

The Boston-Area Climate Experiment

Characterizing ecosystem responses to climate change

The Boston-Area Climate Experiment (BACE) will help researchers understand how ecosystems respond to climate change. In the past, researchers have studied how ecosystems respond to a single amount of warming. In the BACE, plots of land will experience twelve different climates. For the first time, researchers will be able to ask whether processes and properties of communities and ecosystems respond linearly to changes in temperature, or whether there are important threshold temperatures that could be reached. Also, to what extent does an ecosystem's response to warming depend on precipitation patterns? Researchers will measure responses of several variables, including growth of wildflowers, grasses, and tree seedlings.

Experimental design: Twelve climates

Study areas: In an "old field," 36 square plots of land, 2 meters on a side, are being studied.

Three precipitation treatments: no change, -50%, and +50% of actual precipitation

- Structures with clear, partial roofs and sprinklers alter precipitation

Four temperature treatments (to start): no change, or +200, 600, or 1000 W m⁻² of warming

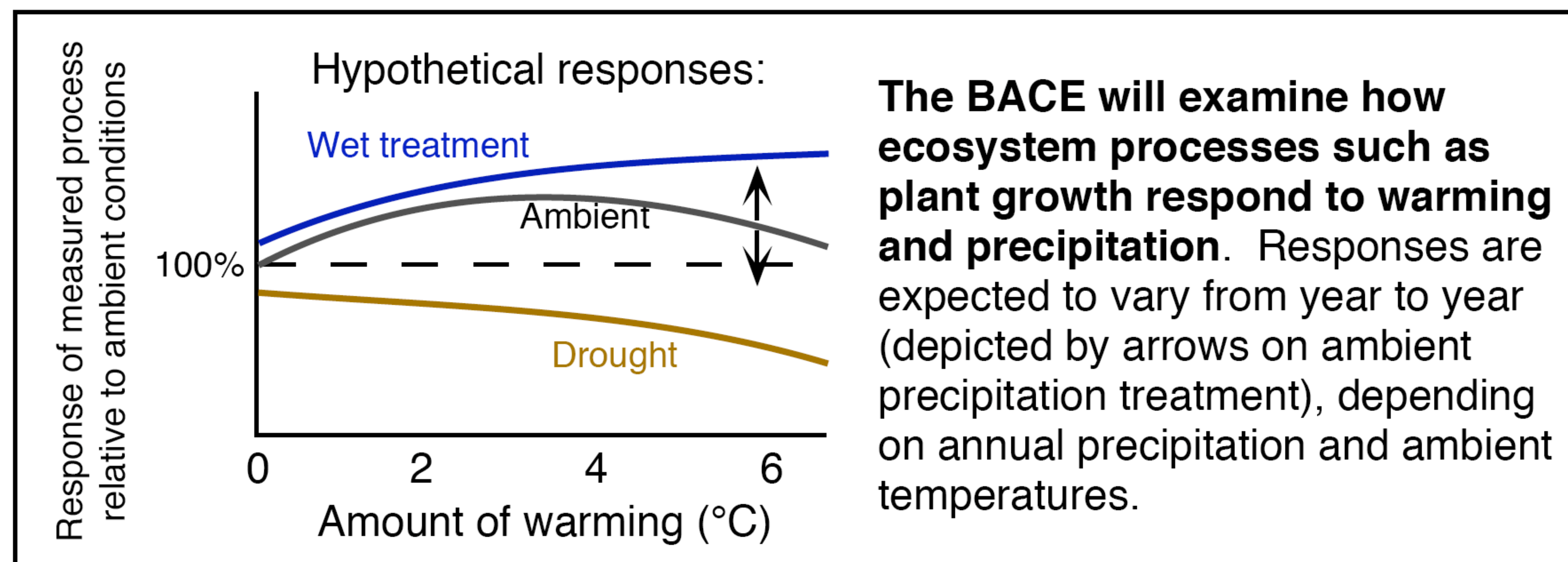
- Above each plot, four ceramic infrared heaters provide the additional warmth



What is measured?

Plant growth per year
Soil respiration (carbon dioxide leaving the soil)
Responses of different plant species
Cycling of nitrogen in the soil (and many more things...)

Two overarching hypotheses The figures below illustrate our hypotheses:



Public exhibit on climate change

An associated set of displays allows the public to "walk into the future" and view the predicted impacts of climate change.

Location and important dates

The BACE public display and experiment are located at 240 Beaver Street in Waltham.

Public display open: starting Earth Day 2007.

Experiment turned on: late spring, 2007.

For more information, contact:

Jeff Dukes
Department of Biology
University of Massachusetts
100 Morrissey Blvd.
Boston MA 02125
<http://www.ecosystems.umb.edu>

The BACE was established with funding from the National Science Foundation and is supported by the U.S. Department of Energy's National Institute for Climatic Change Research.

