Oregon
Coastal Master Naturalists

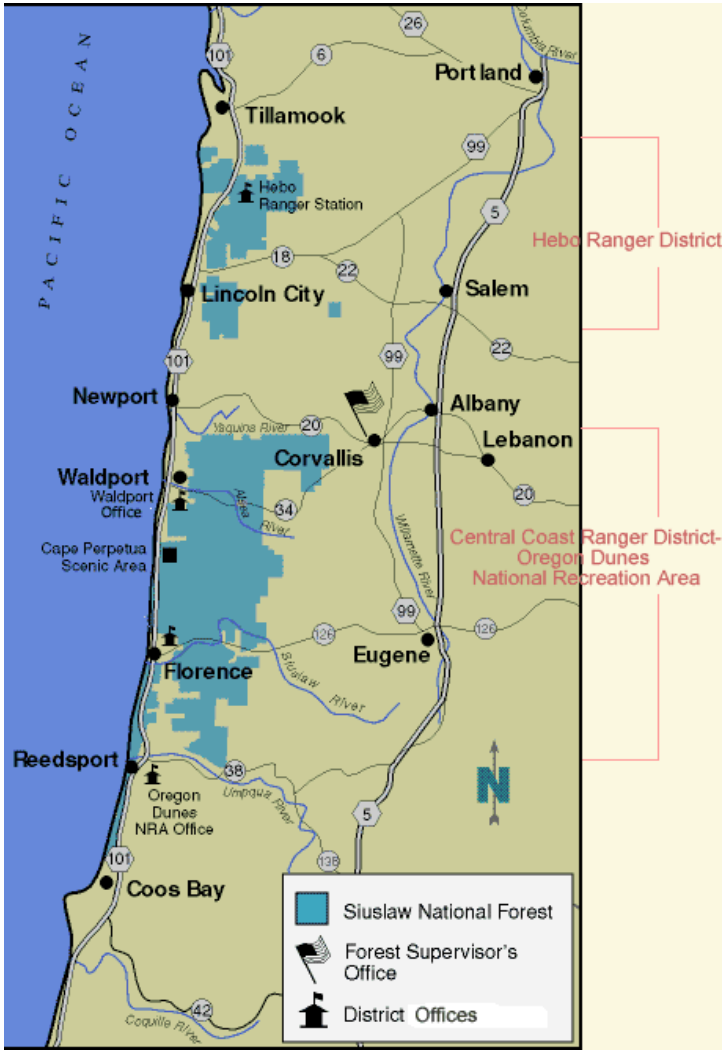
Part 1: Onshore (Rocky & sandy shores, Headlands & sea stacks)

Part 2: Offshore (Shallow subtidal to deep sea)

Part 3: Coastal Forests, Streams, & Estuaries


Coastal Forests
mostly coniferous
understory of broadleaf trees & shrubs

Location in Oregon



- **Major tree species**
  - Douglas-Fir
  - Sitka Spruce
  - Western Hemlock
  - Red Alder
  - Western Red Cedar
  - Big Leaf Maple

http://www.fs.fed.us/r6/siuslaw/about/siuslaw/index.shtml, (accessed on 8-25-10)

Physical Features

- 3-dimensional structure
  - Trees are basis of structure
  - Vertical stature
    - Multiple strata
    - Complex habitats
- Long lived
  - Temporal stability
  - Light gaps
    - Replacement of trees in light gaps

Major Organisms

- Habitat formers or ecosystem engineers
- Understory species
- Ground vegetation
- Below-ground organisms
- Epiphytes

Major Organisms

- Mobile consumers
  - Carnivores
  - Herbivores
  - Detritivores

Ecological Processes

- Primary production
  - Trees
  - Other vascular plants
- Secondary production
  - Herbivorous insects
  - Deer, elk, etc.
- Omnivores
  - Bear, raccoons, etc.
- Carnivores
  - Cougar, bobcats, etc.

Ecological Processes

- Carbon sinks
- Decomposition
- Saprophytes
- Nitrogen fixers

Cultural Geography

- **Giant Spruce of Cape Perpetua Heritage Tree**
- "Half a century before Christopher Columbus sailed to the Americas, a tiny Sitka spruce began its life nourished by a nurse log on the Oregon Coast. Today, it is the largest and oldest tree in the Cape Perpetua Scenic Area of the Siuslaw National Forest. Nearly 600 years old, it stands over 185 feet tall and has a circumference of 40 feet." (Oregon Heritage Tree Program)
- The tree is surrounded by history.
- Indigenous people lived nearby at the mouth of Cape Creek for 1500 years.
  In the 1850's the Coos and Lower Umpqua people were forcibly relocated here to the Coast Reservation.
- In the 1930's the Civilian Conservation Corps set up a camp and build the first trail to the Giant Spruce, probably along the route of an ancient Indian trail.
- The Giant Spruce was dedicated as a Heritage Tree on September 15, 2007

Major Resource Issues

- **Timber industry/logging**
  - Harvest cycle
  - Clear cut vs. selective cutting
  - Slash burning
  - Replanting
- **Hunting**
  - Deer, elk, etc.
  - Large game
  - Game birds

Regeneration

- Nurse logs
- Mycorrhizal species

Streams & Estuaries

Rivers & Streams

- Many major to small rivers:
  - Columbia (7,500 m^3/s)
  - Nehalem
  - Yaquina
  - Nestucca
  - Alsea
  - Siuslaw
  - Umpqua
  - Coquille
  - Rouge
- Many smaller streams, creeks, etc.

www.oregonwatersheds.com
, (accessed on 8-25-10)

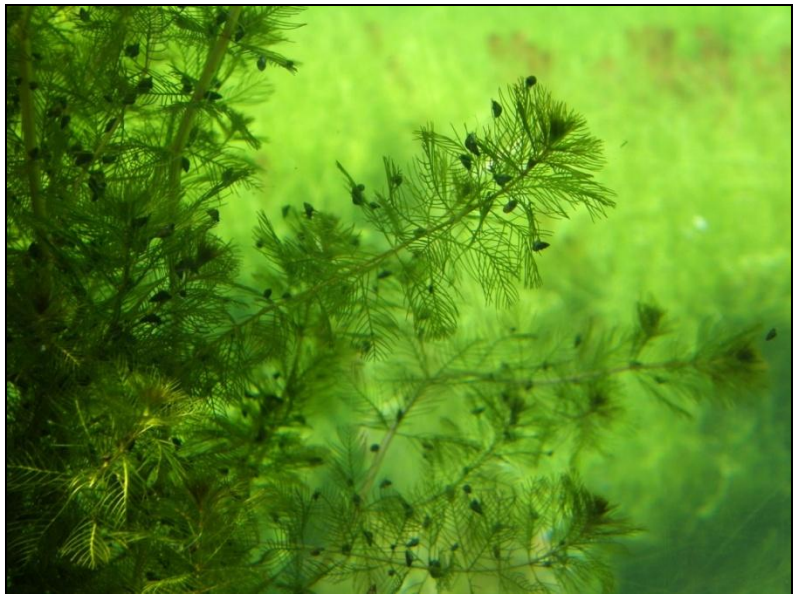
www.geology.com/state-map/maps/oregon-rivers-map.gif/, (accessed on 8-25-10)

