Genetic Inventory of Marine Organisms of the Salish Sea

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Why conduct a genetic inventory?

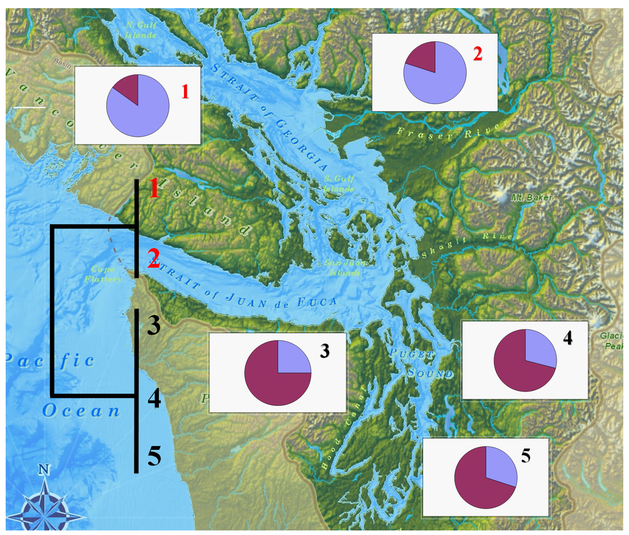
Our goal is to identify stocks, i.e., genetically distinctive groups of a species that may have unique evolutionary and/or adaptive back-grounds. Stocks may respond differently to environmental or man-made changes whether sudden or gradual. A multi-species inventory will identify any concordant zoogeo- graphic boundaries and centers of diversity. These data are used to

- monitor ecosystem response to environmental change
- help select representative stocks for experi-mental work re. ocean acidification and climate change
- contribute to managing the ecosystem for intra-/ inter-species diversity in marine protected areas (MPA).

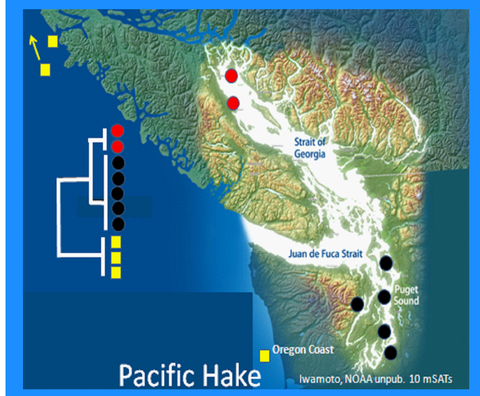
Genetics Primer

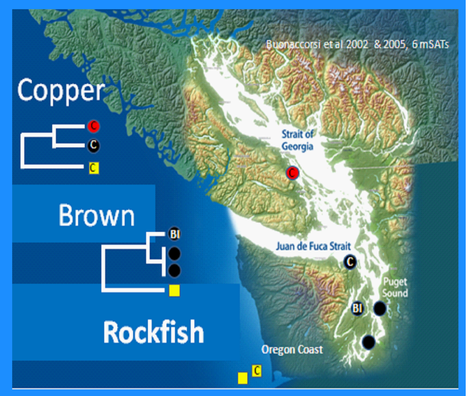
- The goal is to identify collections of organisms that have the same (statistically non significant) frequency for a (suite of) gene character(s).
- The patterns of similarity are illustrated with a "tree" diagram where similar animals share a branch.

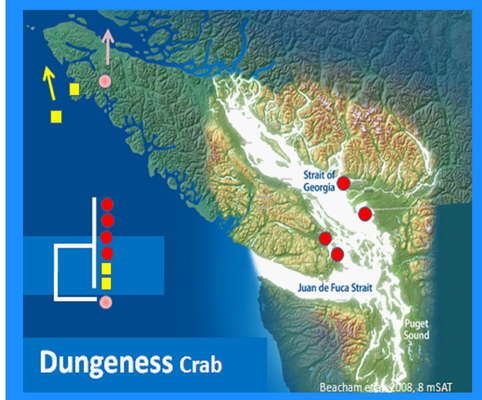
(Five pie diagrams below illustrate the frequency of two genetic characters in each collection of 100 animals.)

