

WETLANDS: Water, Wildlife, Plants & People!



Mangrove Swamp

Estuary

GRADE SCHOOL

Inland Marsh

Lake

Forested Wetland

Salt Marsh

Shrub Wetland

Forested Wetland

Reservoir

Wet Meadow

Wet Meadow

Inland Marsh

Shrub Wetland

AQUIFER

U.S. Department of the Interior



Wetlands are part of all our lives. They can generally be described as transitional areas between land and deepwater habitats. There are many different kinds of wetlands, and they can be found in many different habitat types, from forests to deserts; some are maintained by saltwater, others by freshwater. This poster shows general types of diverse wetlands and demonstrates how people and wetlands can benefit by living together. The diversity of plants and animals is shown in cartooned pictures. As with plants and animals, there are many different common names for the various wetland types. The common names used on this poster were used by the U.S. Fish and Wildlife Service in the publication "Wetlands—Status and Trends in the Conterminous United States, Mid-1970's to Mid-1980's." Estuarine wetland types—salt marshes and mangrove swamps—are labeled in red letters. The estuary is where ocean saltwater and river freshwater mix. The estuary is labeled in orange letters. The inland wetland types—inland marshes and wet meadows, forested wetlands, and shrub wetlands—are labeled in yellow. Other wetlands are present in rivers, lakes, and reservoirs. The water bodies associated with these wetlands are labeled in black. The poster is folded into 8.5" x 11" panels; front and back panels can easily be photocopied.

Without water there would be no wetlands. The two main sources of water for wetlands are surface water and ground water. Surface water includes streams, rivers, lakes, ponds, and oceans. Ground water is water found in pores or cracks in sand, gravel, and rock beneath the land surface. Ground water can supply water to wetlands or obtain water from them. The ultimate source of both surface and ground water is precipitation—rain and snow. Protecting the quality and quantity of water in wetland environments is critical to the maintenance of these diverse ecosystems. By understanding and appreciating wetlands, people can help maintain them. Wetlands can be protected by limiting dredging, channelizing, or draining and by protecting the source of water for the wetland.



Creating Human Access

When trails or walkways are built, it is easier for people to explore wetlands. Trails also keep people in certain areas of the wetland to prevent the people from disturbing wildlife at critical times of their life cycle (nesting). Trails can be made from natural materials, such as wood chips or gravel. Wooden walkways also can be constructed. Care must be taken to minimize the disturbance of soils, vegetation, and the source of water. During certain times of the year, trails might need to be closed temporarily to protect wildlife or restore damaged plants.

Recreation

Wetlands provide many benefits to people. Recreation is, however, the benefit most familiar to children and young adults. Hunting, fishing, boating, animal watching, and hiking are all recreational activities conducted in wetlands. Many children have memorable experiences looking for tadpoles, frogs, fish, and the great variety of insects and birds in wetlands.

ESTUARINE WETLANDS—Wetlands that are affected by tides. The type of water can be freshwater or saltwater. These wetlands are important nursery habitats for many kinds of fishes and birds.

ESTUARINE WETLAND TYPES

Salt Marshes

The type of water is saltwater, and the area is vegetated by salt-tolerant plants. Emergent plants, such as black rush, pickleweed, and spartina, are the most common vegetation type. Representative animals include blue heron, salmon smolt, and fiddler crabs. Salt marshes occur along the Atlantic, Pacific, and Gulf coasts and along the Alaskan and Hawaiian coasts.



ESTUARINE WETLAND TYPES—Continued

Mangrove Swamps

The type of water is saltwater, and the dominant plants are mangrove trees. Mangrove trees have still-like roots to give them stable footing. Birds include egrets and ibis. Mangrove swamps are located primarily along the southern parts of Florida coasts and in Puerto Rico.



INLAND WETLANDS—Wetlands that are not affected by tides. The type of water can be freshwater or saltwater.

INLAND WETLAND TYPES

Inland Marshes and Wet Meadows

The type of water is freshwater or saltwater, and the wetland is covered with shallow water much of the time. Vegetation is characterized by emergent and soft-stemmed plants, such as grasses, sedges, bulrushes, and cattails. These wetlands have many different kinds of flowering plants. Representative animal life includes marsh wrens, pintail ducks, bullfrogs, dragonflies, and mosquitoes. These wetlands occur throughout the United States in low-lying depressions.



