenulata

(cases) N=	86
< 50 mm	0.0
50 - 59	0.0
60 - 69	2.3%
70 - 79	26.7%
80 - 89	55.8%
90 - 99	14.0%
100 - 109	1.2%
110 - 119	0.0
>119 mm	0.0
min size (mm)	65
max size (mm)	102
mean	82
mode	82

1985
Megathura crenulata

(cases) N=	30
< 30 mm	0.0
30 - 39	0.0
40 - 49	3.3%
50 - 59	3.3%
60 - 69	3.3%
70 - 79	40.0%
80 - 89	33.3%
90 - 99	16.7%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	47
max size (mm)	98
mean	79
mode	75

1986
Megathura crenulata

(cases) N=	38
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	5.3%
60 - 69	13.2%
70 - 79	31.6%
80 - 89	34.2%
90 - 99	7.9%
100 - 109	5.3%
110 - 119	0.0
>119 mm	2.6%
min size (mm)	50
max size (mm)	122
mean	79
mode	77

1987
Megathura crenulata

(cases) N=	51
< 30 mm	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	7.8%
60 - 69	19.6%
70 - 79	45.1%
80 - 89	27.5%
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	50
max size (mm)	85
mean	74
mode	78

1988
Megathura crenulata

(cases) N=	37
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	2.7%
40 - 49	0.0
50 - 59	8.1%
60 - 69	24.3%
70 - 79	37.8%
80 - 89	13.5%
90 - 99	8.1%
100 - 109	2.7%
110 - 119	2.7%
>119 mm	0.0
min size (mm)	34
max size (mm)	115
mean	73
mode	70

1989
Megathura crenulata

(cases) N=	18
< 40 mm	0.0
40 - 49	0.0
50 - 59	5.6%
60 - 69	16.7%
70 - 79	33.3%
80 - 89	44.4%
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	56
max size (mm)	89
mean	75
mode	80

LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

1984
Hinnites giganteus

(cases) N=	13
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	7.7%
40 - 49	15.4%
50 - 59	15.4%
60 - 69	15.4%
70 - 79	0.0
80 - 89	15.4%
90 - 99	7.7%
100 - 109	7.7%
110 - 119	7.7%
120 - 129	7.7%
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	38
max size (mm)	129
mean	74
mode	65

1985
Hinnites giganteus

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	3.3%
30 - 39	3.3%
40 - 49	20.0%
50 - 59	10.0%
60 - 69	26.7%
70 - 79	3.3%
80 - 89	10.0%
90 - 99	6.7%
100 - 109	6.7%
110 - 119	0.0
120 - 129	3.3%
130 - 139	3.3%
140 - 149	0.0
>149 mm	3.3%
min size (mm)	25
max size (mm)	153
mean	70
mode	40

1986
Hinnites giganteus

(cases) N=	40
< 10 mm	0.0
10 - 19	0.0
20 - 29	5.0%
30 - 39	7.5%
40 - 49	40.0%
50 - 59	5.0%
60 - 69	7.5%
70 - 79	5.0%
80 - 89	10.0%
90 - 99	2.5%
100 - 109	0.0
110 - 119	12.5%
120 - 129	0.0
130 - 139	2.5%
140 - 149	0.0
>149 mm	2.5%
min size (mm)	21
max size (mm)	154
mean	65
mode	45

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

1984
Patiria miniata

(cases) N=	10
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	10.0%
60 - 69	60.0%
70 - 79	30.0%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	52
max size (mm)	75
mean	67
mode	64

1985
Patiria miniata

(cases) N=	10
< 10 mm	0.0
10 - 19	0.0
20 - 29	10.0%
30 - 39	30.0%
40 - 49	30.0%
50 - 59	10.0%
60 - 69	10.0%
70 - 79	0.0
80 - 89	10.0%
90 - 99	0.0
>100 mm	0.0
min size (mm)	25
max size (mm)	80
mean	48
mode	48

1986
Patiria miniata

(cases) N=	17
< 10 mm	0.0
10 - 19	0.0
20 - 29	11.8%
30 - 39	17.6%
40 - 49	17.6%
50 - 59	11.8%
60 - 69	17.6%
70 - 79	23.5%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	24
max size (mm)	79
mean	51
mode	69

1987
Patiria miniata

(cases) N=	39
< 10 mm	0.0
10 - 19	2.6%
20 - 29	7.7%
30 - 39	30.8%
40 - 49	28.2%
50 - 59	7.7%
60 - 69	17.9%
70 - 79	0.0
80 - 89	5.1%
90 - 99	0.0
>100 mm	0.0
min size (mm)	19
max size (mm)	84
mean	45
mode	42

1988
Patiria miniata

(cases) N=	50
< 10 mm	0.0
10 - 19	0.0
20 - 29	2.0%
30 - 39	10.0%
40 - 49	18.0%
50 - 59	18.0%
60 - 69	30.0%
70 - 79	18.0%
80 - 89	0.0
90 - 99	2.0%
>100 mm	2.0%
min size (mm)	23
max size (mm)	105
mean	59
mode	70

1989
Patiria miniata

(cases) N=	51
< 10 mm	0.0
10 - 19	0.0
20 - 29	2.0%
30 - 39	3.9%
40 - 49	11.8%
50 - 59	23.5%
60 - 69	23.5%
70 - 79	25.5%
80 - 89	7.8%
90 - 99	2.0%
>100 mm	0.0
min size (mm)	28
max size (mm)	90
mean	62
mode	54

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

1986
Pisaster giganteus

(cases) N=	38
<20 mm	0.0
20 - 39	2.6%
40 - 59	23.7%
60 - 79	28.9%
80 - 99	21.1%
100 - 119	15.8%
120 - 139	2.6%
140 - 159	0.0
160 - 179	5.3%
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	29
max size (mm)	174
mean	81
mode	55

1987
Pisaster giganteus

(cases) N=	38
<20 mm	0.0
20 - 39	0.0
40 - 59	26.3%
60 - 79	44.7%
80 - 99	23.7%
100 - 119	5.3%
120 - 139	0.0
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	51
max size (mm)	101
mean	70
mode	57

1988
Pisaster giganteus

(cases) N=	32
<20 mm	0.0
20 - 39	0.0
40 - 59	6.3%
60 - 79	34.4%
80 - 99	34.4%
100 - 119	18.8%
120 - 139	3.1%
140 - 159	0.0
160 - 179	3.1%
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	49
max size (mm)	168
mean	88
mode	67

1989
Pisaster giganteus

(cases) N=	30
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	23.3%
80 - 99	43.3%
100 - 119	20.0%
120 - 139	6.7%
140 - 159	6.7%
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	60
max size (mm)	152
mean	96
mode	65

LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

1986
Lytechinus anamesus

(cases) N=	107
< 5 mm	0.0
5 - 9	0.9%
10 - 14	12.1%
15 - 19	29.0%
20 - 24	35.5%
25 - 29	20.6%
30 - 34	1.9%
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	9
max size (mm)	32
mean	20
mode	25

1987
Lytechinus anamesus

(cases) N=	102
< 5 mm	0.0
5 - 9	0.0
10 - 14	28.4%
15 - 19	57.8%
20 - 24	13.7%
25 - 29	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	10
max size (mm)	22
mean	16
mode	16

1988
Lytechinus anamesus

(cases) N=	117
< 5 mm	0.0
5 - 9	0.9%
10 - 14	7.7%
15 - 19	36.8%
20 - 24	33.3%
25 - 29	18.8%
30 - 34	2.6%
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	9
max size (mm)	31
mean	21
mode	18

1989
Lytechinus anamesus

(cases) N=	178
< 5 mm	0.0
5 - 9	5.1%
10 - 14	30.9%
15 - 19	45.5%
20 - 24	14.6%
25 - 29	3.9%
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	7
max size (mm)	29
mean	16
mode	16

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

1984	
Strongylocentrotus franciscanus	
(cases) N=	114
< 5 mm	0.0
5 - 9	11.4%
10 - 14	0.9%
15 - 19	1.8%
20 - 24	0.0
25 - 29	0.9%
30 - 34	0.0
35 - 39	1.8%
40 - 44	0.0
45 - 49	3.5%
50 - 54	1.8%
55 - 59	4.4%
60 - 64	4.4%
65 - 69	4.4%
70 - 74	4.4%
75 - 79	8.8%
80 - 84	13.2%
85 - 89	8.8%
90 - 94	6.1%
95 - 99	4.4%
100 - 104	2.6%
105 - 109	0.9%
> 109 mm	15.8%
min size (mm)	5
max size (mm)	142
mean	74
mode	82

1985	
Strongylocentrotus franciscanus	
(cases) N=	100
< 5 mm	0.0
5 - 9	1.0%
10 - 14	2.0%
15 - 19	10.0%
20 - 24	5.0%
25 - 29	3.0%
30 - 34	1.0%
35 - 39	1.0%
40 - 44	1.0%
45 - 49	5.0%
50 - 54	3.0%
55 - 59	2.0%
60 - 64	5.0%
65 - 69	2.0%
70 - 74	5.0%
75 - 79	6.0%
80 - 84	4.0%
85 - 89	7.0%
90 - 94	8.0%
95 - 99	7.0%
100 - 104	8.0%
105 - 109	2.0%
> 109 mm	12.0%
min size (mm)	9
max size (mm)	122
mean	70
mode	15

1986	
Strongylocentrotus franciscanus	
(cases) N=	104
< 5 mm	0.0
5 - 9	1.0%
10 - 14	2.9%
15 - 19	7.7%
20 - 24	15.4%
25 - 29	23.1%
30 - 34	12.5%
35 - 39	3.8%
40 - 44	1.9%
45 - 49	1.9%
50 - 54	2.9%
55 - 59	2.9%
60 - 64	1.0%
65 - 69	1.0%
70 - 74	2.9%
75 - 79	0.0
80 - 84	1.0%
85 - 89	5.8%
90 - 94	5.8%
95 - 99	1.9%
100 - 104	0.0
105 - 109	1.9%
> 109 mm	2.9%
min size (mm)	9
max size (mm)	125
mean	43
mode	25

1987	
Strongylocentrotus franciscanus	
(cases) N=	102
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	2.0%
25 - 29	8.8%
30 - 34	20.6%
35 - 39	6.9%
40 - 44	16.7%
45 - 49	6.9%
50 - 54	5.9%
55 - 59	1.0%
60 - 64	2.0%
65 - 69	2.0%
70 - 74	2.9%
75 - 79	1.0%
80 - 84	2.9%
85 - 89	3.9%
90 - 94	5.9%
95 - 99	3.9%
100 - 104	2.0%
105 - 109	2.9%
> 109 mm	2.0%
min size (mm)	22
max size (mm)	126
mean	54
mode	40

LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

:

1988
Strongylocentrotus franciscanus

(cases) N=	109
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	2.8%
20 - 24	16.5%
25 - 29	33.9%
30 - 34	31.2%
35 - 39	9.2%
40 - 44	1.8%
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.9%
70 - 74	0.9%
75 - 79	0.0
80 - 84	0.9%
85 - 89	0.0
90 - 94	1.8%
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	19
max size (mm)	92
mean	31
mode	30

1989
Strongylocentrotus franciscanus

(cases) N=	76
< 5 mm	0.0
5 - 9	1.3%
10 - 14	1.3%
15 - 19	7.9%
20 - 24	17.1%
25 - 29	28.9%
30 - 34	26.3%
35 - 39	13.2%
40 - 44	3.9%
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	6
max size (mm)	42
mean	28
mode	30

LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

1984
Srongylocentrotus purpuratus

(cases) N=	58
< 5 mm	1.7%
5 - 9	5.2%
10 - 14	3.4%
15 - 19	0.0
20 - 24	10.3%
25 - 29	31.0%
30 - 34	29.3%
35 - 39	6.9%
40 - 44	6.9%
45 - 49	5.2%
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	4
max size (mm)	47
mean	29
mode	27

1985
Srongylocentrotus purpuratus

(cases) N=	99
< 5 mm	0.0
5 - 9	6.1%
10 - 14	3.0%
15 - 19	3.0%
20 - 24	1.0%
25 - 29	31.3%
30 - 34	37.4%
35 - 39	14.1%
40 - 44	4.0%
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	5
max size (mm)	41
mean	29
mode	29

1986
Srongylocentrotus purpuratus

(cases) N=	115
< 5 mm	3.5%
5 - 9	14.8%
10 - 14	44.3%
15 - 19	20.0%
20 - 24	9.6%
25 - 29	1.7%
30 - 34	1.7%
35 - 39	1.7%
40 - 44	2.6%
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	3
max size (mm)	43
mean	15
mode	12

1987
Srongylocentrotus purpuratus

(cases) N=	104
< 5 mm	0.0
5 - 9	0.0
10 - 14	6.7%
15 - 19	1.0%
20 - 24	22.1%
25 - 29	26.0%
30 - 34	25.0%
35 - 39	13.5%
40 - 44	4.8%
45 - 49	0.0
50 - 54	1.0%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	10
max size (mm)	50
mean	28
mode	23

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies
LOCATION 6 SANTA CRUZ ISLAND - GULL ISLAND SOUTH

	1988 *Srongylocentrotus purpuratus*		1989 *Srongylocentrotus purpuratus*
(cases) N=	115	(cases) N=	195
< 5 mm	0.0	< 5 mm	1.0%
5 - 9	1.7%	5 - 9	4.6%
10 - 14	15.7%	10 - 14	3.6%
15 - 19	63.5%	15 - 19	10.8%
20 - 24	16.5%	20 - 24	45.6%
25 - 29	2.6%	25 - 29	31.3%
30 - 34	0.0	30 - 34	2.6%
35 - 39	0.0	35 - 39	0.5%
40 - 44	0.0	40 - 44	0.0
45 - 49	0.0	45 - 49	0.0
50 - 54	0.0	50 - 54	0.0
55 - 59	0.0	55 - 59	0.0
60 - 64	0.0	60 - 64	0.0
65 - 69	0.0	65 - 69	0.0
70 - 74	0.0	70 - 74	0.0
75 - 79	0.0	75 - 79	0.0
80 - 84	0.0	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	0.0
95 - 99	0.0	95 - 99	0.0
100 - 104	0.0	100 - 104	0.0
105 - 109	0.0	105 - 109	0.0
> 109 mm	0.0	> 109 mm	0.0
min size (mm)	6	min size (mm)	4
max size (mm)	28	max size (mm)	36
mean	17	mean	22
mode	15	mode	23

LOCATION 7 SANTA CRUZ ISLAND - FRY'S HARBOR

1986
Tethya aurantia

(cases) N=	18
< 10 mm	0.0
10 - 19	0.0
20 - 29	5.6%
30 - 39	44.4%
40 - 49	27.8%
50 - 59	16.7%
60 - 69	5.6%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	28
max size (mm)	65
mean	43
mode	35

1989
Tethya aurantia

(cases) N=	30
< 10 mm	0.0
10 - 19	3.3%
20 - 29	3.3%
30 - 39	26.7%
40 - 49	53.3%
50 - 59	6.7%
60 - 69	6.7%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	18
max size (mm)	60
mean	42
mode	36

1988
Kelletia kelletii

(cases) N=	18
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	11.1%
80 - 89	0.0
90 - 99	27.8%
100 - 109	11.1%
110 - 119	38.9%
120 - 129	11.1%
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	74
max size (mm)	121
mean	104
mode	110

LOCATION 7 SANTA CRUZ ISLAND - FRY'S HARBOR

1985
Cypraea spadicea

(cases) N=	31
< 30 mm	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	9.7%
45 - 49	38.7%
50 - 54	45.2%
55 - 59	6.5%
>59 mm	0.0
min size (mm)	41
max size (mm)	57
mean	50
mode	53

1986
Cypraea spadicea

(cases) N=	43
< 30 mm	0.0
30 - 34	0.0
35 - 39	2.3%
40 - 44	14.0%
45 - 49	44.2%
50 - 54	25.6%
55 - 59	14.0%
>59 mm	0.0
min size (mm)	37
max size (mm)	57
mean	49
mode	48

1987
Cypraea spadicea

(cases) N=	22
< 30 mm	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	13.6%
45 - 49	31.8%
50 - 54	45.5%
55 - 59	9.1%
>59 mm	0.0
min size (mm)	43
max size (mm)	58
mean	49
mode	45

1988
Cypraea spadicea

(cases) N=	32
< 30 mm	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	15.6%
45 - 49	46.9%
50 - 54	34.4%
55 - 59	3.1%
>59 mm	0.0
min size (mm)	41
max size (mm)	58
mean	48
mode	49

1989
Cypraea spadicea

(cases) N=	30
< 30 mm	0.0
30 - 34	0.0
35 - 39	3.3%
40 - 44	30.0%
45 - 49	36.7%
50 - 54	23.3%
55 - 59	6.7%
>59 mm	0.0
min size (mm)	39
max size (mm)	57
mean	47
mode	46

LOCATION 7 SANTA CRUZ ISLAND - FRY'S HARBOR

1984
Astraea undosa

(cases) N=	30
< 30 MM	0.0
30 - 39	0.0
40 - 49	6.7%
50 - 59	13.3%
60 - 69	10.0%
70 - 79	6.7%
80 - 89	16.7%
90 - 99	33.3%
100 - 109	6.7%
110 - 119	10.0%
>119 mm	0.0
min size (mm)	47
max size (mm)	112
mean	83
mode	97

1985
Astraea undosa

(cases) N=	30
< 30 mm	0.0
30 - 39	10.0%
40 - 49	50.0%
50 - 59	16.7%
60 - 69	10.0%
70 - 79	10.0%
80 - 89	0.0
90 - 99	0.0
100 - 109	3.3%
>110 mm	0.0
min size (mm)	33
max size (mm)	100
mean	52
mode	45

1986
Astraea undosa

(cases) N=	31
< 30 mm	0.0
30 - 39	25.8%
40 - 49	38.7%
50 - 59	9.7%
60 - 69	12.9%
70 - 79	3.2%
80 - 89	3.2%
90 - 99	0.0
100 - 109	3.2%
110 - 119	3.2%
>119 mm	0.0
min size (mm)	31
max size (mm)	113
mean	52
mode	38

1987
Astraea undosa

(cases) N=	30
< 30 mm	0.0
30 - 39	6.7%
40 - 49	10.0%
50 - 59	36.7%
60 - 69	26.7%
70 - 79	16.7%
80 - 89	3.3%
90 - 99	0.0
> 99 mm	0.0
min size (mm)	36
max size (mm)	88
mean	59
mode	51

1988
Astraea undosa

(cases) N=	35
< 30 mm	0.0
30 - 39	0.0
40 - 49	8.6%
50 - 59	20.0%
60 - 69	45.7%
70 - 79	11.4%
80 - 89	5.7%
90 - 99	5.7%
100 - 109	2.9%
110 - 119	0.0
>119 mm	0.0
min size (mm)	43
max size (mm)	104
mean	66
mode	62

1989
Astraea undosa

(cases) N=	42
< 10 mm	0.0
10 - 19	0.0
20 - 29	2.4%
30 - 39	2.4%
40 - 49	2.4%
50 - 59	14.3%
60 - 69	42.9%
70 - 79	23.8%
80 - 89	7.1%
90 - 99	4.8%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	25
max size (mm)	97
mean	66
mode	61

LOCATION 7 SANTA CRUZ ISLAND - FRY'S HARBOR

1984
Megathura crenulata

(cases) N=	30
< 30 mm	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	36.7%
70 - 79	40.0%
80 - 89	6.7%
90 - 99	16.7%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	61
max size (mm)	96
mean	75
mode	68

1985
Megathura crenulata

(cases) N=	32
< 30 mm	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	9.4%
60 - 69	18.8%
70 - 79	31.3%
80 - 89	37.5%
90 - 99	3.1%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	56
max size (mm)	90
mean	75
mode	81

1986
Megathura crenulata

(cases) N=	38
< 30 mm	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	7.9%
60 - 69	13.2%
70 - 79	31.6%
80 - 89	23.7%
90 - 99	23.7%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	56
max size (mm)	99
mean	78
mode	73

1987
Megathura crenulata

(cases) N=	30
< 30 mm	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	16.7%
60 - 69	23.3%
70 - 79	40.0%
80 - 89	13.3%
90 - 99	6.7%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	56
max size (mm)	95
mean	72
mode	78

1988
Megathura crenulata

(cases) N=	53
< 30 mm	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	22.6%
70 - 79	39.6%
80 - 89	34.0%
90 - 99	3.8%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	60
max size (mm)	96
mean	76
mode	85

1989
Megathura crenulata

(cases) N=	29
< 30 mm	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	3.4%
70 - 79	58.6%
80 - 89	27.6%
90 - 99	10.3%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	62
max size (mm)	97
mean	80
mode	78

LOCATION 7 SANTA CRUZ ISLAND - FRY'S HARBOR

1984
Hinnites giganteus

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	3.3%
30 - 39	3.3%
40 - 49	20.0%
50 - 59	16.7%
60 - 69	13.3%
70 - 79	16.7%
80 - 89	6.7%
90 - 99	6.7%
100 - 109	6.7%
110 - 119	3.3%
120 - 129	0.0
130 - 139	3.3%
140 - 149	0.0
>149 mm	0.0
min size (mm)	25
max size (mm)	130
mean	65
mode	50

1985
Hinnites giganteus

(cases) N=	32
< 10 mm	0.0
10 - 19	0.0
20 - 29	3.1%
30 - 39	3.1%
40 - 49	3.1%
50 - 59	12.5%
60 - 69	18.8%
70 - 79	15.6%
80 - 89	25.0%
90 - 99	12.5%
100 - 109	3.1%
110 - 119	3.1%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	22
max size (mm)	113
mean	74
mode	71

1986
Hinnites giganteus

(cases) N=	31
< 10 mm	0.0
10 - 19	0.0
20 - 29	3.2%
30 - 39	29.0%
40 - 49	16.1%
50 - 59	6.5%
60 - 69	12.9%
70 - 79	6.5%
80 - 89	9.7%
90 - 99	6.5%
100 - 109	3.2%
110 - 119	0.0
120 - 129	0.0
130 - 139	3.2%
140 - 149	3.2%
>149 mm	0.0
min size (mm)	26
max size (mm)	140
mean	62
mode	34

1987
Hinnites giganteus

(cases) N=	24
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	12.5%
40 - 49	25.0%
50 - 59	12.5%
60 - 69	12.5%
70 - 79	4.2%
80 - 89	12.5%
90 - 99	0.0
100 - 109	0.0
110 - 119	4.2%
120 - 129	12.5%
130 - 139	4.2%
140 - 149	0.0
>149 mm	0.0
min size (mm)	33
max size (mm)	130
mean	69
mode	34

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
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LOCATION 7 SANTA CRUZ ISLAND - FRY'S HARBOR

1988
Hinnites giganteus

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	10.0%
40 - 49	6.7%
50 - 59	6.7%
60 - 69	10.0%
70 - 79	20.0%
80 - 89	13.3%
90 - 99	3.3%
100 - 109	23.3%
110 - 119	3.3%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	3.3%
min size (mm)	37
max size (mm)	152
mean	79
mode	70

1989
Hinnites giganteus

(cases) N=	36
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	5.6%
40 - 49	38.9%
50 - 59	25.0%
60 - 69	13.9%
70 - 79	2.8%
80 - 89	5.6%
90 - 99	2.8%
100 - 109	2.8%
110 - 119	2.8%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	33
max size (mm)	114
mean	57
mode	47

LOCATION 7 SANTA CRUZ ISLAND - FRY'S HARBOR

1986
Patiria miniata

(cases) N=	41
< 10 mm	0.0
10 - 19	0.0
20 - 29	2.4%
30 - 39	17.1%
40 - 49	14.6%
50 - 59	9.8%
60 - 69	29.3%
70 - 79	19.5%
80 - 89	4.9%
90 - 99	2.4%
>100 mm	0.0
min size (mm)	28
max size (mm)	90
mean	58
mode	38

1987
Patiria miniata

(cases) N=	16
< 10 mm	0.0
10 - 19	0.0
20 - 29	12.5%
30 - 39	12.5%
40 - 49	12.5%
50 - 59	6.3%
60 - 69	31.3%
70 - 79	25.0%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	24
max size (mm)	76
mean	55
mode	60

1988
Patiria miniata

(cases) N=	41
< 10 mm	0.0
10 - 19	0.0
20 - 29	2.4%
30 - 39	14.6%
40 - 49	17.1%
50 - 59	41.5%
60 - 69	17.1%
70 - 79	4.9%
80 - 89	2.4%
90 - 99	0.0
>100 mm	0.0
min size (mm)	28
max size (mm)	82
mean	52
mode	50

1989
Patiria miniata

(cases) N=	66
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	6.1%
40 - 49	6.1%
50 - 59	19.7%
60 - 69	43.9%
70 - 79	19.7%
80 - 89	4.5%
90 - 99	0.0
>100 mm	0.0
min size (mm)	31
max size (mm)	86
mean	63
mode	66

LOCATION 7 SANTA CRUZ ISLAND - FRY'S HARBOR

1986
Pisaster giganteus

(cases) N=	37
<40 mm	0.0
40 - 59	2.7%
60 - 79	2.7%
80 - 99	5.4%
100 - 119	37.8%
120 - 139	18.9%
140 - 159	10.8%
160 - 179	8.1%
180 - 199	2.7%
200 - 219	0.0
220 - 239	8.1%
240 - 259	0.0
260 - 279	2.7%
>279 mm	0.0
min size (mm)	58
max size (mm)	265
mean	132
mode	100

1987
Pisaster giganteus

(cases) N=	29
<40 mm	0.0
40 - 59	3.4%
60 - 79	6.9%
80 - 99	10.3%
100 - 119	44.8%
120 - 139	17.2%
140 - 159	0.0
160 - 179	6.9%
180 - 199	3.4%
200 - 219	3.4%
220 - 239	3.4%
240 - 259	0.0
>259 mm	0.0
min size (mm)	58
max size (mm)	220
mean	121
mode	115

1988
Pisaster giganteus

(cases) N=	43
<40 mm	0.0
40 - 59	0.0
60 - 79	4.7%
80 - 99	14.0%
100 - 119	20.9%
120 - 139	9.3%
140 - 159	16.3%
160 - 179	18.6%
180 - 199	9.3%
200 - 219	2.3%
220 - 239	2.3%
240 - 259	2.3%
260 - 279	0.0
>279 mm	0.0
min size (mm)	66
max size (mm)	252
mean	139
mode	99

1989
Pisaster giganteus

(cases) N=	29
<40 mm	0.0
40 - 59	3.4%
60 - 79	3.4%
80 - 99	10.3%
100 - 119	10.3%
120 - 139	17.2%
140 - 159	31.0%
160 - 179	20.7%
180 - 199	0.0
200 - 219	3.4%
220 - 239	0.0
240 - 259	0.0
>259 mm	0.0
min size (mm)	52
max size (mm)	207
mean	136
mode	89

LOCATION 7 SANTA CRUZ ISLAND - FRY'S HARBOR

1986
Lytechinus anamesus

(cases) N=	134
< 5 mm	0.7%
5 - 9	0.7%
10 - 14	44.8%
15 - 19	33.6%
20 - 24	10.4%
25 - 29	9.0%
30 - 34	0.7%
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	4
max size (mm)	30
mean	16
mode	14

1989
Lytechinus anamesus

(cases) N=	104
< 5 mm	0.0
5 - 9	1.0%
10 - 14	14.4%
15 - 19	32.7%
20 - 24	46.2%
25 - 29	4.8%
30 - 34	1.0%
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	9
max size (mm)	31
mean	19
mode	21

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
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LOCATION 7 SANTA CRUZ ISLAND - FRY'S HARBOR

1984
Strongylocentrotus franciscanus

(cases) N=	100
< 10 mm	0.0
10 - 14	0.0
15 - 19	2.0%
20 - 24	5.0%
25 - 29	1.0%
30 - 34	2.0%
35 - 39	0.0
40 - 44	1.0%
45 - 49	3.0%
50 - 54	0.0
55 - 59	2.0%
60 - 64	5.0%
65 - 69	6.0%
70 - 74	6.0%
75 - 79	7.0%
80 - 84	10.0%
85 - 89	10.0%
90 - 94	7.0%
95 - 99	6.0%
100 - 104	7.0%
105 - 109	7.0%
> 109 mm	12.0%
min size (mm)	17
max size (mm)	134
mean	81
mode	20

1985
Strongylocentrotus franciscanus

(cases) N=	101
< 10 mm	0.0
10 - 14	0.0
15 - 19	2.0%
20 - 24	0.0
25 - 29	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	1.0%
50 - 54	1.0%
55 - 59	3.0%
60 - 64	4.0%
65 - 69	8.9%
70 - 74	8.9%
75 - 79	5.0%
80 - 84	11.9%
85 - 89	10.9%
90 - 94	11.9%
95 - 99	10.9%
100 - 104	8.9%
105 - 109	5.9%
> 109 mm	4.0%
min size (mm)	17
max size (mm)	141
mean	85
mode	92

1986
Strongylocentrotus franciscanus

(cases) N=	90
< 10 mm	0.0
10 - 14	5.6%
15 - 19	16.7%
20 - 24	4.4%
25 - 29	5.6%
30 - 34	10.0%
35 - 39	4.4%
40 - 44	4.4%
45 - 49	6.7%
50 - 54	3.3%
55 - 59	0.0
60 - 64	3.3%
65 - 69	4.4%
70 - 74	3.3%
75 - 79	2.2%
80 - 84	5.6%
85 - 89	2.2%
90 - 94	6.7%
95 - 99	2.2%
100 - 104	3.3%
105 - 109	1.1%
> 109 mm	4.4%
min size (mm)	13
max size (mm)	122
mean	51
mode	18

1987
Strongylocentrotus franciscanus

(cases) N=	94
< 10 mm	0.0
10 - 14	0.0
15 - 19	1.1%
20 - 24	5.3%
25 - 29	9.6%
30 - 34	5.3%
35 - 39	5.3%
40 - 44	11.7%
45 - 49	4.3%
50 - 54	11.7%
55 - 59	2.1%
60 - 64	5.3%
65 - 69	3.2%
70 - 74	7.4%
75 - 79	3.2%
80 - 84	6.4%
85 - 89	8.5%
90 - 94	5.3%
95 - 99	2.1%
100 - 104	1.1%
105 - 109	1.1%
> 109 mm	0.0
min size (mm)	15
max size (mm)	105
mean	57
mode	29

LOCATION 7 SANTA CRUZ ISLAND - FRY'S HARBOR

1988 *Strongylocentrotus franciscanus*		1989 *Strongylocentrotus franciscanus*	
(cases) N=	102	(cases) N=	101
< 5 mm	0.0	< 5 mm	0.0
5 - 9	0.0	5 - 9	0.0
10 - 14	0.0	10 - 14	0.0
15 - 19	0.0	15 - 19	6.9%
20 - 24	2.0%	20 - 24	5.9%
25 - 29	2.0%	25 - 29	5.9%
30 - 34	2.9%	30 - 34	7.9%
35 - 39	7.8%	35 - 39	6.9%
40 - 44	9.8%	40 - 44	2.0%
45 - 49	11.8%	45 - 49	4.0%
50 - 54	12.7%	50 - 54	1.0%
55 - 59	3.9%	55 - 59	5.0%
60 - 64	8.8%	60 - 64	6.9%
65 - 69	9.8%	65 - 69	4.0%
70 - 74	3.9%	70 - 74	8.9%
75 - 79	5.9%	75 - 79	8.9%
80 - 84	5.9%	80 - 84	6.9%
85 - 89	4.9%	85 - 89	7.9%
90 - 94	3.9%	90 - 94	4.0%
95 - 99	1.0%	95 - 99	3.0%
100 - 104	0.0	100 - 104	1.0%
105 - 109	2.9%	105 - 109	1.0%
> 109 mm	0.0	> 109 mm	1.0%
min size (mm)	20	min size (mm)	15
max size (mm)	107	max size (mm)	112
mean	59	mean	59
mode	49	mode	74

LOCATION 7 SANTA CRUZ ISLAND - FRY'S HARBOR

1984
Srongylocentrotus purpuratus

(cases) N=	40
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	2.5%
20 - 24	15.0%
25 - 29	5.0%
30 - 34	5.0%
35 - 39	15.0%
40 - 44	12.5%
45 - 49	7.5%
50 - 54	7.5%
55 - 59	5.0%
60 - 64	7.5%
65 - 69	7.5%
70 - 74	10.0%
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	16
max size (mm)	71
mean	45
mode	24

1985
Srongylocentrotus purpuratus

(cases) N=	102
< 5 mm	0.0
5 - 9	2.9%
10 - 14	6.9%
15 - 19	9.8%
20 - 24	4.9%
25 - 29	1.0%
30 - 34	8.8%
35 - 39	9.8%
40 - 44	12.7%
45 - 49	10.8%
50 - 54	13.7%
55 - 59	10.8%
60 - 64	3.9%
65 - 69	2.0%
70 - 74	2.0%
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	5
max size (mm)	73
mean	39
mode	48

1986
Srongylocentrotus purpuratus

(cases) N=	105
< 5 mm	0.0
5 - 9	0.0
10 - 14	18.1%
15 - 19	35.2%
20 - 24	25.7%
25 - 29	15.2%
30 - 34	2.9%
35 - 39	1.0%
40 - 44	0.0
45 - 49	1.0%
50 - 54	1.0%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	10
max size (mm)	51
mean	20
mode	15