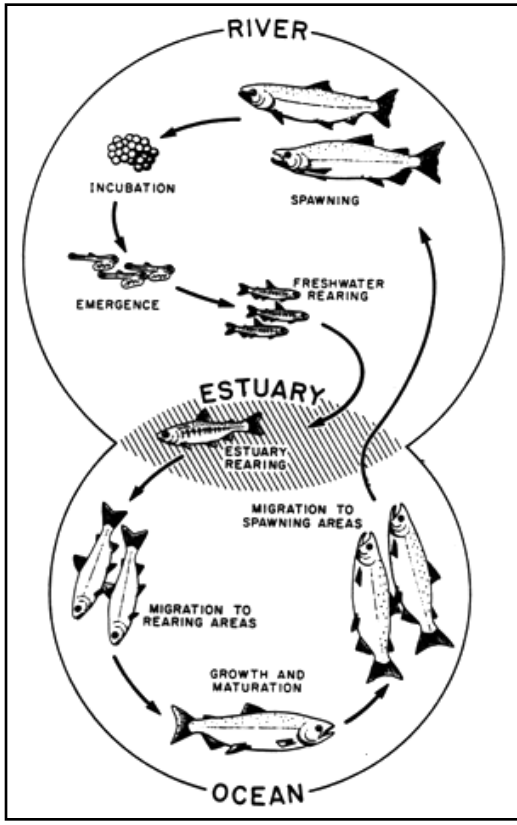
Physical Features

- **Water level**
  - Seasonal
  - Linked to weather
- **Coupled to watershed**
  - Water flows from land
  - Sediment, chemicals, nutrients, etc.
- **Riparian community**
  - Type & size of vegetation flanking river

Major Organisms

- **Anadromous fish**
  - Salmon
  - Steelhead
- **Resident fish**
- **Invertebrates**
  - Aquatic insects
  - Snails

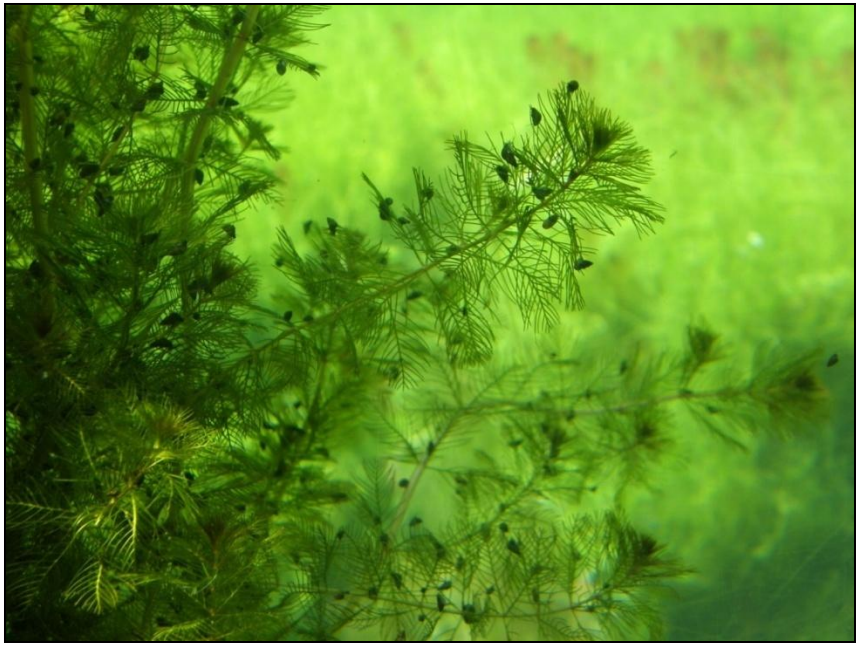


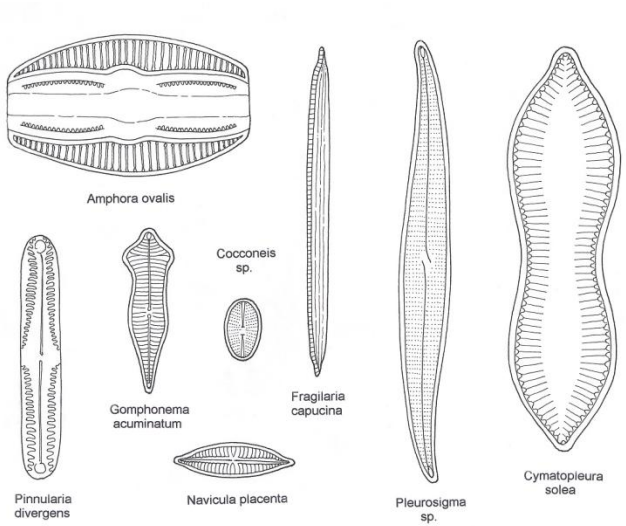


http://www.5counties.org/SalmonLifeCycle800.htm, (accessed on 8-25-10)

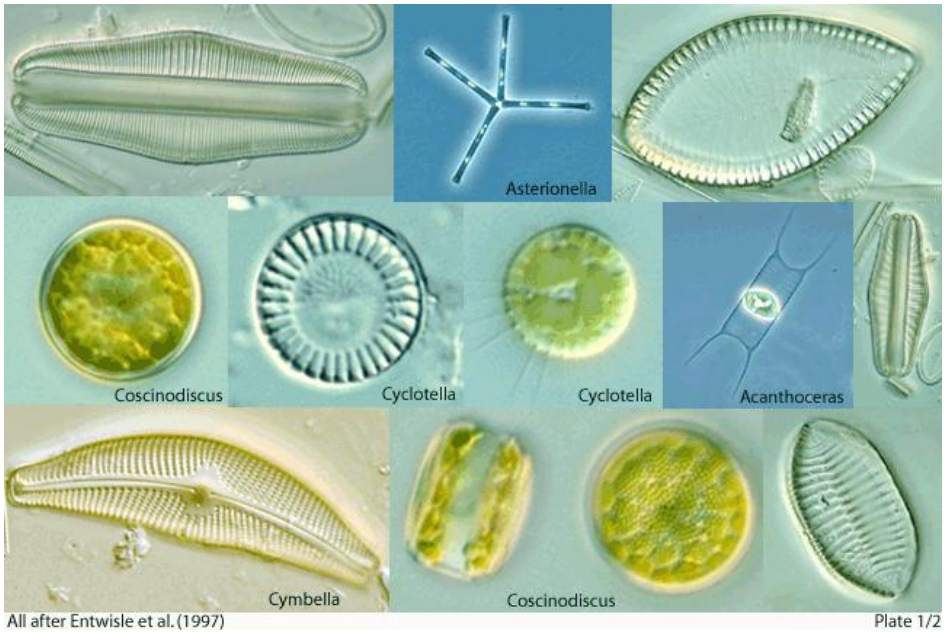
Major Organisms

- **Plants**
  - Vascular plants
  - Microalgae
    - Diatoms
    - Desmids





A selection of diatoms.

