Coastal Expeditions Programs

***In-class*:** Fashion a fish from clay and wooden fins while learning about body form and function. Measure & chart fish and human breathing rates. Infer fishes' diets from examination of real teeth.

Go Fish!

(Grades K-5)

Field/Boat-based: Explore commercial fishing methods and sustainable fishing techniques. Investigate several different underwater habitats with underwater video and sediment sampling.

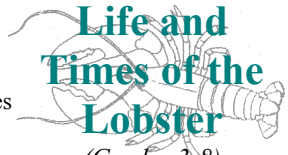
In-class: Investigate characteristics and adaptations of 3 coastal ecosystems: sandy beach, rocky intertidal and salt marsh. Explore the impacts of human activity on the coastal environment.

Coastal Habitats

(Grades K-5)

Field/Boat-based: Observe eel grass, kelp forest, rock and silt habitats and their inhabitants using underwater video. Disembark at Winter Island for a beach seine or tide pool survey.

In-class: Identify the stages of lobster development, from planktonic to adult. Understand the impacts of overfishing and conservation practices in lobster population dynamics.



Life and Times of the Lobster

(Grades 3-8)

Boat-based: Survey lobster habitats and pull lobster traps. Measure water quality at the wastewater treatment plant outfall pipe and explore the impact of wastewater on lobsters.

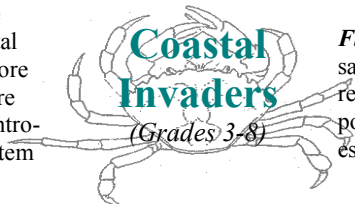
In-class: Explore the composition of beach sand from different locations around the world, in terms of mineral content, grain size and shape and organic composition. Use maps to locate and understand local coastal geologic features.

Coastal Geology

(Grades 2-6)

Field/Boat-based: Explore the coastal processes that form and transform rocks, including erosion, sedimentation, glacial deposition, marine fossilization and continental drift. Collect and classify local sand samples.

In-class: Explore the concept of non-native (invasive) species and their impact on coastal habitats, using the example of the Asian Shore Crab. Investigate how native crab species are adapted to local coastal habitats, and how introduction of a new species can impact ecosystem balance.



Coastal Invaders

(Grades 3-8)

Field-based: Learn basic concepts of scientific sampling methods, data collection and recording. Monitor native and invasive crab populations at Lynch Park, Beverly using established crab monitoring protocol.

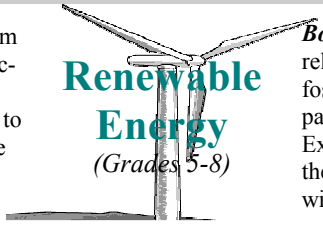
In-class: Build on knowledge of plant structures through comparison of land and marine plants. Examine the challenges sea weeds face by experimenting with water resistance, water clarity and salinity.

See Weeds?

(Grades 3-8)

Boat-based: Investigate plankton and its critical role in the marine food web; construct plankton nets, collect plankton and observe through video microscope. Visit an eel grass bed to explore its ecological importance.

In-class: Explore how energy is transferred from one form to another in the production of electricity and the differences between burning fossil fuels versus using renewable sources of energy to create electricity. Experiment with wind turbine blade designs to maximize electric output.



Renewable Energy

(Grades 5-8)

Boat-based: Investigate environmental impacts related to generating electricity from burning fossil fuels by measuring water quality parameters and collecting marine sediments. Explore fundamental principles of wind energy, then construct a simple anemometer to measure wind speed and direction.