1987
Srongylocentrotus purpuratus

(cases) N=	109
< 5 mm	2.8%
5 - 9	0.0
10 - 14	3.7%
15 - 19	17.4%
20 - 24	26.6%
25 - 29	22.0%
30 - 34	14.7%
35 - 39	7.3%
40 - 44	1.8%
45 - 49	1.8%
50 - 54	1.8%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	4
max size (mm)	53
mean	25
mode	19

LOCATION 7 SANTA CRUZ ISLAND - FRY'S HARBOR

	1988 *Srongylocentrotus purpuratus*	1989 *Srongylocentrotus purpuratus*
(cases) N=	86	117
< 5 mm	0.0	0.9%
5 - 9	0.0	0.0
10 - 14	0.0	2.6%
15 - 19	2.3%	0.0
20 - 24	16.3%	8.5%
25 - 29	32.6%	34.2%
30 - 34	26.7%	32.5%
35 - 39	12.8%	10.3%
40 - 44	5.8%	7.7%
45 - 49	3.5%	1.7%
50 - 54	0.0	1.7%
55 - 59	0.0	0.0
60 - 64	0.0	0.0
65 - 69	0.0	0.0
70 - 74	0.0	0.0
75 - 79	0.0	0.0
80 - 84	0.0	0.0
85 - 89	0.0	0.0
90 - 94	0.0	0.0
95 - 99	0.0	0.0
100 - 104	0.0	0.0
105 - 109	0.0	0.0
> 109 mm	0.0	0.0
min size (mm)	17	4
max size (mm)	47	54
mean	30	30
mode	26	31

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LOCATION 8 SANTA CRUZ ISLAND - PELICAN BAY

1984
Haliotis corrugata

(cases) N=	31
< 25 mm	3.2%
25 - 29	3.2%
30 - 34	0.0
35 - 39	0.0
40 - 44	3.2%
45 - 49	0.0
50 - 54	0.0
55 - 59	3.2%
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	9.7%
95 - 99	3.2%
100 - 104	0.0
105 - 109	3.2%
110 - 114	3.2%
115 - 119	6.5%
120 - 124	12.9%
125 - 129	9.7%
130 - 134	6.5%
135 - 139	6.5%
140 - 144	9.7%
145 - 149	0.0
150 - 154	6.5%
155 - 159	6.5%
160 - 164	0.0
165 - 169	3.2%
> 169 mm	0.0
min size (mm)	22
max size (mm)	165
mean	116
mode	122

1985
Haliotis corrugata

(cases) N=	30
< 25 mm	13.3%
25 - 29	0.0
30 - 34	10.0%
35 - 39	13.3%
40 - 44	3.3%
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	3.3%
75 - 79	0.0
80 - 84	3.3%
85 - 89	0.0
90 - 94	0.0
95 - 99	6.7%
100 - 104	3.3%
105 - 109	0.0
110 - 114	0.0
115 - 119	10.0%
120 - 124	6.7%
125 - 129	3.3%
130 - 134	3.3%
135 - 139	0.0
140 - 144	6.7%
145 - 149	3.3%
150 - 154	3.3%
155 - 159	0.0
160 - 164	6.7%
165 - 169	0.0
> 169 mm	0.0
min size (mm)	14
max size (mm)	164
mean	86
mode	22

1986
Haliotis corrugata

(cases) N=	4
< 25 mm	50.0%
25 - 29	0.0
30 - 34	0.0
35 - 39	25.0%
40 - 44	0.0
45 - 129	0.0
130 - 134	0.0
135 - 139	25.0%
> 139 mm	0.0
min size (mm)	20
max size (mm)	135
mean	54
mode	20

LOCATION 8 SANTA CRUZ ISLAND - PELICAN BAY

1985
Cypraea spadicea

(cases) N=	30
< 30 mm	26.7%
30 - 34	3.3%
35 - 39	10.0%
40 - 44	23.3%
45 - 49	20.0%
50 - 54	16.7%
55 - 59	0.0
>59 mm	0.0
min size (mm)	20
max size (mm)	51
mean	39
mode	50

1987
Cypraea spadicea

(cases) N=	15
< 30 mm	0.0
30 - 34	6.7%
35 - 39	26.7%
40 - 44	20.0%
45 - 49	33.3%
50 - 54	13.3%
55 - 59	0.0
>59 mm	0.0
min size (mm)	33
max size (mm)	54
mean	43
mode	40

1988
Cypraea spadicea

(cases) N=	28
< 30 mm	0.0
30 - 34	3.6%
35 - 39	32.1%
40 - 44	28.6%
45 - 49	28.6%
50 - 54	7.1%
55 - 59	0.0
>59 mm	0.0
min size (mm)	34
max size (mm)	52
mean	42
mode	38

1989
Cypraea spadicea

(cases) N=	28
< 30 mm	0.0
30 - 34	7.1%
35 - 39	17.9%
40 - 44	39.3%
45 - 49	21.4%
50 - 54	7.1%
55 - 59	3.6%
>59 mm	3.6%
min size (mm)	32
max size (mm)	62
mean	43
mode	41

LOCATION 8 SANTA CRUZ ISLAND - PELICAN BAY

1984
Kelletia kelletii

(cases) N=	10
<40 mm	10.0%
40 - 49	0.0
50 - 59	0.0
60 - 69	10.0%
70 - 79	0.0
80 - 89	20.0%
90 - 99	10.0%
100 - 109	0.0
110 - 119	10.0%
120 - 129	20.0%
130 - 139	20.0%
140 - 149	0.0
>149 mm	0.0
min size (mm)	35
max size (mm)	135
mean	100
mode	35

1987
Kelletia kelletii

(cases) N=	17
<40 mm	0.0
40 - 49	5.9%
50 - 59	0.0
60 - 69	0.0
70 - 79	5.9%
80 - 89	5.9%
90 - 99	11.8%
100 - 109	29.4%
110 - 119	23.5%
120 - 129	5.9%
130 - 139	5.9%
140 - 149	5.9%
>149 mm	5.9%
min size (mm)	46
max size (mm)	144
mean	104
mode	101

1989
Kelletia kelletii

(cases) N=	15
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
100 - 109	6.7%
110 - 119	26.7%
120 - 129	40.0%
130 - 139	20.0%
140 - 149	6.7%
>149 mm	0.0
min size (mm)	105
max size (mm)	140
mean	122
mode	111

LOCATION 8 SANTA CRUZ ISLAND - PELICAN BAY

1984
Astraea undosa

(cases) N=	60
< 10 mm	0.0
10 - 19	0.0
20 - 29	1.7%
30 - 39	1.7%
40 - 49	8.3%
50 - 59	11.7%
60 - 69	41.7%
70 - 79	11.7%
80 - 89	16.7%
90 - 99	6.7%
>99 mm	0.0
min size (mm)	24
max size (mm)	96
mean	67
mode	64

1985
Astraea undosa

(cases) N=	33
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	15.2%
40 - 49	15.2%
50 - 59	42.4%
60 - 69	15.2%
70 - 79	9.1%
80 - 89	0.0
90 - 99	3.0%
>99 mm	0.0
min size (mm)	30
max size (mm)	90
mean	55
mode	47

1986
Astraea undosa

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	3.3%
50 - 59	66.7%
60 - 69	23.3%
70 - 79	0.0
80 - 89	0.0
90 - 99	6.7%
>99 mm	0.0
min size (mm)	47
max size (mm)	95
mean	59
mode	58

1987
Astraea undosa

(cases) N=	31
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	19.4%
50 - 59	64.5%
60 - 69	12.9%
70 - 79	3.2%
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	42
max size (mm)	78
mean	56
mode	56

1988
Astraea undosa

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	76.7%
60 - 69	23.3%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	51
max size (mm)	67
mean	58
mode	54

1989
Astraea undosa

(cases) N=	50
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	6.0%
60 - 69	82.0%
70 - 79	8.0%
80 - 89	2.0%
90 - 99	2.0%
>99 mm	0.0
min size (mm)	57
max size (mm)	90
mean	65
mode	62

LOCATION 8 SANTA CRUZ ISLAND - PELICAN BAY

1984
Megathura crenulata

(cases) N=	15
< 30 mm	0.0
30 - 39	0.0
40 - 49	6.7%
50 - 59	0.0
60 - 69	0.0
70 - 79	13.3%
80 - 89	46.7%
90 - 99	33.3%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	49
max size (mm)	95
mean	82
mode	82

1985
Megathura crenulata

(cases) N=	26
< 30 mm	0.0
30 - 39	3.8%
40 - 49	19.2%
50 - 59	19.2%
60 - 69	15.4%
70 - 79	15.4%
80 - 89	19.2%
90 - 99	0.0
100 - 109	3.8%
110 - 119	3.8%
>119 mm	0.0
min size (mm)	30
max size (mm)	110
mean	66
mode	43

1986
Megathura crenulata

(cases) N=	16
< 20 mm	0.0
20 - 29	6.3%
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	25.0%
80 - 89	18.8%
90 - 99	18.8%
100 - 109	6.3%
110 - 119	18.8%
>119 mm	6.3%
min size (mm)	25
max size (mm)	127
mean	90
mode	25

1987
Megathura crenulata

(cases) N=	36
< 10 mm	0.0
10 - 19	0.0
20 - 29	8.3%
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	13.9%
70 - 79	30.6%
80 - 89	36.1%
90 - 99	8.3%
100 - 109	2.8%
110 - 119	0.0
>119 mm	0.0
min size (mm)	20
max size (mm)	101
mean	75
mode	76

1988
Megathura crenulata

(cases) N=	14
< 10 mm	0.0
10 - 19	14.3%
20 - 29	0.0
30 - 39	0.0
40 - 49	7.1%
50 - 59	7.1%
60 - 69	21.4%
70 - 79	35.7%
80 - 89	14.3%
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	16
max size (mm)	82
mean	62
mode	71

LOCATION 8 SANTA CRUZ ISLAND - PELICAN BAY

1984
Hinnites giganteus

(cases) N=	30
< 10 mm	0.0
10 - 19	3.3%
20 - 29	0.0
30 - 39	10.0%
40 - 49	26.7%
50 - 59	26.7%
60 - 69	20.0%
70 - 79	6.7%
80 - 89	3.3%
90 - 99	3.3%
100 - 109	0.0
110 - 119	0.0
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	16
max size (mm)	90
mean	54
mode	35

1985
Hinnites giganteus

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	3.3%
30 - 39	10.0%
40 - 49	16.7%
50 - 59	16.7%
60 - 69	20.0%
70 - 79	13.3%
80 - 89	10.0%
90 - 99	6.7%
100 - 109	3.3%
110 - 119	0.0
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	25
max size (mm)	103
mean	61
mode	53

1986
Hinnites giganteus

(cases) N=	36
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	5.6%
40 - 49	8.3%
50 - 59	11.1%
60 - 69	13.9%
70 - 79	25.0%
80 - 89	13.9%
90 - 99	11.1%
100 - 109	2.8%
110 - 119	8.3%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	30
max size (mm)	117
mean	74
mode	73

1987
Hinnites giganteus

(cases) N=	36
< 10 mm	0.0
10 - 19	2.8%
20 - 29	0.0
30 - 39	0.0
40 - 49	2.8%
50 - 59	16.7%
60 - 69	16.7%
70 - 79	16.7%
80 - 89	8.3%
90 - 99	13.9%
100 - 109	11.1%
110 - 119	8.3%
120 - 129	2.8%
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	15
max size (mm)	121
mean	79
mode	60

LOCATION 8 SANTA CRUZ ISLAND - PELICAN BAY

1988 *Hinnites giganteus*		1989 *Hinnites giganteus*	
(cases) N=	23	(cases) N=	35
< 10 mm	0.0	< 10 mm	2.9%
10 - 19	0.0	10 - 19	0.0
20 - 29	0.0	20 - 29	2.9%
30 - 39	0.0	30 - 39	8.6%
40 - 49	0.0	40 - 49	8.6%
50 - 59	0.0	50 - 59	17.1%
60 - 69	4.3%	60 - 69	8.6%
70 - 79	13.0%	70 - 79	14.3%
80 - 89	26.1%	80 - 89	14.3%
90 - 99	17.4%	90 - 99	11.4%
100 - 109	21.7%	100 - 109	0.0
110 - 119	8.7%	110 - 119	5.7%
120 - 129	8.7%	120 - 129	5.7%
130 - 139	0.0	130 - 139	0.0
140 - 149	0.0	140 - 149	0.0
>149 mm	0.0	>149 mm	0.0
min size (mm)	68	min size (mm)	0
max size (mm)	129	max size (mm)	123
mean	94	mean	69
mode	81	mode	52

LOCATION 8 SANTA CRUZ ISLAND - PELICAN BAY

1985
Patiria miniata

(cases) N=	16
< 10 mm	6.3%
10 - 19	56.3%
20 - 29	12.5%
30 - 39	6.3%
40 - 49	6.3%
50 - 59	6.3%
60 - 69	6.3%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	9
max size (mm)	63
mean	24
mode	14

1988
Patiria miniata

(cases) N=	18
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	5.6%
40 - 49	27.8%
50 - 59	38.9%
60 - 69	22.2%
70 - 79	5.6%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	30
max size (mm)	75
mean	54
mode	45

1989

Patiria miniata

(cases) N=	44
< 10 mm	0.0
10 - 19	6.8%
20 - 29	4.5%
30 - 39	6.8%
40 - 49	11.4%
50 - 59	43.2%
60 - 69	15.9%
70 - 79	9.1%
80 - 89	2.3%
90 - 99	0.0
>100 mm	0.0
min size (mm)	12
max size (mm)	85
mean	52
mode	56

LOCATION 8 SANTA CRUZ ISLAND - PELICAN BAY

1987
Pisaster giganteus

(cases) N=	15
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	13.3%
80 - 99	13.3%
100 - 119	0.0
120 - 139	26.7%
140 - 159	13.3%
160 - 179	6.7%
180 - 199	13.3%
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	13.3%
min size (mm)	72
max size (mm)	330
mean	155
mode	72

1988
Pisaster giganteus

(cases) N=	26
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	0.0
80 - 99	11.5%
100 - 119	26.9%
120 - 139	0.0
140 - 159	15.4%
160 - 179	15.4%
180 - 199	7.7%
200 - 219	3.8%
220 - 239	7.7%
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	11.5%
min size (mm)	90
max size (mm)	323
mean	167
mode	110

1989
Pisaster giganteus

(cases) N=	29
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	0.0
80 - 99	0.0
100 - 119	3.4%
120 - 139	13.8%
140 - 159	10.3%
160 - 179	17.2%
180 - 199	20.7%
200 - 219	20.7%
220 - 239	3.4%
240 - 259	6.9%
260 - 279	3.4%
280 - 299	0.0
>299 mm	0.0
min size (mm)	114
max size (mm)	260
mean	180
mode	185

LOCATION 8 SANTA CRUZ ISLAND - PELICAN BAY

1986
Lytechinus anamesus

(cases) N=	113
< 5 mm	0.0
5 - 9	0.0
10 - 14	4.4%
15 - 19	12.4%
20 - 24	44.2%
25 - 29	37.2%
30 - 34	1.8%
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	10
max size (mm)	31
mean	23
mode	25

1987
Lytechinus anamesus

(cases) N=	115
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.9%
15 - 19	16.5%
20 - 24	49.6%
25 - 29	28.7%
30 - 34	4.3%
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	11
max size (mm)	31
mean	23
mode	22

1988
Lytechinus anamesus

(cases) N=	99
< 5 mm	0.0
5 - 9	0.0
10 - 14	1.0%
15 - 19	28.3%
20 - 24	48.5%
25 - 29	21.2%
30 - 34	1.0%
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	13
max size (mm)	30
mean	21
mode	20

1989
Lytechinus anamesus

(cases) N=	100
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	2.0%
20 - 24	66.0%
25 - 29	32.0%
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	16
max size (mm)	29
mean	24
mode	24

LOCATION 8 SANTA CRUZ ISLAND - PELICAN BAY

1984
Strongylocentrotus franciscanus

(cases) N=	107
< 5 mm	0.0
5 - 9	0.9%
10 - 14	0.9%
15 - 19	0.9%
20 - 24	5.6%
25 - 29	0.9%
30 - 34	8.4%
35 - 39	5.6%
40 - 44	5.6%
45 - 49	8.4%
50 - 54	4.7%
55 - 59	4.7%
60 - 64	6.5%
65 - 69	6.5%
70 - 74	4.7%
75 - 79	5.6%
80 - 84	8.4%
85 - 89	4.7%
90 - 94	5.6%
95 - 99	1.9%
100 - 104	3.7%
105 - 109	0.9%
> 109 mm	4.7%
min size (mm)	9
max size (mm)	125
mean	63
mode	49

1985
Strongylocentrotus franciscanus

(cases) N=	132
< 14 mm	0.0
15 - 19	0.8%
20 - 24	0.8%
25 - 29	0.0
30 - 34	2.3%
35 - 39	2.3%
40 - 44	3.0%
45 - 49	3.8%
50 - 54	7.6%
55 - 59	9.8%
60 - 64	6.1%
65 - 69	6.1%
70 - 74	15.2%
75 - 79	9.1%
80 - 84	11.4%
85 - 89	9.8%
90 - 94	4.5%
95 - 99	5.3%
100 - 104	1.5%
105 - 109	0.0
> 109 mm	0.8%
min size (mm)	17
max size (mm)	115
mean	70
mode	73

1986
Strongylocentrotus franciscanus

(cases) N=	106
< 14 mm	0.0
15 - 19	0.0
20 - 24	0.9%
25 - 29	1.9%
30 - 34	2.8%
35 - 39	4.7%
40 - 44	5.7%
45 - 49	3.8%
50 - 54	5.7%
55 - 59	9.4%
60 - 64	5.7%
65 - 69	7.5%
70 - 74	12.3%
75 - 79	5.7%
80 - 84	10.4%
85 - 89	8.5%
90 - 94	9.4%
95 - 99	3.8%
100 - 104	0.9%
105 - 109	0.9%
> 109 mm	0.0
min size (mm)	24
max size (mm)	105
mean	68
mode	72

1987
Strongylocentrotus franciscanus

(cases) N=	108
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.9%
20 - 24	19.4%
25 - 29	22.2%
30 - 34	15.7%
35 - 39	10.2%
40 - 44	4.6%
45 - 49	2.8%
50 - 54	4.6%
55 - 59	3.7%
60 - 64	0.0
65 - 69	1.9%
70 - 74	1.9%
75 - 79	4.6%
80 - 84	3.7%
85 - 89	0.9%
90 - 94	0.9%
95 - 99	0.9%
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.9%
min size (mm)	19
max size (mm)	116
mean	40
mode	24

LOCATION 8 SANTA CRUZ ISLAND - PELICAN BAY

1988 *Strongylocentrotus franciscanus*		1989 *Strongylocentrotus franciscanus*	
(cases) N=	95	(cases) N=	97
< 5 mm	0.0	< 5 mm	0.0
5 - 9	0.0	5 - 9	0.0
10 - 14	0.0	10 - 14	0.0
15 - 19	0.0	15 - 19	0.0
20 - 24	0.0	20 - 24	0.0
25 - 29	5.3%	25 - 29	1.0%
30 - 34	10.5%	30 - 34	0.0
35 - 39	12.6%	35 - 39	1.0%
40 - 44	13.7%	40 - 44	2.1%
45 - 49	13.7%	45 - 49	5.2%
50 - 54	10.5%	50 - 54	14.4%
55 - 59	10.5%	55 - 59	19.6%
60 - 64	11.6%	60 - 64	15.5%
65 - 69	6.3%	65 - 69	15.5%
70 - 74	3.2%	70 - 74	13.4%
75 - 79	1.1%	75 - 79	3.1%
80 - 84	1.1%	80 - 84	7.2%
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	2.1%
95 - 99	0.0	95 - 99	0.0
100 - 104	0.0	100 - 104	0.0
105 - 109	0.0	105 - 109	0.0
> 109 mm	0.0	> 109 mm	0.0
min size (mm)	25	min size (mm)	29
max size (mm)	83	max size (mm)	91
mean	48	mean	62
mode	45	mode	59

LOCATION 8 SANTA CRUZ ISLAND - PELICAN BAY

1984 *Srongylocentrotus purpuratus*		1985 *Srongylocentrotus purpuratus*	
(cases) N=	113	(cases) N=	110
< 5 mm	0.0	< 5 mm	0.0
5 - 9	0.0	5 - 9	0.0
10 - 14	0.9%	10 - 14	0.0
15 - 19	5.3%	15 - 19	1.8%
20 - 24	8.8%	20 - 24	0.9%
25 - 29	7.1%	25 - 29	9.1%
30 - 34	21.2%	30 - 34	22.7%
35 - 39	15.0%	35 - 39	26.4%
40 - 44	23.0%	40 - 44	12.7%
45 - 49	13.3%	45 - 49	16.4%
50 - 54	5.3%	50 - 54	7.3%
55 - 59	0.0	55 - 59	2.7%
60 - 64	0.0	60 - 64	0.0
65 - 69	0.0	65 - 69	0.0
70 - 74	0.0	70 - 74	0.0
75 - 79	0.0	75 - 79	0.0
80 - 84	0.0	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	0.0
95 - 99	0.0	95 - 99	0.0
> 99 mm	0.0	> 99 mm	0.0
min size (mm)	12	min size (mm)	15
max size (mm)	53	max size (mm)	59
mean	36	mean	38
mode	43	mode	37

LOCATION 8 SANTA CRUZ ISLAND - PELICAN BAY

1986
Srongylocentrotus purpuratus

(cases) N=	107
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.9%
15 - 19	6.5%
20 - 24	11.2%
25 - 29	11.2%
30 - 34	16.8%
35 - 39	21.5%
40 - 44	21.5%
45 - 49	8.4%
50 - 54	1.9%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	12
max size (mm)	51
mean	34
mode	41

1987
Srongylocentrotus purpuratus

(cases) N=	102
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	7.8%
20 - 24	44.1%
25 - 29	30.4%
30 - 34	5.9%
35 - 39	3.9%
40 - 44	5.9%
45 - 49	2.0%
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	15
max size (mm)	47
mean	26
mode	22

1988
Srongylocentrotus purpuratus

(cases) N=	198
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.5%
15 - 19	0.5%
20 - 24	12.1%
25 - 29	29.8%
30 - 34	27.3%
35 - 39	17.2%
40 - 44	10.6%
45 - 49	2.0%
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	11
max size (mm)	47
mean	31
mode	28

1989
Srongylocentrotus purpuratus

(cases) N=	103
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	1.0%
20 - 24	1.0%
25 - 29	9.7%
30 - 34	37.9%
35 - 39	34.0%
40 - 44	9.7%
45 - 49	5.8%
50 - 54	1.0%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	17
max size (mm)	53
mean	35
mode	32

LOCATION 9 SANTA CRUZ ISLAND - SCORPION ANCHORAGE

1986
Tethya aurantia

(cases) N=	15
< 10 mm	0.0
10 - 19	0.0
20 - 29	6.7%
30 - 39	26.7%
40 - 49	26.7%
50 - 59	26.7%
60 - 69	6.7%
70 - 79	0.0
80 - 89	0.0
90 - 99	6.7%
>99 mm	0.0
min size (mm)	25
max size (mm)	91
mean	48
mode	50

1988
Tethya aurantia

(cases) N=	23
< 10 mm	0.0
10 - 19	0.0
20 - 29	13.0%
30 - 39	13.0%
40 - 49	34.8%
50 - 59	26.1%
60 - 69	13.0%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	23
max size (mm)	68
mean	46
mode	32

mode 140

LOCATION 9 SANTA CRUZ ISLAND - SCORPION ANCHORAGE

1984
Haliotis corrugata

(cases) N=	35
< 25 mm	0.0
25 - 29	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	5.7%
70 - 74	0.0
75 - 79	2.9%
80 - 84	2.9%
85 - 89	0.0
90 - 94	2.9%
95 - 99	2.9%
100 - 104	2.9%
105 - 109	0.0
110 - 114	2.9%
115 - 119	5.7%
120 - 124	5.7%
125 - 129	11.4%
130 - 134	8.6%
135 - 139	5.7%
140 - 144	17.1%
145 - 149	11.4%
150 - 154	8.6%
155 - 159	2.9%
160 - 164	0.0
165 - 169	0.0
170 - 174	0.0
175 - 179	0.0
180 - 184	0.0
185 - 189	0.0
190 - 194	0.0
195 - 199	0.0
> 199 mm	0.0
min size (mm)	65
max size (mm)	158
mean	125

1985
Haliotis corrugata

(cases) N=	34
< 25 mm	2.9%
25 - 29	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	5.9%
70 - 74	5.9%
75 - 79	2.9%
80 - 84	0.0
85 - 89	0.0
90 - 94	2.9%
95 - 99	2.9%
100 - 104	0.0
105 - 109	2.9%
110 - 114	0.0
115 - 119	2.9%
120 - 124	5.9%
125 - 129	8.8%
130 - 134	8.8%
135 - 139	14.7%
140 - 144	5.9%
145 - 149	5.9%
150 - 154	14.7%
155 - 159	2.9%
160 - 164	2.9%
165 - 169	0.0
170 - 174	0.0
175 - 179	0.0
180 - 184	0.0
185 - 189	0.0
190 - 194	0.0
195 - 199	0.0
> 199 mm	0.0
min size (mm)	19
max size (mm)	161
mean	122
mode	138

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies
LOCATION 9 SANTA CRUZ ISLAND - SCORPION ANCHORAGE

	1986 *Haliotis corrugata*	1987 *Haliotis corrugata*
(cases) N=	30	9
< 25 mm	0.0	0.0
25 - 29	0.0	0.0
30 - 34	3.3%	0.0
35 - 39	0.0	0.0
40 - 44	0.0	0.0
45 - 49	10.0%	0.0
50 - 54	0.0	0.0
55 - 59	0.0	0.0
60 - 64	0.0	0.0
65 - 69	6.7%	0.0
70 - 74	3.3%	0.0
75 - 79	0.0	0.0
80 - 84	0.0	0.0
85 - 89	3.3%	0.0
90 - 94	0.0	0.0
95 - 99	0.0	0.0
100 - 104	10.0%	0.0
105 - 109	13.3%	0.0
110 - 114	13.3%	0.0
115 - 119	13.3%	11.1%
120 - 124	0.0	11.1%
125 - 129	0.0	22.2%
130 - 134	10.0%	11.1%
135 - 139	6.7%	22.2%
140 - 144	0.0	11.1%
145 - 149	6.7%	11.1%
150 - 154	0.0	0.0
155 - 159	0.0	0.0
160 - 164	0.0	0.0
165 - 169	0.0	0.0
170 - 174	0.0	0.0
175 - 179	0.0	0.0
180 - 184	0.0	0.0
185 - 189	0.0	0.0
190 - 194	0.0	0.0
195 - 199	0.0	0.0
> 199 mm	0.0	0.0
min size (mm)	30	117
max size (mm)	149	149
mean	103	132
mode	49	117

LOCATION 9 SANTA CRUZ ISLAND - SCORPION ANCHORAGE

1985
Cypraea spadicea

(cases) N=	31
< 30 mm	3.2%
30 - 34	12.9%
35 - 39	12.9%
40 - 44	22.6%
45 - 49	19.4%
50 - 54	19.4%
55 - 59	9.7%
>59 mm	0.0
min size (mm)	29
max size (mm)	58
mean	44
mode	50

1986
Cypraea spadicea

(cases) N=	40
< 30 mm	12.5%
30 - 34	5.0%
35 - 39	10.0%
40 - 44	40.0%
45 - 49	17.5%
50 - 54	10.0%
55 - 59	5.0%
>59 mm	0.0
min size (mm)	16
max size (mm)	55
mean	41
mode	43

1987
Cypraea spadicea

(cases) N=	38
< 30 mm	0.0
30 - 34	15.8%
35 - 39	13.2%
40 - 44	34.2%
45 - 49	18.4%
50 - 54	18.4%
55 - 59	0.0
>59 mm	0.0
min size (mm)	31
max size (mm)	54
mean	43
mode	44

1988
Cypraea spadicea

(cases) N=	27
< 30 mm	0.0
30 - 34	3.7%
35 - 39	18.5%
40 - 44	33.3%
45 - 49	29.6%
50 - 54	11.1%
55 - 59	3.7%
>59 mm	0.0
min size (mm)	32
max size (mm)	55
mean	44
mode	43

1989
Cypraea spadicea

(cases) N=	21
< 30 mm	0.0
30 - 34	4.8%
35 - 39	28.6%
40 - 44	14.3%
45 - 49	42.9%
50 - 54	9.5%
55 - 59	0.0
>59 mm	0.0
min size (mm)	34
max size (mm)	52
mean	43
mode	36

LOCATION 9 SANTA CRUZ ISLAND - SCORPION ANCHORAGE

1984
Astraea undosa

(cases) N=	57
< 20 mm	0.0
20 - 29	5.3%
30 - 39	10.5%
40 - 49	3.5%
50 - 59	21.1%
60 - 69	17.5%
70 - 79	8.8%
80 - 89	19.3%
90 - 99	12.3%
100 - 109	1.8%
110 - 119	0.0
>119 mm	0.0
min size (mm)	24
max size (mm)	101
mean	66
mode	59

1985
Astraea undosa

(cases) N=	30
< 10 mm	0.0
10 - 19	3.3%
20 - 29	3.3%
30 - 39	10.0%
40 - 49	6.7%
50 - 59	26.7%
60 - 69	16.7%
70 - 79	20.0%
80 - 89	3.3%
90 - 99	6.7%
100 - 109	3.3%
>109 mm	0.0
min size (mm)	17
max size (mm)	102
mean	59
mode	51

1986
Astraea undosa

(cases) N=	30
< 20 mm	0.0
20 - 29	20.0%
30 - 39	16.7%
40 - 49	26.7%
50 - 59	10.0%
60 - 69	13.3%
70 - 79	6.7%
80 - 89	6.7%
90 - 99	0.0
>99 mm	0.0
min size (mm)	20
max size (mm)	89
mean	47
mode	49

1987
Astraea undosa

(cases) N=	30
< 20 mm	0.0
20 - 29	0.0
30 - 39	3.3%
40 - 49	33.3%
50 - 59	23.3%
60 - 69	26.7%
70 - 79	6.7%
80 - 89	3.3%
90 - 99	3.3%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	39
max size (mm)	94
mean	57
mode	53

1988
Astraea undosa

(cases) N=	30
< 20 mm	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	16.7%
60 - 69	60.0%
70 - 79	23.3%
80 - 89	0.0
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	51
max size (mm)	78
mean	64
mode	61

1989
Astraea undosa

(cases) N=	30
< 20 mm	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	23.3%
60 - 69	63.3%
70 - 79	13.3%
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	54
max size (mm)	74
mean	64
mode	63

LOCATION 9 SANTA CRUZ ISLAND - SCORPION ANCHORAGE

1984
Megathura crenulata

(cases) N=	46
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	2.2%
50 - 59	8.7%
60 - 69	15.2%
70 - 79	47.8%
80 - 89	23.9%
90 - 99	2.2%
>99 mm	0.0
min size (mm)	49
max size (mm)	90
mean	73
mode	76

1985
Megathura crenulata

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	23.3%
60 - 69	20.0%
70 - 79	36.7%
80 - 89	16.7%
90 - 99	3.3%
>99 mm	0.0
min size (mm)	51
max size (mm)	93
mean	70
mode	55

1986
Megathura crenulata

(cases) N=	30
< 30 mm	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	20.0%
70 - 79	16.7%
80 - 89	33.3%
90 - 99	20.0%
100 - 109	6.7%
110 - 119	3.3%
>119 mm	0.0
min size (mm)	60
max size (mm)	119
mean	83
mode	81

1987
Megathura crenulata

(cases) N=	29
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	6.9%
70 - 79	37.9%
80 - 89	44.8%
90 - 99	10.3%
>99 mm	0.0
min size (mm)	66
max size (mm)	95
mean	80
mode	82

1988
Megathura crenulata

(cases) N=	52
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	23.1%
60 - 69	46.2%
70 - 79	26.9%
80 - 89	3.8%
90 - 99	0.0
>99 mm	0.0
min size (mm)	50
max size (mm)	83
mean	65
mode	62

1989
Megathura crenulata

(cases) N=	34
< 10 mm	0.0
10 - 19	0.0
20 - 29	2.9%
30 - 39	0.0
40 - 49	0.0
50 - 59	8.8%
60 - 69	20.6%
70 - 79	50.0%
80 - 89	17.6%
90 - 99	0.0
>99 mm	0.0
min size (mm)	25
max size (mm)	87
mean	71
mode	73

LOCATION 9 SANTA CRUZ ISLAND - SCORPION ANCHORAGE

1984
Hinnites giganteus

(cases) N=	16
< 30 mm	0.0
30 - 39	25.0%
40 - 49	25.0%
50 - 59	18.8%
60 - 69	25.0%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
100 - 109	6.3%
>109 mm	0.0
min size (mm)	30
max size (mm)	101
mean	53
mode	46

1985
Hinnites giganteus

(cases) N=	17
< 20 mm	0.0
20 - 29	11.8%
30 - 39	0.0
40 - 49	35.3%
50 - 59	5.9%
60 - 69	11.8%
70 - 79	17.6%
80 - 89	5.9%
90 - 99	5.9%
100 - 109	0.0
110 - 119	5.9%
>119 mm	0.0
min size (mm)	26
max size (mm)	111
mean	59
mode	42