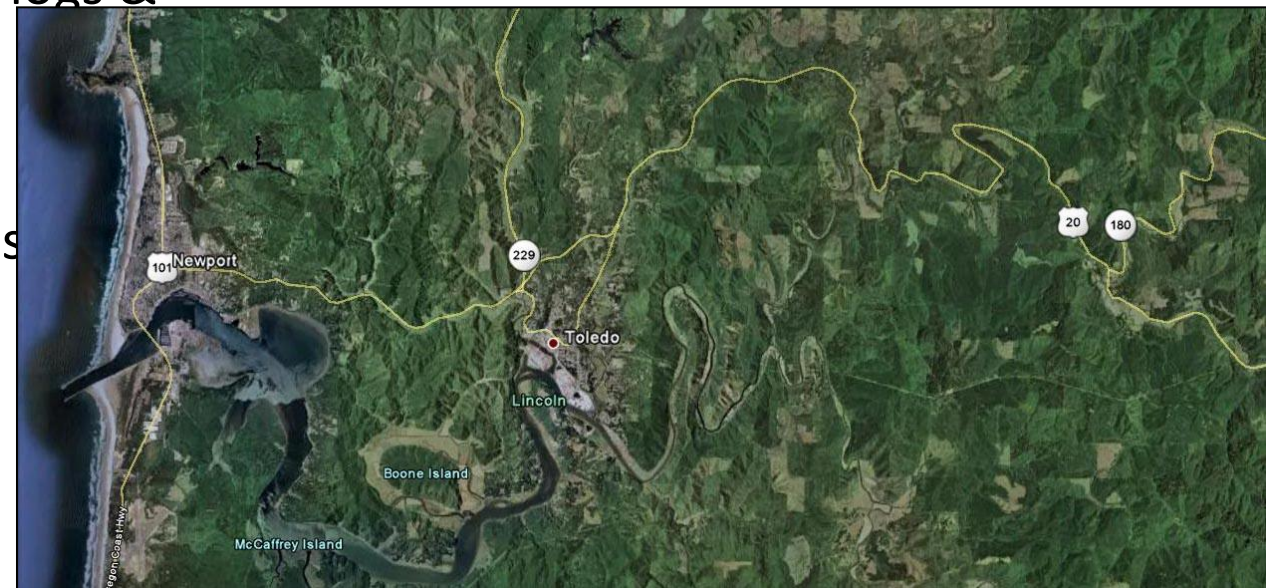


www.microscopy-uk.org.uk/mag/artdec02/cbart1.html, (accessed on 8-25-10)

http://www.rbgsyd.nsw.gov.au/science/Plant_Diversity_Research, (accessed on 8-25-10)

Cultural Geography

- **Homesteads & towns**
  - Transportation
  - Food
  - Waste disposal
  - Industry
- **Logging**
  - Transportation of logs & chips
- **Roads**
  - Track river courses

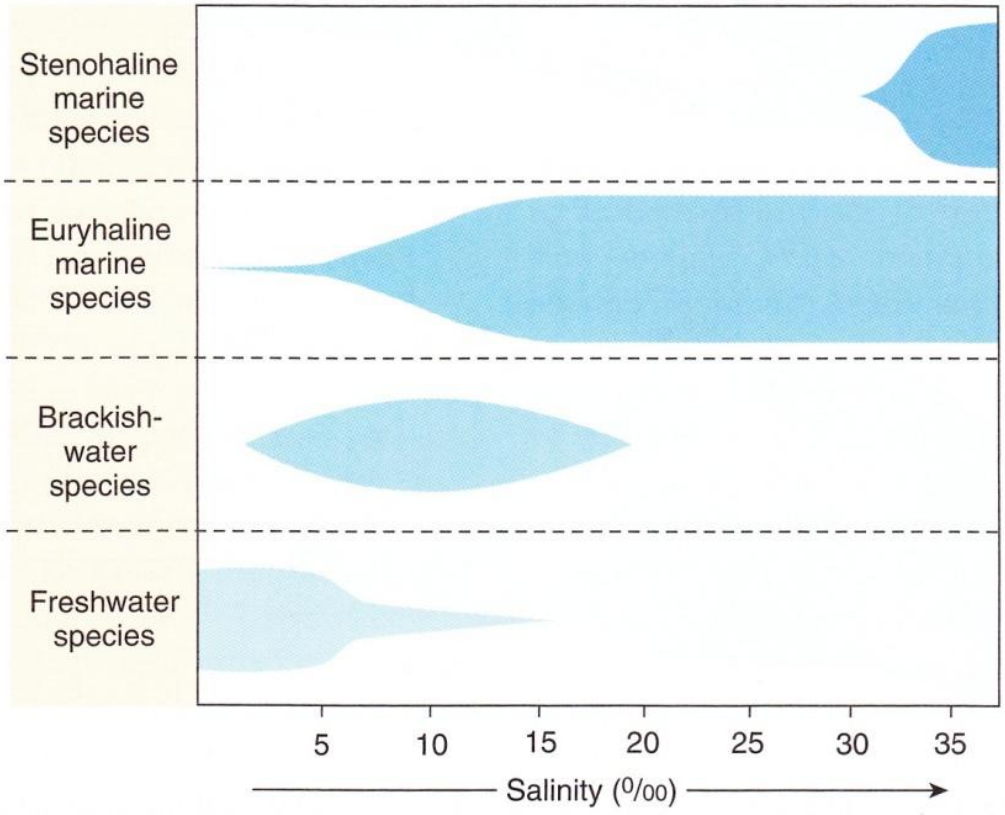


google earth image

http://www.wunderground.com, (accessed on 8-25-10)

Physical Features

- **Streams/rivers meet sea**
  → transition zone
- **Ocean attributes**
  - Tides
  - Waves
  - Brackish water
- **River attributes**
  - Sediment
  - Fresh water
- **Usually highly**
  - Productive
  - Polluted

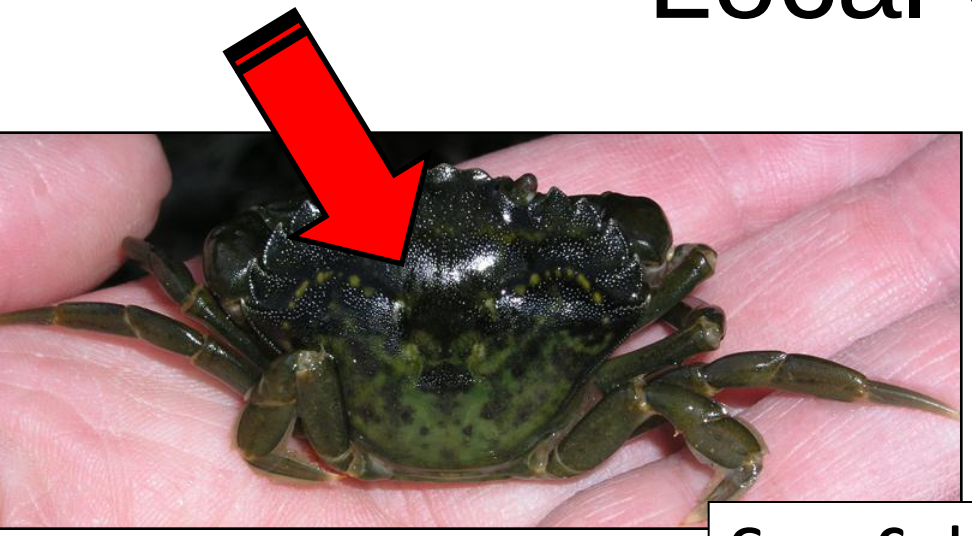


Castro and Huber, 2007

Major Organisms

- **Vertebrate consumers**
  - Birds
  - Mammals
  - Fishes
  - People
- **Invertebrate consumers**
  - Shore crabs
  - Cancer crabs

