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ESCI 340 BIOSTATISTICAL ANALYSIS

Project 2: Moss Growth on Maple Trees

Perhaps you were told stories of lost people navigating by using moss growing on trees as a compass. Such stories assert that moss grows on the north side of trees. Now that you have studied college-level biology, you probably have a deeper understanding of moss distributions. One of the primary determinants of moss growth is water availability, which tends to be higher on north-facing surfaces in some environments, but not in all. … In this project, you will compare moss growth on upward facing surfaces (higher water availability) vs. moss growth on downward facing surfaces (lower water availability).

Research Question

How does relative exposure to moisture affect growth of mosses on the bark of bigleaf maple trees?

Hypothesis

Moss growth and coverage on trunks of leaning bigleaf maple trees is greater on upward surfaces than on downward leaning surfaces, because upward leaning surfaces are exposed to more water.

Note that this study is observational, rather than experimental. You will collect data on moss coverage on trees surfaces that differ in many factors beyond your control. You will attribute differences in your samples to differences in some of the factors, but you will not determine whether or how those factors actually caused the observed differences. In particular, effects of surface orientation on moss growth and coverage may be confounded with proximity to forest canopy gaps, proximity to other forest edges, nutrient availability, proximity to source populations of mosses, and orientation to climatic factors such as exposure to sun and prevailing winds.

Field Methods

Find one or two partners and walk to Sehome Hill Arboretum.

1 Select a bigleaf maple tree at random from all bigleaf maples in your vicinity.

2 Is the trunk vertically oriented? If yes, return to step 1. If no, continue to step 3.

3 You will select a height on the maple trunk at random, between one and two meters above the ground. Select a random number between 0 and 100. Add this number to 50. The resulting sum is the height (cm) above ground level at which you will measure moss coverage. At this height, place your quadrat frame on the upward facing surface of the maple trunk. Estimate the moss coverage to the (nearest 10%) within the quadrat frame. At the same height, place your quadrat frame on the downward facing surface of the maple trunk. Estimate moss coverage within the quadrat on that surface.

4 Repeat steps 1-3 until you have measured moss coverage on at least ten trees.