

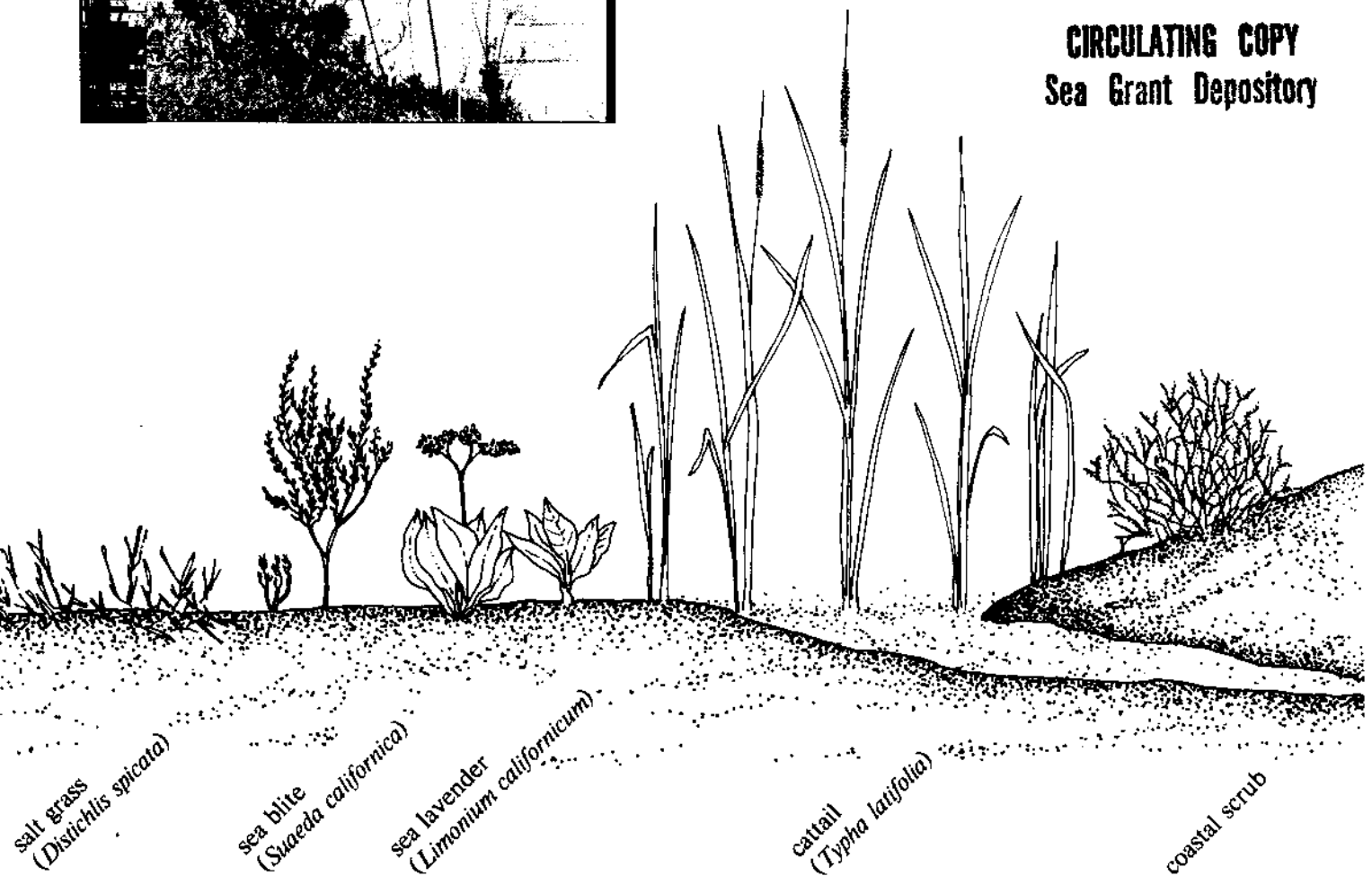
# California's Coastal Wetlands



LOAN COPY ONLY



CIRCULATING COPY  
Sea Grant Depository



# A PLANT COMMUNITY IN A CALIFORNIA COASTAL WETLAND

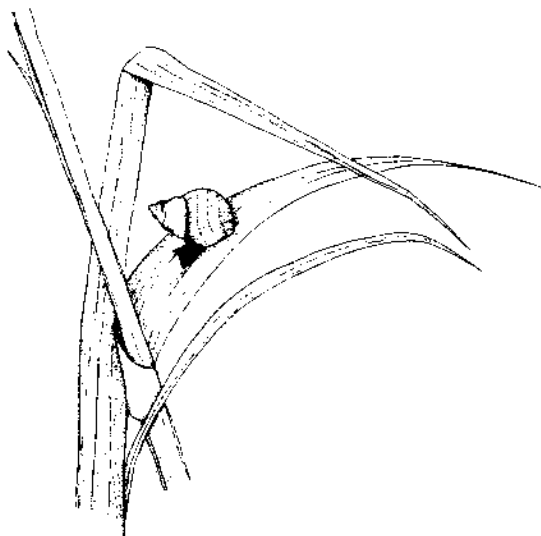
California's coastal wetlands are the setting for a simple plant community made up of diverse zones. The diverse zones reflect the complexity of the wetland environment where tide action, salinity, temperature, and elevation play key roles in determining which plants occur in the wetland area.

Below the limits of the low tide are the submerged lands that are constantly covered by salt water--the marine zone. Often, only a dense population of algae and eelgrass is found in this zone because the environment is too harsh for most vascular plants.

Between the lines of high and low tide is the area that is alternately submerged and exposed twice a day by incoming and outgoing tides. In those California coastal wetlands that are shallow and flat, this area is dominated by a particular marsh grass, cordgrass (*Spartina foliosa*), that requires adequate tidal flushing for survival. Many California coastal wetlands, however, slope steeply upward and experience less tidal inundation. Cordgrass is not found in them. Instead, these wetlands are dominated by various succulents, including the fleshy, green pickleweed (*Salicornia virginica*), that can withstand long periods without submersion. In fact, the pickleweed has evolved from a non-marine environment and can now tolerate submersion in salt water.

