

PLANES AND INSTRUMENTATION OF THE NATION'S SNOW SURVEY PROGRAM

In October, the Twin Cities chapter viewed the snow survey planes of the National Operational Hydrologic Remote Sensing Center in Chanhassen, Minnesota. Pat Didier and David Demers, pilots from the NOAA Corps aviation program, gave a presentation on the snow survey program.

The program was started in the 1970s and measures the amount of water contained in the snowpack by measuring the amount of gamma-ray reduction from the ground. Soil contains different isotopes of uranium, potassium, and thallium. Didier and Demers explained how water attenuates the emission of these isotopes and the amount of attenuation indicates the amount of water contained in the snow overlying

the soil and the top 20 cm of the ground.

For each mission, the pilots fly one of two planes along predetermined flight lines about 500 ft above the ground. Based on measurements made just before the soil freezes and the measurements made during the flights after snow has fallen, the amount of water in the snowpack can be determined. Didier and Demers noted there are currently about 2400 flight lines in the United States, southern Canada, and Alaska. The pilots fly about 12 to 15 missions per year. Each mission lasts 3 to 4 hours with about 5 to 10 minutes spent on each flight line.

Didier and Demers explained how measurements are taken using sodium crystals onboard the plane. These sodium crystals detect the gamma radiation from

the soil. The information gathered from the crystals is run through a computer onboard the plane to determine the amount of water in the snowpack. Five sodium crystals are carried on the plane, with two facing up to help strip out the amount of background cosmic radiation, and three facing down to detect the radiation in the soil.

After the presentation, chapter members were able to take a look at the two planes and their instrument packs up close.

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SOLAR EFFECT AND CLIMATE CHANGE

A physicist at Duke University says that the findings and the methodology implemented in theoretical climate models, which are currently used to describe past climate and predict future climate scenarios, should be carefully reevaluated. Historical accidents and inappropriate scientific simplifications might have misled the global climate change debate resulting in an overestimation of the anthropogenic factor and an underestimation of the solar effect, he concludes.

Nicola Scafetta, a specialist in the mathematical sorting of time series and other data from complex systems, presented to the Palmetto chapter in June his findings from the development of a phenomenological multiscale model used to estimate the solar contribution to global warming since 1600. Scafetta claims that a detailed study of the patterns found in the data might yield to an understanding of climate change complementary to the traditional climate model approach.

TOWERING OVER LOCAL EMISSIONS

In California, what may appear to be ordinary media towers could also be monitors of greenhouse gases. As part of a project organized by scientists at the Lawrence Berkeley National Laboratory (LBNL), two towers—one in San Francisco and another south of Sacramento near Walnut Grove—are being utilized to measure carbon dioxide, methane, and other greenhouse gases in the air. The initiative, called the California Greenhouse Gas Emissions Project (CALGEM), is unusual in that the measurements will focus on regional pollution rather than global trends. “This is the first time that the complete suite of greenhouse gases from a mixture of urban, suburban, and rural areas will be monitored in a systematic fashion,” notes Marc Fischer of LBNL’s Environmental Energy Technologies Division. The researchers plan to study weather patterns to determine the source of the emissions measured at the two locations. A California law passed in 2006 requires the state to reduce its greenhouse gas emissions to 1990 levels by 2020 (a 25% reduction) and to 80% below 1990 levels by 2050. Scientists believe CALGEM could help California meet those obligations by providing an accurate monitor of emissions levels. Plans call for the project to eventually comprise 10 monitors throughout the state. (SOURCE: *The San Francisco Chronicle*)