



A [biome](#) highlights the interaction among plant and animal populations and soil, water and air. Latitude is a major factor defining biomes but not the sole determinate; there is a strong relationship between the distribution of climates with latitude, and homogenous vegetation bands. Tundra, boreal forests/taiga, savanna, wetlands, aquatic, temperate broadleaf and mixed

forests are all examples of biomes.

In northwest Ohio we live in a region that is somewhat unique. Just to the north in Michigan and Canada we have boreal forests, just to the east we have eastern woodlands, just to our west we sit on the edge of the great tall grass plains, and finally to our north we have the shores and wetlands associated with the Great Lakes.

Much of the northern border of Ohio is occupied by Lake Erie and this plays a significant role in the weather for many of its nearshore communities. Just as the altitude of a mountain can affect the climate of a region, so can the effects of a vast body of water such as Lake Erie. On any given day look at a temperature map of northwest Ohio; on many days you might see a 10^o temperature difference between areas on the shores of Lake Erie and the southern portions of the region. This effect can impose both benefits and burdens to those who must work with the land.

In addition to the climate effecting in our environment, human impact also has been a significant determinate. The vast area of wetlands, once known as the "Great Black Swamp," has been drained to make room for civilization. Terrain once friendly to native species has been altered, making their survival difficult. For native plantings to be successful, landscapers must plan and recreate native conditions for them.

Program Objectives

Students will learn that:

- Science and scientists are at work in northwest Ohio solving the problems created by human activity and its' effects on the environment.

- Businesses and governments routinely apply the process of scientific investigation to assess risk and cost to the community and environment.
- Science skills learned in high school are needed in the workplace.

Ohio Science Standards

Earth Science

Benchmark B

Explain that many processes occur in patterns within the Earth's systems.

Indicator 1, Grade 10

Summarize the relationship between the climatic zone and the resultant biomes. (This includes explaining the nature of the rainfall and the temperature of the mid-latitude climatic zone that supports the deciduous forest.)

Earth Science

Benchmark D

Describe the finite nature of the Earth's resources and those human activities that can conserve or deplete Earth's resources.

Indicator 5, Grade 10

Explain how the acquisition and use of resources, urban growth and waste disposal can accelerate natural change and impact the quality of life.

Scientific Inquiry

Benchmark A

Participate in and apply the processes of scientific investigation to create models and to design, conduct, evaluate and communicate the results of these investigations.

Indicator 5, Grade 9

Develop oral and written presentations using clear language, accurate data, appropriate graphs, tables, maps and available technology.

Materials

- Computer with access to the Internet
- Paper and pen
- Handouts

Pre-Viewing Activity – Prepare to Learn

The content in this piece can be approached in several different ways. The first way is by looking at the ecosystem that surrounds Lake Erie and how it has been altered by human activity. The once natural landscape consisting of wetlands and forests has been altered; many of the native species that once thrived now are only found in small enclaves such as the Oak Openings Nature Preserve. What was once known as the "Great Black Swamp," is now a landscape of towns, roads and farm fields. Many plants and animals that

once thrived in this environment are now threatened by human activity. Once a forest or field has been cleared for habitation the land often is no longer habitable for native species; the once damp loamy soil has been replaced by compacted clay.

A second approach to this content might be the lake effect on the surrounding environment. For example, when the seasons begin to change from fall to winter, the mass of the lake retains its heat and remains thawed, in spite of the colder temperature of the surrounding air. As this colder air passes over the open water of the lake it picks up moisture, which then freezes and falls on the surrounding land as "lake effect snow." The amount of snowfall near the lake can be much greater than areas inland isolated from its effects. Conversely the heat radiated by the lake's mass in late summer might extend the growing season of fields near the lake to as long as 200 days. In other parts of northwest Ohio the growing season may only average 180 days.

In the spring the ice pack of the frozen lake serves two purposes: first -- a cooling effect on the surrounding land, and second -- to moderate the air temperature in such a way that the threat of damaging frost often ends by April, in contrast to areas further inland. Further inland, frost is considered to be a threat until mid-May.

A final example of how this material might be used, is to explore how landscaping is used to alter the environment or to restore native species to the environment. Think about the tree lines which border many farm fields or the wood mulch in park play areas; many of the landscape features we see are not only attractive, but highly functional. Many of the parks that we enjoy visiting, have been carefully planned to preserve our natural heritage and insure the survival of native species. These features are often the result of careful investigations and well drawn plans.

Vocabulary

- Determinate
- Wetlands
- Native plants
- Erosion control
- Loam
- Compact clay
- Beneficial insects

Related Discussion Items

- Lake temperature and surrounding land
- Human effect on the landscape and habitat
- The use of maps and illustrations when planning landscapes
- Lake effect snow
- The Great Black Swamp
- What is the impact of new construction on native plants and animals?

Activity

Create a cognitive map as a follow-up to the guided discussion. Some possible items might be the environmental impact of human activity. For example, what are some of the ways that new construction affects the surrounding landscape?

Quiz

1. Because the mass of the lake retains warmth from the summer heat, areas near Lake Erie will often experience marginally warmer temperatures in the fall than the surrounding area. This has the effect of producing a longer growing season.

True or False

2. Much of the natural environment in northwest Ohio has been left unaffected by human activity.

True or **False**

3. Native plants adapted to the local soils and climates are an excellent choice for plantings in new construction.

True or **False**

4. When applying pesticides, very little analysis or investigation needs to be done before hand as most insects are harmful to plants.

True or **False**

5. To be a successful landscaper, careful planning needs to take place not only during the spring and summer months, but throughout all four seasons.

True or False

Related Lesson Plans

Ecology and Biome Unit

(ORC # 1003)

This 3-4 week unit integrates biomes, communities, and human ecology in a way that produces a deeper understanding and better ability to apply the principles involved. Students work in teams to create a 4' by 5' free-standing biome project. During this unit, the teacher is often in the role of facilitator.

History of Forest Cover in Ohio

(ORC# 2178)

The Ohio Department of Natural Resources web page "History of Forest Cover in Ohio" describes the deforestation that occurred in the 18th and 19th centuries when Ohio was being settled. The subsequent reforestation is also discussed. The page includes maps of forest coverage, and data tables and graphs.

Educational Resources

Additional Resources Using: D3A2

Search String = soil, crop practices
forestry
pest control



The D3A2 helps educators analyze data, and then points them to resources such as lesson plans, assessments and activities designed specifically to address the academic need identified by the data. In addition to linking content to data analysis, educators will have general search capabilities to locate education content resources aligned to the Ohio's Academic Content Standards. Examples of the state resources queried are:

INFOhio

<http://www.infohio.org/>

Ohio Resource Center

<http://ohiorc.org/>

Other Resources

American Society of Landscape Architects

<http://www.asla.org/>

National Geographic Society, Terrestrial Regions

<http://www.nationalgeographic.com/wildworld/>