



Illinois Envirothon | Aquatic Ecology

AQUATIC ECOLOGY OBJECTIVES

Envirothon aquatic ecology contestants should be able to:

- 1.** Define and understand watersheds and their importance.
- 2.** Briefly explain water quality, the difference between surface water and ground water, and the condition of these water sources in Illinois.
- 3.** Differentiate between non-point source and point source water pollution.
- 4.** Recognize types of water pollution such as organic, inorganic, thermal, toxic, etc.
- 5.** Recognize behaviors of urban, rural, agricultural, and industrial people that have an effect on a watershed & steps that can be taken to enhance a watershed.
- 6.** Using a key of pictures or descriptions, identify aquatic organisms found in rivers and their indication of river health.
- 7.** Differentiate between complete and incomplete metamorphosis and recognize to which group an aquatic insect belongs.
- 8.** Describe how sustainable agriculture can serve to manage water pollution by managing sedimentation, nutrients, confined animal facilities, irrigation, pesticides, and grazing.
- 9.** Discuss land uses that benefit, both economically and environmentally, the soil and water ecological systems, including riparian buffer strips.
- 10.** Be able to identify fifteen species of fish native to Illinois waters.
- 11.** Be able to discuss the various impacts that can occur on aquatic ecosystems.
- 12.** Understand the main cause of summer and winter fish kills.
- 13.** Be able to explain thermal stratification in lakes and lake turnover.
- 14.** Be able to identify common aquatic plants of Illinois and methods used to control aquatic vegetation.
- 15.** Understand common fish diseases and their possible causes.
- 16.** Be able to discuss fish stocking of small ponds in Illinois and to explain carrying capacity.
- 17.** Be able to identify and discuss aquatic invasive species in Illinois.



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AQUATIC ECOLOGY RESOURCES

A. websites and pdf files

- U.S. Environmental Protection Agency. Managing Non-Point Source Pollution from Agriculture.
<<http://www.epa.gov/owow/nps/facts/point6.htm>>.
- U.S. Environmental Protection Agency, Illinois. Lake Stratification & Mixing.
<<http://www.epa.state.il.us/water/conservation-2000/lake-notes/lake-stratification-and-mixing/lake-stratification.pdf>>.
- U.S. Environmental Protection Agency. What are Wetlands?
<<http://www.epa.gov/OWOW/wetlands/vital/what.html>>.
- U.S. Environmental Protection Agency. Wetlands & Nature.
<<http://www.epa.gov/owow/wetlands/vital/nature.html>>.
- Iowa State University, Department of Forestry. Stewards of our Streams - Buffer Strip Design, Establishment and Maintenance. <<http://www.extension.iastate.edu/Publications/PM1626B.pdf>>.
- Iowa State University, Department of Forestry. Stewards of our Streams - Riparian Buffer Systems.
<<http://www.extension.iastate.edu/Publications/PM1626A/homepage.html>>.
- U.S. Environmental Protection Agency, Illinois. The Condition of Illinois Water Resources.
<<http://www.epa.state.il.us/water/water-quality/report-2000/index.html>>.
- Conservation Technology Information Center. Know Your Watershed. Getting to Know Your Local Watershed. <<http://www2.ctic.purdue.edu/KYW/Brochures/GetToKnow.html>>.
- Invasive Species Information
- What are Aquatic Nuisance Species? – <www.fws.gov/contaminants/ANS/ANSSpecies.cfm>.
 - Asian Carp -
<<http://seagrant.psu.edu/publications/posters/supertramps/smallcolor/asiancarp.PDF>>.
 - Purple Loosestrife -
<<http://seagrant.psu.edu/publications/posters/supertramps/smallcolor/purpleloosestrife.PDF>>.
 - Water Milfoil -
<<http://seagrant.psu.edu/publications/posters/supertramps/smallcolor/watermilfoil.PDF>>.
 - Zebra Mussels –
<<http://seagrant.psu.edu/publications/posters/supertramps/smallcolor/zebramussel.PDF>>.

B. material located in packet

- Voshell, Jr., J. Reese. A Guide to Common Freshwater Invertebrates of North America. Virginia: The McDonald & Woodward Publishing Company, 2002.
- Izaak Walton League of America. A Volunteer Monitor's Field Guide to Aquatic Macroinvertebrates. Maryland.
- Illinois Department of Natural Resources. Aquatic Plants, Their Identification and Management. Illinois. 1997.
- Illinois Department of Natural Resources. Management of Small Lakes and Ponds in Illinois. Illinois. 1997.
- Illinois Department of Natural Resources. What Fish is This? Illinois. 1996

***Students are encouraged to search online resources to view color photos of fish and aquatic plants. ***