1986
Hinnites giganteus

(cases) N=	33
< 20 mm	0.0
20 - 29	9.1%
30 - 39	21.2%
40 - 49	9.1%
50 - 59	27.3%
60 - 69	6.1%
70 - 79	12.1%
80 - 89	0.0
90 - 99	0.0
100 - 109	12.1%
110 - 119	0.0
120 - 129	3.0%
>129 mm	0.0
min size (mm)	20
max size (mm)	120
mean	57
mode	34

1988
Hinnites giganteus

(cases) N=	16
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	12.5%
40 - 49	6.3%
50 - 59	12.5%
60 - 69	6.3%
70 - 79	12.5%
80 - 89	18.8%
90 - 99	18.8%
100 - 109	12.5%
110 - 119	0.0
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	36
max size (mm)	108
mean	73
mode	36

1989
Hinnites giganteus

(cases) N=	32
< 10 mm	0.0
10 - 19	3.1%
20 - 29	12.5%
30 - 39	34.4%
40 - 49	18.8%
50 - 59	12.5%
60 - 69	6.3%
70 - 79	6.3%
80 - 89	3.1%
90 - 99	3.1%
100 - 109	0.0
110 - 119	0.0
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	16
max size (mm)	95
mean	45
mode	38

Channel Islands National Park Kelp Forest Monitoring 1982-1989
Size Frequencies
LOCATION 9 SANTA CRUZ ISLAND - SCORPION ANCHORAGE

1985
Patiria miniata

(cases) N=	11
< 10 mm	18.2%
10 - 19	18.2%
20 - 29	45.5%
30 - 39	9.1%
40 - 49	0.0
50 - 59	0.0
60 - 69	9.1%
70 - 79	0.0
>80 mm	0.0
min size (mm)	5
max size (mm)	66
mean	23
mode	21

1987
Patiria miniata

(cases) N=	26
< 10 mm	0.0
10 - 19	3.8%
20 - 29	46.2%
30 - 39	11.5%
40 - 49	11.5%
50 - 59	26.9%
60 - 69	0.0
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	16
max size (mm)	55
mean	36
mode	26

1988
Patiria miniata

(cases) N=	21
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	28.6%
40 - 49	9.5%
50 - 59	23.8%
60 - 69	14.3%
70 - 79	23.8%
>80 mm	0.0
min size (mm)	31
max size (mm)	77
mean	54
mode	32

1989
Patiria miniata

(cases) N=	55
< 10 mm	0.0
10 - 19	10.9%
20 - 29	3.6%
30 - 39	7.3%
40 - 49	9.1%
50 - 59	27.3%
60 - 69	23.6%
70 - 79	7.3%
80 - 89	7.3%
90 - 99	3.6%
>100 mm	0.0
min size (mm)	11
max size (mm)	99
mean	54
mode	56

LOCATION 9 SANTA CRUZ ISLAND - SCORPION ANCHORAGE

1986
Pisaster giganteus

(cases) N=	12
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	0.0
80 - 99	8.3%
100 - 119	41.7%
120 - 139	8.3%
140 - 159	41.7%
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	95
max size (mm)	157
mean	128
mode	109

1988
Pisaster giganteus

(cases) N=	15
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	0.0
80 - 99	0.0
100 - 119	13.3%
120 - 139	46.7%
140 - 159	13.3%
160 - 179	6.7%
180 - 199	13.3%
200 - 219	6.7%
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	113
max size (mm)	210
mean	147
mode	135

1989
Pisaster giganteus

(cases) N=	23
<20 mm	8.7%
20 - 39	21.7%
40 - 59	0.0
60 - 79	8.7%
80 - 99	8.7%
100 - 119	0.0
120 - 139	8.7%
140 - 159	26.1%
160 - 179	4.3%
180 - 199	0.0
200 - 219	4.3%
220 - 239	4.3%
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	4.3%
min size (mm)	14
max size (mm)	305
mean	111
mode	30

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies
LOCATION 9 SANTA CRUZ ISLAND - SCORPION ANCHORAGE

1984
Strongylocentrotus franciscanus

(cases) N=	130
< 14 mm	0.0
15 - 19	2.3%
20 - 24	0.8%
25 - 29	2.3%
30 - 34	0.8%
35 - 39	6.2%
40 - 44	3.8%
45 - 49	4.6%
50 - 54	6.2%
55 - 59	10.8%
60 - 64	10.0%
65 - 69	8.5%
70 - 74	9.2%
75 - 79	7.7%
80 - 84	10.8%
85 - 89	3.8%
90 - 94	6.9%
95 - 99	1.5%
100 - 104	2.3%
105 - 109	0.0
> 109 mm	0.8%
min size (mm)	15
max size (mm)	112
mean	65
mode	70

1985
Strongylocentrotus franciscanus

(cases) N=	127
< 14 mm	0.0
15 - 19	0.0
20 - 24	0.0
25 - 29	0.0
30 - 34	2.4%
35 - 39	3.9%
40 - 44	5.5%
45 - 49	11.0%
50 - 54	7.1%
55 - 59	7.9%
60 - 64	15.0%
65 - 69	5.5%
70 - 74	10.2%
75 - 79	7.9%
80 - 84	11.8%
85 - 89	2.4%
90 - 94	5.5%
95 - 99	0.8%
100 - 104	0.8%
105 - 109 mm	1.6%
> 109 mm	0.0.
min size (mm)	30
max size (mm)	117
mean	65
mode	60

1986
Strongylocentrotus franciscanus

(cases) N=	101
< 14 mm	0.0
15 - 19	4.0%
20 - 24	14.9%
25 - 29	16.8%
30 - 34	3.0%
35 - 39	5.9%
40 - 44	5.0%
45 - 49	2.0%
50 - 54	4.0%
55 - 59	10.9%
60 - 64	5.9%
65 - 69	8.9%
70 - 74	3.0%
75 - 79	3.0%
80 - 84	3.0%
85 - 89	3.0%
90 - 94	5.0%
95 - 99	2.0%
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	16
max size (mm)	97
mean	48
mode	22

1987
Strongylocentrotus franciscanus

(cases) N=	118
< 14 mm	0.0
15 - 19	0.0
20 - 24	8.5%
25 - 29	36.4%
30 - 34	26.3%
35 - 39	5.9%
40 - 44	1.7%
45 - 49	2.5%
50 - 54	2.5%
55 - 59	0.8%
60 - 64	2.5%
65 - 69	3.4%
70 - 74	5.9%
75 - 79	0.8%
80 - 84	0.8%
85 - 89	0.8%
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.8%
> 109 mm	0.0
min size (mm)	22
max size (mm)	106
mean	37
mode	26

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 9 SANTA CRUZ ISLAND - SCORPION ANCHORAGE

1988
Strongylocentrotus franciscanus

(cases) N=	110
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	0.0
25 - 29	9.1%
30 - 34	26.4%
35 - 39	29.1%
40 - 44	10.0%
45 - 49	8.2%
50 - 54	4.5%
55 - 59	6.4%
60 - 64	3.6%
65 - 69	0.0
70 - 74	1.8%
75 - 79	0.0
80 - 84	0.9%
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	26
max size (mm)	83
mean	40
mode	35

1989
Strongylocentrotus franciscanus

(cases) N=	109
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	0.9%
25 - 29	0.0
30 - 34	22.0%
35 - 39	39.4%
40 - 44	11.9%
45 - 49	5.5%
50 - 54	5.5%
55 - 59	1.8%
60 - 64	0.9%
65 - 69	1.8%
70 - 74	2.8%
75 - 79	2.8%
80 - 84	1.8%
85 - 89	0.0
90 - 94	2.8%
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	22
max size (mm)	93
mean	43
mode	36

LOCATION 9 SANTA CRUZ ISLAND - SCORPION ANCHORAGE

1984
Srongylocentrotus purpuratus

(cases) N=	144
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.7%
15 - 19	0.0
20 - 24	4.2%
25 - 29	4.2%
30 - 34	10.4%
35 - 39	11.1%
40 - 44	16.7%
45 - 49	26.4%
50 - 54	16.0%
55 - 59	7.6%
60 - 64	1.4%
65 - 69	0.7%
70 - 74	0.7%
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	12
max size (mm)	71
mean	43
mode	47

1985
Srongylocentrotus purpuratus

(cases) N=	123
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	0.0
25 - 29	0.0
30 - 34	1.6%
35 - 39	4.9%
40 - 44	8.9%
45 - 49	23.6%
50 - 54	30.1%
55 - 59	21.1%
60 - 64	7.3%
65 - 69	2.4%
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	30
max size (mm)	65
mean	51
mode	52

1986
Srongylocentrotus purpuratus

(cases) N=	101
< 5 mm	0.0
5 - 9	0.0
10 - 14	3.0%
15 - 19	12.9%
20 - 24	37.6%
25 - 29	5.0%
30 - 34	3.0%
35 - 39	4.0%
40 - 44	12.9%
45 - 49	5.0%
50 - 54	8.9%
55 - 59	5.0%
60 - 64	2.0%
65 - 69	0.0
70 - 74	1.0%
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	10
max size (mm)	70
mean	32
mode	21

1987
Srongylocentrotus purpuratus

(cases) N=	106
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	14.2%
25 - 29	58.5%
30 - 34	16.0%
35 - 39	7.5%
40 - 44	1.9%
45 - 49	1.9%
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	21
max size (mm)	49
mean	28
mode	26

Channel Islands National Park   Kelp Forest Monitoring 1982-1989

Size Frequencies

LOCATION 9 SANTA CRUZ ISLAND - SCORPION ANCHORAGE

1988

Srongylocentrotus purpuratus

(cases) N=	109
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	10.1%
25 - 29	72.5%
30 - 34	8.3%
35 - 39	4.6%
40 - 44	4.6%
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	22
max size (mm)	42
mean	28
mode	27

1989

Srongylocentrotus purpuratus

(cases) N=	108
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	0.9%
25 - 29	50.0%
30 - 34	43.5%
35 - 39	4.6%
40 - 44	0.9%
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	24
max size (mm)	40
mean	29
mode	30

LOCATION 10 SANTA CRUZ ISLAND - YELLOWBANKS

1986
Tethya aurantia

(cases) N=	33
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	21.2%
40 - 49	12.1%
50 - 59	24.2%
60 - 69	24.2%
70 - 79	9.1%
80 - 89	9.1%
90 - 99	0.0
>99 mm	0.0
min size (mm)	30
max size (mm)	82
mean	56
mode	40

1988
Tethya aurantia

(cases) N=	28
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	17.9%
40 - 49	14.3%
50 - 59	39.3%
60 - 69	25.0%
70 - 79	3.6%
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	35
max size (mm)	71
mean	53
mode	38

1989
Tethya aurantia

(cases) N=	26
< 10 mm	0.0
10 - 19	3.8%
20 - 29	11.5%
30 - 39	3.8%
40 - 49	26.9%
50 - 59	23.1%
60 - 69	11.5%
70 - 79	15.4%
80 - 89	0.0
90 - 99	3.8%
>99 mm	0.0
min size (mm)	15
max size (mm)	94
mean	53
mode	47

LOCATION 10 SANTA CRUZ ISLAND - YELLOWBANKS

1986
Haliotis corrugata

(cases) N=	32
< 45 mm	0.0
45 - 49	3.1%
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	3.1%
70 - 74	0.0
75 - 79	3.1%
80 - 84	0.0
85 - 89	0.0
90 - 94	3.1%
95 - 99	3.1%
100 - 104	0.0
105 - 109	9.4%
110 - 114	15.6%
115 - 119	3.1%
120 - 124	12.5%
125 - 129	3.1%
130 - 134	12.5%
135 - 139	6.3%
140 - 144	3.1%
145 - 149	3.1%
150 - 154	6.3%
155 - 159	3.1%
160 - 164	3.1%
165 - 169	0.0
170 - 174	3.1%
> 174 mm	0.0
min size (mm)	47
max size (mm)	171
mean	121
mode	112

1987
Haliotis corrugata

(cases) N=	20
< 100 mm	0.0
100 - 104	0.0
105 - 109	25.0%
110 - 114	10.0%
115 - 119	10.0%
120 - 124	5.0%
125 - 129	10.0%
130 - 134	10.0%
135 - 139	5.0%
140 - 144	10.0%
145 - 149	10.0%
150 - 154	5.0%
> 154 mm	0.0
min size (mm)	106
max size (mm)	150
mean	125
mode	109

1988
Haliotis corrugata

(cases) N=	11
< 90 mm	0.0
90 - 94	9.1%
95 - 99	9.1%
100 - 104	0.0
105 - 109	9.1%
110 - 114	9.1%
115 - 119	0.0
120 - 124	18.2%
125 - 129	9.1%
130 - 134	9.1%
135 - 139	9.1%
140 - 144	9.1%
145 - 149	9.1%
> 149 mm	0.0
min size (mm)	94
max size (mm)	145
mean	122
mode	94

1989
Haliotis corrugata

(cases) N=	15
< 100 mm	0.0
100 - 104	0.0
105 - 109	0.0
110 - 114	6.7%
115 - 119	6.7%
120 - 124	13.3%
125 - 129	6.7%
130 - 134	6.7%
135 - 139	13.3%
140 - 144	0.0
145 - 149	13.3%
150 - 154	20.0%
155 - 159	0.0
160 - 164	6.7%
165 - 169	0.0
170 - 174	0.0
175 - 179	0.0
180 - 184	6.7%
185 - 189	0.0
190 - 194	0.0
195 - 199	0.0
> 199 mm	0.0
min size (mm)	112
max size (mm)	184
mean	140
mode	112

LOCATION 10 SANTA CRUZ ISLAND - YELLOWBANKS

1986
Cypraea spadicea

(cases) N=	35
< 30 mm	2.9%
30 - 34	11.4%
35 - 39	17.1%
40 - 44	45.7%
45 - 49	17.1%
50 - 54	2.9%
55 - 59	0.0
>59 mm	2.9%
min size (mm)	29
max size (mm)	86
mean	42
mode	41

1987
Cypraea spadicea

(cases) N=	11
< 30 mm	18.2%
30 - 34	0.0
35 - 39	27.3%
40 - 44	18.2%
45 - 49	18.2%
50 - 54	18.2%
55 - 59	0.0
>59 mm	0.0
min size (mm)	24
max size (mm)	52
mean	40
mode	41

1988
Cypraea spadicea

(cases) N=	21
< 30 mm	0.0
30 - 34	14.3%
35 - 39	23.8%
40 - 44	42.9%
45 - 49	19.0%
50 - 54	0.0
55 - 59	0.0
>59 mm	0.0
min size (mm)	32
max size (mm)	47
mean	41
mode	39

1989
Cypraea spadicea

(cases) N=	16
< 30 mm	0.0
30 - 34	6.3%
35 - 39	25.0%
40 - 44	25.0%
45 - 49	18.8%
50 - 54	18.8%
55 - 59	0.0
>59 mm	6.3%
min size (mm)	34
max size (mm)	69
mean	44
mode	42

LOCATION 10 SANTA CRUZ ISLAND - YELLOWBANKS

1986
Kelletia kelletii

(cases) N=	24
<40 mm	0.0
40 - 49	0.0
50 - 59	4.2%
60 - 69	8.3%
70 - 79	8.3%
80 - 89	12.5%
90 - 99	8.3%
100 - 109	41.7%
110 - 119	12.5%
120 - 129	4.2%
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	51
max size (mm)	120
mean	94
mode	95

1987
Kelletia kelletii

(cases) N=	10
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	0.0
80 - 89	10.0%
90 - 99	30.0%
100 - 109	40.0%
110 - 119	20.0%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	86
max size (mm)	115
mean	101
mode	102

1988
Kelletia kelletii

(cases) N=	28
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	3.6%
80 - 89	7.1%
90 - 99	21.4%
100 - 109	21.4%
110 - 119	42.9%
120 - 129	0.0
130 - 139	3.6%
140 - 149	0.0
>149 mm	0.0
min size (mm)	78
max size (mm)	132
mean	105
mode	112

1989
Kelletia kelletii

(cases) N=	11
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	9.1%
80 - 89	18.2%
90 - 99	0.0
100 - 109	0.0
110 - 119	27.3%
120 - 129	18.2%
130 - 139	18.2%
140 - 149	9.1%
>149 mm	9.1%
min size (mm)	75
max size (mm)	145
mean	112
mode	110

LOCATION 10 SANTA CRUZ ISLAND - YELLOWBANKS

1986
Astraea undosa

(cases) N=	32
< 10 mm	0.0
10 - 19	0.0
20 - 29	6.3%
30 - 39	28.1%
40 - 49	31.3%
50 - 59	3.1%
60 - 69	12.5%
70 - 79	0.0
80 - 89	3.1%
90 - 99	3.1%
100 - 109	6.3%
110 - 119	3.1%
>119 mm	3.1%
min size (mm)	28
max size (mm)	140
mean	55
mode	36

1987
Astraea undosa

(cases) N=	29
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	34.5%
60 - 69	20.7%
70 - 79	3.4%
80 - 89	0.0
90 - 99	0.0
100 - 109	6.9%
110 - 119	27.6%
>119 mm	10.3%
min size (mm)	52
max size (mm)	135
mean	83
mode	57

1988
Astraea undosa

(cases) N=	36
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	5.6%
60 - 69	22.2%
70 - 79	11.1%
80 - 89	13.9%
90 - 99	8.3%
100 - 109	11.1%
110 - 119	25.0%
>119 mm	5.6%
min size (mm)	59
max size (mm)	139
mean	89
mode	64

1989
Astraea undosa

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	3.3%
40 - 49	0.0
50 - 59	0.0
60 - 69	3.3%
70 - 79	16.7%
80 - 89	13.3%
90 - 99	23.3%
100 - 109	10.0%
110 - 119	23.3%
>119 mm	10.0%
min size (mm)	37
max size (mm)	124
mean	96
mode	86

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
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LOCATION 10 SANTA CRUZ ISLAND - YELLOWBANKS

1986
Megathura crenulata

(cases) N=	24
< 10 mm	0.0
10 - 19	4.2%
20 - 29	4.2%
30 - 39	0.0
40 - 49	0.0
50 - 59	12.5%
60 - 69	29.2%
70 - 79	33.3%
80 - 89	16.7%
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	15
max size (mm)	87
mean	66
mode	64

1987
Megathura crenulata

(cases) N=	32
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	3.1%
80 - 89	50.0%
90 - 99	40.6%
100 - 109	3.1%
110 - 119	3.1%
>119 mm	0.0
min size (mm)	76
max size (mm)	113
mean	89
mode	80

1988
Megathura crenulata

(cases) N=	34
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	23.5%
70 - 79	44.1%
80 - 89	26.5%
90 - 99	5.9%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	62
max size (mm)	91
mean	75
mode	71

1989
Megathura crenulata

(cases) N=	20
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	5.0%
50 - 59	5.0%
60 - 69	20.0%
70 - 79	50.0%
80 - 89	10.0%
90 - 99	10.0%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	45
max size (mm)	98
mean	73
mode	72

LOCATION 10 SANTA CRUZ ISLAND - YELLOWBANKS

1986
Patiria miniata

(cases) N=	12
< 10 mm	0.0
10 - 19	8.3%
20 - 29	16.7%
30 - 39	33.3%
40 - 49	0.0
50 - 59	8.3%
60 - 69	8.3%
70 - 79	16.7%
80 - 89	8.3%
90 - 99	0.0
>100 mm	0.0
min size (mm)	13
max size (mm)	89
mean	47
mode	13

1988
Patiria miniata

(cases) N=	24
< 10 mm	0.0
10 - 19	4.2%
20 - 29	4.2%
30 - 39	29.2%
40 - 49	8.3%
50 - 59	12.5%
60 - 69	12.5%
70 - 79	8.3%
80 - 89	8.3%
90 - 99	8.3%
>100 mm	4.2%
min size (mm)	18
max size (mm)	104
mean	56
mode	35

1989
Patiria miniata

(cases) N=	54
< 10 mm	0.0
10 - 19	3.7%
20 - 29	1.9%
30 - 39	9.3%
40 - 49	11.1%
50 - 59	18.5%
60 - 69	29.6%
70 - 79	18.5%
80 - 89	5.6%
90 - 99	1.9%
>100 mm	0.0
min size (mm)	18
max size (mm)	97
mean	59
mode	68

LOCATION 10 SANTA CRUZ ISLAND - YELLOWBANKS

1986
Pisaster giganteus

(cases) N=	36
<20 mm	0.0
20 - 39	0.0
40 - 59	50.0%
60 - 79	25.0%
80 - 99	16.7%
100 - 119	8.3%
120 - 139	0.0
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	40
max size (mm)	112
mean	67
mode	56

1987
Pisaster giganteus

(cases) N=	21
<20 mm	0.0
20 - 39	9.5%
40 - 59	23.8%
60 - 79	57.1%
80 - 99	4.8%
100 - 119	4.8%
120 - 139	0.0
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	28
max size (mm)	100
mean	62
mode	60

1988
Pisaster giganteus

(cases) N=	41
<20 mm	0.0
20 - 39	0.0
40 - 59	19.5%
60 - 79	48.8%
80 - 99	24.4%
100 - 119	4.9%
120 - 139	2.4%
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	48
max size (mm)	128
mean	76
mode	62

1989
Pisaster giganteus

(cases) N=	34
<20 mm	0.0
20 - 39	0.0
40 - 59	23.5%
60 - 79	67.6%
80 - 99	5.9%
100 - 119	2.9%
120 - 139	0.0
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	47
max size (mm)	113
mean	67
mode	58

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LOCATION 10 SANTA CRUZ ISLAND - YELLOWBANKS

1986
Lytechinus anamesus

(cases) N=	124
< 5 mm	0.0
5 - 9	0.0
10 - 14	4.8%
15 - 19	35.5%
20 - 24	46.0%
25 - 29	13.7%
>29 mm	0.0
min size (mm)	12
max size (mm)	28
mean	20
mode	22

1987
Lytechinus anamesus

(cases) N=	114
< 5 mm	0.0
5 - 9	5.3%
10 - 14	21.9%
15 - 19	27.2%
20 - 24	32.5%
25 - 29	12.3%
30 - 34	0.9%
>34 mm	0.0
min size (mm)	6
max size (mm)	30
mean	18
mode	20

1988
Lytechinus anamesus

(cases) N=	151
< 5 mm	0.0
5 - 9	3.3%
10 - 14	2.6%
15 - 19	25.8%
20 - 24	50.3%
25 - 29	16.6%
30 - 34	1.3%
>34 mm	0.0
min size (mm)	5
max size (mm)	32
mean	21
mode	20

1989
Lytechinus anamesus

(cases) N=	145
< 5 mm	0.0
5 - 9	0.0
10 - 14	13.1%
15 - 19	34.5%
20 - 24	39.3%
25 - 29	13.1%
>29 mm	0.0
min size (mm)	10
max size (mm)	29
mean	20
mode	20

LOCATION 10 SANTA CRUZ ISLAND - YELLOWBANKS

1986
Strongylocentrotus franciscanus

(cases) N=	125
< 9 mm	0.0
10 - 14	0.8%
15 - 19	1.6%
20 - 24	3.2%
25 - 29	12.8%
30 - 34	12.8%
35 - 39	14.4%
40 - 44	15.2%
45 - 49	14.4%
50 - 54	5.6%
55 - 59	4.8%
60 - 64	4.8%
65 - 69	3.2%
70 - 74	1.6%
75 - 79	2.4%
80 - 84	0.8%
85 - 89	0.0
90 - 94	0.8%
95 - 99	0.0
100 - 104	0.0
105 - 109	0.8%
> 109 mm	0.0
min size (mm)	14
max size (mm)	106
mean	43
mode	44

1987
Strongylocentrotus franciscanus

(cases) N=	109
< 14 mm	0.0
15 - 19	0.0
20 - 24	0.0
25 - 29	0.9%
30 - 34	2.8%
35 - 39	0.9%
40 - 44	1.8%
45 - 49	9.2%
50 - 54	15.6%
55 - 59	19.3%
60 - 64	16.5%
65 - 69	9.2%
70 - 74	9.2%
75 - 79	4.6%
80 - 84	1.8%
85 - 89	0.0
90 - 94	0.9%
95 - 99	3.7%
100 - 104	1.8%
105 - 109	0.0
> 109 mm	1.8%
min size (mm)	29
max size (mm)	123
mean	62
mode	53

LOCATION 10 SANTA CRUZ ISLAND - YELLOWBANKS

	1988 *Strongylocentrotus franciscanus*	1989 *Strongylocentrotus franciscanus*
(cases) N=	92	118
< 5 mm	0.0	1.7%
5 - 9	4.3%	9.3%
10 - 14	13.0%	15.3%
15 - 19	3.3%	14.4%
20 - 24	1.1%	11.9%
25 - 29	0.0	8.5%
30 - 34	1.1%	4.2%
35 - 39	0.0	0.8%
40 - 44	0.0	2.5%
45 - 49	0.0	0.0
50 - 54	2.2%	0.0
55 - 59	2.2%	0.0
60 - 64	4.3%	0.0
65 - 69	5.4%	1.7%
70 - 74	15.2%	1.7%
75 - 79	16.3%	0.0
80 - 84	14.1%	3.4%
85 - 89	5.4%	6.8%
90 - 94	3.3%	10.2%
95 - 99	3.3%	2.5%
100 - 104	1.1%	4.2%
105 - 109	2.2%	0.0
> 109 mm	2.2%	0.8%
min size (mm)	7	3
max size (mm)	117	116
mean	64	41
mode	77	19

LOCATION 10 SANTA CRUZ ISLAND - YELLOWBANKS

	1986 *Srongylocentrotus purpuratus*	1987 *Srongylocentrotus purpuratus*
(cases) N=	107	114
< 5 mm	0.0	0.0
5 - 9	0.9%	0.0
10 - 14	4.7%	0.0
15 - 19	5.6%	1.8%
20 - 24	14.0%	11.4%
25 - 29	20.6%	32.5%
30 - 34	30.8%	22.8%
35 - 39	13.1%	14.9%
40 - 44	5.6%	7.9%
45 - 49	0.0	5.3%
50 - 54	0.9%	0.9%
55 - 59	1.9%	1.8%
60 - 64	0.9%	0.9%
65 - 69	0.0	0.0
70 - 74	0.9%	0.0
75 - 79	0.0	0.0
80 - 84	0.0	0.0
85 - 89	0.0	0.0
90 - 94	0.0	0.0
95 - 99	0.0	0.0
> 99 mm	0.0	0.0
min size (mm)	9	18
max size (mm)	74	61
mean	30	32
mode	35	25

LOCATION 10 SANTA CRUZ ISLAND - YELLOWBANKS

1988
Srongylocentrotus purpuratus

(cases) N=	100
< 5 mm	0.0
5 - 9	1.0%
10 - 14	1.0%
15 - 19	2.0%
20 - 24	11.0%
25 - 29	19.0%
30 - 34	31.0%
35 - 39	18.0%
40 - 44	10.0%
45 - 49	7.0%
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	9
max size (mm)	49
mean	32
mode	30

1989
Srongylocentrotus purpuratus

(cases) N=	105
< 5 mm	0.0
5 - 9	1.0%
10 - 14	9.5%
15 - 19	19.0%
20 - 24	9.5%
25 - 29	4.8%
30 - 34	12.4%
35 - 39	15.2%
40 - 44	18.1%
45 - 49	7.6%
50 - 54	1.9%
55 - 59	1.0%
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	8
max size (mm)	56
mean	30
mode	17

LOCATION 11 ANACAPA ISLAND - ADMIRAL'S REEF

1984
Haliotis corrugata

(cases) N=	31
< 35 mm	0.0
35 - 39	0.0
40 - 44	3.2%
45 - 49	0.0
50 - 54	0.0
55 - 59	3.2%
60 - 64	9.7%
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	3.2%
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	3.2%
110 - 114	12.9%
115 - 119	3.2%
120 - 124	9.7%
125 - 129	9.7%
130 - 134	3.2%
135 - 139	12.9%
140 - 144	3.2%
145 - 149	16.1%
150 - 154	0.0
155 - 159	6.5%
> 159 mm	0.0
min size (mm)	41
max size (mm)	159
mean	118
mode	149

1985
Haliotis corrugata

(cases) N=	34
< 85 mm	0.0
85 - 89	2.9%
90 - 94	2.9%
95 - 99	0.0
100 - 104	5.9%
105 - 109	8.8%
110 - 114	5.9%
115 - 119	5.9%
120 - 124	20.6%
125 - 129	8.8%
130 - 134	5.9%
135 - 139	11.8%
140 - 144	8.8%
145 - 149	8.8%
150 - 154	0.0
155 - 159	0.0
160 - 164	2.9%
165 - 169	0.0
170 - 174	0.0
175 - 179	0.0
180 - 184	0.0
185 - 189	0.0
190 - 194	0.0
195 - 199	0.0
> 199 mm	0.0
min size (mm)	88
max size (mm)	161
mean	124
mode	120

LOCATION 11 ANACAPA ISLAND - ADMIRAL'S REEF

1986
Haliotis corrugata

(cases) N=	20
< 45 mm	0.0
45 - 49	5.0%
50 - 54	5.0%
55 - 59	0.0
60 - 64	0.0
65 - 69	5.0%
70 - 74	0.0
75 - 79	0.0
80 - 84	5.0%
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
110 - 114	10.0%
115 - 119	5.0%
120 - 124	10.0%
125 - 129	5.0%
130 - 134	15.0%
135 - 139	0.0
140 - 144	5.0%
145 - 149	25.0%
150 - 154	0.0
155 - 159	5.0%
> 159 mm	0.0
min size (mm)	49
max size (mm)	155
mean	120
mode	132

1987
Haliotis corrugata

(cases) N=	32
< 55 mm	0.0
55 - 59	6.3%
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	3.1%
80 - 84	3.1%
85 - 89	0.0
90 - 94	3.1%
95 - 99	6.3%
100 - 104	9.4%
105 - 109	3.1%
110 - 114	6.3%
115 - 119	9.4%
120 - 124	6.3%
125 - 129	9.4%
130 - 134	15.6%
135 - 139	3.1%
140 - 144	9.4%
145 - 149	6.3%
> 149 mm	0.0
min size (mm)	55
max size (mm)	148
mean	115
mode	134

1988
Haliotis corrugata

(cases) N=	23
< 55 mm	0.0
55 - 59	4.3%
60 - 64	0.0
65 - 69	4.3%
70 - 74	0.0
75 - 79	8.7%
80 - 84	4.3%
85 - 89	8.7%
90 - 94	8.7%
95 - 99	4.3%
100 - 104	4.3%
105 - 109	4.3%
110 - 114	8.7%
115 - 119	0.0
120 - 124	8.7%
125 - 129	8.7%
130 - 134	8.7%
135 - 139	8.7%
140 - 144	4.3%
145 - 149	0.0
> 149 mm	0.0
min size (mm)	56
max size (mm)	141
mean	105
mode	86

1989
Haliotis corrugata

(cases) N=	53
< 55 mm	0.0
55 - 59	1.9%
60 - 64	0.0
65 - 69	0.0
70 - 74	1.9%
75 - 79	1.9%
80 - 84	1.9%
85 - 89	0.0
90 - 94	7.5%
95 - 99	5.7%
100 - 104	7.5%
105 - 109	5.7%
110 - 114	1.9%
115 - 119	11.3%
120 - 124	15.1%
125 - 129	7.5%
130 - 134	9.4%
135 - 139	1.9%
140 - 144	5.7%
145 - 149	5.7%
150 - 154	1.9%
155 - 159	0.0
160 - 164	3.8%
165 - 169	1.9%
> 169 mm	0.0
min size (mm)	57
max size (mm)	165

mean	118
mode	91

LOCATION 11 ANACAPA ISLAND - ADMIRAL'S REEF

1984
Cypraea spadicea

(cases) N=	38
< 30 mm	0.0
30 - 34	2.6%
35 - 39	7.9%
40 - 44	23.7%
45 - 49	42.1%
50 - 54	21.1%
55 - 59	2.6%
>59 mm	0.0
min size (mm)	34
max size (mm)	56
mean	46
mode	45

1985
Cypraea spadicea

(cases) N=	21
< 30 mm	0.0
30 - 34	0.0
35 - 39	4.8%
40 - 44	28.6%
45 - 49	33.3%
50 - 54	28.6%
55 - 59	4.8%
>59 mm	0.0
min size (mm)	39
max size (mm)	55
mean	47
mode	46

1986
Cypraea spadicea

(cases) N=	26
< 30 mm	0.0
30 - 34	3.8%
35 - 39	11.5%
40 - 44	38.5%
45 - 49	11.5%
50 - 54	30.8%
55 - 59	3.8%
>59 mm	0.0
min size (mm)	30
max size (mm)	58
mean	45
mode	42

1987
Cypraea spadicea

(cases) N=	24
< 30 mm	0.0
30 - 34	0.0
35 - 39	8.3%
40 - 44	33.3%
45 - 49	45.8%
50 - 54	8.3%
55 - 59	4.2%
>59 mm	0.0
min size (mm)	38
max size (mm)	55
mean	46
mode	47

1989
Cypraea spadicea

(cases) N=	36
< 30 mm	0.0
30 - 34	5.6%
35 - 39	8.3%
40 - 44	22.2%
45 - 49	55.6%
50 - 54	8.3%
55 - 59	0.0
>59 mm	0.0
min size (mm)	30
max size (mm)	54
mean	45
mode	45

