

Wet and Wild Along the Mississippi River



National Mississippi River Museum and Aquarium Conservation Education Curriculum

Target Grades: 4 - 10

Key Words: Aquatic, Invertebrates,
Vertebrates, Food Web

Subject Areas: science, biology, limnology,
chemistry, ecology

Duration: 45 minutes
Time can be extended by request

Title: ***Wet and Wild
along the Mississippi River***

Program presented on site at the museum & aquarium.

Summary:

Wetlands, streams, and rivers are unique and fascinating environments which provide habitat for many species of plants and animals. This program will allow students to investigate the life in the wetland, main channel, or ice harbor with hands-on netting and identification of common animals and plants. Students will also discuss and determine how these plants and animals fit into the food web.

Objectives:

Students will be able to...

1. define habitat
2. identify plants and animals living in the wetland
3. define a wetland
4. explain why wetlands are important
5. identify these aquatic animals as herbivore, omnivore or carnivore
6. identify the place of these plants and animals in the food web
7. define benthic macro-invertebrate

Group Size: 10 - 30

Background for Educators:

The museum wetland offers an opportunity for exciting discoveries. While here, students will become better acquainted with many kinds of plants and animals; they will also learn how they live together in a community. During this activity, students will observe a variety of plants, animals and signs of animals in the wetland. Students will also have a chance to capture and study some of the most common aquatic animals (benthic macro-invertebrates). Some of these animals are more adapted to clear, cool lakes and other to shallow, warm ponds. Still others are found in streams as well as in still waters and wetland marshes.

Definitions:

-*Wetland*- lowland area, such as a marsh or swamp, which is saturated with moisture, especially when regarded as the natural habitat of wildlife

*very important environmental areas; they help control flooding by giving the water a place to spread out; they act as a sponge for the water; they act as a purifier as plants soak up the nutrients in the water thereby cleaning it; they are a great habitat for many animals due to variety of plants for shelter and food, presence of water, and variety of animals for food

-*Vertebrate*- having a backbone or spinal column; a member of the subphylum Vertebrata, a primary division of the phylum Chordata that includes the fishes, amphibians, reptiles, birds and mammals, all of which are characterized by a segmented spinal column and a distinct well-differentiated head

-*Invertebrate*- an animal having no backbone or internal skeleton; includes insects and mollusks

-*Benthic macro-invertebrate*- bottom-dwelling organisms with no backbone which can be seen without the aid of any device (seen with the naked eye); are great bio-indicators (examples: insect larvae, crayfish, mussels, water beetles, water striders, snails, aquatic worms, etc)

*very important to food web because they eat zooplankton, plants, etc; they are, in turn, eaten by other animals in the habitat

-*Bio-indicator*- the presence (or lack thereof) of certain animals and plants can aid you in determining the health of your water as some animals are more prone to pollution in the water than others; changes in organisms can be reliably used to indicate a change in the environment (changes may be physiological, chemical or behavioral)

*macro-invertebrates are good bio-indicators because they are relatively easy to collect, have different pollution tolerances, have limited mobility, and are fairly easy to identify

*the presence, condition and diversity of these animals can tell us a lot about water quality (see the identification keys for the pollution tolerances); the higher the species richness and evenness the higher the water quality.

Materials Needed/Equipment:

- dip nets
- collection tubs
- magnifying lenses
- magnifying boxes
- identification books
- identification sheets/keys
- clipboards
- pencils
- recording sheets
- paper towels/handi wipes (just in case)

Procedure:

Discussion: Discuss with the class what a wetland is (i.e. what animals live there, plant cover, depth of water, movement of water, etc). Discuss why wetlands are important to the environment and why each animal and plant is important in the food web (even a mosquito). Discuss what a food web is and what happens when you lose a part of that web. Explain that the group is going to be testing the health of the water in our wetland by catching benthic macro-invertebrates and observing other animal life in the area. Discuss what a benthic macro-invertebrate is and how they help us determine the health of the water. Show them the identification sheet and recording sheet, and teach them how to use both

Netting: Divide group in to smaller groups of 3-5 students each. Before handing out the equipment, explain the proper procedure for using the dip-nets, collection tubs and magnifying boxes/glasses.

