



TOPIC: NORWAY-US IPY SCIENTIFIC TRAVERSE OF EAST ANTARCTICA

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GENERAL BACKGROUND INFORMATION ON THE SUBJECT:

The US-Norwegian traverse is crossing the high polar plateau, an area that few have ever visited and little data have been collected. The team will collect snow samples from the surface and ice cores down to 90 meters (about 300 feet) along the way. The ice at 90 meters is about 1000 years old, and examining them will help us determine what the climate was like that long ago. The team is using radar to track the layers of snow all along the traverse. This tells them how much snow has fallen along the way in different years (the thickness of layers corresponds to snow fall). The team is also using an unmanned aerial vehicle (uav), which is basically a remote controlled plane, to take pictures and radar images of the snow along the way, and setting up automatic weather stations which beam temperature, wind speed, wind direction, and pressure data to researchers in the US via a satellite link.

TERMS YOU SHOULD KNOW (VOCABULARY): **Firn**, which is a term for old snow, snow older than one year found in polar regions where it rarely melts.

WHY ARE WE STUDYING THIS IN THE POLAR REGIONS? Snow, and firn, in polar regions builds up and builds up over thousands of years because temperatures are very rarely above freezing. These built-up layers of snow preserve evidence of past climates, from gases contained in bubbles in the ice, to chemicals (dust, pollutants, radiation, sea salts) found in the snow, to variations in light and heavy isotopes which allow scientists to determine temperature changes in the past. The traverse is going through East Antarctica because very few of these measurements have been made here in the past.

HOW DOES THIS AFFECT US HERE IN THE UNITED STATES?

The climate record contained in the snow and ice in Antarctica reflects things that we in the US have done. For instance, there is a very distinct radioactive layer in the firn that was caused by atomic bomb testing in the 1960's. The absence of lead in antarctic firn marks the switch to unleaded gasoline in the 1970's. Deep cores from East Antarctica provide the longest records of past atmospheric gas concentrations, and show that current and projected future carbon dioxide levels are the higher than any time in the last 800,000 years, and that carbon dioxide and temperature trends are closely tied to one another.

TO LEARN MORE ABOUT THIS TOPIC:

Website: traverse.npolar.no

Book: Two mile time machine, by Richard Alley

ACTIVITY YOU CAN TRY: dig a snow pit in your backyard (No snow? try digging a pit in the dirt). It doesn't need to be deep, maybe a foot or less. Choose a wall of the pit, and make that wall as smooth and as flat as you can. Look for different layers in the snow (or dirt)...maybe there are ice layers caused by rain, or very large crystals if the bottom of your pit is near the ground (these large crystals are called hoar, and are formed by heat from the ground and the air making the crystals grow larger). How thick are some of the layers? what could the thickness of the layers mean?