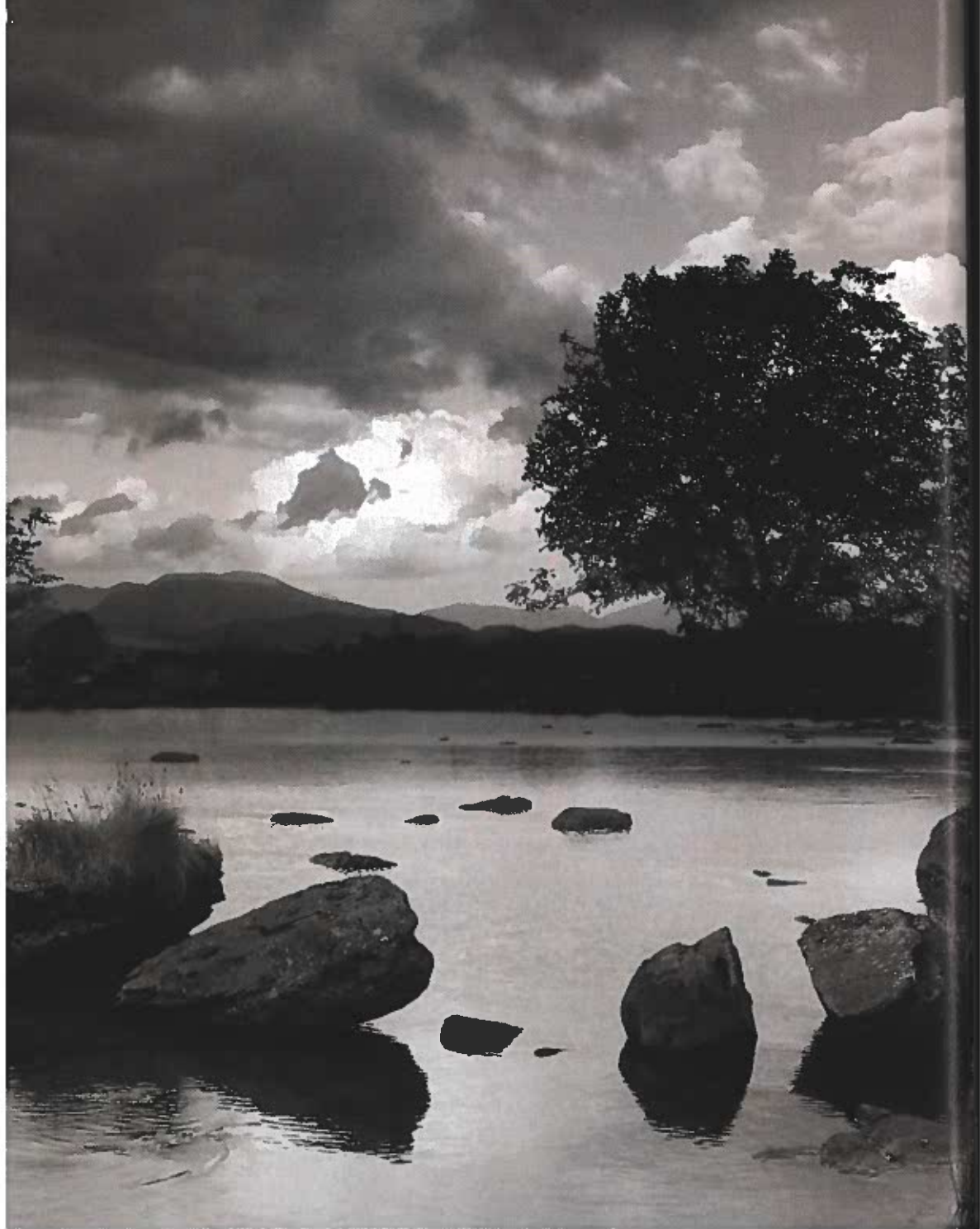


Federal
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The world's largest climate data center calls Asheville home. *By R. Kelly Coffey*

I have arrived at the national headquarters of an important federal agency for a prearranged tour. Its work influences the economy and, in fact, could have life-or-death consequences. This agency is located not in Washington, D.C., but in downtown Asheville, home to the National Climatic Data Center (NCDC), a sub-agency of the U.S. Department of Commerce's National Oceanic and Atmospheric Administration.

NCDC is the nation's weather data library. While the familiar National Weather Service provides weather forecasts, NCDC is concerned with weather in the past. NCDC is responsible for holding and distributing a wide variety of climate information collected across the country and the world. And I am here to see how it works.