At the upper reaches of the high tide and landward, pickleweed becomes more interspersed with sea blite (*Suaeda californica*), arrow grass (*Triglochin*

*maritimum*), and salt grass (*Distichlis spicata*). This is an area subjected to seasonally high tides followed by weeks, sometimes months, of no tidal inundation and little or no rainfall. At greater distances landward, especially in southern California, the salt-tolerant plants gradually give way to coastal sage scrub and other hardy plants that require a minimum amount of water to survive in a dry chaparral environment. Additionally, freshwater pools often collect where there is adequate rainfall, especially in the uplands that surround many coastal wetlands in northern California. They provide habitat for freshwater cattails, frogs, crayfish, and small fish.



Periwinkle on Cordgrass

## SUGGESTED CLASSROOM ACTIVITY \*

### Exploration

What organisms are found in California's coastal wetlands?

Describe where the organisms are found in a California coastal wetland.

### Invention

(Concept: Organisms live in communities that are made up of ecological niches with unique characteristics.)

Why is there a transition of types of organisms from one part of a wetland to another part?

### Discovery

What do all California wetlands have in common?

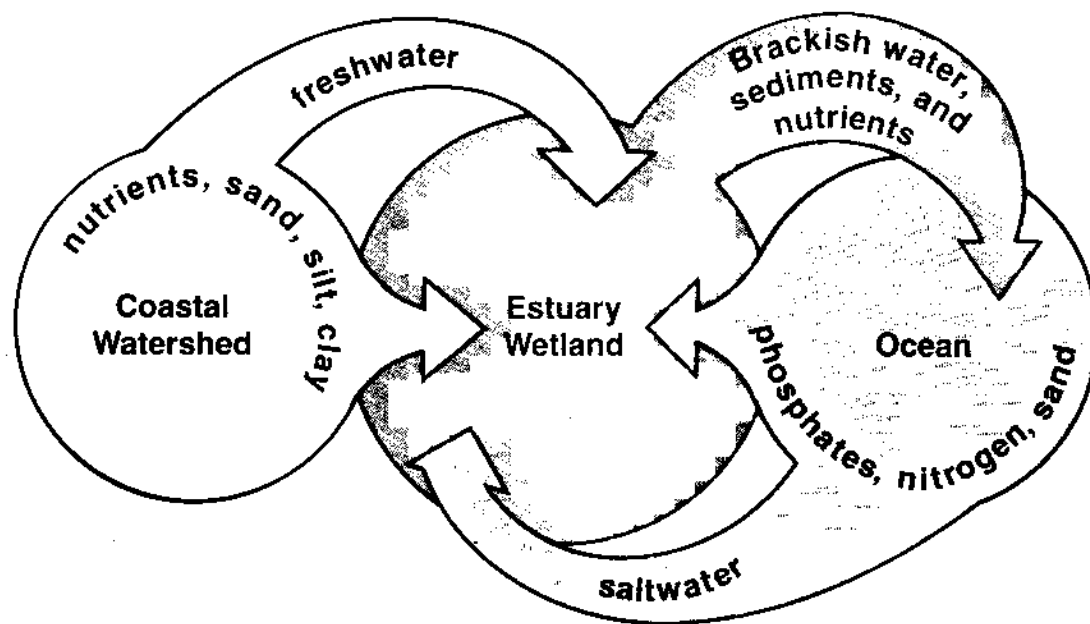
### Suggested Reading:

