Atmospheric Radiation Measurement
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Local Students Tour SGP Facility

A group of 30 seventh graders from the Deer Creek–Lamont school district received a warm welcome at the SGP site on November 1, 2006. The students and their teacher, Deborah McFeeters, heard a slide presentation on the ARM Program by Dan Rusk, SGP operations manager. With the assistance of technician Pat Dowell and SGP assistant site scientist Daniel Hartsock, Rusk also led the group on a walking tour. The students observed a radiosonde (weather balloon) launch by SGP upper air technicians Lynda Theilen and Mary Green. Theilen and Green explained the procedures used, and one student assisted with the launch.

Figure 1. Deer Creek-Lamont school district seventh graders tour the ACRF SGP site (ARM photo).

Field Campaign to Help Scientists Estimate Carbon Dioxide Exchange

The Radon Measurement of Atmospheric Mixing (RAMIX) field campaign began in November at the ACRF SGP site. The aim of this collaborative effort between ARM scientists and researchers from the National Oceanic and Atmospheric Administration's Climate Monitoring and Diagnostics Laboratory is to quantify the mixing rate of air in the atmospheric boundary layer (the bottom layer of the atmosphere that is in contact with Earth's surface). Regional estimates of carbon dioxide (CO_2) exchange produced by models are prone to error. The RAMIX campaign will provide an independent measure of the mixing rate, which scientists will combine with measured variations in atmospheric CO_2 mixing ratio to estimate regional CO_2 exchange more accurately.

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Long identified as a major contributor to global warming, CO_2 is a target for many scientific investigations. Because CO_2 is absorbed from the atmosphere by vegetation and stored in soil in various carbon compounds, scientists believe that carefully chosen land use and management practices can be effective in reducing global warming. Measurements of regional CO_2 exchange can indicate the net rate of warming or cooling.

Radon is a valuable tracer gas for atmospheric mixing because it is released from the ground and has a limited half-life (3.8 days). These properties allow for characterization of mixing processes on the basis of time variations and/or vertical-profile measurements of radon. Scientists working on the RAMIX campaign will use radon measurements and a radon surface flux model — which will be tested with *in situ* measurements — to calculate accurate estimates of the atmospheric mixing rate. The data from RAMIX will also aid the Aircraft Carbon field campaign, which was developed to evaluate the nature of the carbon cycle through measurement of atmospheric carbon profiles.

Figure 2. Researchers installed a continuous radon monitor at the base of the 60-meter tower at the SGP central facility. A sampling tube connected to the tower supplies air to the container where radon is measured (ARM photo).