After passing through tight security, I meet my tour guide, William Angel, an NCDC meteorologist and native Tar Heel who grew up in Hendersonville. As with many folks, he was unaware that a major

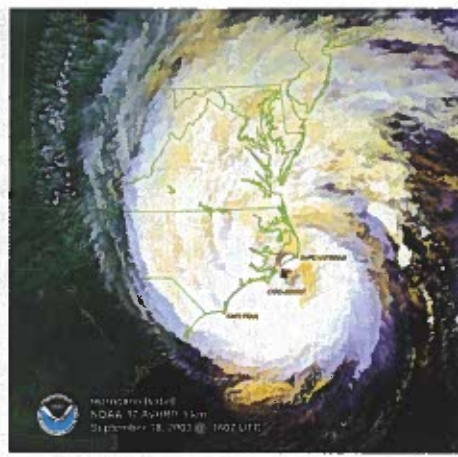


worldwide
Weather

federal agency was headquartered nearby. "I've been interested in weather since the fourth grade," he says. "One day my father offered to take me to visit the National Climatic Data Center in Asheville, and I was surprised to know it was so close by." NCDC is the primary occupant of the Veach-Baley Federal Building on Patton Avenue, where it shares space with the field offices of other federal agencies like the IRS and FBI. Formerly located in the nearby Grove Arcade, NCDC has been in Asheville since 1951.

Weather warehouse

NCDC's sibling agency, the National Weather Service, collects weather data, uses it for forecasting, and transfers the data to NCDC for archiving and dissemination (technology, however, now is so advanced that NCDC receives the data almost as soon as it is collected). The National Weather Service, in turn, depends on the latest



Hurricane Isabel makes landfall in September 2003.

scientific equipment, like satellites and radar, to collect many atmospheric records. But for all the sophisticated technology and highly specialized knowledge utilized by the agencies, much of the data originates in a somewhat modest manner with a diverse group of approximately 10,000 local weather observers —

farmers, radio stations, and universities, for example — who measure temperature, precipitation, wind speed, and various atmospheric phenomenon at sites across the nation. Most are volunteers. "All they do goes into what we do here," Angel explains.

The tour of the agency begins in a small museum room containing an assortment of artifacts and information from the agency's past, like a weather logbook from the 1870s and several historical weather-measuring instruments. A 1916 copy of the Asheville *Weekly Citizen* is displayed with a major headline story on the flood that occurred that year. The earliest records in NCDC's collection are colonial weather observations that might be considered crude by today's standards but are valuable nonetheless in understanding overall climate changes. Perhaps the most interesting records on file in

Wild Weather

BY JOHN HAIRR

On the evening of August 31, 1856, one of the most powerful hurricanes to ever strike the Cape Fear coast roared ashore in New Hanover County near Wilmington. High winds and torrential rains spread destruction across much of eastern North Carolina and coastal Virginia before the storm headed back to sea off Norfolk. Rivers such as the Cape Fear and Neuse went on a rampage, inundating fields, carrying off bridges, and washing away navigational structures. But it was the storm surge that helped this storm claim a place in our state's hurricane lore.

The hurricane season of 1856 was a particularly active one in the Atlantic, as several storms plagued the coast from New England to Texas. The first of the hurricanes to strike the southeastern United States in August 1856 was the Last Island Hurricane, which came ashore on August 15, 1856, at the Louisiana island of Isle Derniere. Winds estimated as high as 130 miles per hour drove heavy rains that lashed the island, which was completely covered by the

13-foot storm surge. More than 150 people lost their lives in this killer storm.

The next hurricane struck on August 30th, 1856, coming ashore in the Florida Panhandle near Cape San Blas. Southeastern North Carolina experienced heavy rains from the storm for only a brief period. Conditions, however, deteriorated after nightfall as another storm approached the Wilmington area. Unbeknownst to the inhabitants of the region, this was an altogether different storm, approaching the Cape Fear not from the west, where the Cape San Blas Hurricane was still hammering away at the Gulf Coast, but from the southeast, straight off the Atlantic Ocean.

Winds of change

An unnamed correspondent for the *Wilmington Journal* described the wind conditions he observed that evening. "In the course of last night, the wind veered round from north or northeast to south or southeast, blowing onto the coast, and giving every reason to fear for the safety of shipping."

The storm surge that accompanied this hurricane as it made landfall along the Cape Fear coast was enormous. For

more than a half century after the event, Reuben Frost, chief of the U.S. Weather Bureau office in Wilmington, gathered accounts of this storm from the local residents of the area. Remarkably, these accounts describe the ocean's breakers washing over Wrightsville Beach and breaking half a mile inland on the mainland near the home of Charlie Tiegen, a German farmer who lived near Masonboro Sound. Frost dubbed the storm, "Charlie Tiegen's Hurricane."

Frost described the scene at Wrightsville Beach on that eventful evening back in 1856. "Wrightsville Beach was then half a mile wide and had many large live oak trees. The storm washed away most of the live oak trees and those remaining died soon after the storm. There were no buildings on Wrightsville Beach, just a few fishing shacks. Trees, wrecked shacks, and other debris floated across the Sound into Tiegen's yard. The breakers broke around the live oak trees in Tiegen's yard, which was half a mile from the Sound and 30 feet above sea level."