1986
Tethya aurantia

(cases) N=	25
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	28.0%
50 - 59	40.0%
60 - 69	20.0%
70 - 79	8.0%
80 - 89	0.0
90 - 99	4.0%
>99 mm	0.0
min size (mm)	40
max size (mm)	95
mean	56
mode	41

LOCATION 11 ANACAPA ISLAND - ADMIRAL'S REEF

1984
Kelletia kelletii

(cases) N=	10
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	20.0%
80 - 89	0.0
90 - 99	20.0%
100 - 109	0.0
110 - 119	20.0%
120 - 129	30.0%
130 - 139	10.0%
140 - 149	0.0
>149 mm	0.0
min size (mm)	73
max size (mm)	135
mean	107
mode	99

1985
Kelletia kelletii

(cases) N=	24
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	12.5%
70 - 79	4.2%
80 - 89	25.0%
90 - 99	4.2%
100 - 109	20.8%
110 - 119	20.8%
120 - 129	12.5%
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	63
max size (mm)	120
mean	95
mode	80

1984
Astraea undosa

(cases) N=	19
< 50 mm	0.0
50 - 59	10.5%
60 - 69	0.0
70 - 79	5.3%
80 - 89	15.8%
90 - 99	26.3%
100 - 109	36.8%
110 - 119	0.0
>119 mm	5.3%
min size (mm)	57
max size (mm)	122
mean	94
mode	104

1985
Astraea undosa

(cases) N=	30
< 30 mm	0.0
30 - 39	0.0
40 - 49	16.7%
50 - 59	16.7%
60 - 69	3.3%
70 - 79	0.0
80 - 89	3.3%
90 - 99	16.7%
100 - 109	23.3%
110 - 119	13.3%
>119 mm	13.3%
min size (mm)	40
max size (mm)	136
mean	87
mode	44

1989
Astraea undosa

(cases) N=	30
< 50 mm	0.0
50 - 59	0.0
60 - 69	16.7%
70 - 79	0.0
80 - 89	33.3%
90 - 99	30.0%
100 - 109	16.7%
110 - 119	3.3%
>119 mm	0.0
min size (mm)	64
max size (mm)	112
mean	88
mode	66

LOCATION 11 ANACAPA ISLAND - ADMIRAL'S REEF

1984
Megathura crenulata

(cases) N=	50
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	2.0%
60 - 69	26.0%
70 - 79	36.0%
80 - 89	28.0%
90 - 99	8.0%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	58
max size (mm)	94
mean	76
mode	82

1985
Megathura crenulata

(cases) N=	32
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	12.5%
60 - 69	43.8%
70 - 79	40.6%
80 - 89	3.1%
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	54
max size (mm)	82
mean	68
mode	69

1989
Megathura crenulata

(cases) N=	11
< 10 mm	0.0
10 - 19	27.3%
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	36.4%
70 - 79	9.1%
80 - 89	18.2%
90 - 99	0.0
100 - 109	0.0
110 - 119	9.1%
>119 mm	0.0
min size (mm)	12
max size (mm)	111
mean	60
mode	12

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LOCATION 11 ANACAPA ISLAND - ADMIRAL'S REEF

1984
Hinnites giganteus

(cases) N=	34
< 30	0.0
30 - 39	20.6%
40 - 49	20.6%
50 - 59	26.5%
60 - 69	20.6%
70 - 79	5.9%
80 - 89	2.9%
90 - 99	0.0
100 - 109	2.9%
>109 mm	0.0
min size (mm)	34
max size (mm)	104
mean	54
mode	34

1985
Hinnites giganteus

(cases) N=	30
< 19 mm	0.0
20 - 29	3.3%
30 - 39	6.7%
40 - 49	20.0%
50 - 59	26.7%
60 - 69	16.7%
70 - 79	3.3%
80 - 89	10.0%
90 - 99	6.7%
100 - 109	3.3%
110 - 119	0.0
120 - 129	3.3%
>129 mm	0.0
min size (mm)	28
max size (mm)	123
mean	62
mode	49

1986
Hinnites giganteus

(cases) N=	44
< 20 mm	0.0
20 - 29	2.3%
30 - 39	15.9%
40 - 49	18.2%
50 - 59	6.8%
60 - 69	18.2%
70 - 79	20.5%
80 - 89	9.1%
90 - 99	4.5%
100 - 109	2.3%
110 - 119	0.0
120 - 129	2.3%
>129 mm	0.0
min size (mm)	27
max size (mm)	125
mean	62
mode	46

1987
Hinnites giganteus

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	6.7%
40 - 49	23.3%
50 - 59	30.0%
60 - 69	16.7%
70 - 79	6.7%
80 - 89	3.3%
90 - 99	3.3%
100 - 109	3.3%
110 - 119	6.7%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	37
max size (mm)	111
mean	62
mode	48

1989
Hinnites giganteus

(cases) N=	46
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	8.7%
40 - 49	32.6%
50 - 59	26.1%
60 - 69	15.2%
70 - 79	8.7%
80 - 89	4.3%
90 - 99	2.2%
100 - 109	2.2%
110 - 119	0.0
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	35
max size (mm)	109
mean	56
mode	48

LOCATION 11 ANACAPA ISLAND - ADMIRAL'S REEF

1986
Patiria miniata

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	30.0%
40 - 49	30.0%
50 - 59	20.0%
60 - 69	6.7%
70 - 79	0.0
80 - 89	10.0%
90 - 99	0.0
>100 mm	3.3%
min size (mm)	32
max size (mm)	101
mean	51
mode	33

1987
Patiria miniata

(cases) N=	11
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	63.6%
60 - 69	27.3%
70 - 79	9.1%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	50
max size (mm)	75
mean	60
mode	58

1988
Patiria miniata

(cases) N=	41
< 10 mm	0.0
10 - 19	0.0
20 - 29	2.4%
30 - 39	17.1%
40 - 49	39.0%
50 - 59	22.0%
60 - 69	19.5%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	28
max size (mm)	69
mean	49
mode	39

1989
Patiria miniata

(cases) N=	51
< 10 mm	2.0%
10 - 19	7.8%
20 - 29	3.9%
30 - 39	7.8%
40 - 49	15.7%
50 - 59	21.6%
60 - 69	21.6%
70 - 79	9.8%
80 - 89	7.8%
90 - 99	2.0%
>100 mm	0.0
min size (mm)	8
max size (mm)	93
mean	54
mode	45

LOCATION 11 ANACAPA ISLAND - ADMIRAL'S REEF

1986
Pisaster giganteus

(cases) N=	23
<20 mm	0.0
20 - 39	0.0
40 - 59	4.3%
60 - 79	0.0
80 - 99	0.0
100 - 119	0.0
120 - 139	8.7%
140 - 159	13.0%
160 - 179	21.7%
180 - 199	30.4%
200 - 219	8.7%
220 - 239	8.7%
240 - 259	4.3%
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	50
max size (mm)	255
mean	176
mode	168

1988
Pisaster giganteus

(cases) N=	31
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	6.5%
80 - 99	19.4%
100 - 119	25.8%
120 - 139	6.5%
140 - 159	16.1%
160 - 179	16.1%
180 - 199	9.7%
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	75
max size (mm)	192
mean	129
mode	92

1989
Pisaster giganteus

(cases) N=	32
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	0.0
80 - 99	12.5%
100 - 119	40.6%
120 - 139	9.4%
140 - 159	9.4%
160 - 179	15.6%
180 - 199	12.5%
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	93
max size (mm)	188
mean	132
mode	93

LOCATION 11 ANACAPA ISLAND - ADMIRAL'S REEF

1986
Lytechinus anamesus

(cases) N=	111
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.9%
20 - 24	10.8%
25 - 29	73.9%
30 - 34	13.5%
35 - 39	0.9%
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	19
max size (mm)	36
mean	27
mode	28

1987
Lytechinus anamesus

(cases) N=	151
< 5 mm	0.0
5 - 9	0.0
10 - 14	1.3%
15 - 19	11.3%
20 - 24	33.8%
25 - 29	41.1%
30 - 34	11.9%
35 - 39	0.7%
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	14
max size (mm)	35
mean	25
mode	22

1988
Lytechinus anamesus

(cases) N=	127
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	11.0%
25 - 29	66.9%
30 - 34	22.0%
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	22
max size (mm)	33
mean	28
mode	28

1989
Lytechinus anamesus

(cases) N=	111
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	13.5%
25 - 29	65.8%
30 - 34	19.8%
35 - 39	0.9%
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	22
max size (mm)	35
mean	28
mode	28

LOCATION 11 ANACAPA ISLAND - ADMIRAL'S REEF

1984
Strongylocentrotus franciscanus

(cases) N=	114
< 9 mm	0.0
10 - 14	0.9%
15 - 19	1.8%
20 - 24	2.6%
25 - 29	1.8%
30 - 34	2.6%
35 - 39	5.3%
40 - 44	2.6%
45 - 49	4.4%
50 - 54	1.8%
55 - 59	7.0%
60 - 64	5.3%
65 - 69	1.8%
70 - 74	9.6%
75 - 79	1.8%
80 - 84	5.3%
85 - 89	6.1%
90 - 94	4.4%
95 - 99	2.6%
100 - 104	7.9%
105 - 109	4.4%
> 109 mm	20.2%
min size (mm)	12
max size (mm)	148
mean	79
mode	70

1985
Strongylocentrotus franciscanus

(cases) N=	106
< 5 mm	0.9%
5 - 9	2.8%
10 - 14	1.9%
15 - 19	9.4%
20 - 24	9.4%
25 - 29	2.8%
30 - 34	5.7%
35 - 39	3.8%
40 - 44	2.8%
45 - 49	0.9%
50 - 54	2.8%
55 - 59	3.8%
60 - 64	2.8%
65 - 69	5.7%
70 - 74	4.7%
75 - 79	13.2%
80 - 84	8.5%
85 - 89	5.7%
90 - 94	2.8%
95 - 99	2.8%
100 - 104	3.8%
105 - 109	1.9%
> 109 mm	0.9%
min size (mm)	3
max size (mm)	112
mean	57
mode	19

1986
Strongylocentrotus franciscanus

(cases) N=	107
< 9 mm	0.0
10 - 14	0.0
15 - 19	3.7%
20 - 24	2.8%
25 - 29	1.9%
30 - 34	1.9%
35 - 39	7.5%
40 - 44	3.7%
45 - 49	4.7%
50 - 54	6.5%
55 - 59	7.5%
60 - 64	6.5%
65 - 69	4.7%
70 - 74	9.3%
75 - 79	12.1%
80 - 84	7.5%
85 - 89	8.4%
90 - 94	3.7%
95 - 99	1.9%
100 - 104	1.9%
105 - 109	0.9%
> 109 mm	1.9%
min size (mm)	17
max size (mm)	140
mean	65
mode	36

1987
Strongylocentrotus franciscanus

(cases) N=	100
< 5 mm	0.0
5 - 9	0.0
10 - 14	1.0%
15 - 19	1.0%
20 - 24	9.0%
25 - 29	8.0%
30 - 34	14.0%
35 - 39	10.0%
40 - 44	5.0%
45 - 49	12.0%
50 - 54	10.0%
55 - 59	4.0%
60 - 64	4.0%
65 - 69	1.0%
70 - 74	2.0%
75 - 79	4.0%
80 - 84	3.0%
85 - 89	2.0%
90 - 94	2.0%
95 - 99	1.0%
100 - 104	1.0%
105 - 109	0.0
> 109 mm	6.0%
min size (mm)	11
max size (mm)	149
mean	51
mode	50

LOCATION 11 ANACAPA ISLAND - ADMIRAL'S REEF

1988 *Strongylocentrotus franciscanus*		1989 *Strongylocentrotus franciscanus*	
(cases) N=	66	(cases) N=	125
< 5 mm	0.0	< 5 mm	0.0
5 - 9	0.0	5 - 9	8.0%
10 - 14	0.0	10 - 14	12.8%
15 - 19	0.0	15 - 19	5.6%
20 - 24	4.5%	20 - 24	4.0%
25 - 29	4.5%	25 - 29	1.6%
30 - 34	4.5%	30 - 34	1.6%
35 - 39	6.1%	35 - 39	0.0
40 - 44	3.0%	40 - 44	0.8%
45 - 49	4.5%	45 - 49	0.8%
50 - 54	7.6%	50 - 54	4.0%
55 - 59	4.5%	55 - 59	5.6%
60 - 64	3.0%	60 - 64	7.2%
65 - 69	3.0%	65 - 69	14.4%
70 - 74	6.1%	70 - 74	7.2%
75 - 79	6.1%	75 - 79	11.2%
80 - 84	6.1%	80 - 84	3.2%
85 - 89	9.1%	85 - 89	4.0%
90 - 94	7.6%	90 - 94	5.6%
95 - 99	6.1%	95 - 99	1.6%
100 - 104	6.1%	100 - 104	0.0
105 - 109	4.5%	105 - 109	0.0
> 109 mm	3.0%	> 109 mm	0.8%
min size (mm)	23	min size (mm)	7
max size (mm)	128	max size (mm)	115
mean	69	mean	52
mode	25	mode	7

LOCATION 11 ANACAPA ISLAND - ADMIRAL'S REEF

1984 *Srongylocentrotus purpuratus*		1985 *Srongylocentrotus purpuratus*	
(cases) N=	101	(cases) N=	102
< 5 mm	0.0	< 5 mm	0.0
5 - 9	1.0%	5 - 9	4.9%
10 - 14	1.0%	10 - 14	6.9%
15 - 19	1.0%	15 - 19	9.8%
20 - 24	5.0%	20 - 24	14.7%
25 - 29	2.0%	25 - 29	6.9%
30 - 34	9.9%	30 - 34	2.0%
35 - 39	15.8%	35 - 39	10.8%
40 - 44	17.8%	40 - 44	12.7%
45 - 49	12.9%	45 - 49	8.8%
50 - 54	13.9%	50 - 54	9.8%
55 - 59	6.9%	55 - 59	9.8%
60 - 64	5.9%	60 - 64	2.0%
65 - 69	4.0%	65 - 69	1.0%
70 - 74	0.0	70 - 74	0.0
75 - 79	1.0%	75 - 79	0.0
80 - 84	1.0%	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	0.0
95 - 99	1.0%	95 - 99	0.0
> 99 mm	0.0	> 99 mm	0.0
min size (mm)	6	min size (mm)	6
max size (mm)	99	max size (mm)	65
mean	44	mean	35
mode	35	mode	20

LOCATION 11 ANACAPA ISLAND - ADMIRAL'S REEF

1986
Srongylocentrotus purpuratus

(cases) N=	110
< 5 mm	4.5%
5 - 9	0.0
10 - 14	2.7%
15 - 19	15.5%
20 - 24	10.9%
25 - 29	15.5%
30 - 34	13.6%
35 - 39	5.5%
40 - 44	4.5%
45 - 49	4.5%
50 - 54	10.0%
55 - 59	5.5%
60 - 64	5.5%
65 - 69	1.8%
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	2
max size (mm)	69
mean	33
mode	19

1987
Srongylocentrotus purpuratus

(cases) N=	120
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	7.5%
25 - 29	15.0%
30 - 34	18.3%
35 - 39	16.7%
40 - 44	10.0%
45 - 49	6.7%
50 - 54	12.5%
55 - 59	5.8%
60 - 64	5.8%
65 - 69	1.7%
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	21
max size (mm)	66
mean	40
mode	34

1988
Srongylocentrotus purpuratus

(cases) N=	95
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	3.2%
20 - 24	3.2%
25 - 29	10.5%
30 - 34	14.7%
35 - 39	16.8%
40 - 44	12.6%
45 - 49	9.5%
50 - 54	11.6%
55 - 59	6.3%
60 - 64	6.3%
65 - 69	2.1%
70 - 74	1.1%
75 - 79	2.1%
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	18
max size (mm)	79
mean	42
mode	32

1989
Srongylocentrotus purpuratus

(cases) N=	82
< 5 mm	0.0
5 - 9	2.4%
10 - 14	4.9%
15 - 19	0.0
20 - 24	1.2%
25 - 29	2.4%
30 - 34	4.9%
35 - 39	11.0%
40 - 44	23.2%
45 - 49	22.0%
50 - 54	19.5%
55 - 59	7.3%
60 - 64	1.2%
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	8
max size (mm)	60
mean	42
mode	51

LOCATION 12 ANACAPA ISLAND - CATHEDRAL COVE

max size (mm)	155
mean	107
mode	108

1984
Haliotis corrugata

(cases) N=	12
< 25 mm	0.0
25 - 29	8.3%
30 - 34	8.3%
35 - 39	0.0
40 - 44	8.3%
45 - 49	16.7%
50 - 54	8.3%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	8.3%
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	8.3%
105 - 109	0.0
110 - 114	8.3%
115 - 119	8.3%
120 - 124	16.7%
125 - 129	0.0
> 129 mm	0.0
min size (mm)	29
max size (mm)	122
mean	74
mode	29

1985
Haliotis corrugata

(cases) N=	31
< 25 mm	3.2%
25 - 29	0.0
30 - 34	3.2%
35 - 39	3.2%
40 - 44	3.2%
45 - 49	0.0
50 - 54	3.2%
55 - 59	3.2%
60 - 64	0.0
65 - 69	0.0
70 - 74	3.2%
75 - 79	0.0
80 - 84	3.2%
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	12.9%
110 - 114	3.2%
115 - 119	6.5%
120 - 124	16.1%
125 - 129	3.2%
130 - 134	9.7%
135 - 139	6.5%
140 - 144	6.5%
145 - 149	3.2%
150 - 154	3.2%
155 - 159	3.2%
> 159 mm	0.0
min size (mm)	17

1986		mean	114
Haliotis corrugata		mode	15

(cases) N=	28
< 25 mm	32.1%
25 - 29	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	3.6%
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	3.6%
100 - 104	0.0
105 - 109	0.0
110 - 114	0.0
115 - 119	0.0
120 - 124	10.7%
125 - 129	14.3%
130 - 134	7.1%
135 - 139	17.9%
140 - 144	3.6%
145 - 149	3.6%
150 - 154	0.0
155 - 159	3.6%
> 159 mm	0.0
min size (mm)	14
max size (mm)	157
mean	92
mode	136

1989
Haliotis corrugata

(cases) N=	22
< 25 mm	13.6%
25 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	4.5%
85 - 89	4.5%
90 - 94	4.5%
95 - 99	4.5%
100 - 104	0.0
105 - 109	4.5%
110 - 114	0.0
115 - 119	0.0
120 - 124	4.5%
125 - 129	0.0
130 - 134	13.6%
135 - 139	0.0
140 - 144	9.1%
145 - 149	18.2%
150 - 154	13.6%
155 - 159	4.5%
> 159 mm	0.0
min size (mm)	15
max size (mm)	155

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 12 ANACAPA ISLAND - CATHEDRAL COVE

1984
Cypraea spadicea

(cases) N=	22
< 30 mm	0.0
30 - 34	13.6%
35 - 39	18.2%
40 - 44	45.5%
45 - 49	18.2%
50 - 54	4.5%
55 - 59	0.0
>59 mm	0.0
min size (mm)	30
max size (mm)	51
mean	41
mode	42

1985
Cypraea spadicea

(cases) N=	42
< 30 mm	0.0
30 - 34	7.1%
35 - 39	23.8%
40 - 44	26.2%
45 - 49	21.4%
50 - 54	19.0%
55 - 59	2.4%
>59 mm	0.0
min size (mm)	31
max size (mm)	56
mean	43
mode	42

1986
Cypraea spadicea

(cases) N=	42
< 30 mm	9.5%
30 - 34	14.3%
35 - 39	23.8%
40 - 44	33.3%
45 - 49	16.7%
50 - 54	2.4%
55 - 59	0.0
>59 mm	0.0
min size (mm)	13
max size (mm)	53
mean	38
mode	42

1987
Cypraea spadicea

(cases) N=	13
< 30 mm	0.0
30 - 34	30.8%
35 - 39	38.5%
40 - 44	15.4%
45 - 49	15.4%
50 - 54	0.0
55 - 59	0.0
>59 mm	0.0
min size (mm)	30
max size (mm)	47
mean	37
mode	30

1988
Cypraea spadicea

(cases) N=	38
< 30 mm	2.6%
30 - 34	7.9%
35 - 39	34.2%
40 - 44	31.6%
45 - 49	15.8%
50 - 54	5.3%
55 - 59	2.6%
>59 mm	0.0
min size (mm)	29
max size (mm)	56
mean	41
mode	42

1989
Cypraea spadicea

(cases) N=	43
< 30 mm	2.3%
30 - 34	16.3%
35 - 39	30.2%
40 - 44	32.6%
45 - 49	11.6%
50 - 54	7.0%
55 - 59	0.0
>59 mm	0.0
min size (mm)	17
max size (mm)	51
mean	39
mode	42

LOCATION 12 ANACAPA ISLAND - CATHEDRAL COVE

1984
Astraea undosa

(cases) N=	63
< 19 mm	0.0
20 - 29	1.6%
30 - 39	1.6%
40 - 49	11.1%
50 - 59	46.0%
60 - 69	25.4%
70 - 79	3.2%
80 - 89	3.2%
90 - 99	1.6%
100 - 109	4.8%
110 - 119	4.8%
>119 mm	0.0
min size (mm)	26
max size (mm)	110
mean	61
mode	56

1985
Astraea undosa

(cases) N=	30
< 29 mm	0.0
30 - 39	6.7%
40 - 49	23.3%
50 - 59	10.0%
60 - 69	13.3%
70 - 79	6.7%
80 - 89	13.3%
90 - 99	10.0%
100 - 109	10.0%
110 - 119	6.7%
>119 mm	0.0
min size (mm)	37
max size (mm)	115
mean	71
mode	48

1986
Astraea undosa

(cases) N=	35
< 29 mm	0.0
30 - 39	20.0%
40 - 49	17.1%
50 - 59	8.6%
60 - 69	8.6%
70 - 79	5.7%
80 - 89	28.6%
90 - 99	2.9%
100 - 109	2.9%
110 - 119	5.7%
>119 mm	0.0
min size (mm)	33
max size (mm)	112
mean	65
mode	34

1987
Astraea undosa

(cases) N=	68
< 19 mm	0.0
20 - 29	2.9%
30 - 39	20.6%
40 - 49	41.2%
50 - 59	17.6%
60 - 69	8.8%
70 - 79	2.9%
80 - 89	2.9%
90 - 99	1.5%
100 - 109	0.0
110 - 119	1.5%
>119 mm	0.0
min size (mm)	22
max size (mm)	118
mean	49
mode	38

1988
Astraea undosa

(cases) N=	31
< 19 mm	0.0
20 - 29	3.2%
30 - 39	0.0
40 - 49	16.1%
50 - 59	12.9%
60 - 69	25.8%
70 - 79	12.9%
80 - 89	12.9%
90 - 99	12.9%
100 - 109	3.2%
>109 mm	0.0
min size (mm)	29
max size (mm)	102
mean	68
mode	46

1989
Astraea undosa

(cases) N=	31
< 19 mm	0.0
20 - 29	3.2%
30 - 39	6.5%
40 - 49	19.4%
50 - 59	9.7%
60 - 69	19.4%
70 - 79	25.8%
80 - 89	9.7%
90 - 99	6.5%
100 - 109	0.0
>109 mm	0.0
min size (mm)	23
max size (mm)	95
mean	63
mode	72

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LOCATION 12 ANACAPA ISLAND - CATHEDRAL COVE

1984
Megathura crenulata

(cases) N=	28
< 10 mm	0.0
10 - 19	7.1%
20 - 29	3.6%
30 - 39	0.0
40 - 49	10.7%
50 - 59	0.0
60 - 69	10.7%
70 - 79	7.1%
80 - 89	50.0%
90 - 99	7.1%
100 - 109	3.6%
110 - 119	0.0
>119 mm	0.0
min size (mm)	15
max size (mm)	103
mean	71
mode	83

1985
Megathura crenulata

(cases) N=	24
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	4.2%
60 - 69	8.3%
70 - 79	12.5%
80 - 89	20.8%
90 - 99	25.0%
100 - 109	25.0%
110 - 119	4.2%
>119 mm	0.0
min size (mm)	58
max size (mm)	113
mean	89
mode	97

1986
Megathura crenulata

(cases) N=	34
< 10 mm	0.0
10 - 19	5.9%
20 - 29	2.9%
30 - 39	0.0
40 - 49	2.9%
50 - 59	0.0
60 - 69	23.5%
70 - 79	35.3%
80 - 89	20.6%
90 - 99	5.9%
100 - 109	0.0
110 - 119	2.9%
>119 mm	0.0
min size (mm)	12
max size (mm)	110
mean	71
mode	60

1989
Megathura crenulata

(cases) N=	16
< 10 mm	0.0
10 - 19	31.3%
20 - 29	18.8%
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	6.3%
70 - 79	12.5%
80 - 89	12.5%
90 - 99	12.5%
100 - 109	0.0
110 - 119	6.3%
>119 mm	0.0
min size (mm)	15
max size (mm)	118
mean	53
mode	17

LOCATION 12 ANACAPA ISLAND - CATHEDRAL COVE

1984
Hinnites giganteus

(cases) N=	35
< 20 mm	0.0
20 - 29	2.9%
30 - 39	8.6%
40 - 49	31.4%
50 - 59	14.3%
60 - 69	5.7%
70 - 79	22.9%
80 - 89	5.7%
90 - 99	8.6%
>99 mm	0.0
min size (mm)	25
max size (mm)	97
mean	59
mode	45

1985
Hinnites giganteus

(cases) N=	31
< 20 mm	0.0
20 - 29	6.5%
30 - 39	6.5%
40 - 49	19.4%
50 - 59	19.4%
60 - 69	19.4%
70 - 79	6.5%
80 - 89	6.5%
90 - 99	6.5%
100 - 109	6.5%
110 - 119	0.0
120 - 129	3.2%
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	20
max size (mm)	128
mean	62
mode	45

1986
Hinnites giganteus

(cases) N=	38
< 20 mm	0.0
20 - 29	0.0
30 - 39	2.6%
40 - 49	7.9%
50 - 59	7.9%
60 - 69	13.2%
70 - 79	36.8%
80 - 89	15.8%
90 - 99	13.2%
100 - 109	0.0
110 - 119	2.6%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	34
max size (mm)	115
mean	73
mode	75

87
Hinnites giganteus

(cases) N=	29
< 20 mm	0.0
20 - 29	0.0
30 - 39	3.4%
40 - 49	10.3%
50 - 59	20.7%
60 - 69	20.7%
70 - 79	6.9%
80 - 89	6.9%
90 - 99	10.3%
100 - 109	6.9%
110 - 119	13.8%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	39
max size (mm)	118
mean	74
mode	51

1988
Hinnites giganteus

(cases) N=	36
< 20 mm	0.0
20 - 29	0.0
30 - 39	2.8%
40 - 49	36.1%
50 - 59	22.2%
60 - 69	19.4%
70 - 79	8.3%
80 - 89	0.0
90 - 99	5.6%
100 - 109	2.8%
110 - 119	0.0
120 - 129	0.0
130 - 139	2.8%
>139 mm	0.0
min size (mm)	38
max size (mm)	130
mean	59
mode	45

1989
Hinnites giganteus

(cases) N=	43
< 10 mm	0.0
10 - 19	2.3%
20 - 29	0.0
30 - 39	4.7%
40 - 49	2.3%
50 - 59	4.7%
60 - 69	14.0%
70 - 79	18.6%
80 - 89	11.6%
90 - 99	14.0%
100 - 109	16.3%
110 - 119	2.3%
120 - 129	7.0%

130 - 139	2.3%
>139 mm	0.0
min size (mm)	12
max size (mm)	138
mean	83
mode	66

LOCATION 12 ANACAPA ISLAND - CATHEDRAL COVE

1986
Patiria miniata

(cases) N=	14
< 10 mm	0.0
10 - 19	71.4%
20 - 29	21.4%
30 - 39	0.0
40 - 49	0.0
50 - 59	7.1%
60 - 69	0.0
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	11
max size (mm)	57
mean	20
mode	14

1988
Patiria miniata

(cases) N=	61
< 10 mm	9.8%
10 - 19	9.8%
20 - 29	9.8%
30 - 39	31.1%
40 - 49	19.7%
50 - 59	11.5%
60 - 69	6.6%
70 - 79	1.6%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	5
max size (mm)	75
mean	36
mode	35

1989
Patiria miniata

(cases) N=	54
< 10 mm	1.9%
10 - 19	1.9%
20 - 29	5.6%
30 - 39	16.7%
40 - 49	13.0%
50 - 59	37.0%
60 - 69	11.1%
70 - 79	13.0%
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	8
max size (mm)	79
mean	51
mode	54

1987
Kelletia kelletii

(cases) N=	30
<40 mm	40.0%
40 - 49	53.3%
50 - 59	0.0
60 - 69	0.0
70 - 79	0.0
80 - 89	0.0
90 - 99	3.3%
100 - 109	0.0
110 - 119	3.3%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	12
max size (mm)	117
mean	43
mode	43

LOCATION 12 ANACAPA ISLAND - CATHEDRAL COVE

1984
Strongylocentrotus franciscanus

(cases) N=	102
< 9 mm	0.0
10 - 14	1.0%
15 - 19	1.0%
20 - 24	1.0%
25 - 29	1.0%
30 - 34	0.0
35 - 39	1.0%
40 - 44	0.0
45 - 49	2.0%
50 - 54	1.0%
55 - 59	0.0
60 - 64	2.0%
65 - 69	10.8%
70 - 74	10.8%
75 - 79	9.8%
80 - 84	9.8%
85 - 89	11.8%
90 - 94	9.8%
95 - 99	9.8%
100 - 104	3.9%
105 - 109	8.8%
> 109 mm	4.9%
min size (mm)	13
max size (mm)	122
mean	82
mode	73

1985
Strongylocentrotus franciscanus

(cases) N=	108
< 9 mm	0.0
10 - 14	0.0
15 - 19	0.9%
20 - 24	1.9%
25 - 29	0.9%
30 - 34	0.9%
35 - 39	1.9%
40 - 44	0.0
45 - 49	1.9%
50 - 54	1.9%
55 - 59	3.7%
60 - 64	3.7%
65 - 69	2.8%
70 - 74	2.8%
75 - 79	3.7%
80 - 84	7.4%
85 - 89	13.0%
90 - 94	12.0%
95 - 99	17.6%
100 - 104	11.1%
105 - 109	4.6%
> 109 mm	6.5%
min size (mm)	19
max size (mm)	121
mean	85
mode	95

1986
Strongylocentrotus franciscanus

(cases) N=	100
< 9 mm	0.0
10 - 14	3.0%
15 - 19	14.0%
20 - 24	19.0%
25 - 29	3.0%
30 - 34	4.0%
35 - 39	2.0%
40 - 44	1.0%
45 - 49	1.0%
50 - 54	2.0%
55 - 59	0.0
60 - 64	2.0%
65 - 69	0.0
70 - 74	1.0%
75 - 79	7.0%
80 - 84	3.0%
85 - 89	4.0%
90 - 94	6.0%
95 - 99	7.0%
100 - 104	9.0%
105 - 109	7.0%
> 109 mm	5.0%
min size (mm)	11
max size (mm)	119
mean	60
mode	22

1987
Strongylocentrotus franciscanus

(cases) N=	101
< 9 mm	0.0
10 - 14	1.0%
15 - 19	2.0%
20 - 24	1.0%
25 - 29	4.0%
30 - 34	5.9%
35 - 39	4.0%
40 - 44	1.0%
45 - 49	0.0
50 - 54	4.0%
55 - 59	6.9%
60 - 64	5.0%
65 - 69	6.9%
70 - 74	6.9%
75 - 79	5.9%
80 - 84	7.9%
85 - 89	10.9%
90 - 94	5.9%
95 - 99	6.9%
100 - 104	6.9%
105 - 109	4.0%
> 109 mm	2.0%
min size (mm)	13
max size (mm)	116
mean	72
mode	88

LOCATION 12 ANACAPA ISLAND - CATHEDRAL COVE

1988 *Strongylocentrotus franciscanus*		1989 *Strongylocentrotus franciscanus*	
(cases) N=	100	(cases) N=	118
< 5 mm	0.0	< 5 mm	0.0
5 - 9	16.0%	5 - 9	0.8%
10 - 14	13.0%	10 - 14	0.8%
15 - 19	1.0%	15 - 19	5.9%
20 - 24	2.0%	20 - 24	7.6%
25 - 29	1.0%	25 - 29	2.5%
30 - 34	4.0%	30 - 34	0.0
35 - 39	0.0	35 - 39	0.0
40 - 44	0.0	40 - 44	0.8%
45 - 49	0.0	45 - 49	0.8%
50 - 54	0.0	50 - 54	2.5%
55 - 59	0.0	55 - 59	1.7%
60 - 64	0.0	60 - 64	3.4%
65 - 69	0.0	65 - 69	6.8%
70 - 74	0.0	70 - 74	7.6%
75 - 79	1.0%	75 - 79	5.9%
80 - 84	2.0%	80 - 84	6.8%
85 - 89	4.0%	85 - 89	5.9%
90 - 94	12.0%	90 - 94	10.2%
95 - 99	7.0%	95 - 99	5.9%
100 - 104	13.0%	100 - 104	8.5%
105 - 109	9.0%	105 - 109	3.4%
> 109 mm	14.0%	> 109 mm	8.5%
min size (mm)	5	min size (mm)	9
max size (mm)	124	max size (mm)	121
mean	69	mean	75
mode	8	mode	100

