

WETLANDS: Water, Wildlife, Plants & People!



Mangrove Swamp

Estuary

Salt Marsh

Forested Wetland

Inland Marsh

Lake

Shrub Wetland

Inland Marsh

Reservoir

Forested Wetland

Wet Meadow

Wet Meadow

Shrub Wetland

AQUIFER

GRADE SCHOOL

U.S. Department of the Interior
USGS
science for a changing world

US Army Corps of Engineers

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 stilt-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.

ACTIVITY 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

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

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.

A WETLANDS VISIT

We wanted to get up early for our hike to a forested wetland. My friend was determined to become a wildlife photographer (Say cheese! click). At the crack of dawn, we headed out. As we got close to our destination, we heard the faint sound of mallards (quack, quack) getting closer. We walked quietly, but we could still hear the sound of our own footsteps (squish, squish) in the wet grasses and mud. Overhead, a huge flock of Canada geese (honk, honk) could be heard calling noisily. When we reached the forested wetland, we sat quietly at the edge where we were hidden by the vegetation. We sat as quietly as possible and listened carefully. At first, all we heard was the water (gurgle, gurgle) gurgling over a beaver dam. The wildlife photographer (Say cheese! click) readied her camera. The mosquitoes (buzzzzz) soon found us and distracted our attention away from a beaver (slap!) that was quietly swimming our way. I turned my head and saw small waves of water (gurgle, gurgle) rippling in the quiet, deep pool on the other side. The beaver (slap!) suddenly seemed to notice our presence, and its broad, flat tail slapped the water (gurgle, gurgle). At the same time, the wildlife photographer (Say cheese! click) missed an incredible photo opportunity while doing some slapping of her own. The mosquitoes (buzzzzz) were getting ferocious!

The water (gurgle, gurgle) continued to keep us company, and the sound of the beaver (slap!) seemed long gone. I was doing my best to keep quiet, but the wildlife photographer (Say cheese! click) was noisily unwrapping a piece of candy. I glanced down at the water (gurgle, gurgle) and noticed a water strider (strider motions) skating on top of the water (gurgle, gurgle).

I was wondering how it could accomplish such a feat. The water strider (strider motions) just kept moving across the water (gurgle, gurgle). Water striders (strider motions) look rather silly, I think.

The wildlife photographer (Say cheese! click) was getting impatient by now and started to get up just as a flock of mallards (quack, quack) flew by. The mallards (quack, quack) were startled by the sudden movement and veered out of camera range. The mosquitoes (buzzzzz) were really getting out of hand now. My friend slumped down dejectedly, and her camera lens cap fell into the water (gurgle, gurgle) below. As she was retrieving the lens cap, I noticed a big moose (clomp, clomp) walking toward us. The moose (clomp, clomp, clomp) was slurping down plants and water (gurgle, gurgle). I grabbed the arm of the wildlife photographer (Say cheese! click) to get her attention and started the water strider (strider motions) she was attempting to photograph. The moose (clomp, clomp, clomp) munched on some willows.

The moose (clomp, clomp, clomp) lumbered out of the water (gurgle, gurgle) and crashed off through the bushes before the wildlife photographer (Say cheese! click) could focus for a picture. The beaver (slap!) that had ventured by again ducked underwater in search of more quiet surroundings.

The water (gurgle, gurgle) kept up its music as we decided to follow our footsteps (squish, squish) home. We walked as quietly as possible to try for another chance to photograph some wildlife. Only our footsteps (squish, squish) betrayed our presence. When we turned around to look behind us, we saw the sunset. The sun was low on the horizon, and the sky was glowing pink and gold. High overhead we heard the flock of Canada geese (honk, honk). I slipped my friend's camera out of her backpack, held it up, and said "I am the mighty wildlife photographer (Say cheese! click)."

ACTIVITY A Wetlands Visit/Create a Wetland

INTRODUCTION

Wetlands are everywhere, so everyone can probably think of a wetland somewhere near their home. This poster depicts a few of the wide variety of wetland types. Wetlands are diverse, and so is the life they support. This activity is designed to emphasize the diversity of life in a wetland. Students will take part in a read-aloud play and make a mural depicting one wetland type.

OBJECTIVE

After completing this activity, students will be able to describe a small part of the diversity of life that exists in a wetland habitat by identifying some plants and animals that can live there.

MATERIALS

"A Wetlands Visit" read-aloud story (adjacent poster panel).
One copy of the poster "Wetlands: Water, Wildlife, Plants, and People".

For each student:

One copy of "Wetland Life" (adjacent poster panel)
Crayons or markers, scissors, glue, one piece of paper: 8 1/2 x 11, or light-colored construction paper.

TEACHER PREPARATION

1. Make one copy of the panel entitled "Wetland Life" for each student.
2. Gather student materials.
3. Display a copy of the poster on the wall where the students can see it.

PROCEDURE

1. Assign students in your class to each of the "parts" in the cast of "A Wetlands Visit." Their roles are to say their lines (words in parentheses) whenever their parts are mentioned.