Bakker, Elna, *An Island Called California*. Berkeley: UC Press, 1971.

The Coastal Wetland Series. Sacramento: California Department of Fish and Game. 1970.

Macdonald, K.B. "Coastal Salt Marsh" in *Terrestrial Vegetation of California*, M.G. Barbour and J. Major, eds. New York: J. Wiley & Sons, 1977.

# THE ESTUARY



An estuary is a semienclosed coastal body of water that has a free connection with the open sea and within which sea water is measurably diluted with fresh water derived from land drainage.\*\*

As fresh water flows from the coastal watershed to the estuary, either by river flow or underground flow, it carries with it sand, silt, clay, and dissolved nutrients. At the same time, the shores of the estuary are alternately flooded and exposed during each tidal cycle. This incoming salt water distributes sand, nitrogen, and phosphates throughout the estuary. Sediment and sand deposits from both these freshwater and saltwater sources eventually settle out to form the shallow geologic base for the estuary.

\*\* Definition from: G.H. Lauff, ed., *Estuaries*. Washington, D.C.: American Association for the Advancement of Science Publication 83, 1967.

## SUGGESTED CLASSROOM ACTIVITY \*

### Exploration

Compare the total amount of food made available to animals (productivity) in a coastal wetland to that in other places such as the open ocean, a desert, a forest, or a meadow.

### Invention

(Concept: Role of concentration and availability of nutrients in determining how much life is present in a place)

How can the results of your exploration be explained?

### Discovery

What effect do coastal wetlands and estuaries have on the ocean adjacent to them?

### Suggested Reading:

Teal, J. and M. Teal. *Life and Death of a Salt Marsh*, Boston: Little, Brown Co., 1949.

Odum, E.P. *Fundamentals of Ecology*. Philadelphia: W. B. Saunders. 1972.

Conomos, T.J., ed. *San Francisco Bay, the Urbanized Estuary*. San Francisco: Pacific Division of AAAS, c/o California Academy of Sciences, 1979.

\* For information about other classroom activities presented in this style, contact: OBIS/Lawrence Hall of Science, University of California, Berkeley, California 94720.

# INTERPRETIVE PROGRAMS FOR THE PUBLIC

Interpretive programs for the public are offered free of charge by the following organizations at the locations indicated. Contact the organization for more information and reservations.

Bodega Bay Institute  
240 Fort Mason  
San Francisco, CA. 94193  
Locations:  
Bodega Bay (Sonoma County)  
San Francisco Bay  
Tomales Bay (Marin County)

Border Field State Park  
Frontera Area  
2725 Congress Street, Suite 2K  
San Diego, CA. 92110  
Locations:  
Tijuana Estuary (San Diego County)

California Department of Parks  
and Recreation  
Area Manager  
1994 Harbor Blvd.  
Ventura, CA. 93003  
Location:  
Santa Clara River Mouth (Ventura County)

California Department of Parks  
and Recreation  
Area Manager  
28754 Mulholland Hwy.  
Agoura, CA. 91301  
Location:  
Malibu Lagoon (Los Angeles County)

Coyote Hills Regional Park  
Interpretive Staff  
8000 Patterson Ranch Road  
Fremont, CA. 94536  
Location:  
San Francisco Bay - Coyote Hills Marsh

Environmental Studies Internship Program  
UCSC/Nature Conservancy  
317 Kerr Hall  
University of California, Santa Cruz  
Santa Cruz, CA. 95064  
Location:  
Elkhorn Slough (Monterey County)

Friends of Ballona Wetland  
6953 Trolley Way  
Playa Del Rey, CA. 92091  
Location:  
La Ballona Estuary (Los Angeles County)