LOCATION 12 ANACAPA ISLAND - CATHEDRAL COVE

1984 *Srongylocentrotus purpuratus*		1985 *Srongylocentrotus purpuratus*	
(cases) N=	135	(cases) N=	122
< 5 mm	0.7%	< 5 mm	0.0
5 - 9	0.0	5 - 9	0.8%
10 - 14	0.0	10 - 14	2.5%
15 - 19	1.5%	15 - 19	1.6%
20 - 24	5.9%	20 - 24	2.5%
25 - 29	8.1%	25 - 29	0.8%
30 - 34	11.1%	30 - 34	3.3%
35 - 39	18.5%	35 - 39	4.9%
40 - 44	16.3%	40 - 44	14.8%
45 - 49	25.2%	45 - 49	18.9%
50 - 54	6.7%	50 - 54	27.9%
55 - 59	3.7%	55 - 59	13.1%
60 - 64	0.7%	60 - 64	3.3%
65 - 69	1.5%	65 - 69	3.3%
70 - 74	0.0	70 - 74	2.5%
75 - 79	0.0	75 - 79	0.0
80 - 84	0.0	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	0.0
95 - 99	0.0	95 - 99	0.0
> 99 mm	0.0	> 99 mm	0.0
min size (mm)	3	min size (mm)	9
max size (mm)	67	max size (mm)	74
mean	40	mean	48
mode	47	mode	52

LOCATION 12 ANACAPA ISLAND - CATHEDRAL COVE

1986
Srongylocentrotus purpuratus

(cases) N=	106
< 5 mm	0.9%
5 - 9	0.0
10 - 14	7.5%
15 - 19	16.0%
20 - 24	8.5%
25 - 29	3.8%
30 - 34	4.7%
35 - 39	7.5%
40 - 44	11.3%
45 - 49	15.1%
50 - 54	11.3%
55 - 59	9.4%
60 - 64	3.8%
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	4
max size (mm)	64
mean	36
mode	18

1987
Srongylocentrotus purpuratus

(cases) N=	105
< 5 mm	11.4%
5 - 9	17.1%
10 - 14	7.6%
15 - 19	1.9%
20 - 24	6.7%
25 - 29	13.3%
30 - 34	12.4%
35 - 39	11.4%
40 - 44	9.5%
45 - 49	3.8%
50 - 54	2.9%
55 - 59	1.0%
60 - 64	1.0%
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	2
max size (mm)	60
mean	24
mode	3

1988
Srongylocentrotus purpuratus

(cases) N=	112
< 5 mm	0.0
5 - 9	5.4%
10 - 14	3.6%
15 - 19	2.7%
20 - 24	0.0
25 - 29	2.7%
30 - 34	5.4%
35 - 39	17.9%
40 - 44	27.7%
45 - 49	17.9%
50 - 54	9.8%
55 - 59	6.3%
60 - 64	0.9%
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	5
max size (mm)	62
mean	39
mode	40

1989
Srongylocentrotus purpuratus

(cases) N=	122
< 5 mm	0.0
5 - 9	18.0%
10 - 14	8.2%
15 - 19	15.6%
20 - 24	1.6%
25 - 29	0.8%
30 - 34	0.8%
35 - 39	3.3%
40 - 44	9.0%
45 - 49	22.1%
50 - 54	11.5%
55 - 59	6.6%
60 - 64	2.5%
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	5
max size (mm)	60
mean	32
mode	47

LOCATION 13 ANACAPA ISLAND - LANDING COVE

	1986 *Haliotis rufescens*	1988 *Haliotis rufescens*
(cases) N=	34	17
< 25 mm	0.0	0.0
25 - 29	0.0	0.0
30 - 34	0.0	0.0
35 - 39	0.0	0.0
40 - 44	0.0	0.0
45 - 49	0.0	0.0
50 - 54	0.0	0.0
55 - 59	0.0	0.0
60 - 64	0.0	0.0
65 - 69	0.0	0.0
70 - 74	0.0	0.0
75 - 79	2.9%	0.0
80 - 84	0.0	0.0
85 - 89	2.9%	0.0
90 - 94	0.0	0.0
95 - 99	2.9%	0.0
100 - 104	2.9%	0.0
105 - 109	0.0	0.0
110 - 114	5.9%	5.9%
115 - 119	0.0	0.0
120 - 124	0.0	5.9%
125 - 129	2.9%	0.0
130 - 134	11.8%	11.8%
135 - 139	14.7%	11.8%
140 - 144	2.9%	5.9%
145 - 149	14.7%	11.8%
150 - 154	5.9%	5.9%
155 - 159	2.9%	11.8%
160 - 164	11.8%	17.6%
165 - 169	0.0	0.0
170 - 174	2.9%	11.8%
175 - 179	0.0	0.0
180 - 184	5.9%	0.0
185 - 189	2.9%	0.0
190 - 194	0.0	0.0
195 - 199	0.0	0.0
> 199 mm	2.9%	0.0
min size (mm)	77	113
max size (mm)	202	173
mean	143	147
mode	132	130

LOCATION 13 ANACAPA ISLAND - LANDING COVE

1984
Haliotis corrugata

(cases) N=	24
< 95 mm	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	4.2%
110 - 114	0.0
115 - 119	0.0
120 - 124	0.0
125 - 129	0.0
130 - 134	12.5%
135 - 139	8.3%
140 - 144	4.2%
145 - 149	20.8%
150 - 154	25.0%
155 - 159	12.5%
160 - 164	4.2%
165 - 169	4.2%
170 - 174	0.0
175 - 179	0.0
180 - 184	0.0
185 - 189	4.2%
> 189 mm	0.0
min size (mm)	105
max size (mm)	185
mean	147
mode	145

1985
Haliotis corrugata

(cases) N=	31
< 70 mm	0.0
70 - 74	3.2%
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
110 - 114	9.7%
115 - 119	6.5%
120 - 124	6.5%
125 - 129	9.7%
130 - 134	6.5%
135 - 139	6.5%
140 - 144	12.9%
145 - 149	6.5%
150 - 154	9.7%
155 - 159	12.9%
160 - 164	3.2%
165 - 169	3.2%
170 - 174	0.0
175 - 179	3.2%
> 179 mm	0.0
min size (mm)	70
max size (mm)	175
mean	137
mode	114

1986
Haliotis corrugata

(cases) N=	31
< 30 mm	0.0
30 - 34	3.2%
35 - 99	0.0
100 - 104	0.0
105 - 109	6.5%
110 - 114	0.0
115 - 119	0.0
120 - 124	3.2%
125 - 129	6.5%
130 - 134	3.2%
135 - 139	12.9%
140 - 144	6.5%
145 - 149	6.5%
150 - 154	12.9%
155 - 159	19.4%
160 - 164	6.5%
165 - 169	6.5%
170 - 174	6.5%
> 174 mm	0.0
min size (mm)	31
max size (mm)	171
mean	143
mode	139

1987
Haliotis corrugata

(cases) N=	41
< 25 mm	4.9%
25 - 29	7.3%
30 - 34	12.2%
35 - 39	7.3%
40 - 44	12.2%
45 - 49	9.8%
50 - 54	7.3%
55 - 59	7.3%
60 - 64	4.9%
65 - 69	4.9%
70 - 74	0.0
75 - 79	0.0
80 - 84	4.9%
85 - 89	2.4%
90 - 94	2.4%
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
110 - 114	0.0
115 - 119	0.0
120 - 124	0.0
125 - 129	0.0
130 - 134	0.0
135 - 139	2.4%
140 - 144	0.0
145 - 149	0.0
150 - 154	2.4%
155 - 159	2.4%
160 - 164	0.0
165 - 169	2.4%
170 - 174	2.4%
> 174 mm	0.0
min size (mm)	8

max size (mm)	170
mean	61
mode	30

LOCATION 13 ANACAPA ISLAND - LANDING COVE

1988 *Haliotis corrugata*		1989 *Haliotis corrugata*	
(cases) N=	3	(cases) N=	32
< 25 mm	0.0	< 25 mm	0.0
25 - 29	0.0	25 - 29	0.0
30 - 34	0.0	30 - 34	0.0
35 - 39	0.0	35 - 39	0.0
40 - 44	0.0	40 - 44	0.0
45 - 49	0.0	45 - 49	0.0
50 - 54	0.0	50 - 54	0.0
55 - 59	0.0	55 - 59	0.0
60 - 64	0.0	60 - 64	0.0
65 - 69	0.0	65 - 69	0.0
70 - 74	0.0	70 - 74	0.0
75 - 79	0.0	75 - 79	3.1%
80 - 84	0.0	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	3.1%
95 - 99	0.0	95 - 99	0.0
100 - 104	0.0	100 - 104	0.0
105 - 109	0.0	105 - 109	0.0
110 - 114	0.0	110 - 114	0.0
115 - 119	0.0	115 - 119	6.3%
120 - 124	0.0	120 - 124	3.1%
125 - 129	0.0	125 - 129	12.5%
130 - 134	0.0	130 - 134	9.4%
135 - 139	33.3%	135 - 139	6.3%
140 - 144	0.0	140 - 144	9.4%
145 - 149	0.0	145 - 149	6.3%
150 - 154	33.3%	150 - 154	9.4%
155 - 159	0.0	155 - 159	15.6%
160 - 164	0.0	160 - 164	6.3%
165 - 169	0.0	165 - 169	6.3%
170 - 174	33.3%	170 - 174	0.0
175 - 179	0.0	175 - 179	0.0
180 - 184	0.0	180 - 184	3.1%
185 - 189	0.0	185 - 189	0.0
190 - 194	0.0	190 - 194	0.0
195 - 199	0.0	195 - 199	0.0
> 199 mm	0.0	> 199 mm	0.0
min size (mm)	138	min size (mm)	78
max size (mm)	172	max size (mm)	181
mean	154	mean	141
mode	138	mode	129

LOCATION 13 ANACAPA ISLAND - LANDING COVE

1984
Cypraea spadicea

(cases) N=	23
< 30 mm	0.0
30 - 34	0.0
35 - 39	4.3%
40 - 44	26.1%
45 - 49	34.8%
50 - 54	21.7%
55 - 59	13.0%
>59 mm	0.0
min size (mm)	36
max size (mm)	58
mean	48
mode	48

1985
Cypraea spadicea

(cases) N=	24
< 30 mm	0.0
30 - 34	4.2%
35 - 39	4.2%
40 - 44	33.3%
45 - 49	20.8%
50 - 54	33.3%
55 - 59	4.2%
>59 mm	0.0
min size (mm)	33
max size (mm)	57
mean	46
mode	40

1987
Cypraea spadicea

(cases) N=	44
< 30 mm	0.0
30 - 34	4.5%
35 - 39	27.3%
40 - 44	34.1%
45 - 49	29.5%
50 - 54	4.5%
55 - 59	0.0
>59 mm	0.0
min size (mm)	32
max size (mm)	52
mean	42
mode	40

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Size Frequencies

LOCATION 13 ANACAPA ISLAND - LANDING COVE

1986
Kelletia kelletii

(cases) N=	11
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	9.1%
80 - 89	18.2%
90 - 99	18.2%
100 - 109	36.4%
110 - 119	18.2%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	75
max size (mm)	113
mean	98
mode	82

1987
Kelletia kelletii

(cases) N=	19
<40 mm	52.6%
40 - 49	26.3%
50 - 59	0.0
60 - 69	0.0
70 - 79	5.3%
80 - 89	10.5%
90 - 99	5.3%
100 - 109	0.0
110 - 119	0.0
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	27
max size (mm)	90
mean	47
mode	27

1988
Kelletia kelletii

(cases) N=	12
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	8.3%
70 - 79	0.0
80 - 89	16.7%
90 - 99	25.0%
100 - 109	25.0%
110 - 119	25.0%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	68
max size (mm)	112
mean	99
mode	68

1989
Kelletia kelletii

(cases) N=	11
<40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	0.0
80 - 89	18.2%
90 - 99	18.2%
100 - 109	27.3%
110 - 119	27.3%
120 - 129	9.1%
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	87
max size (mm)	124
mean	105
mode	103

LOCATION 13 ANACAPA ISLAND - LANDING COVE

1984
Astraea undosa

(cases) N=	46
< 30 mm	0.0
30 - 39	0.0
40 - 49	10.9%
50 - 59	43.5%
60 - 69	19.6%
70 - 79	8.7%
80 - 89	10.9%
90 - 99	6.5%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	40
max size (mm)	99
mean	63
mode	60

1985
Astraea undosa

(cases) N=	30
< 30 mm	0.0
30 - 39	6.7%
40 - 49	6.7%
50 - 59	40.0%
60 - 69	20.0%
70 - 79	26.7%
80 - 89	0.0
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	39
max size (mm)	77
mean	60
mode	52

1986
Astraea undosa

(cases) N=	61
< 10 mm	0.0
10 - 19	0.0
20 - 29	4.9%
30 - 39	0.0
40 - 49	6.6%
50 - 59	13.1%
60 - 69	34.4%
70 - 79	23.0%
80 - 89	14.8%
90 - 99	3.3%
100 - 109	0.0
>109 mm	0.0
min size (mm)	22
max size (mm)	94
mean	66
mode	66

1987
Astraea undosa

(cases) N=	29
< 10 mm	0.0
10 - 19	0.0
20 - 29	3.4%
30 - 39	0.0
40 - 49	27.6%
50 - 59	37.9%
60 - 69	20.7%
70 - 79	6.9%
80 - 89	3.4%
90 - 99	0.0
>99 mm	0.0
min size (mm)	27
max size (mm)	84
mean	56
mode	57

1988
Astraea undosa

(cases) N=	30
< 30 mm	0.0
30 - 39	6.7%
40 - 49	13.3%
50 - 59	3.3%
60 - 69	33.3%
70 - 79	30.0%
80 - 89	10.0%
90 - 99	3.3%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	38
max size (mm)	93
mean	66
mode	48

1989
Astraea undosa

(cases) N=	32
< 30 mm	0.0
30 - 39	3.1%
40 - 49	25.0%
50 - 59	18.8%
60 - 69	12.5%
70 - 79	37.5%
80 - 89	3.1%
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	35
max size (mm)	82
mean	61
mode	40

LOCATION 13 ANACAPA ISLAND - LANDING COVE

1984
Megathura crenulata

(cases) N=	39
< 40 mm	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	10.3%
70 - 79	12.8%
80 - 89	51.3%
90 - 99	17.9%
100 - 109	7.7%
110 - 119	0.0
>119 mm	0.0
min size (mm)	64
max size (mm)	102
mean	85
mode	88

1985
Megathura crenulata

(cases) N=	30
< 40 mm	0.0
40 - 49	0.0
50 - 59	3.3%
60 - 69	0.0
70 - 79	16.7%
80 - 89	46.7%
90 - 99	13.3%
100 - 109	6.7%
110 - 119	10.0%
>119 mm	0.0
min size (mm)	59
max size (mm)	120
mean	89
mode	86

1986
Megathura crenulata

(cases) N=	38
< 40 mm	0.0
40 - 49	0.0
50 - 59	2.6%
60 - 69	5.3%
70 - 79	5.3%
80 - 89	10.5%
90 - 99	15.8%
100 - 109	31.6%
110 - 119	21.1%
>119 mm	7.9%
min size (mm)	50
max size (mm)	128
mean	99
mode	101

1987
Megathura crenulata

(cases) N=	31
< 10 mm	0.0
10 - 19	3.2%
20 - 29	3.2%
30 - 39	0.0
40 - 49	0.0
50 - 59	3.2%
60 - 69	3.2%
70 - 79	12.9%
80 - 89	45.2%
90 - 99	25.8%
100 - 109	3.2%
110 - 119	0.0
>119 mm	0.0
min size (mm)	13
max size (mm)	102
mean	80
mode	86

1988
Megathura crenulata

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	16.7%
80 - 89	33.3%
90 - 99	40.0%
100 - 109	10.0%
110 - 119	0.0
>119 mm	0.0
min size (mm)	75
max size (mm)	103
mean	89
mode	96

1987
Patiria miniata

(cases) N=	19
< 10 mm	15.8%
10 - 19	42.1%
20 - 29	31.6%
30 - 39	5.3%
40 - 49	5.3%
>49 mm	0.0
min size (mm)	8
max size (mm)	42
mean	20
mode	18

LOCATION 13 ANACAPA ISLAND - LANDING COVE

1984
Hinnites giganteus

(cases) N=	50
< 30 mm	0.0
30 - 39	0.0
40 - 49	22.0%
50 - 59	30.0%
60 - 69	14.0%
70 - 79	16.0%
80 - 89	8.0%
90 - 99	4.0%
100 - 109	2.0%
110 - 119	2.0%
120 - 129	0.0
130 - 139	2.0%
>139 mm	0.0
min size (mm)	42
max size (mm)	132
mean	64
mode	50

1985
Hinnites giganteus

(cases) N=	46
< 10 mm	0.0
10 - 19	2.2%
20 - 29	0.0
30 - 39	4.3%
40 - 49	4.3%
50 - 59	21.7%
60 - 69	13.0%
70 - 79	19.6%
80 - 89	17.4%
90 - 99	6.5%
100 - 109	6.5%
110 - 119	4.3%
>119 mm	0.0
min size (mm)	18
max size (mm)	114
mean	71
mode	50

1986
Hinnites giganteus

(cases) N=	35
< 30 mm	0.0
30 - 39	0.0
40 - 49	14.3%
50 - 59	14.3%
60 - 69	28.6%
70 - 79	20.0%
80 - 89	14.3%
90 - 99	2.9%
100 - 109	2.9%
110 - 119	2.9%
>129 mm	0.0
min size (mm)	42
max size (mm)	110
mean	68
mode	65

1987
Hinnites giganteus

(cases) N=	62
< 30 mm	0.0
30 - 39	4.8%
40 - 49	8.1%
50 - 59	14.5%
60 - 69	27.4%
70 - 79	21.0%
80 - 89	6.5%
90 - 99	9.7%
100 - 109	3.2%
110 - 119	3.2%
120 - 129	1.6%
>129 mm	0.0
min size (mm)	33
max size (mm)	127
mean	71
mode	67

1988
Hinnites giganteus

(cases) N=	51
< 10 mm	0.0
10 - 19	2.0%
20 - 29	0.0
30 - 39	7.8%
40 - 49	7.8%
50 - 59	17.6%
60 - 69	15.7%
70 - 79	31.4%
80 - 89	3.9%
90 - 99	3.9%
100 - 109	3.9%
110 - 119	3.9%
120 - 129	2.0%
130 - 139	0.0
>139 mm	0.0
min size (mm)	15
max size (mm)	121
mean	67
mode	72

1989
Hinnites giganteus

(cases) N=	30
< 20 mm	0.0
20 - 29	0.0
30 - 39	3.3%
40 - 49	6.7%
50 - 59	10.0%
60 - 69	13.3%
70 - 79	10.0%
80 - 89	13.3%
90 - 99	13.3%
100 - 109	6.7%
110 - 119	3.3%
120 - 129	6.7%
130 - 139	3.3%
140 - 149	6.7%
>149 mm	3.3%
min size (mm)	37
max size (mm)	153

mean	87
mode	37

LOCATION 13 ANACAPA ISLAND - LANDING COVE

1984

Strongylocentrotus franciscanus

(cases) N=	104
< 5 mm	0.0
5 - 9	4.8%
10 - 14	1.9%
15 - 19	4.8%
20 - 24	3.8%
25 - 29	4.8%
30 - 34	0.0
35 - 39	1.0%
40 - 44	1.0%
45 - 49	1.9%
50 - 54	1.0%
55 - 59	1.0%
60 - 64	1.9%
65 - 69	1.0%
70 - 74	1.0%
75 - 79	4.8%
80 - 84	4.8%
85 - 89	7.7%
90 - 94	7.7%
95 - 99	16.3%
100 - 104	6.7%
105 - 109	8.7%
> 109 mm	12.5%
min size (mm)	6
max size (mm)	127
mean	78
mode	96

1985

Strongylocentrotus franciscanus

(cases) N=	106
< 5 mm	0.0
5 - 9	4.7%
10 - 14	17.9%
15 - 19	2.8%
20 - 24	2.8%
25 - 29	2.8%
30 - 34	1.9%
35 - 39	0.9%
40 - 44	0.0
45 - 49	0.0
50 - 54	0.9%
55 - 59	0.0
60 - 64	0.9%
65 - 69	0.0
70 - 74	0.0
75 - 79	2.8%
80 - 84	5.7%
85 - 89	6.6%
90 - 94	5.7%
95 - 99	12.3%
100 - 104	10.4%
105 - 109	9.4%
> 109 mm	10.4%
min size (mm)	5
max size (mm)	140
mean	70
mode	12

1986

Strongylocentrotus franciscanus

(cases) N=	95
< 5 mm	0.0
5 - 9	0.0
10 - 14	1.1%
15 - 19	2.1%
20 - 24	0.0
25 - 29	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	1.1%
45 - 49	3.2%
50 - 54	1.1%
55 - 59	1.1%
60 - 64	3.2%
65 - 69	0.0
70 - 74	1.1%
75 - 79	5.3%
80 - 84	8.4%
85 - 89	7.4%
90 - 94	15.8%
95 - 99	9.5%
100 - 104	13.7%
105 - 109	12.6%
> 109 mm	12.6%
min size (mm)	12
max size (mm)	134
mean	92
mode	84

1987

Strongylocentrotus franciscanus

(cases) N=	99
< 5 mm	0.0
5 - 9	0.0
10 - 14	1.0%
15 - 19	0.0
20 - 24	1.0%
25 - 29	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
50 - 54	0.0
55 - 59	2.0%
60 - 64	3.0%
65 - 69	1.0%
70 - 74	4.0%
75 - 79	5.1%
80 - 84	7.1%
85 - 89	6.1%
90 - 94	5.1%
95 - 99	13.1%
100 - 104	14.1%
105 - 109	10.1%
> 109 mm	24.2%
min size (mm)	13
max size (mm)	143
mean	97
mode	97

LOCATION 13 ANACAPA ISLAND - LANDING COVE

	1988 *Strongylocentrotus franciscanus*	1989 *Strongylocentrotus franciscanus*
(cases) N=	71	121
< 5 mm	0.0	0.0
5 - 9	0.0	5.8%
10 - 14	9.9%	4.1%
15 - 19	1.4%	4.1%
20 - 24	4.2%	9.1%
25 - 29	1.4%	2.5%
30 - 34	2.8%	1.7%
35 - 39	1.4%	0.0
40 - 44	4.2%	0.8%
45 - 49	0.0	3.3%
50 - 54	1.4%	0.8%
55 - 59	5.6%	4.1%
60 - 64	4.2%	1.7%
65 - 69	2.8%	1.7%
70 - 74	8.5%	1.7%
75 - 79	4.2%	4.1%
80 - 84	7.0%	3.3%
85 - 89	5.6%	5.8%
90 - 94	5.6%	6.6%
95 - 99	5.6%	6.6%
100 - 104	2.8%	7.4%
105 - 109	7.0%	6.6%
> 109 mm	9.9%	18.2%
min size (mm)	11	5
max size (mm)	126	129
mean	72	72
mode	13	100

LOCATION 13 ANACAPA ISLAND - LANDING COVE

1984
Srongylocentrotus purpuratus

(cases) N=	63
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	3.2%
20 - 24	4.8%
25 - 29	6.3%
30 - 34	4.8%
35 - 39	4.8%
40 - 44	15.9%
45 - 49	14.3%
50 - 54	20.6%
55 - 59	14.3%
60 - 64	6.3%
65 - 69	4.8%
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	16
max size (mm)	66
mean	46
mode	47

1985
Srongylocentrotus purpuratus

(cases) N=	99
< 5 mm	2.0%
5 - 9	19.2%
10 - 14	20.2%
15 - 19	3.0%
20 - 24	2.0%
25 - 29	3.0%
30 - 34	3.0%
35 - 39	3.0%
40 - 44	11.1%
45 - 49	15.2%
50 - 54	8.1%
55 - 59	4.0%
60 - 64	2.0%
65 - 69	3.0%
70 - 74	1.0%
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	4
max size (mm)	71
mean	30
mode	11

1986
Srongylocentrotus purpuratus

(cases) N=	98
< 5 mm	0.0
5 - 9	4.1%
10 - 14	6.1%
15 - 19	15.3%
20 - 24	22.4%
25 - 29	13.3%
30 - 34	2.0%
35 - 39	1.0%
40 - 44	7.1%
45 - 49	4.1%
50 - 54	12.2%
55 - 59	7.1%
60 - 64	3.1%
65 - 69	2.0%
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	9
max size (mm)	67
mean	32
mode	22

1987
Srongylocentrotus purpuratus

(cases) N=	103
< 5 mm	0.0
5 - 9	6.8%
10 - 14	1.0%
15 - 19	9.7%
20 - 24	7.8%
25 - 29	15.5%
30 - 34	4.9%
35 - 39	15.5%
40 - 44	9.7%
45 - 49	9.7%
50 - 54	3.9%
55 - 59	8.7%
60 - 64	3.9%
65 - 69	1.0%
70 - 74	1.0%
75 - 79	1.0%
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	6
max size (mm)	75
mean	36
mode	17

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies

LOCATION 13 ANACAPA ISLAND - LANDING COVE

1988 *Srongylocentrotus purpuratus*		1989 *Srongylocentrotus purpuratus*	
(cases) N=	75	(cases) N=	111
< 5 mm	0.0	< 5 mm	0.0
5 - 9	0.0	5 - 9	11.7%
10 - 14	0.0	10 - 14	5.4%
15 - 19	4.0%	15 - 19	8.1%
20 - 24	2.7%	20 - 24	7.2%
25 - 29	8.0%	25 - 29	4.5%
30 - 34	5.3%	30 - 34	4.5%
35 - 39	12.0%	35 - 39	8.1%
40 - 44	13.3%	40 - 44	11.7%
45 - 49	16.0%	45 - 49	9.0%
50 - 54	20.0%	50 - 54	17.1%
55 - 59	13.3%	55 - 59	5.4%
60 - 64	4.0%	60 - 64	5.4%
65 - 69	1.3%	65 - 69	1.8%
70 - 74	0.0	70 - 74	0.0
75 - 79	0.0	75 - 79	0.0
80 - 84	0.0	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	0.0
95 - 99	0.0	95 - 99	0.0
100 - 104	0.0	100 - 104	0.0
105 - 109	0.0	105 - 109	0.0
> 109 mm	0.0	> 109 mm	0.0
min size (mm)	15	min size (mm)	5
max size (mm)	65	max size (mm)	68
mean	44	mean	35
mode	52	mode	50

LOCATION 14 SANTA BARBARA ISLAND - SOUTH EAST
SEALION ROOKERY

1986
Tethya aurantia

(cases) N=	33
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	6.1%
40 - 49	27.3%
50 - 59	24.2%
60 - 69	18.2%
70 - 79	18.2%
80 - 89	6.1%
90 - 99	0.0
>99 mm	0.0
min size (mm)	36
max size (mm)	85
mean	58
mode	48

1987
Tethya aurantia

(cases) N=	39
< 10 mm	0.0
10 - 19	0.0
20 - 29	5.1%
30 - 39	10.3%
40 - 49	15.4%
50 - 59	15.4%
60 - 69	28.2%
70 - 79	17.9%
80 - 89	7.7%
90 - 99	0.0
>99 mm	0.0
min size (mm)	24
max size (mm)	84
mean	58
mode	69

1988
Tethya aurantia

(cases) N=	32
< 10 mm	0.0
10 - 19	0.0
20 - 29	6.3%
30 - 39	21.9%
40 - 49	9.4%
50 - 59	25.0%
60 - 69	21.9%
70 - 79	9.4%
80 - 89	6.3%
90 - 99	0.0
>99 mm	0.0
min size (mm)	21
max size (mm)	84
mean	54
mode	35

1989
Tethya aurantia

(cases) N=	31
< 10 mm	0.0
10 - 19	0.0
20 - 29	12.9%
30 - 39	6.5%
40 - 49	9.7%
50 - 59	16.1%
60 - 69	16.1%
70 - 79	25.8%
80 - 89	12.9%
90 - 99	0.0
>99 mm	0.0
min size (mm)	20
max size (mm)	86
mean	59
mode	76

LOCATION 14 SANTA BARBARA ISLAND - SOUTH EAST SEALION ROOKERY

1984
Haliotis corrugata

(cases) N=	8
< 70 mm	0.0
70 - 74	12.5%
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
110 - 114	12.5%
115 - 119	0.0
120 - 124	12.5%
125 - 129	0.0
130 - 134	0.0
135 - 139	0.0
140 - 144	0.0
145 - 149	12.5%
150 - 154	0.0
155 - 159	0.0
160 - 164	12.5%
165 - 169	12.5%
170 - 174	12.5%
175 - 179	0.0
180 - 184	0.0
185 - 189	0.0
190 - 194	0.0
195 - 199	12.5%
> 199 mm	0.0
min size (mm)	70
max size (mm)	195
mean	142
mode	70

1985
Haliotis corrugata

(cases) N=	10
< 35 mm	0.0
35 - 39	10.0%
40 - 44	0.0
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	10.0%
80 - 84	0.0
85 - 89	10.0%
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
110 - 114	0.0
115 - 119	0.0
120 - 124	0.0
125 - 129	0.0
130 - 134	0.0
135 - 139	10.0%
140 - 144	0.0
145 - 149	40.0%
150 - 154	0.0
155 - 159	0.0
160 - 164	10.0%
165 - 169	0.0
170 - 174	0.0
175 - 179	0.0
180 - 184	0.0
185 - 189	0.0
190 - 194	0.0
195 - 199	10.0%
> 199 mm	0.0
min size (mm)	37
max size (mm)	199
mean	129
mode	145

1986
Haliotis corrugata

(cases) N=	9
< 115 mm	0.0
115 - 119	0.0
120 - 124	11.1%
125 - 129	11.1%
130 - 134	22.2%
135 - 139	22.2%
140 - 144	22.2%
145 - 149	0.0
150 - 154	11.1%
> 155 mm	0.0
min size (mm)	124
max size (mm)	153
mean	136
mode	124

LOCATION 14 SANTA BARBARA ISLAND - SOUTH EAST SEALION ROOKERY

1985
Cypraea spadicea

(cases) N=	14
< 30 mm	0.0
30 - 34	7.1%
35 - 39	14.3%
40 - 44	42.9%
45 - 49	28.6%
50 - 54	7.1%
55 - 59	0.0
>59 mm	0.0
min size (mm)	34
max size (mm)	51
mean	43
mode	42

1986
Cypraea spadicea

(cases) N=	14
< 30 mm	0.0
30 - 34	0.0
35 - 39	50.0%
40 - 44	35.7%
45 - 49	7.1%
50 - 54	7.1%
55 - 59	0.0
>59 mm	0.0
min size (mm)	35
max size (mm)	50
mean	41
mode	36

1987
Cypraea spadicea

(cases) N=	41
< 30 mm	2.4%
30 - 34	7.3%
35 - 39	22.0%
40 - 44	46.3%
45 - 49	19.5%
50 - 54	2.4%
55 - 59	0.0
>59 mm	0.0
min size (mm)	16
max size (mm)	50
mean	41
mode	41

1988
Cypraea spadicea

(cases) N=	14
< 30 mm	0.0
30 - 34	0.0
35 - 39	14.3%
40 - 44	35.7%
45 - 49	42.9%
50 - 54	7.1%
55 - 59	0.0
>59 mm	0.0
min size (mm)	37
max size (mm)	53
mean	45
mode	44

1989
Cypraea spadicea

(cases) N=	30
< 30 mm	0.0
30 - 34	3.3%
35 - 39	23.3%
40 - 44	36.7%
45 - 49	30.0%
50 - 54	6.7%
55 - 59	0.0
>59 mm	0.0
min size (mm)	34
max size (mm)	52
mean	42
mode	46

LOCATION 14 SANTA BARBARA ISLAND - SOUTH EAST SEALION ROOKERY

1984
Astraea undosa

(cases) N=	38
< 10 mm	0.0
10 - 19	2.6%
20 - 29	7.9%
30 - 39	0.0
40 - 49	7.9%
50 - 59	2.6%
60 - 69	2.6%
70 - 79	18.4%
80 - 89	21.1%
90 - 99	34.2%
100 - 109	2.6%
110 - 119	0.0
>119 mm	0.0
min size (mm)	17
max size (mm)	100
mean	76
mode	79

1985
Astraea undosa

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	43.3%
30 - 39	30.0%
40 - 49	20.0%
50 - 59	3.3%
60 - 69	3.3%
>79 mm	0.0
min size (mm)	21
max size (mm)	65
mean	34
mode	40

1986
Astraea undosa

(cases) N=	32
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	34.4%
40 - 49	62.5%
50 - 59	0.0
60 - 69	3.1%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	33
max size (mm)	63
mean	40
mode	40

1987
Astraea undosa

(cases) N=	54
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	13.0%
40 - 49	35.2%
50 - 59	29.6%
60 - 69	13.0%
70 - 79	1.9%
80 - 89	5.6%
90 - 99	1.9%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	30
max size (mm)	96
mean	52
mode	44

1988
Astraea undosa

(cases) N=	33
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	9.1%
50 - 59	39.4%
60 - 69	45.5%
70 - 79	6.1%
80 - 89	0.0
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	40
max size (mm)	78
mean	59
mode	52

