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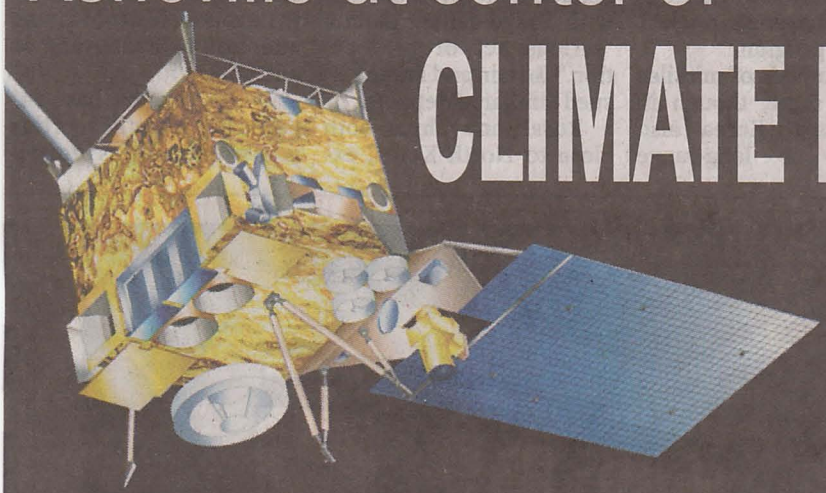
CITIZEN-TIMES
VOICE OF THE MOUNTAINS • CITIZEN-TIMES.com
SUNDAY EDITION
SUNDAY, JULY 5, 2009

Asheville at center of CLIMATE RESEARCH



With the history in hand, researchers to chart weather future

ASHEVILLE – Researchers in Asheville have spent 60 years collecting vast amounts of weather data, working amid little fanfare.

Now more scientists are headed to the National Climatic Data Center to comb the weather of the past for clues to predict the weather of the future, helping governments, businesses and individuals deal with the world's changing climate.

Backed by $32 million in federal funding, the new Cooperative Institute for Climate and Satellites will bring as many as 100 scientific jobs to the National Climatic Data Center, enhancing Asheville's role as a leader for climate change research.

"If someone tells you the Earth is going to warm by 2 degrees, or 4 degrees, it's hard for you to get your head around the globe," said Otis Brown who will head the new research group. "You want to know what's going to happen where you live and work."

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NCDC stores:

2,000 gigabytes
of data daily

3.5 million gigabytes
of data going back more than a century

Data received from:

16 orbiting satellites
operated by NOAA and the Defense Department

50 Doppler radar sites
across the country

300 National Weather Service stations
at airports reporting hourly

10,000 cooperative weather sites
reporting daily, including ships and buoys at sea and weather balloon launches

115 sites in the Climate Reference Network
reporting data, including the N.C. Arboretum and the Mountain Horticultural Crops Research Station in Fletcher

Asheville's role grows in climate change forecasts

Research will build on data mine

By Dale Neal
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ASHEVILLE — From the big-picture view of satellites orbiting Earth every hour and a half, weathermen can tell you if it's going to rain in your backyard this weekend.

Now scientists coming to Asheville hope to use that same satellite data to forecast what weather patterns people can expect by the end of the century.

"Climate is changing, and it's clear that humanity at large is the main reason for this change," said Otis Brown, who will head a new group of university researchers at the National Climatic Data Center in Asheville.

"We're looking at 50- to 100-year time scales where it's hard to argue that the changes aren't going to be very significant and affect quality of life for hundreds of millions if not billions of people."

In part by using an archive of weather records stashed in Asheville's Grove Arcade starting in 1950, NCDC is shifting its mission beyond a massive storehouse in the federal building to a cutting-edge research center that can confidently predict how climate will change.

The information could be tapped by businesses, engineers, governments and others needing to plan for the future.

Brown will head NCDC's new Cooperative Institute for Climate and Satellites in Asheville, while another center will be housed at the University of Maryland.

Project cost

The project is expected to cost $93 million over the next five years, with $32 million earmarked for Asheville, adding perhaps as many as 100 scientific jobs to the area.

Civic leaders ranging from the Asheville Chamber of Commerce to the Asheville Hub, a local economic think tank, worked behind the scenes, pushing Asheville as a prime candidate to host the new climate research institute, to promote job growth and more graduate education in science and technology.

"We have been working for years to build collaborations among community leaders in preparation for opportunities similar to the new institute," said Max Lennon, president of Education & Research Services in Asheville.

With Congress considering a cap-and-trade bill on carbon emissions, U.S. policymakers are starting to look at how to ward off the worst impacts of climate change.

