

Ecological Succession Lab

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In Southern Michigan, as in other Biomes, there is a succession of communities which may be observed and measured. This succession of communities can be thought of as a Timeline from the Pioneer Stage to Climax Stage. Once the students understand the concept of change over time, it enables them to view any community with reference to both its past and its future condition.

A given organism found in any community is considered a resident, a remnant of any previous stage or an invader from any future stage. Invader plants appear to drive the change. Animals tend to follow the plants which are the basis for their food chain or food web. Succession of communities is a continuum rather than a series of stages. However, general stages can be identified. Each community creates physical conditions to which the invader species are better suited than the resident species. The succession is orderly and directional from Pioneer to Climax.

This lab meets Science Benchmark currently called III.5.HS.4: All students will explain how parts of an ecosystem are related and how they interact; explain how energy is distributed to living things in an ecosystem; investigate and explain how communities of living things change over a period of time; describe how materials cycle through an ecosystem and get reused in the environment; and analyze how humans and the environment interact.

This lab gives teachers and students a way to examine the communities in their continuum. Or, they may sample in one or 2 communities and use the data given to make comparisons.

The research for this lab is a summary of findings reported by S.L. Beckwith, "Ecological succession on abandoned farm lands and its relation to wildlife management." *Ecological Monographs* 23, 1954.

The Community Stages in most Southern Michigan locations include

Community / Stage	Years to Develop	Age of Continuum
Pioneer	0-3	1-3 Years
Perennial Grass	1-12	1-15 Years
Mixed Herbaceous Perennial	5-16	6-31 Years
Shrub	16-20	23-51 Years
Intolerant Tree	5-50	28-101 Years
Mid-tolerant Tree	25-80	53-181 Years
Tolerant Tree	Climax	181 plus age of oldest Tolerant Tree Stage trees