1989
Astraea undosa

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	3.3%
50 - 59	36.7%
60 - 69	53.3%
70 - 79	6.7%
80 - 89	0.0
90 - 99	0.0
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	49
max size (mm)	72
mean	61
mode	64

LOCATION 14 SANTA BARBARA ISLAND - SOUTH EAST SEALION ROOKERY

1985
Kelletia kelletii

(cases) N=	13
<40 mm	46.2%
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	0.0
80 - 89	0.0
90 - 99	7.7%
100 - 109	15.4%
110 - 119	15.4%
120 - 129	7.7%
130 - 139	0.0
140 - 149	7.7%
>149 mm	7.7%
min size (mm)	15
max size (mm)	143
mean	72
mode	15

1984
Megathura crenulata

(cases) N=	42
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	2.4%
50 - 59	16.7%
60 - 69	4.8%
70 - 79	31.0%
80 - 89	26.2%
90 - 99	16.7%
100 - 109	2.4%
110 - 119	0.0
>119 mm	0.0
min size (mm)	47
max size (mm)	104
mean	76
mode	76

1985
Megathura crenulata

(cases) N=	13
< 10 mm	0.0
10 - 19	0.0
20 - 29	7.7%
30 - 39	0.0
40 - 49	0.0
50 - 59	30.8%
60 - 69	7.7%
70 - 79	7.7%
80 - 89	38.5%
90 - 99	7.7%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	27
max size (mm)	97
mean	69
mode	55

LOCATION 14 SANTA BARBARA ISLAND - SOUTH EAST SEALION ROOKERY

1985
Hinnites giganteus

(cases) N=	21
< 10 mm	0.0
10 - 19	0.0
20 - 29	9.5%
30 - 39	19.0%
40 - 49	19.0%
50 - 59	4.8%
60 - 69	4.8%
70 - 79	9.5%
80 - 89	9.5%
90 - 99	14.3%
100 - 109	4.8%
110 - 119	0.0
120 - 129	0.0
130 - 139	4.8%
140 - 149	0.0
>149 mm	0.0
min size (mm)	23
max size (mm)	133
mean	62
mode	37

1986
Hinnites giganteus

(cases) N=	12
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	25.0%
50 - 59	0.0
60 - 69	0.0
70 - 79	8.3%
80 - 89	8.3%
90 - 99	0.0
100 - 109	8.3%
110 - 119	33.3%
120 - 129	16.7%
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	42
max size (mm)	125
mean	91
mode	45

1987
Patiria miniata

(cases) N=	34
< 10 mm	0.0
10 - 19	11.8%
20 - 29	20.6%
30 - 39	47.1%
40 - 49	17.6%
50 - 59	0.0
60 - 69	2.9%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	11
max size (mm)	67
mean	33
mode	31

1988
Patiria miniata

(cases) N=	34
< 10 mm	0.0
10 - 19	0.0
20 - 29	8.8%
30 - 39	32.4%
40 - 49	14.7%
50 - 59	38.2%
60 - 69	5.9%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	23
max size (mm)	67
mean	45
mode	56

1989
Patiria miniata

(cases) N=	55
< 10 mm	0.0
10 - 19	0.0
20 - 29	3.6%
30 - 39	21.8%
40 - 49	21.8%
50 - 59	34.5%
60 - 69	12.7%
70 - 79	3.6%
80 - 89	1.8%
90 - 99	0.0
>100 mm	0.0
min size (mm)	21
max size (mm)	80
mean	49
mode	45

LOCATION 14 SANTA BARBARA ISLAND - SOUTH EAST SEALION ROOKERY

1986
Pisaster giganteus

(cases) N=	23
<20 mm	0.0
20 - 39	4.3%
40 - 59	4.3%
60 - 79	8.7%
80 - 99	21.7%
100 - 119	30.4%
120 - 139	17.4%
140 - 159	13.0%
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	24
max size (mm)	145
mean	104
mode	115

1987
Pisaster giganteus

(cases) N=	26
<20 mm	0.0
20 - 39	0.0
40 - 59	3.8%
60 - 79	30.8%
80 - 99	26.9%
100 - 119	19.2%
120 - 139	0.0
140 - 159	11.5%
160 - 179	3.8%
180 - 199	0.0
200 - 219	3.8%
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	55
max size (mm)	215
mean	101
mode	75

1988
Pisaster giganteus

(cases) N=	32
<20 mm	0.0
20 - 39	0.0
40 - 59	6.3%
60 - 79	28.1%
80 - 99	31.3%
100 - 119	21.9%
120 - 139	12.5%
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	45
max size (mm)	135
mean	92
mode	89

1989
Pisaster giganteus

(cases) N=	31
<20 mm	0.0
20 - 39	0.0
40 - 59	3.2%
60 - 79	12.9%
80 - 99	67.7%
100 - 119	9.7%
120 - 139	6.5%
140 - 159	0.0
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	53
max size (mm)	131
mean	89
mode	88

LOCATION 14 SANTA BARBARA ISLAND - SOUTH EAST SEALION ROOKERY

1986
Lytechinus anamesus

(cases) N=	103
< 5 mm	0.0
5 - 9	2.9%
10 - 14	10.7%
15 - 19	57.3%
20 - 24	29.1%
25 - 29	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	8
max size (mm)	24
mean	18
mode	20

1987
Lytechinus anamesus

(cases) N=	104
< 5 mm	0.0
5 - 9	3.8%
10 - 14	44.2%
15 - 19	33.7%
20 - 24	18.3%
25 - 29	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	8
max size (mm)	24
mean	15
mode	13

1988
Lytechinus anamesus

(cases) N=	102
< 5 mm	0.0
5 - 9	5.9%
10 - 14	37.3%
15 - 19	48.0%
20 - 24	8.8%
25 - 29	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	7
max size (mm)	23
mean	15
mode	15

1989
Lytechinus anamesus

(cases) N=	117
< 5 mm	0.0
5 - 9	0.0
10 - 14	4.3%
15 - 19	63.2%
20 - 24	29.9%
25 - 29	2.6%
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	10
max size (mm)	26
mean	18
mode	18

LOCATION 14 SANTA BARBARA ISLAND - SOUTH EAST SEALION ROOKERY

1984

Strongylocentrotus franciscanus

(cases) N=	100
< 5 mm	0.0
5 - 9	1.0%
10 - 14	3.0%
15 - 19	12.0%
20 - 24	3.0%
25 - 29	1.0%
30 - 34	1.0%
35 - 39	4.0%
40 - 44	2.0%
45 - 49	0.0
50 - 54	4.0%
55 - 59	2.0%
60 - 64	8.0%
65 - 69	13.0%
70 - 74	18.0%
75 - 79	7.0%
80 - 84	6.0%
85 - 89	7.0%
90 - 94	4.0%
95 - 99	2.0%
100 - 104	0.0
105 - 109	1.0%
> 109 mm	1.0%
min size (mm)	6
max size (mm)	112
mean	60
mode	70

1985

Strongylocentrotus franciscanus

(cases) N=	131
< 5 mm	2.3%
5 - 9	9.9%
10 - 14	6.1%
15 - 19	7.6%
20 - 24	22.1%
25 - 29	5.3%
30 - 34	6.1%
35 - 39	1.5%
40 - 44	4.6%
45 - 49	1.5%
50 - 54	3.8%
55 - 59	3.1%
60 - 64	0.0
65 - 69	3.1%
70 - 74	0.8%
75 - 79	3.8%
80 - 84	4.6%
85 - 89	3.1%
90 - 94	4.6%
95 - 99	2.3%
100 - 104	1.5%
105 - 109	0.8%
> 109 mm	0.8%
min size (mm)	2
max size (mm)	114
mean	41
mode	22

1986

Strongylocentrotus franciscanus

(cases) N=	97
< 5 mm	0.0
5 - 9	0.0
10 - 14	1.0%
15 - 19	5.2%
20 - 24	21.6%
25 - 29	29.9%
30 - 34	15.5%
35 - 39	4.1%
40 - 44	1.0%
45 - 49	3.1%
50 - 54	0.0
55 - 59	1.0%
60 - 64	1.0%
65 - 69	1.0%
70 - 74	3.1%
75 - 79	0.0
80 - 84	5.2%
85 - 89	2.1%
90 - 94	0.0
95 - 99	3.1%
100 - 104	2.1%
105 - 109	0.0
> 109 mm	0.0
min size (mm)	14
max size (mm)	104
mean	37
mode	26

1987

Strongylocentrotus franciscanus

(cases) N=	115
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.9%
15 - 19	15.7%
20 - 24	47.8%
25 - 29	14.8%
30 - 34	2.6%
35 - 39	0.9%
40 - 44	0.0
45 - 49	0.0
50 - 54	0.0
55 - 59	0.9%
60 - 64	0.0
65 - 69	2.6%
70 - 74	0.9%
75 - 79	2.6%
80 - 84	1.7%
85 - 89	2.6%
90 - 94	3.5%
95 - 99	0.9%
100 - 104	0.9%
105 - 109	0.9%
> 109 mm	0.0
min size (mm)	13
max size (mm)	107
mean	33
mode	21

Channel Islands National Park   Kelp Forest Monitoring 1982-1989

Size Frequencies

LOCATION 14 SANTA BARBARA ISLAND - SOUTH EAST SEALION ROOKERY

1988 *Strongylocentrotus franciscanus*		1989 *Strongylocentrotus franciscanus*	
(cases) N=	102	(cases) N=	128
< 5 mm	0.0	< 5 mm	0.0
5 - 9	2.9%	5 - 9	1.6%
10 - 14	1.0%	10 - 14	1.6%
15 - 19	0.0	15 - 19	7.0%
20 - 24	11.8%	20 - 24	3.1%
25 - 29	36.3%	25 - 29	12.5%
30 - 34	34.3%	30 - 34	34.4%
35 - 39	3.9%	35 - 39	15.6%
40 - 44	1.0%	40 - 44	4.7%
45 - 49	0.0	45 - 49	1.6%
50 - 54	0.0	50 - 54	2.3%
55 - 59	0.0	55 - 59	0.0
60 - 64	0.0	60 - 64	0.0
65 - 69	0.0	65 - 69	0.0
70 - 74	1.0%	70 - 74	0.8%
75 - 79	0.0	75 - 79	2.3%
80 - 84	2.0%	80 - 84	3.1%
85 - 89	2.9%	85 - 89	1.6%
90 - 94	2.0%	90 - 94	2.3%
95 - 99	1.0%	95 - 99	2.3%
100 - 104	0.0	100 - 104	1.6%
105 - 109	0.0	105 - 109	1.6%
> 109 mm	0.0	> 109 mm	0.0
min size (mm)	6	min size (mm)	5
max size (mm)	97	max size (mm)	108
mean	33	mean	40
mode	30	mode	31

LOCATION 14 SANTA BARBARA ISLAND - SOUTH EAST SEALION ROOKERY

1984
Srongylocentrotus purpuratus

(cases) N=	107
< 5 mm	0.0
5 - 9	0.9%
10 - 14	3.7%
15 - 19	5.6%
20 - 24	29.9%
25 - 29	29.9%
30 - 34	19.6%
35 - 39	6.5%
40 - 44	1.9%
45 - 49	0.9%
50 - 54	0.9%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
> 89 mm	0.0
min size (mm)	7
max size (mm)	52
mean	26
mode	22

1985
Srongylocentrotus purpuratus

(cases) N=	138
< 5 mm	5.1%
5 - 9	39.1%
10 - 14	5.8%
15 - 19	14.5%
20 - 24	5.1%
25 - 29	1.4%
30 - 34	15.9%
35 - 39	10.9%
40 - 44	2.2%
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	3
max size (mm)	41
mean	17
mode	7

1986
Srongylocentrotus purpuratus

(cases) N=	106
< 5 mm	0.9%
5 - 9	10.4%
10 - 14	56.6%
15 - 19	20.8%
20 - 24	4.7%
25 - 29	0.0
30 - 34	4.7%
35 - 39	0.9%
40 - 44	0.9%
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
> 89 mm	0.0
min size (mm)	3
max size (mm)	43
mean	14
mode	14

1987
Srongylocentrotus purpuratus

(cases) N=	109
< 5 mm	0.0
5 - 9	1.8%
10 - 14	14.7%
15 - 19	33.9%
20 - 24	31.2%
25 - 29	14.7%
30 - 34	2.8%
35 - 39	0.9%
40 - 44	0.0
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	5
max size (mm)	38
mean	20
mode	21

Channel Islands National Park   Kelp Forest Monitoring 1982-1989
Size Frequencies
LOCATION 14 SANTA BARBARA ISLAND - SOUTH EAST SEALION ROOKERY

1988
Srongylocentrotus purpuratus

(cases) N=	118
< 5 mm	0.0
5 - 9	5.1%
10 - 14	16.9%
15 - 19	56.8%
20 - 24	17.8%
25 - 29	2.5%
30 - 34	0.8%
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	7
max size (mm)	31
mean	17
mode	18

1989
Srongylocentrotus purpuratus

(cases) N=	165
< 5 mm	0.0
5 - 9	0.6%
10 - 14	17.0%
15 - 19	44.2%
20 - 24	35.2%
25 - 29	3.0%
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	7
max size (mm)	27
mean	18
mode	20

LOCATION 15 SANTA BARBARA ISLAND - ARCH POINT

1984
Astraea undosa

(cases) N=	53
< 10 mm	0.0
10 - 19	1.9%
20 - 29	13.2%
30 - 39	5.7%
40 - 49	17.0%
50 - 59	28.3%
60 - 69	13.2%
70 - 79	9.4%
80 - 89	9.4%
90 - 99	1.9%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	18
max size (mm)	92
mean	54
mode	49

1985
Astraea undosa

(cases) N=	35
< 10 mm	0.0
10 - 19	0.0
20 - 29	31.4%
30 - 39	22.9%
40 - 49	22.9%
50 - 59	0.0
60 - 69	8.6%
70 - 79	8.6%
80 - 89	0.0
90 - 99	2.9%
100 - 109	2.9%
110 - 119	0.0
>119 mm	0.0
min size (mm)	22
max size (mm)	101
mean	44
mode	28

1986
Astraea undosa

(cases) N=	31
< 10 mm	0.0
10 - 19	3.2%
20 - 29	32.3%
30 - 39	16.1%
40 - 49	22.6%
50 - 59	25.8%
60 - 69	0.0
> 69 mm	0.0
min size (mm)	19
max size (mm)	57
mean	38
mode	29

1987
Astraea undosa

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	6.7%
40 - 49	33.3%
50 - 59	26.7%
60 - 69	26.7%
70 - 79	0.0
80 - 89	0.0
90 - 99	3.3%
100 - 109	3.3%
110 - 119	0.0
>119 mm	0.0
min size (mm)	33
max size (mm)	102
mean	54
mode	43

1988
Astraea undosa

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	3.3%
30 - 39	13.3%
40 - 49	46.7%
50 - 59	20.0%
60 - 69	10.0%
70 - 79	6.7%
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	29
max size (mm)	73
mean	48
mode	41

1989
Astraea undosa

(cases) N=	39
< 10 mm	0.0
10 - 19	17.9%
20 - 29	7.7%
30 - 39	2.6%
40 - 49	0.0
50 - 59	30.8%
60 - 69	28.2%
70 - 79	7.7%
80 - 89	5.1%
> 89 mm	0.0
min size (mm)	14
max size (mm)	85
mean	51
mode	56

LOCATION 15 SANTA BARBARA ISLAND - ARCH POINT

1984
Hinnites giganteus

(cases) N=	23
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	21.7%
40 - 49	39.1%
50 - 59	8.7%
60 - 69	4.3%
70 - 79	8.7%
80 - 89	0.0
90 - 99	8.7%
100 - 109	4.3%
110 - 119	0.0
120 - 129	0.0
130 - 139	4.3%
140 - 149	0.0
>149 mm	0.0
min size (mm)	35
max size (mm)	130
mean	58
mode	35

1985
Hinnites giganteus

(cases) N=	12
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	16.7%
50 - 59	41.7%
60 - 69	16.7%
70 - 79	8.3%
80 - 89	0.0
90 - 99	8.3%
100 - 109	0.0
110 - 119	8.3%
120 - 129	0.0
130 - 139	0.0
140 - 149	0.0
>149 mm	0.0
min size (mm)	44
max size (mm)	111
mean	64
mode	57

1986
Hinnites giganteus

(cases) N=	21
< 29 mm	0.0
30 - 39	14.3%
40 - 49	14.3%
50 - 59	9.5%
60 - 69	23.8%
70 - 79	23.8%
80 - 89	0.0
90 - 99	0.0
100 - 109	9.5%
110 - 119	0.0
120 - 129	0.0
130 - 139	4.8%
140 - 149	0.0
>149 mm	0.0
min size (mm)	34
max size (mm)	134
mean	66
mode	49

1986
Cypraea spadicea

(cases) N=	20
< 30 mm	0.0
30 - 34	5.0%
35 - 39	25.0%
40 - 44	40.0%
45 - 49	20.0%
50 - 54	10.0%
55 - 59	0.0
>59 mm	0.0
min size (mm)	34
max size (mm)	54
mean	43
mode	44

1989
Cypraea spadicea

(cases) N=	28
< 30 mm	3.6%
30 - 34	10.7%
35 - 39	32.1%
40 - 44	17.9%
45 - 49	28.6%
50 - 54	7.1%
55 - 59	0.0
>59 mm	0.0
min size (mm)	24
max size (mm)	54
mean	41
mode	35

LOCATION 15 SANTA BARBARA ISLAND - ARCH POINT

1988
Patiria miniata

(cases) N=	50
< 10 mm	12.0%
10 - 19	88.0%
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	0.0
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	8
max size (mm)	16
mean	11
mode	10

89
Patiria miniata

(cases) N=	34
< 10 mm	8.8%
10 - 19	41.2%
20 - 29	26.5%
30 - 39	17.6%
40 - 49	2.9%
50 - 59	0.0
60 - 69	2.9%
70 - 79	0.0
80 - 89	0.0
90 - 99	0.0
>100 mm	0.0
min size (mm)	8
max size (mm)	62
mean	22
mode	13

1988
Pisaster giganteus

(cases) N=	29
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	13.8%
80 - 99	31.0%
100 - 119	24.1%
120 - 139	20.7%
140 - 159	3.4%
160 - 179	3.4%
180 - 199	0.0
200 - 219	3.4%
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	61
max size (mm)	212
mean	110
mode	96

1989
Pisaster giganteus

(cases) N=	33
<20 mm	3.0%
20 - 39	0.0
40 - 59	0.0
60 - 79	0.0
80 - 99	30.3%
100 - 119	39.4%
120 - 139	9.1%
140 - 159	15.2%
160 - 179	0.0
180 - 199	0.0
200 - 219	3.0%
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	17
max size (mm)	200
mean	109
mode	100

LOCATION 15 SANTA BARBARA ISLAND - ARCH POINT

1986
Lytechinus anamesus

(cases) N=	62
< 5 mm	0.0
5 - 9	3.2%
10 - 14	21.0%
15 - 19	46.8%
20 - 24	27.4%
25 - 29	1.6%
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	8
max size (mm)	25
mean	17
mode	15

1987
Lytechinus anamesus

(cases) N=	149
< 5 mm	0.0
5 - 9	0.7%
10 - 14	86.6%
15 - 19	10.7%
20 - 24	1.3%
25 - 29	0.7%
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	9
max size (mm)	28
mean	13
mode	12

1988
Lytechinus anamesus

(cases) N=	104
< 5 mm	0.0
5 - 9	6.7%
10 - 14	51.0%
15 - 19	39.4%
20 - 24	2.9%
25 - 29	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	7
max size (mm)	23
mean	14
mode	13

1989
Lytechinus anamesus

(cases) N=	90
< 5 mm	0.0
5 - 9	4.4%
10 - 14	73.3%
15 - 19	20.0%
20 - 24	2.2%
25 - 29	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
>49 mm	0.0
min size (mm)	7
max size (mm)	22
mean	13
mode	12

LOCATION 15 SANTA BARBARA ISLAND - ARCH POINT

1984

Strongylocentrotus franciscanus

(cases) N=	127
< 5 mm	35.4%
5 - 9	17.3%
10 - 14	2.4%
15 - 19	9.4%
20 - 24	1.6%
25 - 29	0.8%
30 - 34	0.0
35 - 39	0.0
40 - 44	0.0
45 - 49	0.0
50 - 54	1.6%
55 - 59	0.0
60 - 64	4.7%
65 - 69	1.6%
70 - 74	1.6%
75 - 79	1.6%
80 - 84	7.1%
85 - 89	5.5%
90 - 94	2.4%
95 - 99	2.4%
100 - 104	2.4%
105 - 109	2.4%
> 109 mm	0.0
min size (mm)	2
max size (mm)	107
mean	32
mode	3

1985

Strongylocentrotus franciscanus

(cases) N=	184
< 5 mm	1.1%
5 - 9	17.9%
10 - 14	15.2%
15 - 19	10.3%
20 - 24	16.3%
25 - 29	10.3%
30 - 34	5.4%
35 - 39	3.8%
40 - 44	2.2%
45 - 49	0.5%
50 - 54	0.5%
55 - 59	1.1%
60 - 64	0.0
65 - 69	2.2%
70 - 74	1.6%
75 - 79	1.1%
80 - 84	1.1%
85 - 89	1.6%
90 - 94	2.2%
95 - 99	0.5%
100 - 104	2.2%
105 - 109	1.1%
> 109 mm	1.1%
min size (mm)	3
max size (mm)	113
mean	30
mode	10

1986

Strongylocentrotus franciscanus

(cases) N=	103
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	2.9%
20 - 24	6.8%
25 - 29	16.5%
30 - 34	15.5%
35 - 39	12.6%
40 - 44	9.7%
45 - 49	3.9%
50 - 54	4.9%
55 - 59	1.9%
60 - 64	0.0
65 - 69	3.9%
70 - 74	2.9%
75 - 79	4.9%
80 - 84	3.9%
85 - 89	1.9%
90 - 94	4.9%
95 - 99	2.9%
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	17
max size (mm)	99
mean	46
mode	29

1987

Strongylocentrotus franciscanus

(cases) N=	129
< 5 mm	0.0
5 - 9	0.0
10 - 14	0.0
15 - 19	0.0
20 - 24	1.6%
25 - 29	7.0%
30 - 34	16.3%
35 - 39	18.6%
40 - 44	9.3%
45 - 49	13.2%
50 - 54	6.2%
55 - 59	3.9%
60 - 64	1.6%
65 - 69	5.4%
70 - 74	3.1%
75 - 79	0.8%
80 - 84	2.3%
85 - 89	5.4%
90 - 94	2.3%
95 - 99	1.6%
100 - 104	0.8%
105 - 109	0.8%
> 109 mm	0.0
min size (mm)	24
max size (mm)	105
mean	49
mode	31

LOCATION 15 SANTA BARBARA ISLAND - ARCH POINT

1988 *Strongylocentrotus franciscanus*		1989 *Strongylocentrotus franciscanus*	
(cases) N=	102	(cases) N=	119
< 5 mm	0.0	< 5 mm	0.0
5 - 9	1.0%	5 - 9	9.2%
10 - 14	1.0%	10 - 14	15.1%
15 - 19	0.0	15 - 19	3.4%
20 - 24	0.0	20 - 24	0.0
25 - 29	0.0	25 - 29	0.8%
30 - 34	1.0%	30 - 34	1.7%
35 - 39	2.0%	35 - 39	2.5%
40 - 44	5.9%	40 - 44	5.0%
45 - 49	8.8%	45 - 49	7.6%
50 - 54	10.8%	50 - 54	8.4%
55 - 59	11.8%	55 - 59	5.9%
60 - 64	9.8%	60 - 64	7.6%
65 - 69	11.8%	65 - 69	4.2%
70 - 74	6.9%	70 - 74	6.7%
75 - 79	3.9%	75 - 79	4.2%
80 - 84	4.9%	80 - 84	5.9%
85 - 89	4.9%	85 - 89	3.4%
90 - 94	5.9%	90 - 94	4.2%
95 - 99	2.9%	95 - 99	0.8%
100 - 104	3.9%	100 - 104	2.5%
105 - 109	1.0%	105 - 109	0.8%
> 109 mm	2.0%	> 109 mm	0.0
min size (mm)	9	min size (mm)	5
max size (mm)	128	max size (mm)	108
mean	66	mean	50
mode	53	mode	9

LOCATION 15 SANTA BARBARA ISLAND - ARCH POINT

1984 *Srongylocentrotus purpuratus*		1985 *Srongylocentrotus purpuratus*	
(cases) N=	143	(cases) N=	129
< 5 mm	2.1%	< 5 mm	6.2%
5 - 9	24.5%	5 - 9	34.1%
10 - 14	4.2%	10 - 14	19.4%
15 - 19	7.0%	15 - 19	14.7%
20 - 24	2.8%	20 - 24	17.1%
25 - 29	1.4%	25 - 29	1.6%
30 - 34	4.9%	30 - 34	0.8%
35 - 39	14.0%	35 - 39	0.8%
40 - 44	15.4%	40 - 44	2.3%
45 - 49	14.0%	45 - 49	2.3%
50 - 54	7.0%	50 - 54	0.8%
55 - 59	2.1%	55 - 59	0.0
60 - 64	0.7%	60 - 64	0.0
65 - 69	0.0	65 - 69	0.0
70 - 74	0.0	70 - 74	0.0
75 - 79	0.0	75 - 79	0.0
80 - 84	0.0	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
> 89 mm	0.0	> 89 mm	0.0
min size (mm)	4	min size (mm)	3
max size (mm)	61	max size (mm)	53
mean	29	mean	14
mode	6	mode	6

LOCATION 15 SANTA BARBARA ISLAND - ARCH POINT:

1986
Srongylocentrotus purpuratus

(cases) N=	105
< 5 mm	0.0
5 - 9	51.4%
10 - 14	33.3%
15 - 19	1.9%
20 - 24	3.8%
25 - 29	3.8%
30 - 34	2.9%
35 - 39	1.0%
40 - 44	0.0
45 - 49	1.0%
50 - 54	0.0
55 - 59	0.0
60 - 64	1.0%
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
> 89 mm	0.0
min size (mm)	5
max size (mm)	63
mean	12
mode	11

1987
Srongylocentrotus purpuratus

(cases) N=	138
< 5 mm	0.0
5 - 9	3.6%
10 - 14	26.8%
15 - 19	25.4%
20 - 24	18.1%
25 - 29	15.9%
30 - 34	8.7%
35 - 39	0.0
40 - 44	1.4%
45 - 49	0.0
50 - 54	0.0
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
> 89 mm	0.0
min size (mm)	6
max size (mm)	42
mean	19
mode	12

1988
Srongylocentrotus purpuratus

(cases) N=	123
< 5 mm	0.0
5 - 9	3.3%
10 - 14	7.3%
15 - 19	3.3%
20 - 24	9.8%
25 - 29	22.8%
30 - 34	30.9%
35 - 39	17.9%
40 - 44	4.1%
45 - 49	0.0
50 - 54	0.8%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
> 89 mm	0.0
min size (mm)	6
max size (mm)	50
mean	28
mode	31

1989
Srongylocentrotus purpuratus

(cases) N=	213
< 5 mm	4.2%
5 - 9	11.3%
10 - 14	13.6%
15 - 19	19.2%
20 - 24	8.5%
25 - 29	7.5%
30 - 34	13.6%
35 - 39	16.4%
40 - 44	4.2%
45 - 49	0.9%
50 - 54	0.5%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	3
max size (mm)	50
mean	23
mode	15

LOCATION 16 SANTA BARBARA ISLAND - CAT CANYON

1986 *Haliotis corrugata*		1987 *Haliotis corrugata*	
(cases) N=	6	(cases) N=	26
< 25 mm	16.7%	< 25 mm	0.0
25 - 29	0.0	25 - 29	0.0
30 - 34	0.0	30 - 34	0.0
35 - 39	16.7%	35 - 39	0.0
40 - 44	0.0	40 - 44	0.0
45 - 49	0.0	45 - 49	0.0
50 - 54	0.0	50 - 54	0.0
55 - 59	16.7%	55 - 59	0.0
60 - 64	0.0	60 - 64	0.0
65 - 69	0.0	65 - 69	0.0
70 - 74	0.0	70 - 74	0.0
75 - 79	0.0	75 - 79	0.0
80 - 84	0.0	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	0.0
95 - 99	0.0	95 - 99	3.8%
100 - 104	16.7%	100 - 104	3.8%
105 - 109	0.0	105 - 109	0.0
110 - 114	0.0	110 - 114	0.0
115 - 119	0.0	115 - 119	3.8%
120 - 124	0.0	120 - 124	0.0
125 - 129	16.7%	125 - 129	3.8%
130 - 134	0.0	130 - 134	23.1%
135 - 139	16.7%	135 - 139	15.4%
140 - 144	0.0	140 - 144	3.8%
145 - 149	0.0	145 - 149	19.2%
150 - 154	0.0	150 - 154	7.7%
155 - 159	0.0	155 - 159	7.7%
160 - 164	0.0	160 - 164	3.8%
165 - 169	0.0	165 - 169	0.0
170 - 174	0.0	170 - 174	0.0
175 - 179	0.0	175 - 179	0.0
180 - 184	0.0	180 - 184	3.8%
185 - 189	0.0	185 - 189	0.0
190 - 194	0.0	190 - 194	0.0
195 - 199	0.0	195 - 199	0.0
> 199 mm	0.0	> 199 mm	0.0
min size (mm)	19	min size (mm)	98
max size (mm)	136	max size (mm)	180
mean	80	mean	139
mode	19	mode	132

LOCATION 16 SANTA BARBARA ISLAND - CAT CANYON

	1988 *Haliotis corrugata*		1989 *Haliotis corrugata*
(cases) N=	16	(cases) N=	2
< 25 mm	0.0	< 25 mm	100.0%
25 - 29	0.0	25 - 29	0.0
30 - 34	0.0	30 - 34	0.0
35 - 39	0.0	35 - 39	0.0
40 - 44	0.0	40 - 44	0.0
45 - 49	0.0	45 - 49	0.0
50 - 54	0.0	50 - 54	0.0
55 - 59	0.0	55 - 59	0.0
60 - 64	0.0	60 - 64	0.0
65 - 69	0.0	65 - 69	0.0
70 - 74	0.0	70 - 74	0.0
75 - 79	0.0	75 - 79	0.0
80 - 84	0.0	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	0.0
95 - 99	0.0	95 - 99	0.0
100 - 104	6.3%	100 - 104	0.0
105 - 109	0.0	105 - 109	0.0
110 - 114	0.0	110 - 114	0.0
115 - 119	6.3%	115 - 119	0.0
120 - 124	6.3%	120 - 124	0.0
125 - 129	6.3%	125 - 129	0.0
130 - 134	12.5%	130 - 134	0.0
135 - 139	6.3%	135 - 139	0.0
140 - 144	6.3%	140 - 144	0.0
145 - 149	25.0%	145 - 149	0.0
150 - 154	6.3%	150 - 154	0.0
155 - 159	6.3%	155 - 159	0.0
160 - 164	12.5%	160 - 164	0.0
165 - 169	0.0	165 - 169	0.0
170 - 174	0.0	170 - 174	0.0
175 - 179	0.0	175 - 179	0.0
180 - 184	0.0	180 - 184	0.0
185 - 189	0.0	185 - 189	0.0
190 - 194	0.0	190 - 194	0.0
195 - 199	0.0	195 - 199	0.0
> 199 mm	0.0	> 199 mm	0.0
min size (mm)	103	min size (mm)	21
max size (mm)	162	max size (mm)	24
mean	139	mean	23
mode	147	mode	21

LOCATION 16 SANTA BARBARA ISLAND - CAT CANYON

1986 *Haliotis fulgens*		1987 *Haliotis fulgens*	
(cases) N=	44	(cases) N=	3
< 25 mm	2.3%	< 25 mm	0.0
25 - 29	2.3%	25 - 29	0.0
30 - 34	4.5%	30 - 34	0.0
35 - 39	2.3%	35 - 39	0.0
40 - 44	4.5%	40 - 44	0.0
45 - 49	4.5%	45 - 49	0.0
50 - 54	6.8%	50 - 54	0.0
55 - 59	0.0	55 - 59	0.0
60 - 64	4.5%	60 - 64	0.0
65 - 69	0.0	65 - 69	0.0
70 - 74	2.3%	70 - 74	0.0
75 - 79	0.0	75 - 79	0.0
80 - 84	6.8%	80 - 84	0.0
85 - 89	2.3%	85 - 89	33.3%
90 - 94	0.0	90 - 94	0.0
95 - 99	0.0	95 - 99	0.0
100 - 104	4.5%	100 - 104	0.0
105 - 109	11.4%	105 - 109	0.0
110 - 114	2.3%	110 - 114	0.0
115 - 119	2.3%	115 - 119	0.0
120 - 124	4.5%	120 - 124	0.0
125 - 129	6.8%	125 - 129	0.0
130 - 134	0.0	130 - 134	33.3%
135 - 139	6.8%	135 - 139	0.0
140 - 144	4.5%	140 - 144	0.0
145 - 149	4.5%	145 - 149	0.0
150 - 154	4.5%	150 - 154	0.0
155 - 159	2.3%	155 - 159	33.3%
160 - 164	2.3%	160 - 164	0.0
165 - 169	0.0	165 - 169	0.0
170 - 174	0.0	170 - 174	0.0
175 - 179	0.0	175 - 179	0.0
180 - 184	0.0	180 - 184	0.0
185 - 189	0.0	185 - 189	0.0
190 - 194	0.0	190 - 194	0.0
195 - 199	0.0	195 - 199	0.0
> 199 mm	0.0	> 199 mm	0.0
min size (mm)	23	min size (mm)	86
max size (mm)	160	max size (mm)	155
mean	96	mean	124
mode	83	mode	86

