

TIDES activity summaries

August 1, 2006

Classroom-based Activities

— Activity 1 - Welcome to the Estuary

In this introductory unit, the teacher provides an overview of how estuaries fit into the coastal environment using a scripted PowerPoint presentation and a short story. During this activity the students are introduced to the idea of estuaries, basic vocabulary and the concepts of connections between the watershed and ocean through the estuary. Students are assigned as members of a team of scientists exploring the land and seascape by developing a classroom watershed map or model for use throughout the TIDES study.

— Activity 2 - An introduction to the “Tide of the Heron”

Students watch the short film “Tide of the Heron” and answer study questions individually and then engage in a group discussion. The information presented in the film is then generalized to include other Oregon estuaries. Students may be asked to read selected articles and answer questions from the Estuaries Feature Series in advance or as a follow-up assignment.

— Activity 3 - Estuary Connections - Watersheds to the Ocean

This activity uses a game to provide students with an understanding of the scale and type of changes which have occurred over the past 10,000 years in estuaries along the Pacific Northwest coast through the actions of nature and humans. Students hold cards representing different elements within the Watershed/Estuary/Ocean and they must complete the set to make up a functional, healthy ecosystem and produce abundant resources.

— Activity 4 - Tides of Change

Through a series of interactive exercises, students develop an understanding of the fundamental role that tidal forces play on the waters and habitats of the estuary. Activities include learning to read a tide table accurately, graphing tides, and exploring the factors that influence tidal height as well as the resulting impacts to habitat, human and natural.

— Activity 5 - Life in the Waters of Productivity and Change - Physical Environments

Classroom experiments to show how sediment travels in water, how salinity affects density and what effects temperature, dissolved oxygen, and nutrients can have on water in an estuary. An advanced module explores the use of on-line data as a means to learn about the waters of the estuary using the modern technology employed by the NERRS System-wide Monitoring Program.

— **Activity 6 - Life in the Waters of Productivity and Change – Estuary Survival**

Students and the teacher participate in a model of an ecosystem to understand the relationships between habitat complexity, survival, adaptation, and species diversity. Participants take part in a game involving Coho salmon, Dungeness crab, and eelgrass beds to illustrate these concepts.

— **Activity 7 - Humans and the Estuary – Clams Enough for Everybody**

Students participate in a role playing game to understand the impacts which humans can have on an estuary by acting as regulators, educators, and harvesters in a role playing mock clam harvest. Participants take part in a clam digging activity to develop an understanding of conservation, regulation, and education as essential elements to protect a resource.

Field & Lab Study Activities

— **Activity 8 - Preparations for a Field Experience**

This activity is designed to properly prepare students, teachers, and adult assistants for a field experience along the shores of an estuary. Students will develop a personal field study checklist of the items and gear needed for the field study the class will be conducting. The activity emphasizes the importance of field time to a scientist and the cost of errors in the field to support a sense of personal responsibility.

— **Activity 9 - Mapping Watersheds, Habitat & Uses of the Coast**

This laboratory activity is designed to help students look critically at a landscape using remote sensing imagery to identify habitats present and develop a classification scheme of natural and human derived land uses. The participants will each work on part of an aerial mosaic of the landscape to identify land use and land cover on an overlay. They will then transfer this information to the large scale map of the study area and discuss the implications of the identified land uses.

— **Activity 10 - Tidal Marshes - Richness & Diversity**

Through hands-on sampling and investigation, the class will discover the many different types of plants that have adapted to life in a tidal marsh. Students will understand a simple way to test diversity within one zone of the estuary, gain experience making careful observations to distinguish physical differences and characteristics between species of marsh plants, and understand how sampling a subset is used to make observations about a larger area.

— **Activity 11 - Tidal flats - A Hidden World Revealed by the Tides**

The class will conduct a structured investigation of the life of the tidal flats of the estuary and explore the relationship between sediments, elevation, and the life beneath surface. Using the TIDES Explorer kits and Field Study backpack, the class will discover evidence of

life beneath the mud, the tidal cycle, and the diversity of sediment types, as they explore the different types of adaptations these creatures possess.

— **Activity 12 - Waters of Life - A Journey into the Microworld**

Using simple field microscopes and sampling equipment, the students will collect plankton for observation along with water quality information which can then be used to try to understand the basis for the incredible estuary web of life. Students will draw actual and imaginary plankton and then work to explain how these microscopic plants and animals of the estuary live.

— **Activity 13 - Waters of Life - Eelgrass and a Community of Creatures**

The class works to discover the diversity of plants and animals that use eelgrass beds while exploring the adaptations of eelgrass to life in the intertidal estuary waters. Using a study method that is commonly employed by scientists to study sea grass beds, the class will contribute to a broader understanding of the health of these vital communities.

— **Activity 14 - Protect, Conserve & Restore - A Connection to your Community**

Students and their teacher will choose from a variety of ways in which they can share the information they have collected in their study of the estuary with the local community and the staff at South Slough NERR. The class is encouraged to identify and participate in a project to support protection, conservation, and restoration of an estuary.