Local Crabs

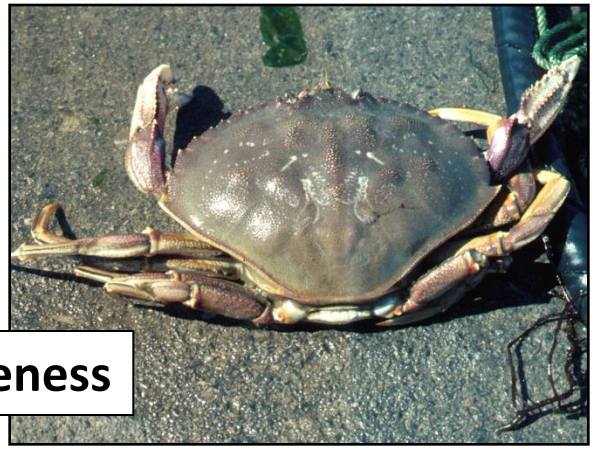


Green Crab

Shore Crabs

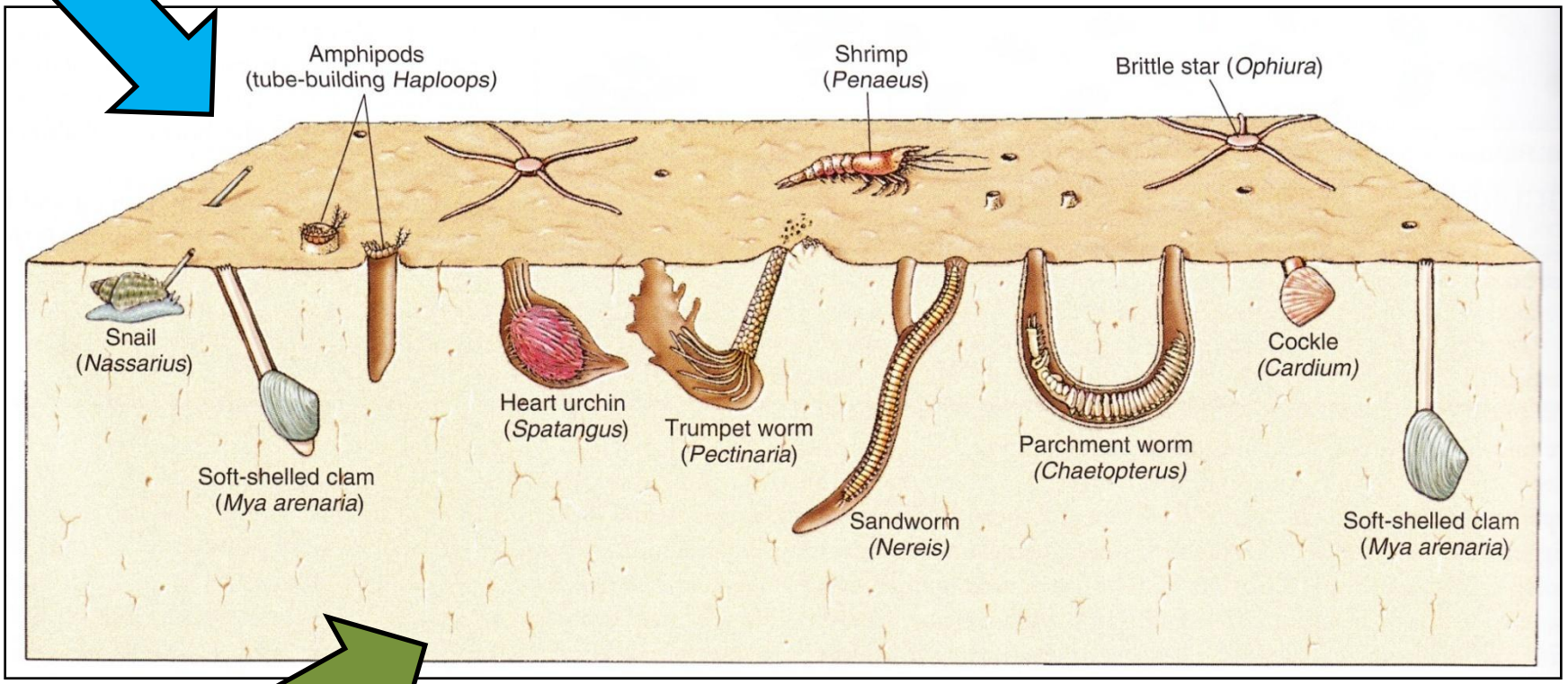
Red Rock

Dungeness



Major Organisms

epifauna



infauna

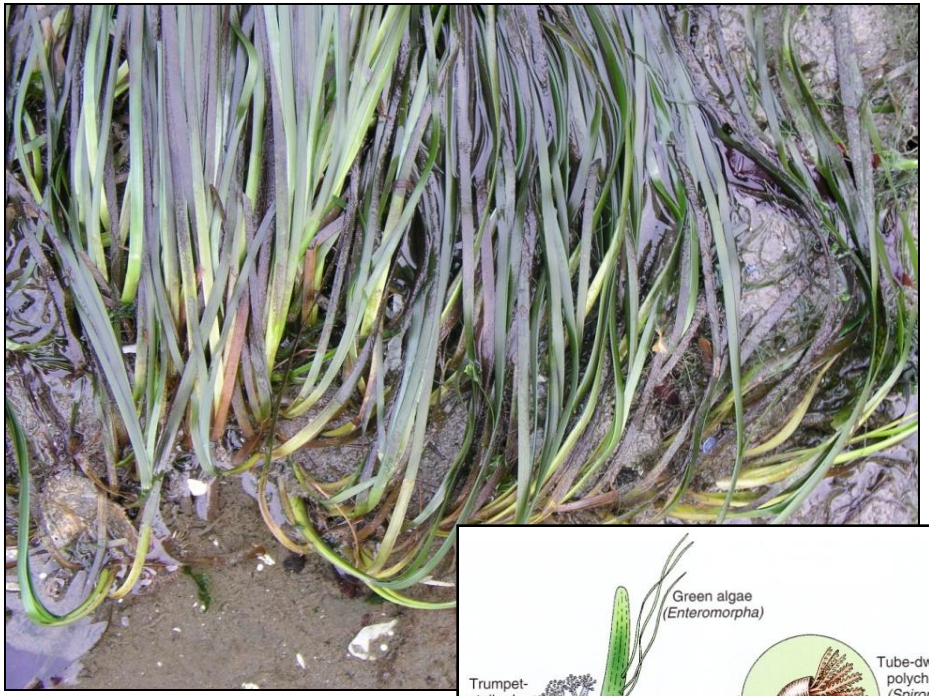
Castro and Huber, 2007

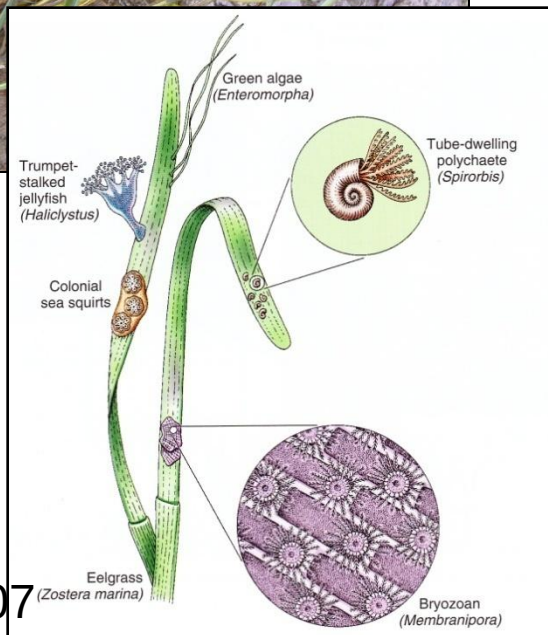
Major Organisms

- Infauna – animals dwelling within mud
  - Clams & allies
  - Worms, worms, & worms
  - Mud & ghost shrimp
- Epifauna – animals living on surface
  - Cockles

