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GLOBAL CLIMATE CHANGE EXPERTS MEET IN POLSON

By Cary Shimek
University Relations

MISSOULA, Mont.--

Seventy of the world's leading experts on global warming met in Polson this month to discuss ways to coordinate the international flow of terrestrial climate change data.

Steve Running, a University of Montana-Missoula forestry professor and leading biospheric climate change expert, organized the FLUXNET meeting, which was held at the KwaTawNuk Resort on Flathead Lake. FLUXNET is a project being developed by an international group of climate change scientists who are creating a worldwide system to measure fluctuations of carbon dioxide gas (CO₂) in the atmosphere.

"Virtually all the people who came to Polson had never visited Montana before," he said. "I'm pretty sure this was the largest international conference the town had ever hosted. We had people there from 13 countries."

Many of those researchers believe that levels of CO₂ and other greenhouse gases are increasing because of human activity -- such as the burning of fossil fuels -- causing warmer temperatures, rising sea levels, erratic weather patterns, shrinking glaciers worldwide and longer growing seasons.

The Polson conference followed on the heels of the historic December 1997 Global Summit on Climate Warming in Kyoto, Japan, where many nations agreed to reduce emission of greenhouse gases to below 1990 levels over a 15-year period.

Running, who co-chairs the FLUXNET group, said the improved biospheric monitoring system they discussed in Polson is precisely the technology needed to determine if the Kyoto agreement is working.

He said various parts of the world are "sources" -- producers -- and "sinks" -- reducers -- of carbon dioxide gas. Much of the industrialized world produces more CO₂ than it uses, especially during winter when much plant life lies dormant. Areas like the Amazonian rain forest always take in more CO₂ than they produce, converting the gas to oxygen. CO₂ emissions change depending on the seasons, and areas like western Montana actually become sinks for the gas during the green summer months.

A primary tool for global change scientists is the CO₂ flux tower, which monitors CO₂ and water changes in a local area year-round. Resembling radio station transmitters, there are currently about 70 flux towers scattered around the globe, and Running said more are planned. The towers measure the atmosphere in their area every five minutes.

He said there has been no overall organized network to exchange data between the towers. Instead individual towers or regional tower networks have existed -- like AmeriFlux in North America and EUROFLUX in Europe. Now the Polson planners have created a blueprint for a worldwide exchange of information between all the towers -- the FLUXNET system.

"We have lots of raw data," Running said, "but now we will have a global network that will (eventually) give a global map of carbon balance." Pointing to a computer screen in his UM office,

he displays a color-coded carbon map of the world. CO₂ source areas like the United States glow with red or orange colors. Rainforest areas -- CO₂ sinks -- are swathed in blue or green colors. The colors swirl and change as Running shows how the map would look in different seasons.

While computer model maps of carbon balance look nice, he said, they aren't sure they are accurate. The computer models need to be tested against the flux towers and the Earth Observing System, a satellite NASA plans to launch next year that will measure greenhouse gases. Running has been designing the software for the Earth Observing System for the past 13 years.

"When we finally launch ... that's the big payoff," he said. "The satellite will produce a global carbon map of the world every eight days."

Scientists will be able to verify the satellite data with Earth-based CO₂ flux towers. Then, accompanied by computer models, they should be able to provide policy-makers with a complete global analysis of whether the Earth's climate is indeed changing.

"I'm convinced we are seeing the leading edge of human-induced global warming," Running said. "There are just too many lines of evidence showing that it's warmer than it's supposed to be. But we don't know how big or how fast (global warming) will come on."

Years from now at the next summit on global warming, Running hopes to provide world leaders with detailed, accurate measurements of CO₂ fluctuations in the atmosphere. And the groundwork for providing future lawmakers with this data may have been laid in Polson.

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