



Connecting the Global Ocean to Inland Audiences

Module 5: The Physical Basis of Weather – Part II

This module extends our learning of the course's central concept of "Ocean/Weather and Climate Connection" with three weather-related lessons and some focused reading. The ocean controls weather and climate by absorbing, storing, and moving heat, carbon, and water. The Earth's ocean, atmosphere and climate have changed over time.

Learning Sequence:

1. Carry out the [Heat Balance – Convection and Density Lesson \(PDF\)](#). You will learn more about convection and density to see how these processes are connected to the water cycle and to weather on Earth. You will also look at computer simulations to observe what's happening at the molecular level. Keep this focusing question in mind as you proceed through the various activities.
2. Carry out the [Phase Change, Humidity, and Precipitation Lesson \(PDF\)](#). You will experiment with different phases of water to determine how water vapor or humidity becomes part of the weather picture.
3. The National Center for Atmospheric Research (NCAR) has a Weather Trail that is open to the public and includes a series of stations that you and your students can carry out. If you live locally, take advantage of its ridgetop location to provide you with tangible experiences of 10 weather phenomena. The trail is accessible virtually with a combination of exhibit text and photographs. [Click here](#) to learn more about these phenomena.

More Resources:

Molecules in Motion Simulation:

<http://mc2.cchem.berkeley.edu/Java/molecules/index.html>

Convection Simulation: <http://www.youtube.com/watch?v=7xWWowXtuvA>

Phase Change Simulation: <http://www.chm.davidson.edu/ronutt/che115/Phase/Phase.htm>