Forested Wetlands

The type of water is freshwater, and the soils are often waterlogged in winter and early spring but can be dry in summer. Vegetation primarily consists of trees. Black spruce trees represent the northern forested wetlands, and bald cypress are common in the southern forested wetlands. Representative animal life in northern forested wetlands includes woodpeckers, wood ducks, moose, and snowshoe hares. Representative animal life in southern forested wetlands includes raccoons, opossums, and alligators. Forested wetlands often accumulate dead organic matter called peat. Forested wetlands can be found in many areas of the United States.



Shrub Wetlands

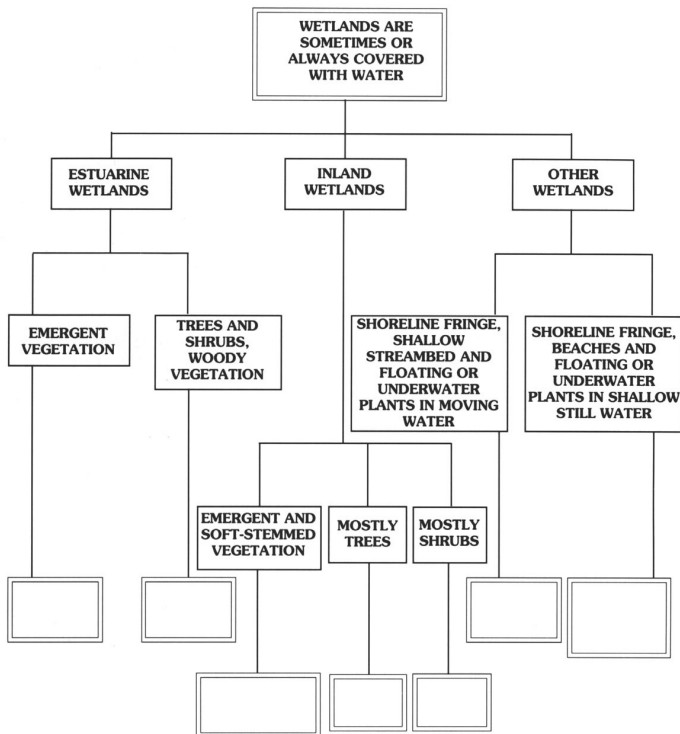
The type of water is freshwater, and the vegetation type is characterized by woody vegetation less than 6 meters in height, such as black willows. Representative animal life includes red-winged blackbirds, mice, and muskrats. This wetland type is one of the most widespread in the United States and is very important in the Desert Southwest. Shrub wetlands primarily occur along rivers and streams and around lakes and reservoirs.



OTHER WETLANDS—Wetlands in rivers, lakes, and reservoirs. These wetlands are shallow-water habitats or unvegetated wetlands. Water is less than 2 meters deep. These wetlands may include a shoreline fringe of water lilies and underwater plants, or they may provide a home for small animals on an unvegetated streambed, beach, or bar. Representative plants and animals found in lake and reservoir wetlands include duckweed, water lilies, water striders, beavers, shrews, red-winged blackbirds, and osprey. Bears, snakes, mayflies, and water lilies might also be found in river wetlands.

WETLAND HABITATS

The following flow chart should help your students understand wetland classification. Make a copy for each student and have them fill in the wetland type in the blank boxes.



WETLAND MODEL

INTRODUCTION

Wetlands are complicated systems that provide food, recreation, wildlife habitat, water-quality improvements, and flood control and are natural sources of environmental aesthetics. Not all wetlands provide all the above-listed benefits. The following activity will concentrate on two of these benefits: flood control and water-quality improvement.

Wetlands serve as water-storage areas that reduce flooding by retaining excess water and slowly releasing it to lakes and streams. Wetlands also act as sediment trappers. As flowing, sediment-laden water is slowed by wetlands, the sediments suspended by faster flowing water settle among wetland plants. Wetlands can also act as a filter for pollutants. Plants and micro-organisms can take up and use some chemical pollutants.

OBJECTIVE

- After completing this activity, students will be able to:
1. Describe what a wetland is and the diversity of different wetland types.
 2. Discuss two functions common to different wetland types.

MATERIALS

This activity can be done as a demonstration or in small groups.