-Proper procedure: First fill your collection tub with clear water from the collection site (these animals live in water and we don't want to kill them by putting them into a dry tub). Bounce the net along the bottom of the wetland (don't scoop like a shovel). The areas around many plants or under logs, etc are the best places to test since the animals are trying to hide from predators. Bring the net out of the water, and lay it on the deck. First, watch for movement in the net, gently dig through the mud and plants in the net to find the animals, and move the animals from the net to the tub, using your fingers like tweezers. Make sure not to dump the contents of the net into your collection tub, for that will make the water dirty. Also be sure to be very careful with the nets. The handles are very long. Watch where you are going so nobody gets hit or pushed into the wetland. Remind the students again of the animals we are looking for. Frogs and fish may be found, but guide them to look for the smaller animals (macro-invertebrates) discussed earlier as well. Set the boundaries of the collection site before allowing the students to get the equipment and begin collecting.

- Make one student in every small group responsible for each of the following (clipboard/recording sheets, net, collection tub) initially. The student responsible for the net is responsible for the cleaning and returning of the net after collection is finished. The student in charge of the clipboard/recording sheets is responsible for returning these at the end of the activity. The student in charge of the tub is responsible for filling the tub with clear water before collection begins and making sure the tub is with the group at all times. Students should be reminded that walking into the water is not necessary, and may actually hurt their chances of collecting a good variety of animals.

- Allow ample time for students to collect the aquatic animals. Remind students to take turns collecting with the net and recording the animals on the sheets. This should be a group project. Remind them also to take some time while collecting to try to identify the animals they are collecting. During collection, go from group to group to help them identify the animals and to make sure everything is running smoothly.

- After collection is complete, bring the students back into the large group. Place all the tubs in the middle of the group. Take a few minutes to do some final identification, and have each small group of students read the list of animals caught to the whole group. Use this information to determine the health of the wetland.

- Discuss how these animals fit into the food web and what environmental factors may affect the health of the water here.

Evaluation:

* Students will be evaluated on their understanding of ecological relationships of various aquatic organisms based on discussion following the program on benthic macro-invertebrates, the food web, and the wetland habitat.

* Students will be evaluated on their understanding based on the notes taken during the program.

Additional resources:

* *Pond Life, A Guide to Common Plants and Animals of North American Ponds and Lakes*, * A Golden Nature Guide, Golden Press, New York. 1967.

* IOWATER aquatic organism identification chart

<http://www.iowater.net/Publications/Level1BenthicKey05.pdf>

<http://www.iowater.net/Publications/IOWATERBenthicFlowChart.pdf>

<http://www.iowater.net/Publications/BenthicManual.pdf>

* Study organisms in the aquarium exhibits and touch tanks.

Extensions:

Related programs available at the National Mississippi River Museum & Aquarium:

Water Logged

Water We Doing to Our Environment
Rockin' Reptiles and Awesome Amphibians
Mammals of the Mississippi
Mississippi River Life
On the Right Track

- * Testing for dissolved oxygen, pH, temperature, or nitrates of a pond or stream.
- * Use sweep nets to catch insects from the upland vegetation in the wetland area to compare insect forms of aquatic habitats to dryer vegetative habitats, or from the leaf litter of a savanna or wooded area.
- * Have the students diagram a food web using the animals they caught as an entire class.
- * Signs of Life Program
- * Food Web Activity (see post-activities folder)

Credits:

Developed in 2003 by Mark D. Wagner, Iowa State University Extension, Director of Education for the National Mississippi River Museum & Aquarium; Dubuque, Iowa, Revised 12-2005 by Annette Wittrock & Mark Wagner

YOU AND YOUR ENVIRONMENT, Jasper County Conservation Board, Newton, Iowa

WOW! The Wonders of Wetlands, Environmental Concern Inc., Michaels, Maryland

Investigating Your Environment series, U.S. Forest Service, Portland, Oregon

Pond Life, A Guide to Common Plants and Animals of North American Ponds and Lakes, A Golden Nature Guide, Golden Press, New York. 1967.