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LOCATION 16 SANTA BARBARA ISLAND - CAT CANYON

1988 *Haliotis fulgens*		1989 *Haliotis fulgens*	
(cases) N=	2	(cases) N=	4
< 25 mm	0.0	< 25 mm	0.0
25 - 29	0.0	25 - 29	0.0
30 - 34	0.0	30 - 34	0.0
35 - 39	0.0	35 - 39	0.0
40 - 44	0.0	40 - 44	0.0
45 - 49	0.0	45 - 49	0.0
50 - 54	0.0	50 - 54	0.0
55 - 59	0.0	55 - 59	0.0
60 - 64	0.0	60 - 64	0.0
65 - 69	0.0	65 - 69	0.0
70 - 74	0.0	70 - 74	0.0
75 - 79	0.0	75 - 79	0.0
80 - 84	0.0	80 - 84	0.0
85 - 89	0.0	85 - 89	0.0
90 - 94	0.0	90 - 94	0.0
95 - 99	0.0	95 - 99	0.0
100 - 104	0.0	100 - 104	0.0
105 - 109	0.0	105 - 109	0.0
110 - 114	0.0	110 - 114	0.0
115 - 119	50.0%	115 - 119	0.0
120 - 124	0.0	120 - 124	0.0
125 - 129	0.0	125 - 129	0.0
130 - 134	0.0	130 - 134	25.0%
135 - 139	0.0	135 - 139	0.0
140 - 144	0.0	140 - 144	0.0
145 - 149	0.0	145 - 149	25.0%
150 - 154	0.0	150 - 154	25.0%
155 - 159	0.0	155 - 159	0.0
160 - 164	50.0%	160 - 164	0.0
165 - 169	0.0	165 - 169	25.0%
170 - 174	0.0	170 - 174	0.0
175 - 179	0.0	175 - 179	0.0
180 - 184	0.0	180 - 184	0.0
185 - 189	0.0	185 - 189	0.0
190 - 194	0.0	190 - 194	0.0
195 - 199	0.0	195 - 199	0.0
> 199 mm	0.0	> 199 mm	0.0
min size (mm)	119	min size (mm)	134
max size (mm)	160	max size (mm)	168
mean	140	mean	151
mode	119	mode	134

LOCATION 16 SANTA BARBARA ISLAND - CAT CANYON

1988
Cypraea spadicea

(cases) N=	10
< 30 mm	0.0
30 - 34	0.0
35 - 39	0.0
40 - 44	70.0%
45 - 49	10.0%
50 - 54	10.0%
55 - 59	0.0
>59 mm	10.0%
min size (mm)	40
max size (mm)	70
mean	47
mode	43

1989
Cypraea spadicea

(cases) N=	19
< 30 mm	0.0
30 - 34	0.0
35 - 39	21.1%
40 - 44	31.6%
45 - 49	36.8%
50 - 54	10.5%
55 - 59	0.0
>59 mm	0.0
min size (mm)	35
max size (mm)	52
mean	44
mode	42

1986
Astraea undosa

(cases) N=	39
< 10 mm	0.0
10 - 19	0.0
20 - 29	2.6%
30 - 39	5.1%
40 - 49	25.6%
50 - 59	38.5%
60 - 69	15.4%
70 - 79	0.0
80 - 89	10.3%
90 - 99	2.6%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	24
max size (mm)	90
mean	56
mode	52

1987
Astraea undosa

(cases) N=	46
< 10 mm	2.2%
10 - 19	0.0
20 - 29	8.7%
30 - 39	15.2%
40 - 49	21.7%
50 - 59	23.9%
60 - 69	19.6%
70 - 79	8.7%
80 - 89	0.0
90 - 99	0.0
>99 mm	0.0
min size (mm)	9
max size (mm)	75
mean	49
mode	42

1988
Astraea undosa

(cases) N=	30
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	6.7%
40 - 49	23.3%
50 - 59	23.3%
60 - 69	36.7%
70 - 79	6.7%
80 - 89	3.3%
90 - 99	0.0
>99 mm	0.0
min size (mm)	30
max size (mm)	87
mean	57
mode	53

1989
Astraea undosa

(cases) N=	71
< 10 mm	0.0
10 - 19	1.4%
20 - 29	0.0
30 - 39	4.2%
40 - 49	16.9%
50 - 59	39.4%
60 - 69	28.2%
70 - 79	8.5%
80 - 89	1.4%
90 - 99	0.0
>99 mm	0.0
min size (mm)	14
max size (mm)	86
mean	56
mode	56

LOCATION 16 SANTA BARBARA ISLAND - CAT CANYON

1987
Megathura crenulata

(cases) N=	10
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	0.0
60 - 69	10.0%
70 - 79	10.0%
80 - 89	20.0%
90 - 99	40.0%
100 - 109	10.0%
110 - 119	10.0%
>119 mm	0.0
min size (mm)	66
max size (mm)	115
mean	91
mode	98

1989
Megathura crenulata

(cases) N=	14
< 10 mm	0.0
10 - 19	0.0
20 - 29	0.0
30 - 39	0.0
40 - 49	0.0
50 - 59	7.1%
60 - 69	28.6%
70 - 79	21.4%
80 - 89	35.7%
90 - 99	7.1%
100 - 109	0.0
110 - 119	0.0
>119 mm	0.0
min size (mm)	55
max size (mm)	92
mean	75
mode	80

1989
Patiria miniata

(cases) N=	11
< 10 mm	36.4%
10 - 19	36.4%
20 - 29	0.0
30 - 39	18.2%
40 - 49	9.1%
50 - 59	0.0
>59 mm	0.0
min size (mm)	6
max size (mm)	49
mean	18
mode	6

1987
Pisaster giganteus

(cases) N=	48
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	10.4%
80 - 99	41.7%
100 - 119	31.3%
120 - 139	12.5%
140 - 159	4.2%
160 - 179	0.0
180 - 199	0.0
200 - 219	0.0
220 - 239	0.0
240 - 259	0.0
260 - 279	0.0
280 - 299	0.0
>299 mm	0.0
min size (mm)	72
max size (mm)	151
mean	100
mode	100

1988
Pisaster giganteus

(cases) N=	32
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	0.0
80 - 99	34.4%
100 - 119	43.8%
120 - 139	15.6%
140 - 159	6.3%
>159 mm	0.0
min size (mm)	81
max size (mm)	157
mean	109
mode	120

1989
Pisaster giganteus

(cases) N=	47
<20 mm	0.0
20 - 39	0.0
40 - 59	0.0
60 - 79	0.0
80 - 99	34.0%
100 - 119	51.1%
120 - 139	8.5%
140 - 159	6.4%
>159 mm	0.0
min size (mm)	85
max size (mm)	148
mean	106
mode	100

LOCATION 16 SANTA BARBARA ISLAND - CAT CANYON

1987
Strongylocentrotus franciscanus

(cases) N=	108
< 5 mm	0.0
5 - 9	0.0
10 - 14	3.7%
15 - 19	11.1%
20 - 24	6.5%
25 - 29	8.3%
30 - 34	7.4%
35 - 39	5.6%
40 - 44	4.6%
45 - 49	6.5%
50 - 54	5.6%
55 - 59	9.3%
60 - 64	5.6%
65 - 69	2.8%
70 - 74	4.6%
75 - 79	6.5%
80 - 84	6.5%
85 - 89	2.8%
90 - 94	0.9%
95 - 99	0.9%
100 - 109	0.0
> 109 mm	0.9%
min size (mm)	11
max size (mm)	111
mean	48
mode	80

1988
Strongylocentrotus franciscanus

(cases) N=	105
< 5 mm	0.0
5 - 9	0.0
10 - 14	1.0%
15 - 19	2.9%
20 - 24	2.9%
25 - 29	6.7%
30 - 34	10.5%
35 - 39	8.6%
40 - 44	10.5%
45 - 49	5.7%
50 - 54	6.7%
55 - 59	7.6%
60 - 64	6.7%
65 - 69	3.8%
70 - 74	11.4%
75 - 79	4.8%
80 - 84	5.7%
85 - 89	3.8%
90 - 94	0.0
95 - 99	1.0%
> 99 mm	0.0
min size (mm)	14
max size (mm)	98
mean	52
mode	29

1989
Strongylocentrotus franciscanus

(cases) N=	130
< 5 mm	0.0
5 - 9	0.8%
10 - 14	0.0
15 - 19	0.0
20 - 24	1.5%
25 - 29	6.2%
30 - 34	14.6%
35 - 39	11.5%
40 - 44	8.5%
45 - 49	10.8%
50 - 54	7.7%
55 - 59	6.9%
60 - 64	4.6%
65 - 69	8.5%
70 - 74	5.4%
75 - 79	5.4%
80 - 84	3.1%
85 - 89	2.3%
90 - 94	2.3%
95 - 99	0.0
100 - 104	0.0
105 - 109	0.0
> 109 mm	0.0
min size (mm)	9
max size (mm)	93
mean	51
mode	38

LOCATION 16 SANTA BARBARA ISLAND - CAT CANYON

1986
Srongylocentrotus purpuratus

(cases) N=	107
< 5 mm	2.8%
5 - 9	3.7%
10 - 14	16.8%
15 - 19	26.2%
20 - 24	18.7%
25 - 29	7.5%
30 - 34	1.9%
35 - 39	5.6%
40 - 44	3.7%
45 - 49	4.7%
50 - 54	4.7%
55 - 59	2.8%
60 - 64	0.9%
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	2
max size (mm)	61
mean	24
mode	16

1987
Srongylocentrotus purpuratus

(cases) N=	105
< 5 mm	0.0
5 - 9	1.0%
10 - 14	1.9%
15 - 19	9.5%
20 - 24	18.1%
25 - 29	20.0%
30 - 34	22.9%
35 - 39	15.2%
40 - 44	6.7%
45 - 49	2.9%
50 - 54	1.9%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	8
max size (mm)	53
mean	29
mode	27

1988
Srongylocentrotus purpuratus

(cases) N=	131
< 5 mm	0.8%
5 - 9	3.1%
10 - 14	0.8%
15 - 19	0.0
20 - 24	6.1%
25 - 29	14.5%
30 - 34	30.5%
35 - 39	24.4%
40 - 44	14.5%
45 - 49	3.1%
50 - 54	2.3%
55 - 59	0.0
60 - 64	0.0
65 - 69	0.0
70 - 74	0.0
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	4
max size (mm)	52
mean	33
mode	33

1989
Srongylocentrotus purpuratus

(cases) N=	213
< 5 mm	0.0
5 - 9	0.5%
10 - 14	0.0
15 - 19	0.0
20 - 24	6.1%
25 - 29	29.1%
30 - 34	30.0%
35 - 39	21.1%
40 - 44	8.5%
45 - 49	2.8%
50 - 54	0.9%
55 - 59	0.5%
60 - 64	0.0
65 - 69	0.0
70 - 74	0.5%
75 - 79	0.0
80 - 84	0.0
85 - 89	0.0
90 - 94	0.0
95 - 99	0.0
> 99 mm	0.0
min size (mm)	6
max size (mm)	70
mean	32
mode	32

Appendix 6. 1982-1989 Kelp Forest Monitoring Data - Species Lists

Introduction

The species list contains presence/absence data for all species that could be found during the site visits between June and October. Generally at least one dive is made by an experienced biologist strictly for species list observations. The overall effort varies from station to station with the water conditions and available time. Some species assemblages are more difficult to identify than others and may be lumped into general categories. Organisms were generally not collected for additional taxonomic work. Voucher specimens generally do not exist except for a few algae. When identification is tentative we either do not mark it or place a question mark on the list.. Some of the more questionable notes have been removed from this list. Some categories, (e.g. sponges or tunicates) may be much more diverse than it would appear from the list. Subjective abundance ratings (rare-abundant) for most sites and years are available in the raw data but are not presented here. Station names are listed in Table 3 of the text.

SPECIES LIST SURVEYS 1982-1989

	LOCATION															
year	**1**	**2**	**3**	**4**	**5***	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1982	x	x	x	x	x	x	x	x	x	-	0	0	x	x	x	-
1983	x	x	x	x	x	x	x	x	x	-	x	x	x	x	x	-
1984	0	x	x	x	x	0	x	x	0	-	x	x	0	0	0	-
1985	x	x	x	x	x	x	0	x	x	-	0	x	0	0	0	-
1986	x	x	x	x	x	x	x	x	0	x	x	x	x	x	x	x
1987	x	x	x	x	0	x	0	x	0	x	x	0	0	0	0	0
1988	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
1989	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

* SRIRR transect was re-established in 1984
- SCIYB (#10) and SBICC (#16) were not established until 1986
0 RECONNAISSANCE SURVEYS UNATTEMPTED OR MISSING

NOTES:
J = Juvenile
D = Drift
I = Intertidal near site
M = molt
S = shell
O = noticeably absent
E = eggs

1982-1989 Kelp Forest Monitoring Species List

LOCATION:	SMIWL	SMIHR	SRIJLN	SRIJLS	SRIRR	SCIGI	SCIFH	SCIPB	SCISA	SCIYB	ANIAR	ANICC	ANILC	SBISESL	SBIAP	SBICC
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
Chlorophyta																
BRYOPSIS CORTICULANS		X	X	X			X	X	X			X		X	X	X
CHAETOMORPHA SP.			X						X				X			
CHAETOMORPHA SPIRALIS														X		X
CLADOPHORA GRAMINEA		X	X	X		X	X	X	X	X	X	X	X			X
CLADOPHORA MICROCLADIOIDES												X				
CLADOPHORA SP.	X				X				X	X	X	X				X
CODIUM CUNEATUM		X	X	X		X	X	X	X		X	X	X	X	X	X
CODIUM FRAGILE		X	X	X	X	X	X	X	X		X	X	X		X	X
CODIUM HUBBSII/SETCHELLII	X		X	X	X	X	X	X		X	X	X	X	X	X	X
CODIUM JOHNSTONEI										X	X					
DERBESIA MARINA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
ENTEROMORPHA SP.			X				X	X	X						X	
GREEN MAT ON SAND												X				
HALICYSTIS OVALIS			X		X	X	X	X	X	X	X	X	X	X	X	X
ULVA LOBATA												X				
ULVA TAENIATA			X													
ULVA SP.	X	X	X	X			X	X							X	
Phaeophyta																
ACINETOSPORA NICHOLSONIAE								X								X
AGARUM FIMBRIATUM				X							X					
COILODESME CORRUGATA														X		X
COILODESME SP.	X								X	X				X		
COLPOMENIA SINUOSA			X			X	X	X	X		X	X		X	X	X
COLPOMENIA SP.		X	X	X		X	X	X	X		X	X	X	X	X	X
COSTARIA COSTATA				X												
CYSTOSEIRA OSMUNDACEA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CYSTOSEIRA SETCHELLII										X	X					
CYSTOSEIRA SP.			X				X	X	X		X	X	X	X	X	
DESMARESTIA LATIFRONS	X	X	X				X	X						X		
DESMARESTIA LIGULATA	X	X	X	X	X		X	X		X				X		X
DESMARESTIA LIGULATA VAR. FIRMA			X											X		
DESMARESTIA SP.	X	X	X	X	X				X	X	X	X		X		X
DESMARESTIA VIRIDIS			X													
DICTYONEUROPSIS RETICULATA				X	X											
DICTYOPTERIS NEW SP.										X	X		X			
DICTYOPTERIS UNDULATA							X	X	X	X	X	X	X	X	X	X
DICTYOTA BINGHAMIAE			X	X	X	X	X	X	X	X	X	X	X	X	X	X
DICTYOTA FLABELLATA						X	X	X	X	X	X	X	X	X	X	X
DICTYOTA/PACHYDICTYON			X	X	X	X	X	X	X	X	X	X	X	X	X	
ECTOCARPOID FUZZ									X							

1982-1989 Kelp Forest Monitoring Species List

LOCATION:	SMIWL	SMIHR	SRIJLN	SRIJLS	SRIRR	SCIGI	SCIFH	SCIPB	SCISA	SCIYB	ANIAR	ANICC	ANILC	SBISESL	SBIAP	SBICC
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
EGREGIA MENZIESII	X	X	X	X	X	D		X	D	X	X	X			X	X
EISENIA ARBOREA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GIFFORDIA/ECTOCARPUS		X				X	X	X				X				
GIFFORDIA MITCHELLIAE		X		X												
GIFFORDIA SP.				X												
HALIDRYS DIOICA		X	D	D	X		X			?					X	
HESPEROPHYCUS HARVEYANUS												INT				
HYDROCLATHRUS CLATHRATUS							X					X			X	
LAMINARIA FARLOWII	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
MACROCYSTIS PYRIFERA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PACHYDICTYON CORIACEUM			X	X	X	X	?	X	X	X	X	X	X	X	X	X
PELAGOPHYCUS PORRA				D						X				D		
PELVETIA FASTIGIATA												X			X	
PTERYGOPHORA CALIFORNICA	X		X	X	X	X		X	X	X	X	X	X	X		
SARGASSUM MUTICUM				X				X	X	X		X	X	X	X	X
SARGASSUM SP.													X			
SPHACELARIA CALIFORNICA												X				
SPOROCHNUS PEDUNCULATUS														X		
TINOCLADIA CRASSA															X	
TAONIA LENNEBACKERIAE	X		X	X						X		X		X	X	X
ZONARIA FARLOWII							X	X	X	X	X	X	X	X	X	X
Rhodophyta																
ACROCHAETIUM DESMARESTIAE				X		X	X									
ACROSORIUM UNCINATUM	X		X	X	X	X	X			X	X	X				X
AMPHIROA ZONATA							X	X				X				X
AMPLISIPHONIA PACIFICA										X						
ANISOCLADELLA PACIFICA										X						
ANTITHAMNION DENDROIDEUM				X												
BONNEMAISONIA HAMIFERA															X	X
BOSSIELLA CALIFORNICA			X				X	X	X							
BOSSIELLA CALIFORNICA VAR. SCHMITTII							X									
BOSSIELLA ORBIGNIANA	X				X			X	X	X		X	X			X
BOSSIELLA PLUMOSA													X			
BOSSIELLA/CALLIARTHRON	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BOTRYOCLADIA PSEUDODICHOTOMA	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
BOTRYOGLOSSUM FARLOWIANUM	X	X														
BRANCHIOGLOSSUM WOODII						X				X	X	X				
CALLIARTHRON CHEILOSPORIOIDES	X	X	X	X	X	X	X	X	X	X	X	X	X			
CALLIARTHRON SP.	X								X				X		X	
CALLIARTHRON TUBERCULOSUM				X												
CALLITHAMNION BISERIATUM				X												

1982-1989 Kelp Forest Monitoring Species List

LOCATION:	SMIWL	SMIHR	SRIJLN	SRIJLS	SRIRR	SCIGI	SCIFH	SCIPB	SCISA	SCIYB	ANIAR	ANICC	ANILC	SBISESL	SBIAP	SBICC
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
CALLITHAMNION SP.	X								X				X		X	
CALLOCOLAX FUNGIFORMIS				X												
CALLOPHYLLIS FIRMA	X		X	X	X	X				X	X					
CALLOPHYLLIS FLABELLULATA	X			X	X	X				X		X			X	
CALLOPHYLLIS PINNATA	X			X												
CALLOPHYLLIS SP.	X	X	X	X	X	X	X			X						
CALLOPHYLLIS VIOLACEA	X		X	X	X											
CARPOPELTIS BUSHIAE										X		X	X			X
CARPOPELTIS SP.									X			X				
CERAMIACEAE										X						
CERAMIUM CALIFORNICUM				X												
CERAMIUM CAUDATUM				X												
CERAMIUM CLARIONENSE				X												
CERAMIUM CODICOLA		X				X										
CERAMIUM SINICOLA				X												
CHONDRIA CALIFORNICA								X				X				
CHONDRIA DECIPIENS				X												
CHONDRIA SP.							X									
COELOSEIRA COMPRESSA		X									X	X				
CORALLINA OFFICINALIS			X	X		X	X	X	X	X	X	X	X	X	X	X
CORALLINA VANCOUVERIENSIS				X							X	X		X	X	X
CORALLINES - ENCRUSTING	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CORALLINES - ERECT	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CRYPTONEMIA OBOVATA										X						
CRYPTONEMIA SP.				X												
CRYPTOPLEURA CORALLINARA						X										
CRYPTOPLEURA CRISPA			X	X												
CRYPTOPLEURA SP.	X												X			
CRYPTOPLEURA VIOLACEA				X												
CUMAGLOIA ANDERSONII															X	
DASYA SINICOLA											X					
ERYTHROCYSTIS SACCATA	X						X	X								X
ERYTHROTRICHIA CARNEA				X												
ERYTHROTRICHIA TETRASERIATA				X												
FARLOWIA CONFERTA	X			X								X				
FARLOWIA PINK/WHITE ROSETTE										X						
FAUCHEA LACINIATA	X	X	X	X	X	X	X			X	X	X				
FAUCHEA SP.				X	X						X			X		
FILAMENTOUS RED ALGAE						X		X								
FRYEELLA GARDNERI	X	X	X	X	X	X				X	X	X				
GASTROCLONIUM COULTERI	X			X												

1982-1989 Kelp Forest Monitoring Species List

LOCATION:	SMIWL	SMIHR	SRIJLN	SRIJLS	SRIRR	SCIGI	SCIFH	SCIPB	SCISA	SCIYB	ANIAR	ANICC	ANILC	SBISESL	SBIAP	SBICC
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
GELIDIUM COULTERI												X				
GELIDIUM NUDIFRONS							X	X	X	X	X	X		?	X	X
GELIDIUM PURPURASCENS	X							X				X				X
GELIDIUM ROBUSTUM	X		X			X	X	X	X	X	X	X	X		X	X
GELIDIUM/PTEROCLADIA						X	X	X	X	X	X	X	X	X	X	X
GIGARTINA CANALICULATA								X								
GIGARTINA CORYMBIFERA	X	X	X	X	X					X	X	X	X			
GIGARTINA EXASPERATA	X	X	X	X	X			X			X	X				
GIGARTINA HARVEYANA	X	X		X												
GIGARTINA SP.	X	X	X	X	X		X		X	X		X	X	X	X	
GIGARTINA SPINOSA	X	X	X	X			X	X	X	X	X	X	X			X
GONIOTRICHOPSIS SUBLITTORALIS				X												
GONIOTRICHUN ALSIDII				X												
GRACILARIA SJOESTEDTII				X								X				
GRACILARIA SP.	X		X									X				
GRATELOUPIA FILICINA												X				
GRIFFITHSIA PACIFICA		X		X	X	X				X						
GYMNOGONGRUS LEPTOPHYLLUS												X				
GYMNOGONGRUS PLATYPHYLLUS				X		X						X				
GYMNOGONGRUS SP.								X					X			
HALIPTYLON GRACILE			X													X
HALYMENIA CALIFORNICA				X												
HALYMENIA/SCHIZYMENIA	X		X	X	X	X	X	X		X	X	X	X			
HALYMENIA SP.	X			X	X					X						
HELMINTHOCLADIA AUSTRALIS															X	
HERPOSIPHONIA PLUMULA				X												
HERPOSIPHONIA VERTICILLATA				X												
HETEROSIPHONIA JAPONICA										X						
JANIA SP.							X	X						X	X	X
LAURENCIA PACIFICA	X	X	X	X	X	X	X	X	X			X		X		
LAURENCIA SINICOLA				X												
LAURENCIA SP.	X	X	X	X		X	X	X				X		X	X	X
LAURENCIA SPECTABILIS	X	X		X			X	X								
LEPTOCLADIA BINGHAMIAE	X		X	X						X		X				
LITHOTHRIX ASPERGILLUM	X			X					X			X	X			X
MARIPELTA ROTATA			X	X			X									
MELOBESIA MEDIOCRIS	X									X						
MICROCLADIA COULTERI	X	X	X	X	X					X					X	
NEMALION HELMINTHOIDES								INT								
NIENBURGIA ANDERSONIANA	X		X	X	X	X				X		X				
OPUNTIELLA CALIFORNICA	X	X	X	X	X											

1982-1989 Kelp Forest Monitoring Species List

LOCATION:	SMIWL	SMIHR	SRIJLN	SRIJLS	SRIRR	SCIGI	SCIFH	SCIPB	SCISA	SCIYB	ANIAR	ANICC	ANILC	SBISESL	SBIAP	SBICC
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
OZOPHORA CLEVELANDII																
OZOPHORA LATIFOLIA	?									X						
PHYCODRYS SP.			X													
PHYCODRYS SETCHELLII	X		?	X	X						X					
PIKEA SP.					X											
PIKEA ROBUSTA	X		X	X	X											
PLEONOSPORIUM SQUARRULOSUM				X												
PLEONOSPORIUM VANCOUVERIANUM				X												
PLOCAMIUM CARTILAGINEUM							X	X	X	X	X	X	X	X	X	X
PLOCAMIUM SP.								X						X	X	
POLYNEURA LATISSIMA	X			X	X											
POLYSIPHONIA SP.	X	X	X	X	X	X	X	X	X		X	X	X	X	X	
PORPHYRA PERFORATA	X		D													
PORPHYRA SP.				X												
PRIONITIS ANGUSTA												X				
PRIONITIS CORNEA				X								X				
PRIONITIS LYALLII				X												
PRIONITIS SP.	X	X			X		X	X	X	X		X	X		X	X
PRIOPELTIS (?CARPOPELTIS DI.)					X		X	X			X	X	X			X
PSEUDOLITHOPHYLLUM MURICATUM			X													
PSEUDOGLOIOPHLOEA CONFUSA			?	X												
PSEUDOSCINAIA SNYDERIAE		X														
PTEROCHONDRIA WOODII	X										X					
PTEROCLADIA CAPILLACEA						X	X	X		X		X	X			X
PTEROSIPHONIA BAILEYI				X												
PTEROSIPHONIA DENDROIDEA					X	X				X	X					
PTILOTHAMNIOPSIS LEJOLISEA					X					X	X	X				
PUGETIA FRAGILISSIMA						X					X					
RHODOGLOSSUM AFFINE												X				
RHODOPTILUM PLUMOSUM	X			X												
RHODYMENIA ARBORESCENS						X				X		X				
RHODYMENIA CALIFORNICA	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X
RHODYMENIA CALLOPHYLLIDOIDES				X	X	X				X	X					
RHODYMENIA PACIFICA	X		X	X		X	X	X		X	X	X	X			X
RHODYMENIA SP.	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
SARCODIOTHECA GAUDICHAUDII	X															
SCHIZYMENIA/HALIMENIA			X	X	X							X				
SCHIZYMENIA PACIFICA	X	X	X	X	X								X			
SCIADOPHYCUS STELLATUS						X	X	X		X	X	X	X			
SCINAIA ARTICULATA			X	X	X										X	
SCINAIA JOHNSTONIAE	X	X	X	X						X			X			

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
SCINAIA SP.	X	X	X	X	X		X	X	X			X			X	X
SMITHORA NAIADUM	X									X						
SORELLA DELICATULA					X					X	X	X				
TIFFANIELLA SNYDERIAE				X												
Misc. Plants																
PHYLLOSPADIX TORREYI									X	X						
PHYLLOSPADIX SPP.	X	X	X	X	D			X	X		X	X			X	X
ZOSTERA MARINA			X	X				X	X			X				
CYANOBACTERIAL FILM						X										
CYANOBACTERIAL FILAMENTS			X		X											
DIATOM FILM						X	X	X	X	X	X	X				
SCHIZYMENIA COLONIAL DIATOMS			X	X	X	X	X	X	X	X		X	X		X	
Protozoa																
DENDRITIS JELLY				X												
HYPSYPOPS TURF NEST			X			X	X	X	X			X	X	X	X	X
HOMOTREMA RUBRUM								X			X	X		X	X	X
GROMIA OVIFORMIS	X															
Porifera																
CLATHRINA BLANCA						X	X	X	X			X	X	?	X	X
CLATHRINA CORIACEA																X
CLATHRINA SP.													X			
LEUCANDRA HEALTHI	X	X	X			X	X	X	X	X	X					
LEUCANDRA/SCYPHA	X	X	X	X		X	X	X	X	X		X	X	X	X	X
LEUCETTA LOSANGELENSIS	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
LEUCILLA NUTTINGI	X			X	X		X		X	X	X	X	X			X
LEUCOSOLENIA ELEANOR	X	X		X		X	X	X	X			X	X		X	X
SCYPHA CILIATA (SPICULE CROWN)		X	X	X	X	X	X	X	X	X	X	X				X
ACARNUS ERITHACUS	X	X	X	X	X	X				X	X	X	X	X	X	
ACARNUS SP.								X	X							
AXINELLA MEXICANA		?														
CLIONA CELATA	X	X	X	X	X	X	X	X	X		X	X	X			
HALICLONA PERMOLLIS						X	X	X		X	X	X	X	X	X	X
HALICLONA ORANGE OR GRN/WHT FORM	X							X		X						
HEMECTYON HYALE		X														
HYMENAMPHIASTRA CYANOCRYPTA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LISSODENDORYX TOPSENTI		X	X			?	X	X		X	X	?	X	X		X
PENARES CORTIUS			X	X		X		X			X	X	X		X	
POLYMASTIA PACHYMASTIA	X		X	X	X										X	
RED SPONGES - ENCRUSTING	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SPHECIOSPONGIA CONFOEDERATA			X	X	X	X					X	X	X			
STELETTA ESTRELLA							X									

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	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
SPECIES																
TETHYA AURANTIA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TETILLA ARB			X	X	X	X					X					
TOXODOCIA ZUMI	X															
VERONGIA AUREA						X	X				X	X	X	X	X	X
XESTOSPONGIA TRINDINAEA	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
XESTOSPONGIA VANILLA			X	X		X								X		X
Cnidaria																
ABIETINARIA SP.		X	X	X	X	X	X	X			X					
AGLAOPHENIA SP.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ALLOPORA CALIFORNICA						X										
ANTENELLA AVALONIA						X										
APOLEMIA SIPHONOPHORE	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
CAMPANULARIA SP.	X															
EUDENDRIUM CALIFORNICUM		X	X			X	X	X	X	X	X	X	X		X	X
GARVEIA ANNULATA	X					X										
HYDRACTINIA SP.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LYTOCARPUS NUTTINGI				X				X			X				X	X
OBELIA SP.	X	X	X	X			X	X	X	X	X	X	X	X	X	X
PLUMULARIA SP.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SERTULARELLA SP.	X		X	X		X	X	X		X	X		X		X	X
SERTULARIA SP.	X		X			X	X				X		X		X	X
TUBULARIA SP.	X	X	X			X	X					X		X	X	X
PELAGIA COLORATA	X						D								X	
STAUROMEDUSAE	X		X		X											
THAUMATOSCYPHUS ATLANTICUS	X															
PACHYCERIANTHUS FIMBRIATUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CLAVULARIA SP.	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
EUGORGIA RUBENS											X					
LOPHOGORGIA CHILENSIS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MURICEA CALIFORNICA			X	X				X		X	X	X		X	X	X
MURICEA FRUTICOSA			X			X		X	X	X	X			X	X	
RENILLA KOLLIKERI			X	X								X				
STYLATULA ELONGATA					X			X				X			X	
EPIZOANTHUS SP.				X	X											X
CORYNACTIS CALIFORNICA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ANTHOPLEURA ARTEMISIA	X	X	X	X	X	X	X			X	X			X	X	X
ANTHOPLEURA ELEGANTISSIMA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ANTHOPLEURA XANTHOGRAMMICA		X		X												
CACTOSOMA ARENARIA			X		X	X	X			X		X		X		
DIADUMENE SP.							X									
EPIACTIS PROLIFERA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
HALCAMPA DECEMTENTACULATA	X	X	X	X	X	X	X	X	X			X				
HARENACTIS ATTENUATA			X									X		X	X	
METRIDIUM EXILIS		X	X	X	X	X	X			X						
METRIDIUM SENILE		X	X	X												
PHYLACTIS SP.												X			X	
SAGARTIA CATALINENSIS									X	X	X	X	X	X		X
TEALIA COLUMBIANA	X		X		X											
TEALIA CORIACEA			X	X	X	X		X	X	X	X	X		X		
TEALIA N.SP.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TEALIA CRASSICORNIS			X	X	X							X				
TEALIA LOFOTENSIS	X	X	X	X	X	X	X			X	X		X	X		
TEALIA PISCIVORA					X											
TEALIA SP.			X	X			X									
ZAOLUTUS ACTIUS	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
ASTRANGIA LAJOLLENSIS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BALANOPHYLLIA ELEGANS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
COENOCYATHUS BOWERSI						X	X	X					X		X	
PARACYATHUS STEARNSI	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ctoenophores																
BEROE SP.			X											X		X
LEUCOTHEA SP.		X														
VENUS' GIRDLE															X	
PLATYHELMINTHES (FLATWORMS)		X								X	X				X	
ENCHIRIDIUM PUNCTATUM									X							
LEPTOPLANA/NOTOPLANA															X	
PROSTHECERAEUS BELLOSTRIATUS	X	X		X	X									X		
PSUEDOCEROS LUTEUS				X												
PSEUDOCEROS MONTEREYENSIS								X								
PSEUDOCEROS PERVIOLACEUS		X	X	X	X			X	X		X	X		X		X
THYSANOZOON CALIFORNICUM												X				
NEMERTEA (RIBBONS WORMS)		X	X	X											X	
BASEODISCUS PUNNETTI		X														
CEREBRATULUS SP.	X	X			X											
PARANEMERTES PEREGRINA					X											
TUBULANUS FRENATUS					?											
TUBULANUS SEXLINEATUS	X	X		X	X	X										
SIPUNCULA (PEANUT WORMS)	X		X	X	X	X			X	X		X				
PHASCOLOSOMA SP.	X								X					X		X
THEMISTE PYROIDES	X	X	X	?	X	X				X				X		X
Annelida (polychaetes)																
ANAITIDES SP.	X	X	X					X				X		X	X	