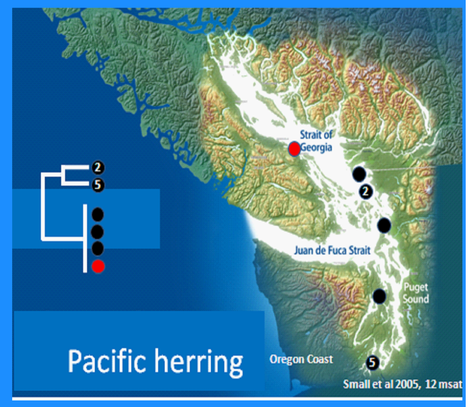


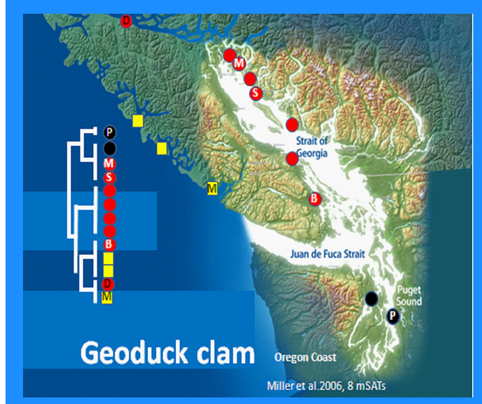
AVAILABLE RESULTS from studies that have examined the null hypothesis—populations of a species in the Salish Sea are panmictic, i.e., one interbreeding population.

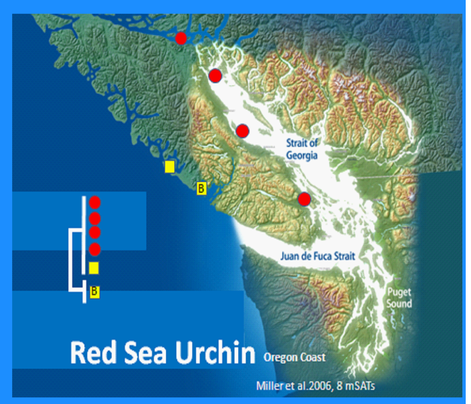












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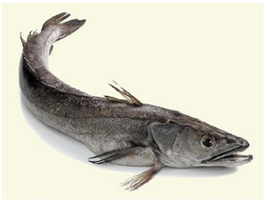
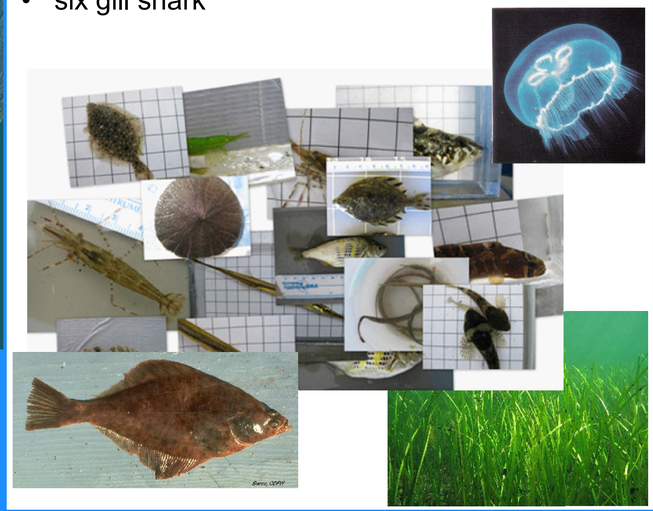
Patterns of Variability

Isolation by distance…
...hake
…rockfish, both species
~geoduck clam
Local ("gem") populations
…Dungeness crab
…Pacific herring
Low-level chaos
…sea urchin
…geoduck clam



To-do List: Data Gaps

- all the principal forage fish (Pacific herring, sand lance, and surf smelt) as they are a critical portion of the marine food chain
- eel grass inhabitants (sculpins, surfperch, sand dollar, kelp crab, Pandalus shrimp) as these ani-mals constitute a key marine nursery area
- eel grass Zostera (see above)
- pelagic invertebrates (squid and moon jellyfish) that are affected directly by changes in water chemistry and freshwater input
- "flats and rats," i.e., flatfishes and ratfish as they are the dominant biomass in Puget Sound (Palsson et al 1997, WDFW)
- six gill shark