NOAA 'TALL TOWER' TO TRACK FRONT RANGE CARBON EMISSIONS, AIR QUALITY

July 31, 2007 — A new sensor in what will be a broad nationwide network for tracking carbon is now monitoring the air over Colorado's Front Range. A 1,000-foot-high tower east of Erie is one of 12 "tall towers" being instrumented by NOAA to capture the regional ebb and flow of atmospheric carbon. This network of sensors monitors the natural carbon cycle and fossil fuel emissions, which help drive climate change. NOAA's Earth System Research Lab in Boulder, Colo., is developing the tower network across the nation as part of its global observations of carbon-cycle gases.

"Boulder and other cities are spending money to reduce their fossil fuel emissions. They need accurate data to know what is working and what is not," says ESRL scientist Arlyn Andrews. "With this new regional information, decision-makers will be able to see if their emissions reductions have an impact on the atmosphere."

Cities and states have relied on proxy data, such as point-source inventories, gasoline sales records, and other tallies to estimate fossil fuel emissions, but there has been no objective way to verify what is released into the atmosphere.

The tower instruments in Erie are expected to give scientists the detailed information they need to tell how the region's carbon dioxide is affected by forests, crops, or an upwind Front Range city. Finding carbon monoxide in the same air parcel, for example, is a clue that the carbon dioxide source is a high-traffic urban area, since carbon monoxide is produced through combustion.

As other towers in the network collect similar regional details from around the country, the data will be fed into ESRL's online Carbon Tracker site, a powerful data framework unveiled earlier this year. Now geared to scientists, Carbon Tracker will ultimately provide easy-to-use information on local scales for policymakers, business leaders, teachers and the public. **(Click NOAA image for a larger view of the 1,000-foot-high tower which is now monitoring the air over Colorado's Front Range. Please credit "NOAA.")**

Land use, drought, forest growth, wildfires and

the daily carbon flux produced by daytime plant photosynthesis and nighttime respiration can dwarf short-term changes in human-produced fossil fuel emissions. Over time, however, the release of carbon dioxide as a byproduct of fossil fuel combustion has raised atmospheric levels 30 percent since preindustrial times.

"Eventually we'll be able to measure all of these effects — natural and human. Nature has been giving us a break on carbon storage. If that starts to change, we need to be able to see it," Andrews says.

For the U.S. network, NOAA rents space on television broadcast towers up to 2,000 feet high — tall enough to capture air from several hundred miles upwind and give a regional view of atmospheric carbon levels. The Erie tower is an exception. NOAA built it in the 1970s to gather wind, temperature, humidity and other weather data for research and forecasting, and it still collects those data today. Known as the Boulder Atmospheric Observatory (BAO), the steel-scaffold structure supports two elevators that carry people and instruments to the top.

So far, the U.S. NOAA network also includes active towers in Park Falls, Wis.; Moody, Texas; Argyle, Maine; and West Branch, Iowa. Seven other sites are planned over the next few years in Illinois, California, South Carolina, North Dakota, Nebraska, Alabama, and Ohio.

In Erie, the carbon dioxide and carbon monoxide sensors sit in a six-foot high metal frame at the base of the tower. They draw in air through tubes from three different levels along the tower. Next year, ESRL scientists will begin gathering air in metal flasks, which will be sent to the Boulder lab for analysis. The flask samples will provide even greater detail on sources of Front Range carbon emissions.

In a separate air-quality study starting July 23, NOAA/ESRL scientists will install four additional instruments on the NOAA tower to measure particulates, pollutants that form ozone, and ozone itself, with a special interest in nighttime chemistry. Researchers will also comb the data for clues on how natural gas production in Weld County is affecting regional air. For two weeks, air quality instruments will collect data nonstop from the surface to the tower top from aboard an elevator. **(Click NOAA image for a larger view of NOAA staff working on the 1,000-foot-high tower which is now monitoring the air over Colorado's Front Range. Please credit "NOAA.")**

The National Oceanic and Atmospheric Administration, an agency of the U.S. Commerce Department, is celebrating 200 years of science and service to the nation. From the establishment of the Survey of the Coast in 1807 by Thomas Jefferson to the formation of the Weather Bureau and the Commission of Fish and Fisheries in the 1870s, much of America's scientific heritage is rooted in NOAA.

NOAA is dedicated to enhancing economic security and national safety through the

prediction and research of weather and climate-related events and information service delivery for transportation, and by providing environmental stewardship of our nation's coastal and marine resources. Through the emerging Global Earth Observation System of Systems (GEOSS), NOAA is working with its federal partners, more than 60 countries and the European Commission to develop a global monitoring network that is as integrated as the planet it observes, predicts and protects.

NOAA

NOAA CarbonTracker

NOAA BAO Tower

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