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
ARCTONOE PULCHRA	X	X				X	X	X	X	X		X	X	X	X	X
BISPIRA TURNERI								X								
CHAETOPTERUS VARIOPEDATUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CIRRIFORMIA LUXURIOSA							X	X								
DIOPATRA ORNATA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
DODECACERIA FEWKESI	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EUDISTYLIA POLYMORPHA	X	X	X	X	X	X	X	X	X	X	X	X	X			
EUPHROSINE SP.		X	X					X		X						
HARMOTHOE LUNULATA								X								
FLABELLIGERA COMMENSALIS										X						
FLABELLIGERA ESSENBERGE		X						X								
MYXICOLA INFUNDIBULUM	X	X	X	X	X	X	X	X	X	X	X	X		X		X
OPHIODROMUS PUGETTENSIS	X	X	X	X	X	X	X	X	X	X		X	X		X	
PHRAGMATOPOMA CALIFORNICA	X	X	X	X	X			X	X	X	X	X	X	X	X	X
PHYLLOCHAETOPTERUS PROLIFICA						X		X								
PHYLLODOCID																
PISTA ELONGATA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
POLYDORIS ALLOPORIS						X										
POLYNOID	X	X	X	X		X	X	X	X			X	X		X	
BISPIRA CRASSICORNIS			?						X			?				
SABELLARIA CEMENTUM			X							X		?				
SABELLID	X			X	X		X	X	X			X				
SABELLID WITH EYESTALK		X	X	X			X			X		?		X		X
SALMACINA TRIBRANCHIATA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SERPULA VERMICULARIS	X	X	X	X		X						X				X
SERPULID	X	X		X	X	X	X	X	X	X	X	X				
SPIOCHAETOPTERUS COSTARUM	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
SPIROBRANCHUS SPINOSUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SPIRORBID	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TEREBELLID	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
THELEPUS CRISPUS										X				X		
Arthropoda																
ARMATOBALANUS NEFRENS						X										
BALANUS AQUILA		X														
BALANUS AQUILA/NUBILUS	X	X	X	X	X		X	X	X			X				
BALANUS GLANDULA								INT								
BALANUS NUBILUS	X	X	X		X	X	X	X	X							
BALANUS TRIGONUS			X		X	X		X	X			X		X	X	X
BALANUS SP.		X	X	X	X		X	X		X	X			X	X	
CONOPEA GALEATA			X	X		X	X	X		X	X			X		
MEGABALANUS CALIFORNICUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X		

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	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
SPECIES																
MEMBRANOBALANUS ORCUTTI			X													
POLLICIPES POLYMERUS								X								
TETRACLITA ELEGANS	X	X	X	X	X	X	X	X	X	X	X	X	X			
TETRACLITA RUBESCENS	X		X				X	X			X			X		X
MYSIDS	X	X	X	X	X		X	X	X			X		X	X	
ACANTHOMYSIS SCULPTA	X															
ISOPODA (ORDER)								X								
CIROLANA HARFORDI	X															
IDOTEA SP.	X	X	X	X	X	X	X			X						
AMPHIPOD TUBE MASSES	X	X	X	X	X	X	X			X	?	X	X	X	X	X
AMPITHOE HUMERALIS									X							
BROWN AND YELLOW PLEUSTID	X															
CAPRELLID (SUBORDER)	X	X	X	X		X	X	X	X				X	X	X	X
GAMMARID (SUBORDER)	X			X		X	X	X	X	X		X	X	X		
ALPHEUS SP.	X		X			X	X	X				X				
BETAEUS HARFORDI		X	X					X								
BETAEUS LONGIDACTYLUS												X	X		X	
BETAEUS MACGINITIEAE	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
BETAEUS SP.														X	X	
HEPTACARPUS PICTUS	X	X														
HEPTACARPUS SP.		X										X				
HIPPOLYTE CALIFORNIENSIS								X								
HIPPOLYTE CLARKI	X															
LYSMATA CALIFORNICA			X	X		X	X	X	X		X	X	X	X	X	
PANDALUS SP.	X	X	X	X	X	X	X	X	X	X	X	X				
SPIRONTOCARIS PRIONATA		X	X		X											
PANULIRUS INTERRUPTUS					X	X	X	X	X	X	X	X	X	X	X	X
BLEPHARIPODA OCCIDENTALIS												X				
CRYPTOLITHODES SITCHENSIS	X															
FABIA SP.	X															
HAPALOGASTER CAVICAUDA	X	X	X	X	X							X		X	X	
ISOCHELES PILOSUS				X												
PACHYCHELES SP.	X	X														
PAGURISTES SP.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PAGURUS SP.	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
PETROLISTHES SP.		X	X		X	X		X								
PLEURONCODES PLANIPES							X	X								
PYLOPAGURUS SP.	X								X	X			X			
CANCER ANTENNARIUS	X	X					X								X	
CANCER PRODUCTUS	X															
CANCER SP.			S												J/X	

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
CYCLOXANTHOPS NOVEMDENTATUS	X					S						X			X	
EPIALTOIDES HILTONI		X														
ERILEPTUS SPINOSUS				X												
HERBSTIA PARVIFRONS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LOPHOPANOPEUS SP.			X													X
LOXORHYNCHUS CRISPATUS	X	X	X		X					X	X				X	
LOXORHYNCHUS GRANDIS	X							X	X	X			?		X	
MIMULUS FOLIATUS		X	X													
OREGONIA GRACILIS							X									
PARAXANTHIAS TAYLORI	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
PELIA TUMIDA		X	X	X				X	X	X						
PINNOTHERID SP.	X	X														
PODOCHELA HEMPHILLI	?		?													
PORTUNUS XANTUSII								X				M				
PUGETTIA DALLI				X												
PUGETTIA PRODUCTA	X	X	X	X	X			X							X	
PUGETTIA RICHII		X														
PUGETTIA SP.			X	X	X											X
RANDALLIA ORNATA								X							X	
SCYRA ACUTIFRONS	X	X			X	S			X			X			X	
TALIEPUS NUTTALLI	X				X			X	X			X			X	
Mollusca																
ACMAEA MITRA	X	X	X	X	X											
ALIA CARINATA	X			X	X				X	X						
AMPHISSA VERSICOLOR	X	X	X	X	X	X	X	X		X	X				X	
ASTRAEA GIBBEROSA	X	X	X		X	X										
ASTRAEA UNDOSA	O	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BALCIS RUTILA	X						X									
BURSA CALIFORNICA	X		X	X			X									
CALLIOSTOMA ANNULATUM	X	X	X	X	X	X		X								
CALLIOSTOMA CANALICULATUM	X	X														
CALLIOSTOMA GEMMULATUM			X													
CALLIOSTOMA LIGATUM	X	X		X											X	
CALLIOSTOMA SUPRAGRANOSUM	X	X	X	X	X	X	X	X	X			X				
CALLIOSTOMA GLORIOSUM				X				X								
CALLIOSTOMA SP.			X			X	X	X	X		X			X		
CANCELLARIA COOPERI	X	X														
CERATOSTOMA FOLIATUM	X	X	X	X	X	X			X	X	X			X		
CERATOSTOMA NUTTALLI			X	X		X	X	X	X	X	X	X	X	X	X	X
COLLISELLA CONUS									X							
COLLISELLA OCHRACEA		X	X													X

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
COLLISELLA SP.															X	
CONUS CALIFORNICUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CRASSISPIRA SEMIINFLATA			X													
CREPIDULA ADUNCA	X															
CREPIDULA DORSATA (=CREPIPAT.)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CREPIDULA NORRISARUM										X						
CREPIDULA SP.	X		X	X	X					X		X				
CYPRAEA SPADICEA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
DENDROPOMA SP.	X							X	X							
DIODORA ASPERA		X	X			X		X	X							
DIODORA SP.		X	X	X	X			X								
EPITONIUM SP.			X	X		S			X						S	
ERATO VITELLINA						X				X				X		
FISSURELLA VOLCANO	X	X		X		X									X	
FUSINUS KOBELTI		X	X	X	X					X						
F.K. GOBLET EGG CAPSULES		X	X	X	X											
FUSINUS LUTEOPICTUS			X		X	X	X	X	X			X	X	X	X	X
FISINUS SP.	X															
HALIOTIS CORRUGATA		X	X	X		J/X	X	X	X	X	X	X	X	X	X	X
HALIOTIS CRACHERODII	S	X		X			X	X				X			X	X
HALIOTIS FULGENS									S		S	X			X	X
HALIOTIS RUFESCENS	X	X	X	X	X	X	X	X	X	X	X	X				
HALIOTIS SORENSENI						X					X					
HIPPONIX SP.									S	X				S		S
HOMALOPOMA LURIDUM	X	X	X	X	X	X	X	X	X	X	X	X	X			
KELLETIA KELLETII	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
LACUNA SP.			X	X			X									
LATIAXIS OLDROYDI								X					X			
MAXWELLIA GEMMA	X	X	X	X		X	X	X	X		X	X	X	X	X	X
MAXWELLIA SANTAROSANA	X	X	X	X	X	X	X	X	X	X	X			X		X
MEGASURCULA STEARNSIANA	X															
MEGATHURA CRENULATA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MEGATEBENNUS BIMACULATUS	X															
MITRA IDAE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NASSARIUS MENDICUS									X							
NASSARIUS SP.									X							
NORRISIA NORRISI	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
NOTOACMAEA INSESSA			X													
OCENEBRA LURIDUM									X							
OCENEBRA SP.	X	X								X						
OLIVELLA BIPLICATA	X	X	X									X				

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
OLIVELLA SP.	X			X								S				
PEDICULARIA CALIFORNICA						X										
PETALOCONCHUS MONTEREYENSIS	X						X	X	X							
POLINICES SP.		X	X					E							X	
PSEUDOMELATOMA TOROSA																
PTEROPURPURA FESTIVA										X						
PTEROPURPURA SP.	X	X	X													
SEILA MONTEREYENSIS												X				
SERPULORBIS SQUAMIGERUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SIMNIA VIDLERI				X		X	X	X		X	X					
TEGULA AUREOTINCTA			X			X		X	X	X		X		X	X	X
TEGULA BRUNNEA	S															
TEGULA EISENI								X				X	X	X	X	X
TEGULA FUNEBRALIS								X							X	
TEGULA PULLIGO	X	X														
TEGULA REGINA			X			X	X	X		X			X	X	X	X
TRIVIA CALIFORNIANA	X	X		X		X	X		X	X	X			X	X	
TRIVIA SOLANDRI						X		X		X		X				
TRIVIA SP.			X			X						X		X	X	X
VOLVARINA TAENIOLATA	X	X	X	X	X		X	X	X	X		X			X	
APLYSIA CALIFORNICA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
APLYSIA VACCARIA		X	X	X	X		X	X	X	X		X		X		
APLYSIOPSIS SMITHI			X													
BERTHELLA CALIFORNICA	X	X				X		X		X						
BERTHELLINA ENGELI								X		X	X	X	X		X	X
BULLA GOULDIANA		X	X			X		X				S				X
BULLA/HAMINOEA									E	E						
NAVANAX INERMIS	X	X	X	X	X	X	X	XE	X	XE	X	X	X	X	XE	X
ELYSIA HEDGEPETHII		X														
HAMINOEA VIRESCENS																
HAMINOEA VIRESCENS EGGS			X	X										X		
PLEUROBRANCHUS SP.														X		
RICTAXIS PUNCTOCAELATUS	X		X	X						X						
RICTAXIS "DNA" EGG SPIRALS										X						
TYLODINA FUNGINA												X	X			X
ACANTHODORIS LUTEA					X											
ACANTHODORIS RHODOCERAS												X				
AEGIRES ALBOPUNCTATUS	X		X	X			X	X								
AEOLIDIA PAPILLOSA		X										X				
ALDISA SANGUINEA														X		
ANISODORIS NOBILIS	X	X	X	X	X	X	X		X			X		X		

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
ANTIOPELLA BARBARENSIS			X				X									
ARCHIDORIS MONTEREYENSIS	X	X	X		X									X		
ARCHIDORIS ODHNERI		X	X		X											
ARMINA CALIFORNICA																
ATAGEMA QUADRIMACULATA			X		X											
CADLINA FLAVOMACULATA	X							X		X						
CADLINA LIMBAUGHI			X			X	X			X				X		
CADLINA LUTEOMARGINATA	X		X	X	X	X	X			X		X				
CADLINA SP.			X													
CHROMODORIS MACFARLANDI		X	X	X	X	X	X	X				X	X	X	X	
CHROMODORIS PORTERAE								X			X			X		
CONUALEVIA ALBA		X														
CORAMBE PACIFICA							X									
CORYPHELLA TRILINEATA			X			X	X	X								
CUTHONA LAGUNAE																
DENDRODORIS N.SP.			X					X	X					X		
DENDRONOTUS ALBUS/DIVERSICOLOR		X	X	X												
DENDRONOTUS FRONDOSUS							X									
DENDRONOTUS IRIS			X													
DIAULULA SANDIEGENSIS	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
DIRONA PICTA					X			X					X			
DORIOPSILLA ALBOPUNCTATA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FIONA PINNATA															D	
CORYPHELLA IODINEA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HERMISSENDA CRASSICORNIS	X	X	X	X	X	X	X		X	X			X	X	X	X
HOPKINSIA ROSACEA			X		X								X			
JORUNNA PARDUS				X			X	X			X		X	X		
LAILA COCKERELLI	X	X	X	X	X	X	X	X	X			X		X	X	
MELIBE LEONINA	X		X		X		X									
MEXICHROMIS PORTERAE						X	X	X	X		X	X	X	X	X	X
PELTODORIS N.SP.													X			
PHIDIANA PUGNAX	X	X	X	X	X	X				X	X	X		X	X	X
POLYCERA ATRA		X	X	X			X	X		X						
POLYCERA TRICOLOR										X				X	X	X
PRECUTHONA DIVAE						X	X	X	X							
ROSTANGA PULCHRA				X				X							X	
SPURILLA OLIVAE																X
TRIOPHA CATALINAE	X	X	X	X	X	X	X	X	X	X	X	X				
TRIOPHA MACULATA		X	X	X	X											
TRITONIA FESTIVA			X				X	X				X		X		
POLYPLACOPHORA (CLASS)			X							X						

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
CALLISTOCHITON CRASSICOSTATUS								X								
CALLISTOCHITON SP.	X				X											
CRYPTOCHITON STELLERI	X	X		X											X	
CYANOPLAX DENTIENS CRYPTICA													X			
LEPIDOZONA MERTENSII	?	?														
LEPIDOZONA PECTINULATA								X		X						
PLACIPHORELLA VELATA			X													
STENOPLAX CONSPICUA	X															X
STENOPLAX SP.	X															
TONICELLA LINEATA	X	X	X											X		
ADULA FALCATA								S								
AMERICARDIA BIANGULATA							X	X								
CHACEIA OVOIDEA	X		X	X	X	X										
CHAMA ARCANA		X	X	X		X	X	X			X	X	X		X	X
CHLAMYDOCONCHA ORCUTTI	X		X					X	X	X		X		X		
GARI CALIFORNICA		X	X			S	S	S	S	S						
HIATELLA ARTICA	X	X	X	X	X	X		X	X							
HINNITES GIGANTEUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
IRUSELLA LAMELLIFERA	X					S				S						
LEPTOPECTEN LATIAURATUS							X									
LIMA HEMPHILLI	X	X	X	X	X	X	X	X	X	X	S	X			X	X
LITHOPHAGA PLUMULA	X						S									
MODIOLUS CAPAX								S								
MYTILIMERIA NUTTALLI	X															
MYTILUS CALIFORNIANUS		X					X	X				X	X		S	
PANOPEA GENEROSA		X	X													
PARAPHOLUS CALIFORNICUS	X	X	X	X												
PECTEN DIEGENSIS										XS						
PENITELLA PENITA			?	X		X		X		X			X			
PHOLAD (UNIDENTIFIED)	X	X	X	X	X		X	X			X		X			
PODODESMUS CEPIO	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SEMELE DECISA								S								
SEMELE RUPICOLA		X													S	
THRACIA SP.															S	
TRACHYCARDIUM QUADRAGENARIUM			X		X			S		S						
TRESUS NUTTALLII																
VENTRICOLARIA FORDII		X	X	S	X	X	X	X	S	S		X			X	
OCTOPUS BIMACULATUS/BIMACULOIDES	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
OCTOPUS MICROPYRSUS		X														
OCTOPUS RUBESCENS	X	X	X		X											
OCTOPUS SP.	X	X	X	X	X	X	X	X	X	X				X	XJUV	

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
Ectoprocta (Bryozoans)																
AETEA SP. (ON HERBSTIA)	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
ANTROPORA TINCTA				X		X	X	X		X						
BUGULA NERITINA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BUGULA SP.	X	X	X	X		X	X	X		X			X	X	X	X
CELLEPORARIA BRUNNEA	X	X	X	X	X	X	X	X	X	X		X	X			
COSTAZIA ROBERTSONIAE	X	X	X	X	X	X	X	X	X	X	X	X		X		
CRISIA SP.	X		X	X		X	X	X	X							X
CRISULIPORA SP.				X	X											
DENDROBEANIA TYPE (FLEXIBLE)	?															
DIAPEROECIA CALIFORNICA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EURYSTOMELLA BILABIATA						X		X								
EURYSTOMELLA SP.	X	X		X	X			?		X	X			X		X
FENESTRULINA MALUSI						X		X								
HETEROPORA MAGNA		X		?		X	X	X							X	
HIPPODIPLOSIA INSCULPTA	X	X	X	X	X	X	X	X	X	X		X	X		X	X
LICHENOPORA NOVAE-ZELANDIAE			X	X		X			X		X	X	X	X	X	X
MEMBRANIPORA MEMBRANACEA	X	X	X	X	X	X		X		X	X	X	X	X	X	X
MEMBRANIPORA TUBERCULATA						X	X	X				X	X			
MEMBRANIPORA SP.	X		X	X	X	X	X	X	X	X	X	X	X			
PARASMITTINA/RHYNCHOZOON	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
PHIDOLOPORA LABIATA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PHIDOLOPORA PACIFICA			X	X	X	X	X	X	X	X	X	X	X	X	X	X
RHYNCHOZOON SP.				X												
SCHIZOPORELLA SP.	X	X	X	X		X	X	X	X	X		X	X			
SCRUPOCELLARIA SP.	X	X	X				?	?			X			X		X
THALAMOPORELLA CALIFORNICA	X		X	X		X	X	X	X	X	X	X			X	X
Entoprocta																
BARENTSIA SP.						X	X	X	X			X	X		X	X
Phoronida																
PHORONIS VANCOUVERENSIS		X	X			X	X	X	X	X		X				
PHORONOPSIS CALIFORNICA		X	X			X	X	X		X						
Echinodermata																
ASTROMETIS SERTULIFERA			X	X				X		X				X		X
ASTROPECTEN ARMATUS	X	X		X			X	X				X				
DERMASTERIAS IMBRICATA			X	X	X					X						
HENRICIA LEVIUSCULA	X	X	X	X	X	X	X			X	X			X		
HENRICIA N.SP.	X		X	X	X	X					X					
LEPTASTERIAS SP.		X	X		X			X								
LINCKIA COLUMBIAE	X		X	X		X	X	X	X		X	X	X			X

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
LUIDIA FOLIOLATA			X	X												
MEDIASTER AEQUALIS	X		X	X	X	X				X	X			X		
ORTHASTERIAS KOEHLERI	X	X	X	X	X	X	X	X		X						
ASTERINA MINIATA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PISASTER BREVISPINUS	X	X			X					X						
PISASTER GIGANTEUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PISASTER OCHRACEUS	X	X					X	X								
PYCNOPODIA HELIANTHOIDES	X	X	X	X	X	X				X						
CENTROSTEPHANUS CORONATUS						X	X	X	X		X	X	X	X	X	X
DENDRASTER EXCENTRICUS	X											S				
LOVENIA CORDIFORMIS		X		X				X				X				
LYTECHINUS ANAMESUS	X	X	X	X	X	X	X	X	X	X	X			X	X	X
LYTECHINUS ANAMESUS JUVENILES										X	X	X				
STRONGYLOCENTROTUS FRANCISCANUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
STRONGLYOCENTROTUS FRANCISCANUS JUVENILES			X	X	X					X				X	X	X
STRONGYLOCENTROTUS PURPURATUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
STRONGLYOCENTROTUS PURPURATUS JUVENILES										X				X	X	X
OPHIUROIDEA (CLASS)															X	
AMPHIPHOLIS SQUAMATA											X					
OPHIACTIS SIMPLEX							X	X	X							
OPHIODERMA PANAMENSE	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
OPHIOPLOCUS ESMARKI	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
OPHIOPSILA CALIFORNICA			X	X	X	X		X	X	X	X	X		X	X	
OPHIOPTERIS PAPILLOSA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
OPHIOTHRIX SPICULATA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CHIRIDOTA ALBATROSSI			X							X						
CUCUMARIA CURATA/PSEUDOCURATA			X													
CUCUMARIA LUBRICA			X	X												
CUCUMARIA MINIATA			X	X	X			X				X	X		X	
CUCUMARIA PIPERATA	X	X	X	X	X		X		X	X			X			
CUCUMARIA SP.		X	X	X	X	X					X					
CUCUMARIA SALMA	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
EUPENTACTA QUINQUESEMITA	X	X	X	X	X	X	X	X	X	X			X			
LEPTOSYNAPTA ALBICANS			X			X	X	X								
LISSOTHURIA NUTRIENS			X	X				X	X			X				
MOLPADIA	X															
PACHYTHYONE RUBRA			X	X	X	X	X	X	X	X						
PARASTICHOPUS CALIFORNICUS	X	X	X	X		X	X									
PARASTICHOPUS PARVIMENSIS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Urochordata (tunicates)																
APLIDIUM SOLIDUM			X													

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
APLIDIUM SP.			?		X		X	X								X
ARCHIDISTOMA DIAPHANES		X	X	?		?	X	?	X		X					X
ARCHIDISTOMA MOLLE												?				
ARCHIDISTOMA PSAMMION	X	X	X	X	X				X	X	X	X				X
ARCHIDISTOMA SP.				X		X	X	X							X	
ASCIDIA CERATODES	X	X									X	X		X		
ASCIDIA VERMIFORMIS		X						X			X					
BOLTENIA VILLOSA	X	X	X	X	X	X		X		X						
BOTRYLLUS/BOTRYLLOIDES						X	X	X		X		X		X	X	X
BOTRYLLUS SP.						X	X	X		X				X	X	X
BOTRYLLUS TUBERATUS							X	X								
CLAVELINA HUNTSMANI	X	X	X	X	X	X	X	X		X		X	X	X	X	X
CNEMIDOCARPA FINMARKIENSIS	X	X	X		X							X		X		
CYSTODYTES LOBATUS	X	X	X	X	X	X	X	X	X			X				
DIDEMNID	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
DIDEMNUM CARNULENTUM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
DISTAPLIA OCCIDENTALIS						X										
EUHERDMANIA CLAVIFORMIS	X	X	X	X		X	X	X	X	X	X	X				X
HALOCYNTHIA HILGENDORFI IGABOJA			X			X										
METANDROCARPA DURA			X	X						X						
METANDROCARPA TAYLORI							X	X	X		X	X		X	X	X
PEROPHORA ANNECTENS				X					X							
POLYCLINUM PLANUM	X			X												
PYCNOCLAVELLA STANLEYI	X	X	X	X	X	X		X	X			X		X	X	X
PYURA HAUSTOR	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
PYURA MIRABILIS								X		X						
RITTERELLA SP.								X								
SALPS	D	D							D			D				
STYELA CLAVA								X								
STYELA GIBBSII/TRUNCATA	X	X	X	X			X	X		X						
STYELA MONTEREYENSIS	X	X	X	X	X	X	X	X		X						
STYELA SP.							X	X							X	X
SYNOICUM PARFUSTIS	X		X													
THETIS VAGINA														X	X	
TRIDIDEMNUM OPACUM	X		X	X			X	X	X	X	X	X	X	X	X	
Chordata (vertebrates)																
CEPHALOSCYLLIUM VENTRIOSUM		X	X	X	X	X	X	X				XE				
HETERODONTUS FRANCISCI							X	X	X			XE	X		X	X
MYLIOBATIS CALIFORNICA	X	X	X	X		X		X	X	X	X	X	X	X		X
SQUATINA CALIFORNICA	X	X	X	X	X	X	X		X		X	X	X		X	
TORPEDO CALIFORNICA			X					X			X					

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
TRIAKIS SEMIFASCIATA												X				
GYMNOTHORAX MORDAX							X	X			X	X	X	X	X	X
PORICHTHYS NOTATUS			X					X								
GOBIESOCIFORMES			X													
GOBIESOX SP.														X		
GOBIESOX EUGRAMMUS												?				
GOBIESOX MAEANDRICUS	X	X														
GOBIESOX RHESSODON									X					X	X	X
RIMICOLA MUSCARUM										X						
CHILARA TAYLORI								X								
ENGRAULIS MORDAX							X	X								
ATHERINOPS AFFINIS	X		X	X							X		X			X
ATHERINOPS/LEURESTHES			X	X	X	X	X	X	X	X	X	X			X	X
CYPSELURUS CALIFORNICUS			X					X			X					
AULORHYNCHUS FLAVIDUS	X	X	X		X											
SYNGNATHUS SP.								X								
SYNGNATHUS CALIFORNIENSIS				X												
SYNGNATHUS LEPTORHYNCHUS			X													
RATHBUNELLA HYPOPLECTA		X	X		X	X	X									
RATHBONELLA SP.		X														
HYPSOBLENNIUS JENKINSI								X				X				
SERIOLA LALANDEI			X	X												
TRACHURUS SYMMETRICUS	X	X	X	X	X		X	X		X	X	X	X		X	X
ALLOCLINUS HOLDERI		X				X	X	X	X	X	X	X	X	X	X	X
GIBBONSIA SP.	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GIBBONSIA ELEGANS			X								X				X	
GIBBONSIA METZI			X													
HETEROSTICHUS ROSTRATUS		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
HETEROSTICHUS ROSTRATUS JUVENILES											X		X			
NEOCLINUS SP.	X	X														
NEOCLINUS STEPHANSAE	X	X	X	X	X	X	X	X	X	X		JUV	X			
PARACLINUS INTEGRIPINNIS									X							
COTTIDAE (SCULPINS)	X	X														
ARTEDIUS SP.					X											
ARTEDIUS CORALLINUS	X	X	X	X	X	X		X		X		X		X	X	X
ARTEDIUS CREASERI				X		X	X	X	X		X	X			X	
HEMILEPIDOTUS SPINOSUS															X	
LEIOCOTTUS HIRUNDO	X		X	X	X					X		X		X	X	
ORTHONOPIAS TRIACIS	X	X	X	X	X	X		X	X	X		X	X	X	X	X
SCORPAENICHTHYS MARMORATUS	X	X	X	X	X	X		X	X	X		X		X		
BRACHYISTIUS FRENATUS	X	X	X	X	X	X		X	X		X	X	X		X	X

1982-1989 Kelp Forest Monitoring Species List

LOCATION:	SMIWL	SMIHR	SRIJLN	SRIJLS	SRIRR	SCIGI	SCIFH	SCIPB	SCISA	SCIYB	ANIAR	ANICC	ANILC	SBISESL	SBIAP	SBICC
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
CYMATOGASTER AGGREGATA	X		X	X	X				X	X		X				X
RHACOCHILUS VACCA	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
EMBIOTOCA JACKSONI	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EMBIOTOCA LATERALIS	X	X	X	X	X	X	X	X	X		X	X				
HYPERPROSOPON ARGENTEUM				X						X						
HYPERPROSOPON ELLIPTICUM			X	X												
HYPSURUS CARYI	X		X	X	X				X	X	X	X		X		X
MICROMETRUS MINIMUS				X												
PHANERODON SP.		X	X					X	X							
PHANERODON FURCATUS		X	X	X												
RHACOCHILUS TOXOTES	X	X	X	X	X	X	X	X	X		X	X				
CORYPHOPTERUS NICHOLSI	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LYTHRYPNUS DALLI		X	X	X		X	X	X	X	X	X	X	X		X	
LYTHRYPNUS ZEBRA		X	X			X	X	X	X	X	X	X	X	X	X	X
ANISOTREMUS DAVIDSONII								X				X				
XENISTIUS CALIFORNIENSIS								X								
HEXAGRAMMOS DECAGRAMMUS													X		X	
OPHIODON ELONGATUS	X		X			X										
OXYLEBIUS PICTUS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GIRELLA NIGRICANS			X	X	X	X	X	X	X	X	X	X	X	X	X	X
MEDIALUNA CALIFORNIENSIS		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MEDIALUNA JUVENILES			X													
HALICHOERES SEMICINCTUS			X	X	X	X	X	X	X	X	X	X	X	X	X	X
H. SEMICINCTUS FEMALES						X	X	X			X	X	X			X
H. SEMICINCTUS MALES							X	X		X	X	X	X			
H. SEMICINCTUS JUVENILES													X			
OXYJULIS CALIFORNICA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
O. CALIFORNICA JUVENILES	X			X									X			X
SEMICOSSYPHUS PULCHER	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
S. PULCHER FEMALES	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
S. PULCHER MALES			X	X	X	X	X	X		X	X	X	X	X	X	X
S. PULCHER JUVENILES							X	X				X	X			
CAULOLATILUS PRINCEPS		X	X	X	X	X	X	X						X	X	
CHROMIS PUNCTIPINNIS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
C. PUNCTIPINNIS JUVENILES						X	X	X	X		X	X	X	X	X	X
HYPSYPOPS RUBICUNDUS			X	X		X	X	X	X		X	X	X	X	X	X
H. RUBICUNDUS JUVENILES								X	X						X	
ATRACTOSCION NOBILIS				X												
SCOMBER JAPONICUS	X			X	X		X	X			X					
SCORPAENA GUTTATA	X		X	X		X	X	X	X	X	X	X	X	X	X	X
SEBASTES ATROVIRENS	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X

1982-1989 Kelp Forest Monitoring Species List

LOCATION:	SMIWL	SMIHR	SRIJLN	SRIJLS	SRIRR	SCIGI	SCIFH	SCIPB	SCISA	SCIYB	ANIAR	ANICC	ANILC	SBISESL	SBIAP	SBICC
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SPECIES																
S. ATROVIRENS JUVENILES	X	X	X													
SEBASTES CARNATUS	X	X	X	X	X	X	X	X	X	X	X		X	X		
SEBASTES CAURINUS	X	X	X	X	X	X	X		X							
S. CARNATUS/CAURINUS	X	X					X					X				
SEBASTES CHRYSOMELAS	X	X	X	X	X	X	X	X	X	X	X	X	X		X	
SEBASTES MINIATUS		X	X		X	X	X		X							
S. MINIATUS JUVENILES	X	X				X										
SEBASTES MYSTINUS	X	X	X	X	X	X	X		X			X				
S. MYSTINUS JUVENILES	X	X	X	X	X	X	X					X				
SEBASTES PAUCISPINIS	J/X		X		J/X				X						X	
S. PAUCISPINIS JUVENILES	X				X											
SEBASTES PINNIGER			X													
SEBASTES RASTRELLIGER	X		X	X			X	X	X			X			X	X
SEBASTES SERRANOIDES	X	X	X	X	X	X	X	X	X		X	X				
S. SERRAN./S. FLAVIDUS JUVS	X	X	X	X	X							X				
SEBASTES SERRICEPS	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X
S. SERRICEPS JUVENILES			X	X			X				X				X	
PARALABRAX CLATHRATUS		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
P. CLATHRATUS JUVENILES					X			X						X		
PARALABRAX NEBULIFER											X	X				
SPHYRAENA ARGENTEA					X											
CEBIDICHTHYS SP.	X															
CITHARICHTHYS SP.		X	X									X			X	
CITHARICHTHYS STIGMAEUS			X													
CITHARICHTHYS JUVENILES	X	X	X	X												
PARALICHTHYS CALIFORNICUS					X							X				
PLEURONICHTHYS COENOSUS	X	X	X	X		X		X	X	X		X		X	X	X
MOLA MOLA					X		X									
CEPPHUS COLUMBA (Pigeon Guillemot)									X						X	
PHALACROCORAX SP.		X		X	X										X	
MIROUNGA ANGUSTIROSTRIS	X															
PHOCA VITULINA	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
ZALOPHUS CALIFORNIANUS	X	X	X	X	X	X	X	X			X	X		X	X	X
GREAT BLUE HERON (ON KELP)										X						

Appendix 7. Oceanographic Data

Introduction

This appendix includes tables from Fausak (1989) that list the deployment dates for Bathythermographs (temperature/depth loggers), and sample graphs from the data set.