

MAPS – GIS Lesson: Forest Fire Ecology - Introduction to Geographic Information System Use in Forest Ecology

Subject Area: Ecology, Biology, Environmental Science, Physical Geography

Designer: Eric A. Sproles

Lesson Description: In this lesson students examine species distribution and age class of forest stands and the relation to the fire regime in the Fall Creek watershed in the Western Cascades of Oregon. The forest has a range of ages from old growth to recent harvests. The lesson also provides context for a class field trip to area.

This lesson was written for a Forest Ecology course and introduces new species and their scientific taxa to the students. Physical relationships of diameter breast height to age are also introduced. General geo-spatial concepts are presented through measuring and calculating area, creating queries and buffers.

ITSE National Technology Standards

- 1) Research and Information Fluency** - Students apply digital tools to gather, evaluate, and use information.
- 2) Critical Thinking, Problem Solving, and Decision Making** - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
- 3) Demonstrate Creative Thinking** - Students use technology to explore models and simulations of complex systems.

Geography Standards - Geography for Life 9-12th

- 1) The physical processes that shape the patterns of earth's surface.
- 2) The characteristics and spatial distribution of ecosystems on earth's surface.
- 3) The changes that occur in the meaning, use, distribution, and importance of resources.
- 4) How to apply geography to interpret the past.
- 5) How to apply geography to interpret the present and plan for the future.

Objectives: The students will be able to:

- 1) Describe the basic concepts of species distribution.
- 2) Develop an understanding of the processes from a landscape perspective.
- 3) Design Boolean Logic queries.
- 4) Use aerial images and GIS as a tool to form hypothesis on the fire ecology of forested landscapes.

Prerequisites:

- 1) Students should have completed the MAPS-GIS Tutorial activity and be familiar with geospatial skill such as viewing data layers, performing Boolean logic queries and analyzing spatial patterns.
- 2) Students should be familiar with concepts of tree species.

Materials: Computer access with high-speed internet, student activity sheet

Lesson Estimated Time: Approximately 60 minutes

Lesson Procedure: A basic introduction to the concepts of species distribution, fire frequency, and GIS should proceed the exercise.

Assessment/Evaluation: Will vary

References and Citations: None