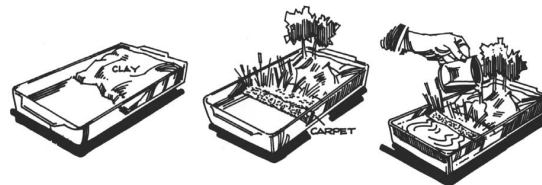
- 23 cm x 33 cm baking pan (one per 3–5 students).
- modeling clay, 23 cm x 13 cm x 8 cm, sloped to 3 cm.
- small piece of indoor-outdoor carpet, 23 cm x 10 cm.
- 200 mL of clear water.
- 5 tablespoons of soil.
- model-building materials such as: tree needles, twigs, grass, cotton swabs to represent cattails, small plastic animals and people, etc.
- copy of the poster entitled "Wetlands: Water, Wildlife, Plants and People".

If modeling clay is not available, crumpled paper covered with aluminum foil can be substituted.

TEACHER PREPARATION

Make your own model ahead of time for demonstration or as a comparison for the students.

1. Spread a sloping layer of modeling clay or crumpled paper covered with aluminum foil in approximately one-third of the pan to represent land. The empty one-third will represent water, the remaining one-third will be wetland.
2. Make sure the clay is sealed to the pan on the edges, or the foil lies against the edge and then wraps up onto the side of the pan, to prevent water from getting underneath. Meandering streams can be formed in the clay to lead to the body of water.
3. Cut a piece of indoor-outdoor carpeting to fill completely the space across the pan along the edge of the clay and between the clay and water body. This is the wetland. Make sure the wetland fits well—the model won't work if there are spaces under the wetland or between it and the sides of the pan.
4. Place some of the model-building materials on both the land and the wetland to represent plants, animals, and people.



Wise Wetland Ways

INTRODUCTION

People use wetlands in many ways, directly and indirectly. In this activity, students pretend to be archaeologists of the future and work in groups to examine a collection of "artifacts." They then create a short story or skit to explain how the "artifacts" relate to human uses of wetlands by the "ancient" people of the 20th century.

OBJECTIVE

After completing this activity, students will be able to:

1. Describe at least five ways people benefit from wetlands.
2. Discuss actions people can take to be sure that this diversity of use does not damage or destroy wetlands for future generations.

MATERIALS

Wetland "artifacts" (can be labeled with numbers)

can of clam chowder	blueberry muffin	book of nature poetry
commercial and sport fishing lure	can of smoked salmon	empty soft drink can
camera lens or film container	binoculars	sport fishing or hunting license
woven basket	field guide to birds or wetland plants	duck stamp
paper and pencil for each group	brochure from a hunting or fishing-guide company that uses wetlands	

TEACHER PREPARATION

Gather "artifacts." Label with numbers (optional).

PROCEDURE

1. Explain to students that this is the year 2100. They are fortunate that today a local archaeologist has left some artifacts from a study of the nearby (name a local) wetland for students to examine. Some artifacts were actually found in the wetland, and others were gathered during research on how people used wetlands 100 years ago. (The principal or a willing teacher or parent might want to role play the archaeologist.) Explain that students must handle each artifact carefully to try to figure out how the artifact is related to human use of the wetlands and how it got to the place where the archaeologist found it.
2. Divide the class into groups of three to five (depending on the number of students and artifacts). Their assignment is to create a story or skit, using their artifacts, that explains how their artifacts relate to human uses of wetlands by "ancient" 20th-century people. Set a time limit of 10 minutes or so for the groups to develop their presentation.
3. Each group should present their story or skit about how the wetlands were used to the class. On the chalkboard, make a list of all the uses of wetlands that are mentioned. Ask the class if they can think of other uses of wetlands by people. Discuss the uses in terms of coexistence of people and wetlands: How can people use the wetlands in ways that ensure that the wetlands and the life within them will continue to thrive? Which uses need to be moderated so that the uses can continue indefinitely? Which uses would have to be stopped to avoid wetland destruction? Which uses would have to be altered to minimize their effect on the wetland and the wildlife that lives there? Is it possible for people and wetlands to coexist?

INTERPRETIVE QUESTIONS

1. Which uses would still continue in the year 2100 if people had used the wetlands wisely?
2. Which artifacts would students find in the year 2200 (in another hundred years)?
3. Presuming that the students in the year 2100 are very conscientious about taking good care of wetlands, which artifacts would the students in the year 2200 likely not find?