Friends of Newport Bay  
Box 4088 Irvine Station  
Newport Beach, CA. 92664  
Location:  
Upper Newport Bay (Orange County)

Marine Adventures  
College of Marin  
Kentfield, CA. 94904  
Locations:  
Bolinas Lagoon (Marin County)  
San Francisco Bay

Marine Ecological Institute  
811 Harbor Boulevard  
Redwood City, CA. 94063  
Location:  
San Francisco Bay

Morro Bay Museum of Natural History  
State Park Road  
Morro Bay, CA. 93442  
Location:  
Morro Bay (San Luis Obispo County)

Newport Bay Nature Tours  
Chuck Schneebeck (school tours)  
Division of Life Science  
Fullerton College  
321 E. Chapman  
Fullerton, CA. 92634  
Location:  
Upper Newport Bay (Orange County)

S.I.O. Aquarium/Museum  
University of California (A-007)  
La Jolla, CA. 92093  
Locations:  
Kendall Frost Marsh (San Diego County)  
Los Penasquitos Lagoon (San Diego County)  
Tijuana Estuary (San Diego County)

Torrey Pines State Reserve  
P.O. Box 38  
Carlsbad, CA. 92008  
Location:  
Los Penasquitos Lagoon (San Diego County)



The California Sea Grant College Program is a statewide multi-university program of marine research, education, and advisory services, administered by the University of California Institute of Marine Resources. Sea Grant-sponsored research contributes to the growing body of knowledge about our coastal and oceanic resources and to the solution of contemporary problems in the marine sphere. Through its Marine Advisory Program, Sea Grant transfers information and technology developed in research efforts to a wide community of users in California, the region, and the nation. Sea Grant also supports a broad range of educational programs for university students, public school teachers and students, and the general public so our coastal and oceanic resources may be understood and judiciously used by this and future generations.

James J. Sullivan, Program Manager  
California Sea Grant College Program  
IMR, A-032, UCSD  
La Jolla, CA. 92093

For California Sea Grant College Program Publications in Marine Education or information about the Marine Advisory Program write:

Maynard Cummings  
Coordinator of Marine Advisory Programs  
554 Hutchison Hall  
University of California  
Davis, CA. 95616  
(916) 752-3342

This booklet was adapted from *California's Coastal Wetlands* by Sana Siwolop and Henri Albert. La Jolla: California Sea Grant College Program Report #2, 1979. You are welcome to make photocopies for educational purposes. This work was supported, in part, by the National Sea Grant College Program, NOAA, Dept. of Commerce under grant #NA80AA-D-00120 to the University of California and by the California State Resources Agency.

Sea Grant educational programs for school children, teachers and the general public are available through:

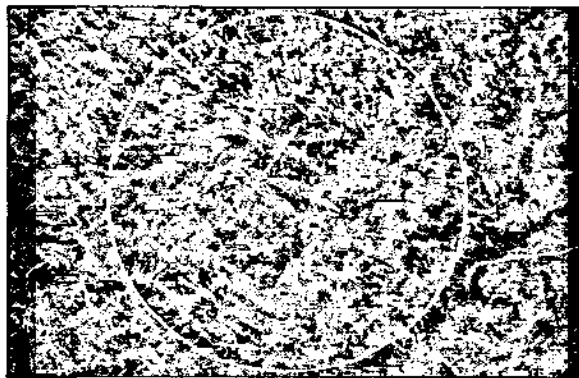
S.I.O. Aquarium/Museum  
University of California (A-007)  
La Jolla, CA. 92093

Center for Coastal Marine Studies  
University of California  
Santa Cruz, CA. 95064

Humboldt State University  
Marine Laboratory  
P. O. Box 624  
Trinidad, CA. 95570

Marine Science Institute  
University of California  
Santa Barbara, CA. 93106

Moss Landing Marine Laboratories  
P.O. Box 223  
Moss Landing, CA. 95039



Algal mat (*Monanthochloe littoralis*)



Cordgrass (*Spartina foliosa*)



Pickleweed (*Salicornia virginica*)



Light-footed clapper rail (*Rallus longirostris levipes*)

NATIONAL SEA GRANT DEPOSITORY  
PELL LIBRARY BUILDING  
URI, NARRAGANSETT BAY CAMPUS  
NARRAGANSETT, RI 02882

RECEIVED  
NATIONAL SEA GRANT DEPOSITORY  
DATE: JAN 5 1981