Wildlife photographer (Say cheese! click)	Moose (clomp, clomp, clomp)	Mosquitoes (buzzzzz)
Footsteps (squish, squish)	Mallards (quack, quack)	Beaver (slap!)
Canada geese (honk, honk)	Water (gurgle, gurgle)	Water strider (move arms silently like a water strider)

2. Read the story "A Wetlands Visit" aloud, pausing for the sound effects of the cast.
3. After the "play" is finished, explain that the freshwater wetland just "visited" would be found in northern States in a forested wetland, but that every child in the United States has a wetland somewhere near home. Besides a diversity of animals, many types of plants also are found in wetlands. Ask the students if they have ever had a chance to explore a wetland.
4. Give each student a sheet of blank paper. Review the definition of a freshwater wetland. Tell the students to draw any freshwater wetland background scene on the blank paper, using the poster as an example. Hand out the pictures from the panel titled "Wetland Life." Then the students can cut out their plants and animals and glue them down in their scenes to create a freshwater wetland picture. They also can draw in other wetland plants and/or animals. The wetland type descriptions located on adjacent panels provide a "key" to matching the plants and animals displayed on the "Wetland Life" panel with representative wetlands.

INTERPRETIVE QUESTIONS

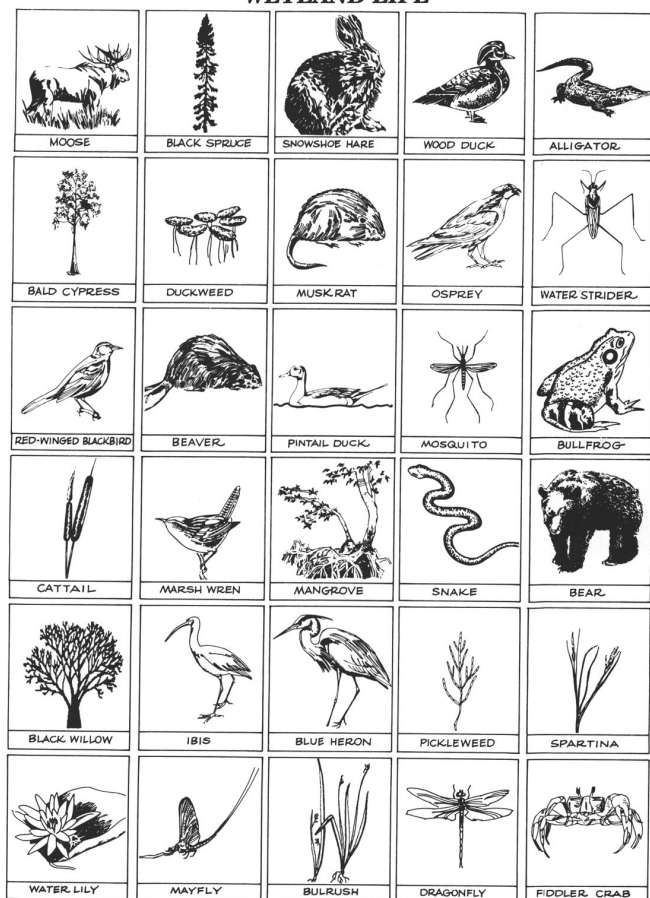
1. Which animals in the wetlands scene would you find near your home? Why or why not?
2. Which animals could live in another habitat? Which do you think could only live in a wetland?
3. What can we say about wetlands and the life they support?

EXTENSION

If there is a wetland nearby, take a field trip so the students can look for the wetland plants and animals in their neighborhood wetland. Have the students list animals they might see there, draw pictures of the animals, and make another wetland scene. Take reference books for identification of the plants and animals that live in the wetland.

(Adapted from Nature Scope *Wading into Wetlands*, "Creating a Scene" and *Alaska Wildlife Curriculum Wetlands and Wildlife*, "A Wetlands Visit")

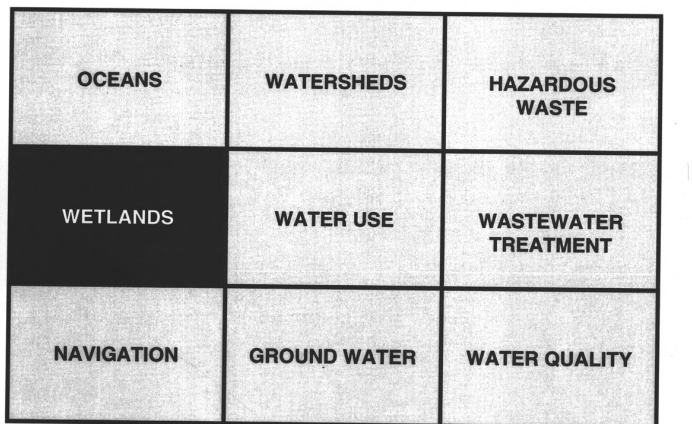
WETLAND LIFE



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
Branch of Information Services
P.O. Box 25286
Denver Federal Center
Denver, CO 80225
Telephone: 1-800-435-7627

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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