Climate Lab Student Materials – Lesson 2

Activity 1: Signal vs. Noise: What's *really* going on?

Activity 1

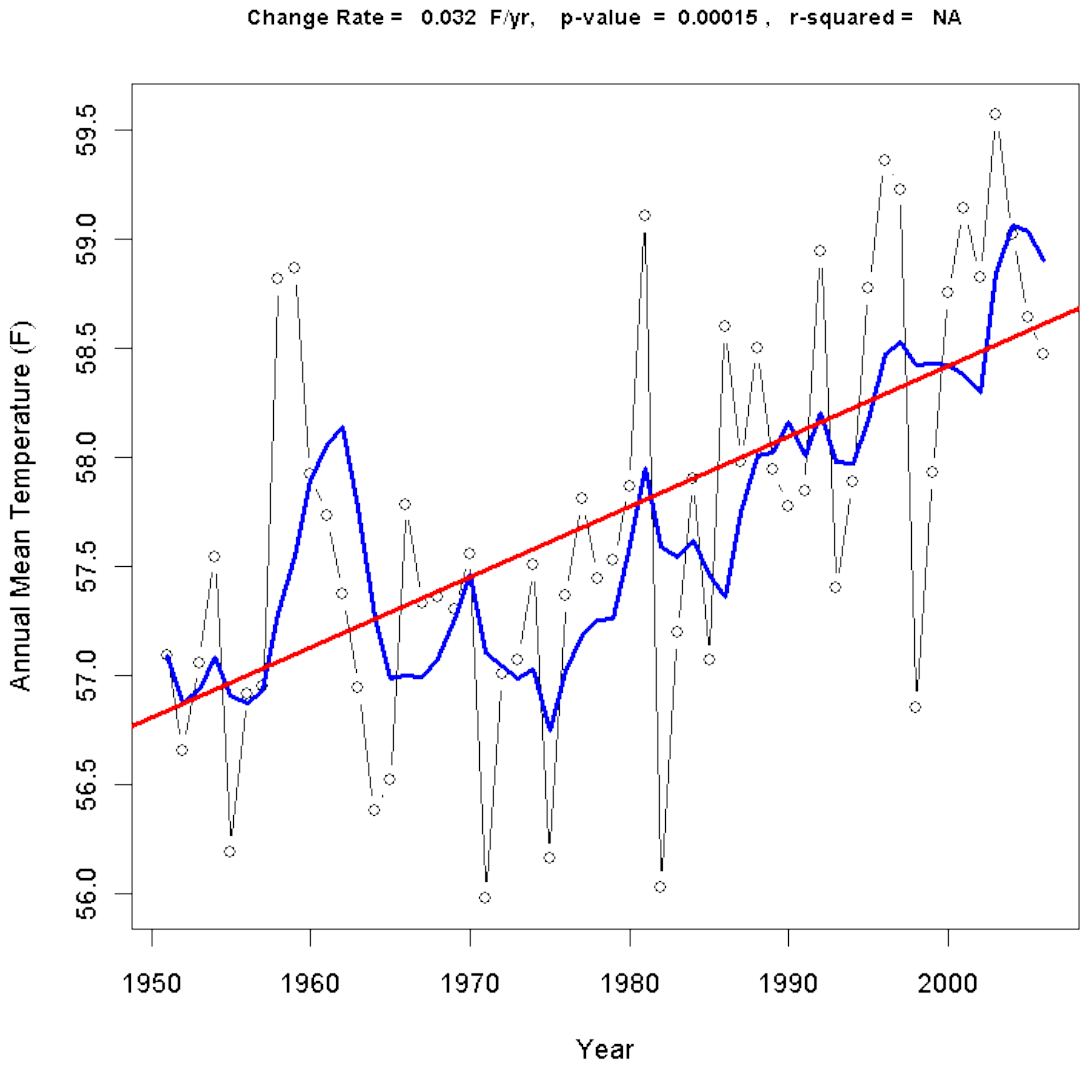
Given that the range of many species is limited by temperature, one of the expected responses to global warming is a shift towards areas with lower temperatures. Plants and animals moving north on land, or towards deeper water in the ocean. These changes have been observed in ecosystems all over the world, more or less as expected.

In California, however, 64 species plant have moved *downhill* by an average of 260 feet between 1930 and 2000.

In your small groups, discuss, and then agree on a possible explanation for why those species are moving downhill. You don't have much information, so just come up with the best idea you can, as a group, based on what you know.
Once you have your idea, think about how you might go about investigating further.

- What sort of information would give you a clearer signal about what's going on?
- What sort of information would disprove your idea?

Now, look at this graph of temperature in California over the last 50 years, and think about it as you move into a full-class discussion.



Map produced by ClimateWizard (c) University of Washington and The Nature Conservancy, 2009.
Base climate data from the PRISM Group, Oregon State University, http://www.prismclimate.org

Activity 2: How do plants and animals experience climate?

Your teacher will give you (or ask you to choose) a plant or animal species that lives locally. Fill out a month-by-month calendar of events for your assigned species, using what you know about the species already, or what you can find out from reliable sources (ask your teacher to recommend a couple of sources).
Your calendar should answer the following questions:

- Is your species active or visible in this month? If not, why not?
- If active, what behavior is your species exhibiting? (example answers - seeking a mate, mating, flowering, fruiting, rearing young, migrating, growing, gathering resources for mating or for winter)
- What would happen if less water was available than your species is used to at this time?
- What would happen if temperature increased and precipitation did not?
- What would happen if precipitation increased?

Names of students in group: **Date:_____**

_____
_____
_____
_____
_____

Species name:_____

Using this chart, write down the main things your species will be doing, month by month. As you go, think back to the activity on weather and climate, and note any ways that temperature and precipitation may influence what your species is doing.

January - *Winter*	February - *Winter*	March - *Spring*
April - *Spring*	May - *Spring*	June - *Summer*
July - *Summer*	August - *Summer*	September - *Autumn*
October – *Autumn*	November - *Autumn*	December - *Winter*

This activity is designed to get you thinking about the life histories and seasonal habits of local plants and animals, and how those are influenced or governed by the regional climate. It's also worthwhile to think about how different species interact with each other, at the same time as they are reacting to their regional climate.

For example, red-tailed hawks sometimes migrate south in the winter, in part because of cold, and in part because the species they eat (like chipmunks) have migrated, are hibernating, or are under the snow.
Chipmunks, sometimes prey for hawks, hibernate because temperatures are low, and food is scarce in the winter, and foraging for food while maintaining body temperature would require a lot of energy.
Chipmunks in turn live off of a variety of foods, including fruits, nuts, bulbs, and mushrooms, all of which are dead, frozen in the soil, or too scarce to be a reliable food source during the winter. In summary, the fact that one species is effectively absent during the winter may result in the absence of another species that relies on the first.