

1 m Quadrats

Access Table Design Structure for 1 m Quadrat

Field Name	Data Type
ProgramCode	Text
Year	Number
EventCode	Text
IslandCode	Text
SiteCode	Text
Species	Number
Quadrat	Number
CountA	Number
CountB	Number

Sample Size and Database Anomalies

The number of quadrats sampled per year has changed several times starting with 30 sampled in 1982, 40 sampled in 1983 and 1984, 20 sampled from 1985-1995 and 12 sampled from 1996 to present. Each quadrat for 1982, 1983, and 1984 represents 1m². From 1985 to present each quadrat represents 2m² (Table 13).

CountA and CountB

From 1982-1984 each 1 m quadrat was entered into the database under CountA, and CountB is null (Table 13).

From 1985-present 2 m² quadrats were sampled. However, from 1985-1994 two divers (sampling adjacent 1 m² quadrats) added their Counts together before entering the data. Hence, from 1985-1994 data entered under CountA represents 2 m² and CountB is null (Table 13).

From 1995-present, the data for each diver is entered under CountA and CountB, so by adding both counts together from each sampling point represents 2 m².

Table 14. Number and size of 1 m quadrats 1982-Present.

Year	# Quadrats sampled	Quadrat Size	Count A	Count B
1982	30	1m ²	yes	null
1983 – 1984	40	1m ²	yes	null
1985 – 1994	20	2m ²	yes	null
1995	20	2m ²	yes	yes
1996 – present	12	2m ²	yes	yes

Quadrat Placement

Prior to 1996 random points selected for placement of the quadrats were stratified random. After 1996, the sampling points are systematic with a randomly selected starting point.

Organisms Sampled Information

Table 15. 1 m quadrat species sampling history.

Species Name	Species Code	Comments
<i>Macrocystis pyrifera</i> adult	2002.00	Sampling began in 1983
<i>Macrocystis pyrifera</i> juvenile	2002.50	Sampling began in 1983
<i>Macrocystis pyrifera</i> STIPES (>1 m tall)	2002.99	Sampling began in 2007 and discontinued in 2015
<i>Macrocystis pyrifera</i> all*	2010.00	Discontinued in 1996 * (can be calculated by adding ad.+ juv.)
<i>Eisenia arborea</i> adult	2004.00	Sampling began in 1996
<i>Eisenia arborea</i> juvenile	2004.50	Sampling began in 1996
<i>Eisenia arborea</i> all*	2012.00	Discontinued in 1996 * (can be calculated by adding ad.+ juv.)
<i>Pterygophora californica</i> adult	2005.00	Sampling began in 1996
<i>Pterygophora californica</i> juvenile	2005.50	Sampling began in 1996
<i>Pterygophora californica</i> all*	2013.00	Discontinued in 1996* (can be calculated by adding ad.+ juv.)
<i>Laminaria farlowii</i> adult	2006.00	Sampling began in 1996
<i>Laminaria farlowii</i> juvenile	2006.50	Sampling began in 1996
<i>Laminaria farlowii</i> all*	2014.00	Discontinued in 1996* (can be calculated by adding ad.+ juv.)
<i>Undaria pinnatifida</i> adult	2009.00	Sampling began in 2016*
<i>Undaria pinnatifida</i> juvenile	2009.50	Sampling began in 2016*
<i>Dictyoneuropsis reticulata</i> /Agarum fimbriatum adult *	2015.00	Sampling began in 2003, when present*
<i>Dictyoneuropsis reticulata</i> /Agarum fimbriatum juvenile*	2015.50	Sampling began in 2003, when present*
<i>Sargassum horneri</i> adult	2016.00	Sampling began in 2010
<i>Sargassum horneri</i> juvenile	2016.50	Sampling began in 2010
<i>Cypraea spadicea</i>	9005.00	Sampling began in 1983(except AR,RR began 1982)
<i>Kelletia kelletii</i>	9006.00	Sampling conducted sporadically 1992-2011
<i>Megastrea (Astraea) undosa</i>	9007.00	Continuously sampled
<i>Lithopoma (Astraea) gibberosa</i>	9008.00	Began sampling in 1985(sporadic sampling)
<i>Crassadoma (Hinnites) gigantea</i>	9010.00	Sampling conducted sporadically, 1994-2011
<i>Tegula regina</i>	9014.00	Sampling began in 2006
<i>Patiria (Asterina) miniata</i>	11001.00	Continuously sampled
<i>Pisaster giganteus</i>	11002.00	Continuously sampled
<i>Lytechinus anamesus</i> *	11004.00	Sampled when densities were high, discontinued in 2012.*
<i>Strongylocentrotus franciscanus</i>	11005.00	Continuously sampled
<i>Strongylocentrotus purpuratus</i>	11006.00	Continuously sampled
<i>Parastichopus parvimensis</i>	11007.00	Continuously sampled, with the exception of no data taken at Pelican Bay in 1988
<i>Centrostephanus coronatus</i>	11009.00	Sampling began in 1996
<i>Styela montereyensis</i>	12002.00	Continuously sampled
<i>Lythrypnus dalli</i>	14025.00	Sampling began in 1985
<i>Coryphopterus nicholsii</i>	14026.00	Sampling began in 1985
<i>Alloclinus holderi</i>	14027.00	Sampling began in 1985