EXTENSIONS

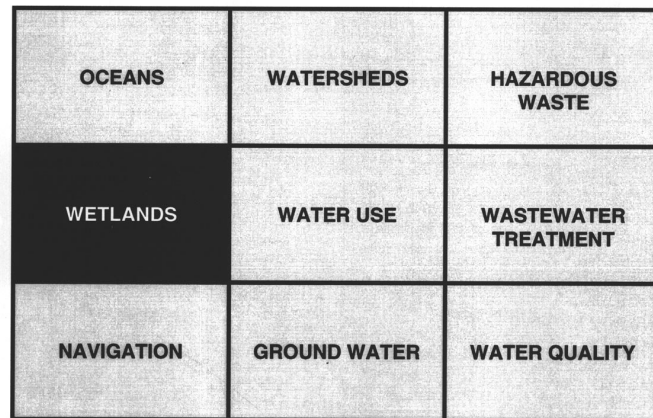
1. Students can think about the kind of information they would want future generations to know about wetlands. What are some important aspects of wetlands that they would want to express, and how would they communicate these aspects to the people of the future? Ask students to identify items related to wetlands to include in a time capsule that will be opened 20 years from now.
2. Use items similar to those included in the time capsule to make a collage.
3. Visit a local wetland. Take along resource books for identification of the plants and animals that live in the wetland.

(Adapted from "Wetland In A Pan" W.O.W., Wonders of Wetlands, Environmental Concern, Inc., and "Wetland Model" Wetlands and Wildlife, Alaska Department of Fish and Game and U.S. Fish and Wildlife Service, Alaska.)

Poster Series

This poster is part of a series of water-resources education posters developed through the U.S. Geological Survey's Water-Resources Education Initiative, a cooperative effort between public and private education interests. Partners in the program include the U.S. Geological Survey, Bureau of Reclamation, and the U.S. Fish and Wildlife Service of the U.S. Department of the Interior; the National Oceanic and Atmospheric Administration; the U.S. Environmental Protection Agency; the U.S. Army Corps of Engineers; the Nebraska Groundwater Foundation; and the National Science Teachers Association.

The other posters in the series are entitled "Water: The Resource That Gets Used & Used & Used for Everything!"; "How Do We Treat Our Wastewater?"; "Ground Water: The Hidden Resource!"; "Water Quality: Potential Sources of Pollution"; "Navigation: Traveling the Water Highways!"; "Hazardous Waste: Cleanup and Prevention"; "Watersheds: Where We Live"; and "Oceans—Coastal Hazards: Hurricanes, Tsunamis, Coastal Erosion." The posters in the series are designed to be joined to create a large wall mural. A schematic of the wall mural is displayed on this panel. The gray shaded spaces represent the posters listed above. The black shaded space represents this poster.



Water-resources topics of the posters are drawn in a cartoon format by the same cartoonist. Posters are available in color or black and white. The reverse sides of the color posters contain educational activities: one version for children in grades 3–5 and the other for children in grades 6–8. The black-and-white posters are intended for coloring by children in grades K–2.

ORDERING INFORMATION

Copies of the first seven posters in the series (see Poster Series Panel) and this Wetlands poster (color for grades 3–5 and 6–8 or black-and-white) can be obtained at no cost from the U.S. Geological Survey. Write to the address below and specify the poster title(s) and grade level(s) desired. A limited number of color and black-and-white posters entitled "Water: The Resource That Gets Used & Used & Used for Everything!" also are available in Spanish by writing to the address below.

U.S. Geological Survey
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DEFINITIONS

Ground water—Ground water is water found in pores or cracks in sand, gravel, and rock beneath the land surface. Discharging ground water sustains streamflow and supplies water to springs and wells.

Surface water—Water that is on the Earth's surface, such as rivers, streams, reservoirs, lakes, ponds, and oceans.

Deepwater habitat—Habitats that are permanently flooded lands lying below the deepwater boundary of wetlands. The surface water is permanent and often deep (greater than 2 meters) so that water, rather than air, is the principal medium within which the dominant organisms live.

Saltwater—Water that contains at least one-half of 1 percent salt. Example: greater than 5 parts salt per 1,000 parts water.

Freshwater—Water that contains less than one-half of 1 percent salt. Example: less than 5 parts salt per 1,000 parts water.

Flood—An overflow or inundation that comes from a river, lake, or body of water that exceeds its natural banks or water level.

Emergent plants—Plants that are partially covered with water but can support themselves above the water.

Water table—The top of the water within an unconfined aquifer.

U.S. GEOLOGICAL SURVEY

As the Nation's largest earth-science information and research agency, the U.S. Geological Survey maintains a long tradition of providing "Earth Science in the Public Service." As a Nation, we face serious questions concerning our global environment. Providing the scientific information necessary to answer these questions is the primary mission of the U.S. Geological Survey. Such information is essential for the public and its officials to make informed decisions concerning the wise use of our natural resources and the management of our global environment.

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