Middle Bear Dendro Class

Sky Island Science Investigators – LTRR

Activities:

**Introduction to Dendrochronology**

Materials: Tree cookies and tree cores. Increment Borer. Magnifying glasses.

*Essential questions*

* What do trees need to grow?
* What information can we learn from tree rings?
* How can we learn about past climate and fire history of the region from the way trees grow?

*Student misconceptions*

* The oldest wood is on the outside, by the bark.
* Trees grow upward from their base.
* All trees have rings, and all are annual rings.

*Learning structure*

* Discussion within a group of any size, often drawing alone or in pairs, followed by practice coring a tree by small groups or individuals with close supervision and assistance from an instructor.

**Species Identification Activity**

Materials: White Board, Markers, Measuring Tapes, Species Identification Color Sheets, Increment Borers (3) & Paper Cores

Using the Species Identification Color Sheets, students will survey the tree species in their site (wash or hillslope location) and measure the diameter of the tree trunks. Students will record their data. Students will also map their survey site – drawing a “plan view” or “bird’s eye view” of the site.

Data Sheet Example:

|  |  |  |
| --- | --- | --- |
| **Tree Species** | **Diameter (in inches)** | **Number of trunks** |
| Ponderosa Pine | 20 | 1 |
| Arizona Walnut | 10 | 2 |

After reviewing their data, students will determine which tree has the largest diameter. Students will then core this tree, and make observations. Following data collection, students can graph the species diversity within their study area.

Tree rings are an example of climate proxy data, providing indirect evidence of past climates. Scientists can use tree-ring patterns to reconstruct regional patterns of climate change. The amount of tree growth depends on various local environmental conditions.

**Fire Ecology Mapping Exercises**

Materials: White Board, Markers, & the exercises developed by Lori Daniels.

We will discuss different features we can observe in tree rings, such as release, suppression, and marker rings.

Students will examine thirty “cookies” collected from trees after a wildfire in 2001. Tree cookies with fire scars demonstrate tree adaptations to fire. Using images of fire scarred trees, students will use several types of evidence derived from tree-ring analysis to determine the date of a forest fire and map its impact in the forest.

Following the mapping activity, we will discuss difference in tree-ring width as a result of fires, droughts, and insect activity – and how we determine each.

**What Cores can tell us: Soil profiles vs Tree Cores.**

Materials: Spades, and Water Infiltration Kit items.

1. The transformation of parent material into soil is brought about through interactive physical, biological, and chemical processes as considered by the soil forming factors. This results in the organization of soil into distinctive layers, or horizons. The differentiation of soil into horizons is a hallmark of soil formation. The kinds of properties and horizons that develop in soils depend on the nature, intensity and duration of these processes, which are in turn governed by climate, geology, living organisms and landscape topographic factors. Soil profiles are two-dimensional vertical cuts down through the soil that include all the horizons.

Students will dig a soil profile in their site (wash or hillslope location) to make observations about the soil layers.