Major Organisms

- **Primary producers**
  - Eel grass
  - Seaweed
  - Microalgae



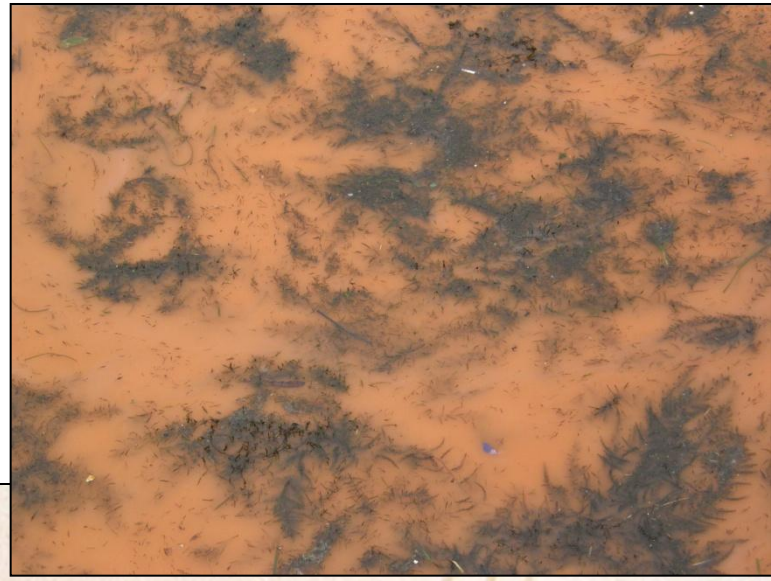


Castro and Huber, 2007

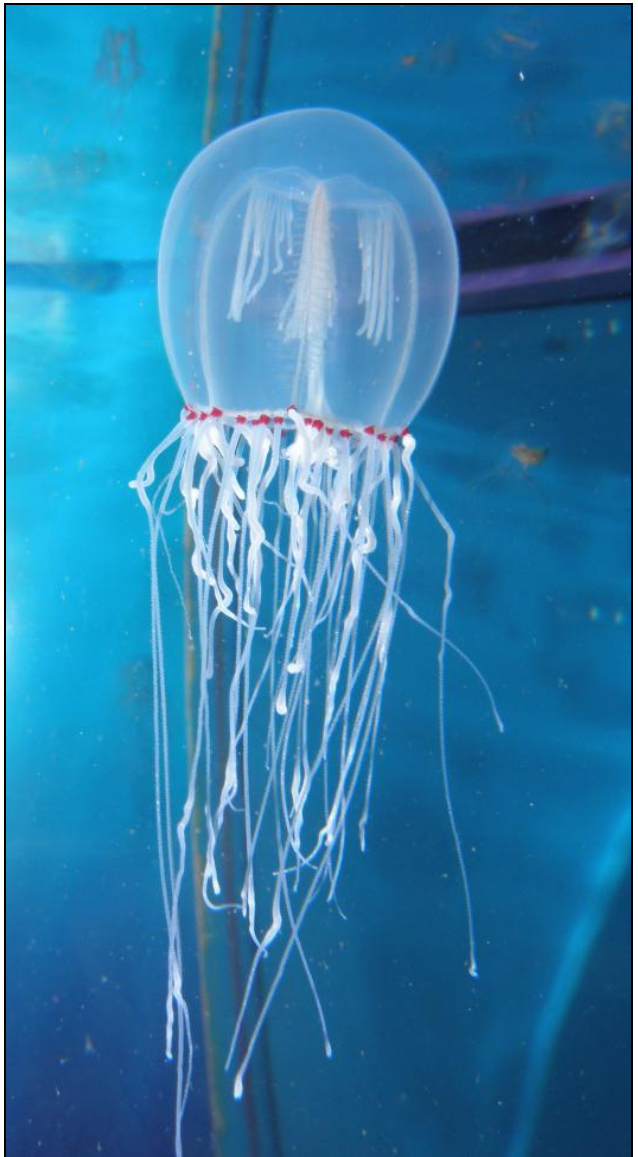
Major Organisms

planktonic biota

- larval animals
- adult animals
- reproductive animals
- microalgal species

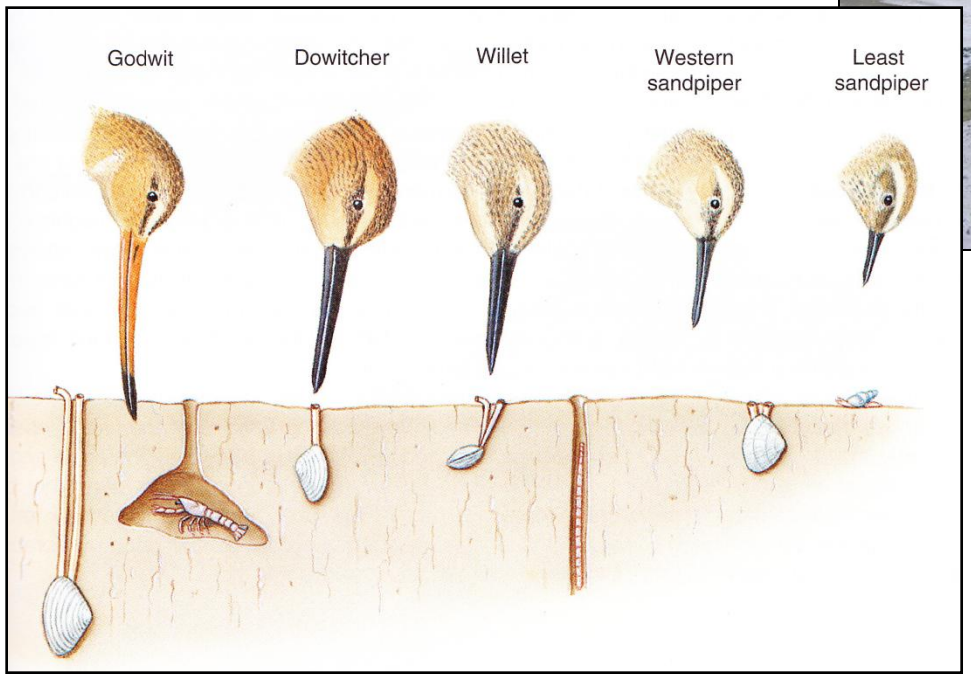


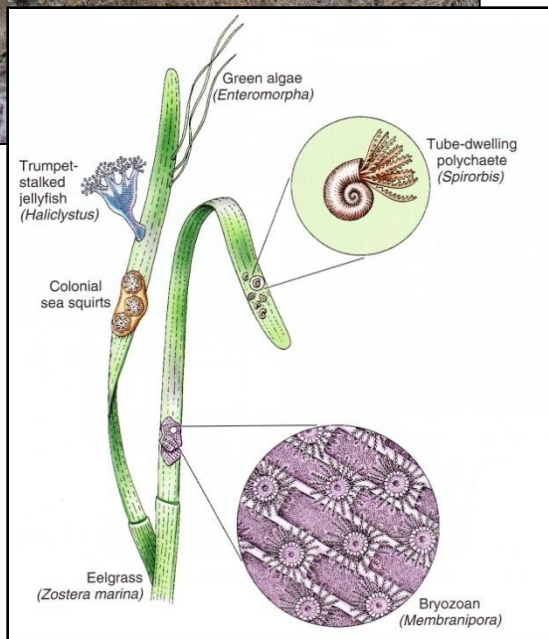
Major Organisms



Ecological Processes

- **Competition**
  - Space
