REM 475—Sheltered Nearshore Ecosystems

BC coastline

- Linear coastline distance is 965 km. Total length is 243,000 km.
- 40,000 islands
- Heavily indented coastline with fjords
    - Chile? Norway?
- Unlike most places in the world, much of this coastline is still fairly wild.
- Rapid growth in protected coastal areas of BC (eastside of Vancouver Island, etc.).

There are a variety of ecosystems in sheltered nearshore marine ecosystems of BC. These include:

- **Estuaries--**Places where rivers meet the ocean. With a mix of salt and freshwater, these are often extremely productive and dynamic ecosystems, driven by tides, winds, and freshwater flows.

- **Rocky shores—**often covered with plants (algae) and animals (e.g., mussels and barnacles)

- **Mudflats—**Often in the most sheltered of ecosystems. The food web of mudflats depends on the rich mat of algae (diatoms)/bacteria that covers the mud. This fuels a variety of primary consumers: clams, worms, shrimp. These in turn fuel larger and often mobile consumers, including vast flocks of migrating waterfowl.

    - **Bioturbation**—the activities of borrowing animals (and their predators) keeps the mudflats from becoming anoxic.

- **Shallow sandy bottoms—**Found in slightly more wind/wave-swept ecosystems than mudflats.

- **Eel grass meadows—**rooted in mud and gravel. Enormously productive ecosystems.

Just like rivers, you would predict that the sediment size will be larger in areas with more water force (larger waves, larger tidal flushing). mudflats < sandy < pebbles < cobbles < boulders

These ecosystems have three main sources of production (carbon)

1. **Inputs from land (mostly from rivers)**

2. **Pelagic production—**Phytoplankton. Can respond extremely quickly to changes in growing conditions. Blooms.

3. **Benthic production—**Periphyton and aquatic vegetation (eelgrass, kelp)

Aquaculture

- The aquaculture industry is important to sheltered nearshore marine ecosystems.
- These species often need very clean water. For example, shellfish aquaculture demands clean water to avoid paralytic shellfish poisoning and other contaminant accumulation.
- Many of these farmed shellfish are preferred (in terms of sustainability) to their wild counterparts.
- The reverse is true for salmon.

Main species that are cultivated in BC coastal waters

Salmon	**Introduced?**	**Monterey Bay Sustainability rating**
Atlantic	Non-native	Avoid
Chinook	Native	Avoid
Shellfish		
Pacific oysters	Non-native (Japan)	Best Choice (clean water)
Manila calms	Non-native	Best Choice (farmed off bottom)
Gallo mussels	Non-native (Mediterranean)	Best Choice (farmed off bottom)
Scallops	hybrid Japanese/weathervane	Best Choice (farmed off bottom)
Geoduck	Native	Best Choice (little by-catch)
Abalone	Native	Best Choice (doesn't deplete wild stocks)

AMOUNT HARVESTED

Year	**Salmon**	**Shellfish**	**Other**
2008	81.4	7.5	2.5
2009	76.4	7.7	1.4
2010	78.7	10.0	1.9

***(numbers are 1000s of tones)**

ECONOMIC WORTH

Year	**Salmon**	**Shellfish**	**Other**
2008	409.3	16.2	9.0
2009	394.2	17.3	7.9
2010	499.6	21.7	12.5

***(numbers are millions of $)**

All data from Ministry of Environment