

## Tidal Freshwater Marshes

### Definitions:

Euhaline: "true" marine zone, above 30 ppt salinity

Polyhaline: 18 to 30 ppt salinity, dominated by grasses like *Spartina*

Mesohaline: middle zone, 5 ppt salinity

Oligohaline: less than 5 ppt salinity, diverse plants and animals, high productivity  
- tidal energy subsidy: a "flushing" effect brings water and nutrients

### Three types

1. Mature Marshes - 500 yrs old, well-developed peat substrate, Atlantic coast
2. Floating Marshes - broke free of substrate, northern Gulf Coast
3. New Marshes - on new river deltas

### Distribution

Found in areas with significant rainfall

Still developing on the Atlantic coast in river deltas

Elevation differences within the marsh due to tidal variation

In northern Gulf of Mexico, less elevation difference

### Soil Characteristics

Anaerobic except for a thin layer at the top of the sediment

Nutrients vary, ammonia in winter, low levels in summer

### Plants

#### Mature marshes

Submerged - *Nuphar*, *Elodea*, *Potamogeton*, *Myriophyllum*

Low marsh behind stream levee - *Peltandra virginica* (arrow arum), *Pontederia cordata* (pickerelweed), *Sagittaria* (arrowhead)

High marsh - *Zizania aquatica* (wild rice), *Typha*, *Spartina*

#### Floating marshes

*Phragmites*, *sagittaria*, *spartina*

#### New marshes

*Salix*, *Scirpus*, *deltarum*, *Sagittaria latifolia*, *Typha*

### Animal Diversity:

Supports largest density and diversity of birds

-280 spp of birds

-44 spp of ducks and other waterfowl

-supported by the mass amount of food built up in the backs of the marshes

Supports a large variety of mammals

-beavers, otters, muskrat, mink, and nutria (an introduced spp that looks like a small beaver or muskrat but is taking over the muskrat's habitat)

### Fish and Crustacean Life Cycle:

Freshwater species: bluegill, largemouth bass

Estuarine: bay anchovy

Estuarine-marine: silver perch, black drum, tarpon, brown shrimp

Catadromous: spawns out at sea, returns to live in freshwater (example: eel)

Anadromous: spawns in freshwater, lives out at sea (examples: striped bass, herring, shad, sturgeons, and some shrimp)

Productivity:

Produce 10 to 30 tons/dry matter/ hectare/ year (only the plants)  
more species richness, but less productivity

Nutrients

exporters of nutrients: lose nutrients

new marshes plant growth unrelated to sediment nutrients

Eutrophic areas due to anthropologic influences

SF Bay Tidal Wetland Restoration

<http://sfbay.wr.usgs.gov/access/Dingler/home.html>

San Pablo Bay Sedimentation Changes

<http://sfbay.wr.usgs.gov/access/Bathy/sanpablobay/>

Suisun Bay

<http://sfbay.wr.usgs.gov/access/Bathy/suisunbay/>

South San Francisco Bay

<http://sfbay.wr.usgs.gov/access/Bathy/southSanFrancisco/index.html>

California Coastlines