  - Food, oxygen, & light

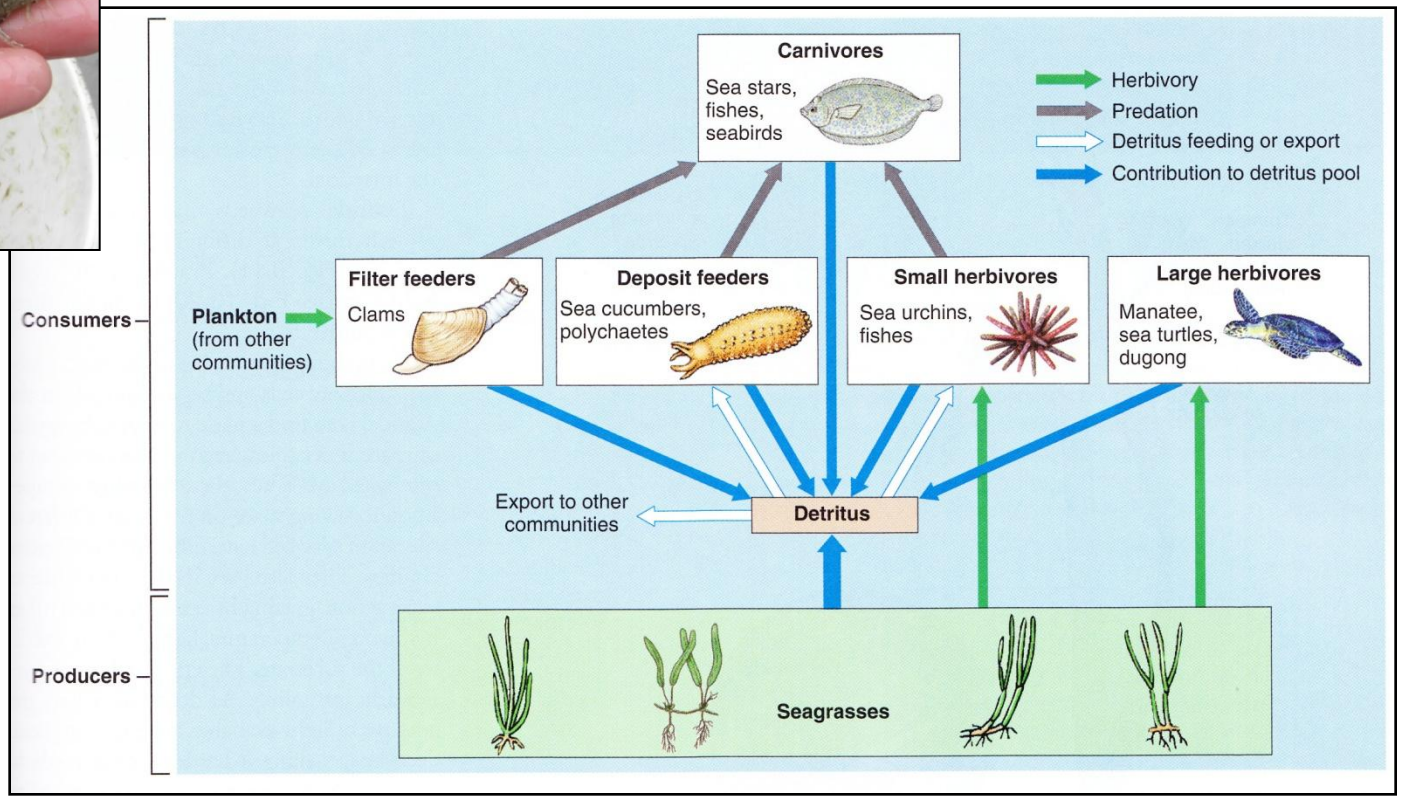




Castro and Huber, 2007

Ecological Processes

- **Predation & Herbivory**



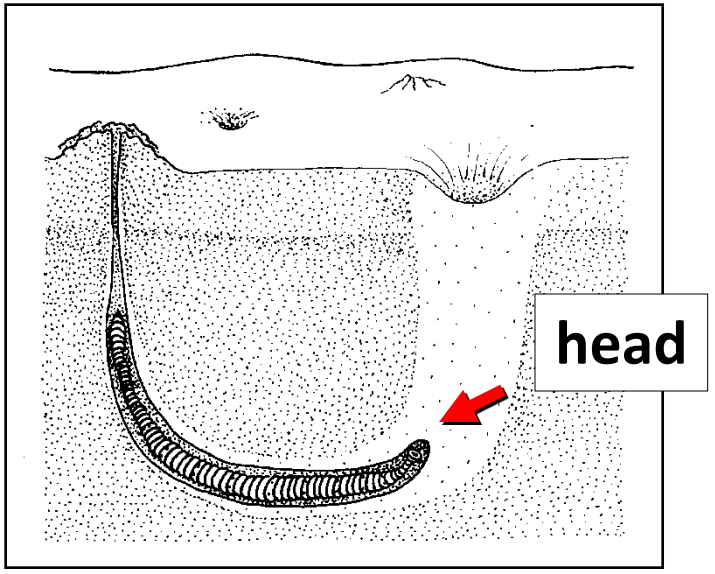
Castro and Huber, 2007

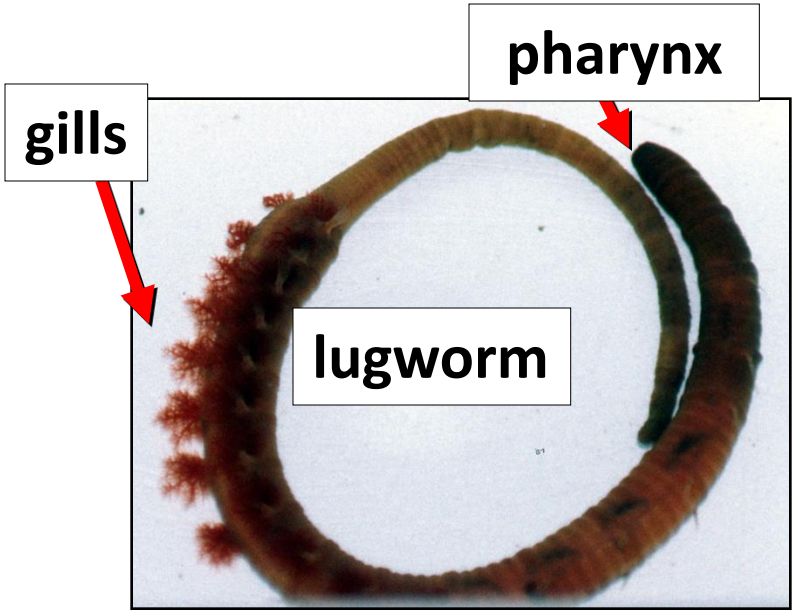
Ecological Processes

- **Herbivory**
- **Disturbance**
  - Salinity fluctuations
  - Temperature fluctuations
  - Sediment movement
- **Recruitment/Nursery area**
  - Juveniles fishes
  - Juvenile crabs

