

Narragansett Bay Research Reserve “Teachers on the Estuary” 2009 Lesson Plans

Middle School Lesson Plans (Grades 6-8):

Marine Ecology Site Survey (Rodriguez)

*Time: 1-1.5 hours**

Students will learn about the four basic components of a coastal ecosystem (producers, consumers, decomposers, abiotic elements) and the tasks each performs to sustain the ecosystem. Students will learn to collect data in the field, make observations, present data, and draw conclusions that are backed up by data. Students will also practice group-work skills.

Enviro-Scape Model (Cavanagh)

Time: 2 class periods

Students will be introduced to vocabulary terms and concepts of watershed and point-and non-point source pollution. Students will take notes and use a diagram of the area to show sources of pollution. Students will use the Enviro-Scape model to help visualize sources of pollution and make predictions about different types of pollution and the effects it could have on the environment.

Surveying the Taunton River (Chapin)

Time: 1 field day

Students will explore sections of a field site, practicing observation and other techniques of data collection. Students will continue site exploration by completing a scavenger hunt. They will notice and organize objects into three categories – abiotic, biotic, and human made. Students will learn basic data collection techniques.

High School Lesson Plans (Grades 9-12):

Water Chemistry Analysis of the Narrow River Estuary (Reis)

Time: several months for data collection in field, classroom time for data processing

Students should have working knowledge of EXCEL, Word, and PowerPoint and will process and analyze data collected weekly (over the course of several months) from two sites in the Narrow River estuary. Desired outcomes include observation of the dynamic nature of estuarine chemistry, the comprehension of relationships between water quality parameters, and the implications on estuary health.

Geography of Narragansett Bay (Kirch)

Time: 1 hour

Students will label geographic landmarks on a chart of Narragansett Bay (cities, islands, rivers, bridges, lighthouses). They will then discuss personal experiences in experiencing human impacts on the bay.

Salinity vs Depth (Kirch)

Time: 1 hour

The students will analyze salinity vs. depth data from three bay locations to determine how one parameter affects the other. They will identify three areas on a Bay Windows Sampling Station Map and from the data discuss why Narragansett Bay is an estuary, and describe why salinity levels are different in these three bay locations.

Incorporating Technology and Stewardship (Amaral)

Time: throughout the school year

Students will choose a site from the “Rhode Island Guide to Public Access” brochure to visit and photograph. Photos will then be uploaded to Google Earth to create a virtual guide including points of interest at each site. Students will monitor each site for the duration of the school year while conducting field surveys twice a month.

Biodiversity on the Pettaquamscutt River Estuary (Couchon)

Time: 1 hour

Students will follow Part 1 and 2 of the Estuaries 101 curriculum’s Life Science Module; Activity 3 - Biodiversity in an Estuary. They will investigate habitats in an estuary with site-specific modifications to the lesson.

Estuary Party Crashers (Gourlis Drane)

Time: 1 hour

Students will review a typical estuary food web. Students will learn about invasive species and methods of dispersal and invasion, focusing specifically on the green crab and Asian shore crab.

Ecosystem Development Project (Kampper)

Time: 4 sections ~1 hour per section

Students will work in groups to role-play the development of a large parcel of land adjacent to Narragansett Bay. The development project will incorporate real world economic, social, environmental issues. The project will engage students in an environmental survey, an environmental impact assessment, the assessment of economic and social benefits, and the concept of best practices in ecosystem management.

What effect does excessive human waste from communities have on nearby estuarine ecosystems? (Martino)

Time: Two 45-minute sessions

Students will locate the estuary closest to their school. They will describe the characteristics that make it an estuary. They will delineate the watershed for this estuary and discuss its characteristics such as population, types of development etc. Students will discuss sewage treatment and visualize sewage treatment with a model in the classroom.

** NOTE: Times listed are estimations; lessons can be altered to fit times desired.*