Biodiversity: Biomes with BiomeViewer Teaching Notes

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General course information:
Department: Biology
Level: Introductory Undergraduate
Course Type: Lecture
Students: Majors
Number of Students: 100-150

I teach Introduction to Ecology & Evolution every semester. It typically has 100-150 students, and is required of all bio majors. It also satisfies a core requirement so it always attracts non-bio majors as well. I break the course into 3 units: Evolution, Tree of Life, and Ecology. This would happen at the beginning of the Ecology unit. I designed this activity to go along with the SimUText Biodiversity chapter. It connects specifically to section 4, which describes biomes. SimUText ecology resources can be found here. For this activity, students will use a free online app called BiomeViewer which can be found here.

Resource Locations (in case previous hyperlinks do not work)

- http://simbio.com/products-college/simutext-ecology
- https://www.hhmi.org/biointeractive/BiomeViewer

Learning Outcomes/Objectives:

- Comprehend and interpret a climatogram
- Understand broad global patterns of temperature and precipitation
- Connect abiotic factors to biodiversity
- Collect data and determining whether or not those data support a hypothesis
- Explain how global atmospheric and oceanic circulation patterns affect the local climate and thus the location of biomes.
- Explain why biome classification schemes can differ. In particular, describe why some schemes recognized more distinct biomes than others.

Background knowledge: This is designed to happen in class after students have completed section 4 of the Biodiversity SimUText chapter. Students will have completed a unit on the Tree of Life, so this would mark the transition between describing Earth's biodiversity, and analyzing that biodiversity (where, why, how) through the lens of Ecology. This took us 40 minutes to work through. I teach 75 minute classes, and so I preceded it with an introduction to some of the abiotic factors that influence biodiversity as well as what biomes are and how they are defined.

Adapting the case-study: To shorten this, or for a more abiotic focus, the final portion could be left out. There are lots of ways to go deeper. BiomeViewer has an “anthromes” tab that this doesn’t deal with. Additionally, you could more directly integrate use of the temperature, precipitation, and terrain tabs. The way I’ve set this up, students will likely use those in their investigations, but I haven’t explicitly provided instructions to do so.

Classroom management: I present this activity as a series of slides that guide students through an online investigation that they need an internet-connected device (or an iPad with the app previously downloaded) to complete. I have students work in small groups to troubleshoot and discuss, and I use PollEverywhere (which all students in my class are registered for and use daily) to record student feedback and ideas.