*see below

Prior to 1996, adult and juvenile *Laminaria farlowii*, *Pterygophora californica*, and *Eisenia arborea* were not distinguished and were grouped into *L. farlowii* all, *P. californica* all, and *E. arborea* all categories. Adult and juvenile categories for each of these species were added in 1996.

In 1996, the categories for *M. pyrifera* all, *L. farlowii* all, *P. californica* all and *E. arborea* all were discontinued. However, this information can still be calculated by combining the adult and juvenile categories from 1996 to present.

Dictyoneuropsis reticulata/Agarum fimbriatum was added to quadrats as a write-in species in 2003. The two different species were combined since divers may have a difficult time distinguishing between *D. reticulata* and *A. fimbriatum*. This species is sampled whenever it is present.

Lytechinus anamesus were sampled on quadrats in place of band transects at PB in 1987, at YB from 1986-1990, and at AR from 1986-1990 due to very high densities being present. However, the data collected are not very comparable since the habitat sampled on quadrats differs greatly from the habitat sampled on band transects. Therefore, sampling of *L. anamesus* on 1 m quadrats in place of sampling *L. anamesus* on band transects will not be continued. In addition, *L. anamesus* had been sampled sporadically frequently at various sites up to 2011.

In 2001 at Miracle Mile, San Miguel Island, only the first 6 of 12 quadrats were sampled. Since those data are not comparable with proceeding years, the data were deleted from the database in 2013. The datasheets were scanned and filed so that they are available for reference if needed.

Undaria pinnatifida was added as a write in species in 2016, after it was seen for the first time at the Northern Channel Islands at the KFM site Keyhole, Anacapa Island. In the first year of sampling, *U. pinnatifida* was separated into adult and subadult categories based solely on whether the plants possessed mature looking reproductive sporophylls, regardless of size class, but no small juveniles were observed in 2016. In 2017, it was decided to make the distinction of juvenile, subadult, and adult plants based on the size class of the plant and the level of sporophylls development. The definition for the different *U. pinnatifida* life stages in 2017 were: juveniles have no midrib present, subadults have midrib but not fluted sporophylls, adults have fluted sporophylls. This posed challenges in keeping the data consistent across all years, so it was decided to enter subadults as juveniles in the database. In 2018 and thereafter, the categorization of juvenile, subadult and adult plants was further refined to include size classes. The current size classes are: juveniles are less than 0.5 m tall, reproductive sporophyll absent, subadults are greater than 0.5 m tall and not reproductive (can have frills on either side of blade above the holdfast, but lacks mature, dark brown sporophyll), and adults are greater than 0.5 m tall and have with well developed/reproductive sporophylls. While we are attempting to collect all three of these demographic categories in anticipation they may be useful in the future, the data is only entered as juveniles (both juvenile and subadult categories combined (non reproductive) and adults (reproductive). If the subadult category is deemed useful in the future the juvenile category will need to be re-entered as juveniles and adults. We believe due to the rapid growth rate of this algae that this will not be important.

Sites Sampled Information

Table 16. 1 m quadrat site sampling history.

Dates Available	Island Name	Site Code
1982 – Present	San Miguel	WL, HR
	Santa Rosa	JLNO, JLSO, RR
	Santa Cruz	GI, FH, PB, SA
	Anacapa	AR, CC, LC
	Santa Barbara	SESL, AP
1986 – Present	Santa Barbara	CAT
	Santa Cruz	YB
2001 – Present	San Miguel	MM
2003 – 2004	San Clemente	NWH, BSC, EP, HBC
2005 – Present	Santa Rosa	CP, TC, CSAW, SP
	Santa Cruz	DPM, PP, CVP, LS, PRF
	Anacapa	KH, EFC, BSB, LH

Santa Barbara	WA, GC, SER
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