Scientists say the world's climate is growing steadily warmer and largely blame greenhouse gases given off by the burning of fossil fuels in cars and power plants.

How will climate changes affect the bottom line for many businesses?

Airports may have to consider longer runways to get jets off the ground as temperatures warm. Engineers may have to design different bridges as rainfall patterns change, increasing the risks of flash floods.

"We're trying to understand the confidence levels for certain investments," Brown said. "If you're a ski-slope operator in the Southern Appalachians, facing these warming winter nights that are projected, at what point does your business model no longer work?"

To find those answers, Brown and his team will start with the vast amount of data at NCDC.

If researchers can feed that data into new computer models to replicate past changes seen in the climate, then they could predict with some confidence what the warming trends in the world's climate could mean for transportation, agriculture, rising sea levels and public health.

Vast records

For more than a half century, NCDC has been home to the world's largest archive of weather records, with 3.5 million gigabytes of data stored in the federal building in downtown Asheville.

But each day, satellites, ships, radar towers, weather balloons, airports and other weather stations send another 2,000 gigabytes into Asheville. That's the equivalent of 425 movie DVDs, added to the massive databases each day.

The National Atmospheric and Oceanic Administration just launched a new geostationary satellite last week from Cape Canaveral, Fla. The agency has 16 dedicated satellites that measure weather and climate data from ocean and land temperatures and solar activity, adding to the wealth of information flowing into Asheville's archives.

In recent years, NCDC has built out a Climate Reference Network of 114 sites that go beyond the day-to-day observations of weather station and measure changes over the seasons. The first site was placed at the N.C. Arboretum with another at the Mountain Horticultural Research Station in Fletcher.

Now, NCDC is moving ahead with five more stations in Colorado as part of a program to add another 1,000 more climate stations nationwide for more local coverage.

"We've been moving toward a reorganization that will help us do a better delivery of climate services that are going to be needed with the nation's focus on climate change," said Sharon LeDuc, assistant director of NCDC who will be the federal manager of the new institute.

Working with faculty at N.C. State University — as well as universities including Princeton, UNC Chapel Hill, Duke, Columbia and Miami — the new institute will give NCDC more intellectual firepower, adding to an existing brain trust of Nobel laureates.

Scientists at NCDC contributed to the climate change reports issued by the Intergovernmental Panel on Climate Change, which was awarded the 2007 Nobel Peace Prize.

The missing piece

Academics will comb through the satellite data that has been stored at NCDC over the last 30 years, and start sorting the data that is beaming down continuously from an array of 16 climate satellites operated by NOAA and the defense department.

"While we have a few hundred years of weather records on the ground, the satellite data didn't really begin until the 1970s," said Greg Wilson, a scientist and entrepreneur who heads Scientific Research Corp., a private weather company that opened offices in Asheville last year.

"It's a matter of precision. The data that has been taken for weather purposes has not always been enough to look for a climate change signal. We're looking for both the natural and the human-induced climate change, and we have to be able to look at the whole globe and on a regional and local scale," Wilson said.

The cooperative institute has been "the missing piece to bring the science and technology people here to Asheville, along with the graduate education in weather and climate science," Wilson said.

Brown said the institute's mission is to help governments, policymakers, businesses and individuals weigh the risks of climate change.

Raised in Raleigh, Brown is an oceanographer who obtained his undergraduate degree from N.C State and graduate degrees in physics from the University of Miami. He's spent his career in Miami, serving as dean of the Rosenstiel School of Marine and Atmospheric Sciences.

Brown saw an opportunity to return to North Carolina and to make a difference with the work of the institute, tackling the challenge of greenhouse gas emissions that are changing the world's climate.

"We as humanity are going to be big losers if we don't start doing something quickly. This is cutting edge science that needs to be done and you can see the societal benefit. If we succeed, we will make a difference."

NATIONAL CLIMATIC DATA CENTER

Mission: Collect, store and provide information on climate. The difference between weather and climate is a measure of time. Weather is what conditions of the atmosphere are over a short period of time, and climate is how the atmosphere "behaves" over relatively long periods of time. An agency of the National Oceanic and Atmospheric Administration.

Number of employees: 161 federal workers based in Asheville, 90 contract workers with 10 different companies.

Budget: $80 million annually.

COOPERATIVE INSTITUTE FOR CLIMATE AND SCIENCES

An academic partnership with NOAA headed by N.C. State University and the University of Maryland.

Mission: Researchers will sort through 30 years of satellite data as well as incoming information, looking to build computer models to more accurately predict changes in climate over the next century.

Employees: 20 employees in Asheville, with up to 100 in five years.

Budget: $32 million in Asheville over the next five years.