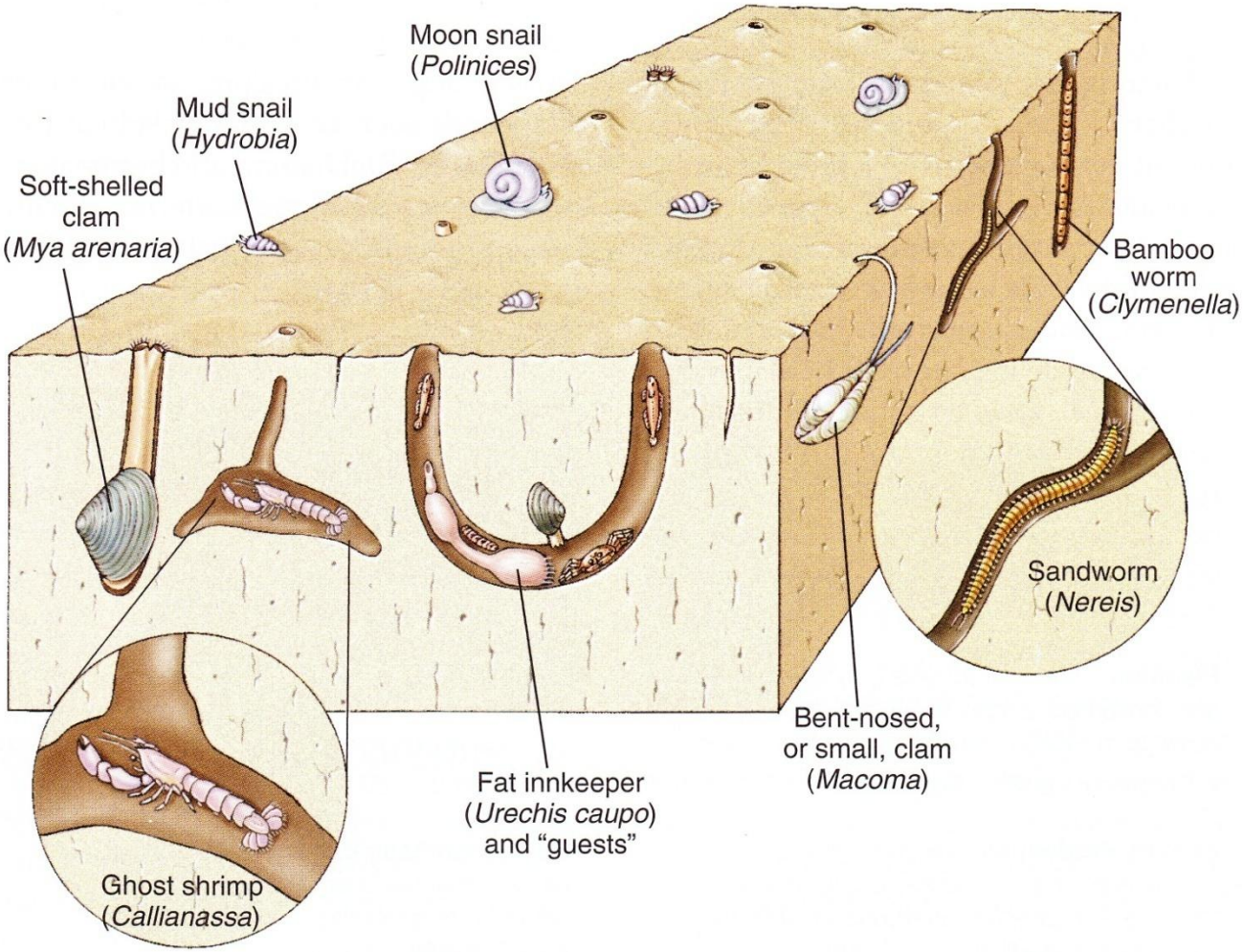
Lugworms

Castro and Huber, 2007





Aeration of Sediments



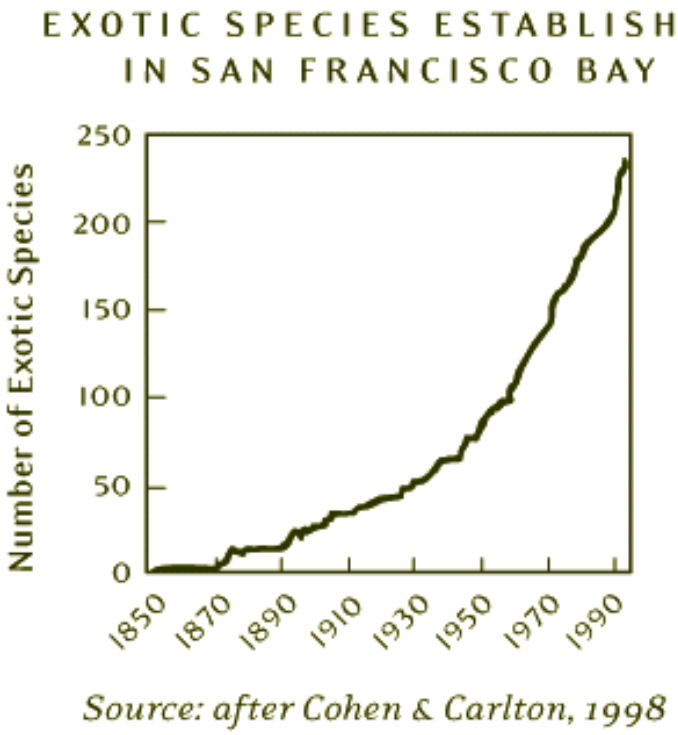
Castro and Huber, 2007

Cultural Geography

- **Human foraging**
  - Shellfish
  - Bait collection
  - Fishing
- **Shipping**
- **Mariculture**

Cultural Geography

- **Introduced Species**



Data are from A. N. Cohen and J. T. Carlton. 1998. *Accelerating Invasion Rate In A Highly Invaded Estuary*: Science 279: 555-558.

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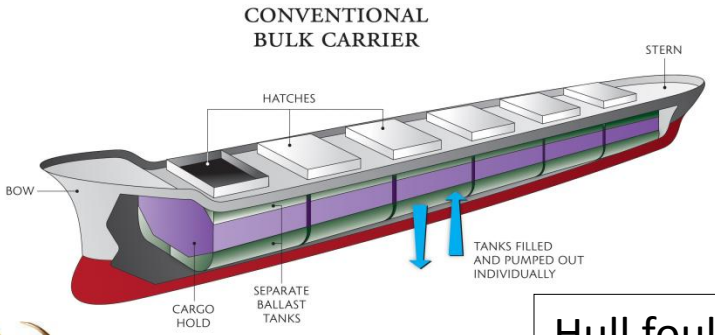
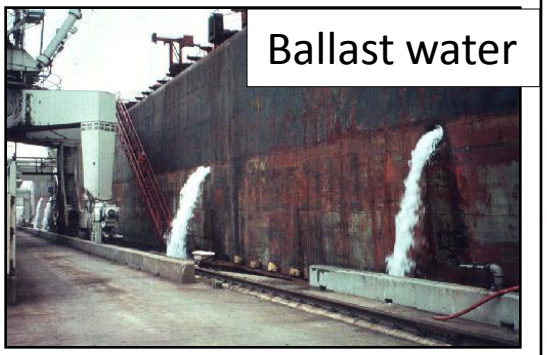


http://www.colreg.net/hotstuff.htm, (accessed on 8-25-10)

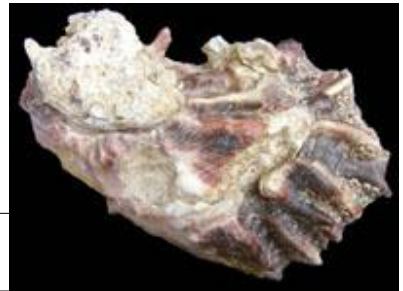
Hull fouli

http://massbay.mit.edu/exoticspecies/seafood/index.html, (accessed on 8-25-10)



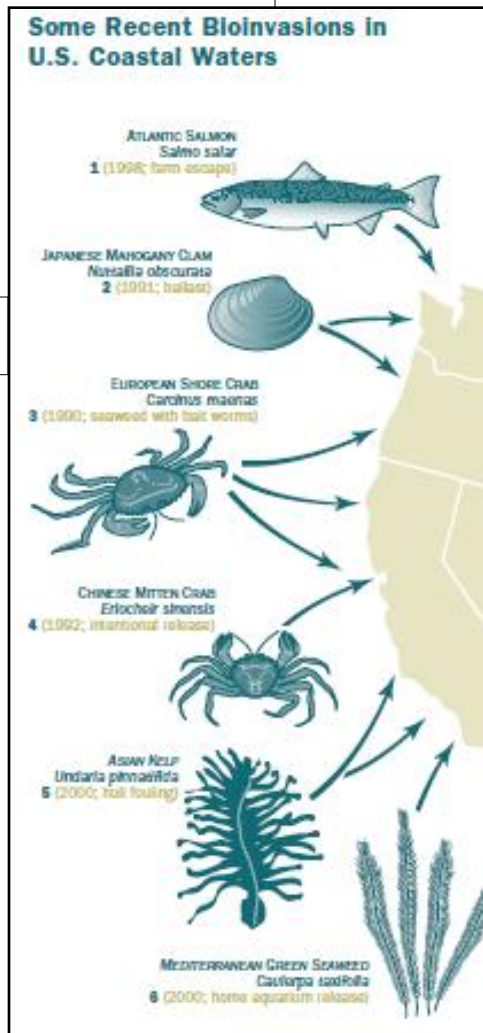
Ballast water

http://www.pkharbour.org/Ballast%20Water%20Issues.htm, (accessed on 8-25-10)



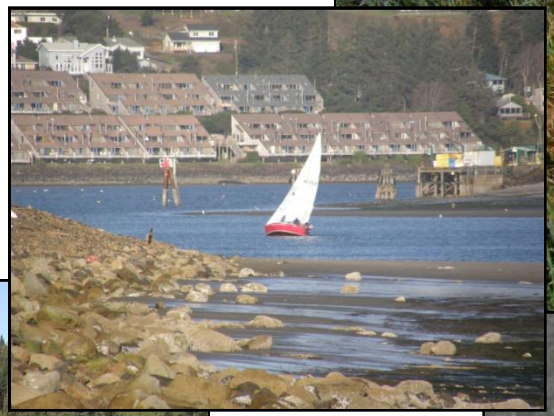
www.marbef.org, (accesed on 8-25-10)

Transplanting oysters



Major Resource Use

- Grazing (diked pastures)
- Shellfish harvesting
- Recreation
- Education



Sources

1. Castro, P. and M.E. Huber. 2007. Marine Biology 7th edition. McGraw-Hill . New York, NY. P.459
2. Cohen, A.N. and J. T. Carlton. 1998. *Accelerating Invasion Rate In A Highly Invaded Estuary*: Science 279: 555-558.
3. Internet sources (accessed 8-25-10):
   http://www.fs.fed.us/r6/siuslaw/about/siuslaw/index.shtml
   http://www.oregonwatersheds.com
   http://www.geology.com/state-map/maps/oregon-rivers-map.gif/
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   http://www.microscopy-uk.org.uk/mag/artdec02/cbart1.html
   http://www.rbgsyd.nsw.gov.au/science/Plant_Diversity_Research
   http://www.wunderground.com
   http://www.colreg.net/hotstuff.htm
   http://massbay.mit.edu/exoticspecies/seafood/index.html
   http://www.pkharbour.org/Ballast%20Water%20Issues.htm
   http://www.marbef.org