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Asheville are the weather observations of Thomas Jefferson and Benjamin Franklin, including Jefferson's record of weather conditions in Philadelphia on July 4, 1776.

We head into a cavernous warehouse room filled floor to ceiling with paper files of weather data. Randomly glancing at a few shelves, I see weather records ranging from Darlington, South Carolina, in 1943 to San Antonio, Texas, in 1976. A couple of employees are removing data from the shelves and stacking them on carts. The destinations for these files are private contractors in Kentucky and West Virginia who are scanning the paper copies into an electronic format. Angel explains, "Our ultimate goal is to have all records available on the Internet." It appears to be a massive undertaking.

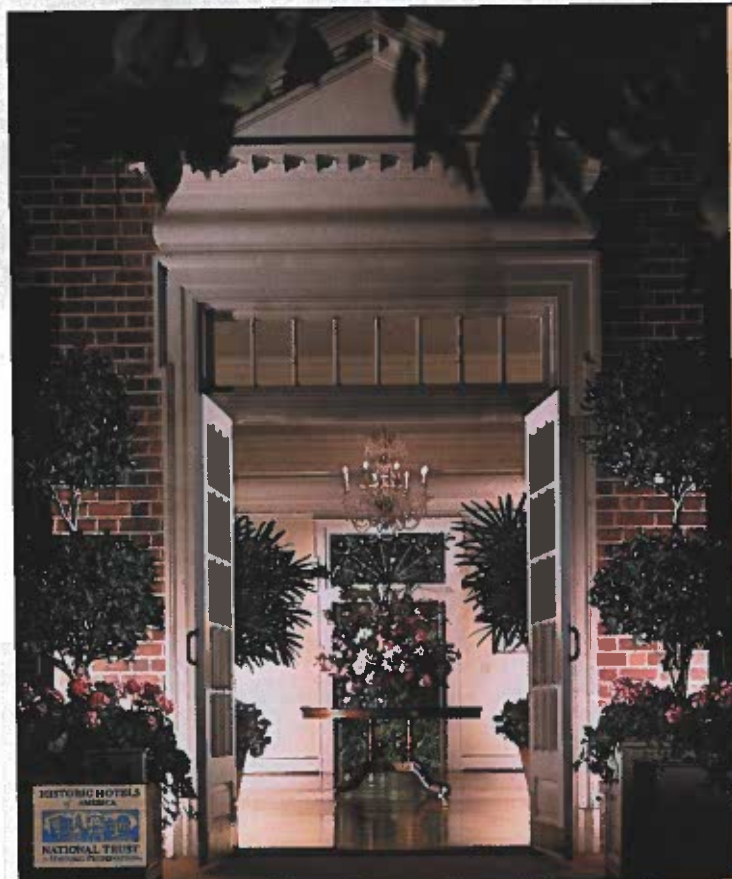
From the records room we go to another part of the building and also to the other end of the technology spectrum. In a much smaller room, long cabinets house numerous

computers that store more recent data already available electronically. The volume of data now flowing into the Asheville agency is incomprehensible. For example, electronic data currently transmitted to NCDC is the equivalent of 72 million pages per day. Angel directs my attention to a glass wall at the end of one of the computer cabinets. Cupping my hands around my face, I peer inside. "I call it a robotic jukebox system," Angel says, and it's an appropriate description. I see a waist-high device with "arms" zipping along a track in the middle of the cabinet, removing and inserting files as it travels in a stop-and-go manner from one end of the cabinet to the other. Angel explains that it is retrieving and sending electronic files in response to orders placed by customers through the agency's website. The agency receives around 2 million data requests per year. I ask how long a customer must wait to receive the requested data

after ordering online. "The average response takes about 10 minutes," Angel replies.

A variety of customers

Who are these users? Knowing the atmospheric conditions at a particular time and place in the past may seem, on the surface, useful only to atmospheric science professionals. The practical uses of such data, however, are countless. Examples include: Insurance companies use climate data to set premium rates, courts find it essential in re-creating the conditions at crime scenes, and architects and engineers need climate information in designing buildings and other structures to withstand winds and temperature extremes. NCDC tracks and categorizes online users. Academic and government users collectively account for only six percent of the total orders, while business users (a broad category that includes agriculture) are by far the most numerous, at 87 percent.



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Wild Weather continued from page 38

Conditions farther south along the coast at New Inlet were almost as bad as at Wrightsville. Waters from the storm surge nearly washed away Zeke's Island, along with the workers quartered there constructing navigational improvements at New Inlet. A correspondent for the *Wilmington Journal* noted that the region had narrowly averted a "Last Island affair."

Inland, the rains from two hurricanes caused raging floods along the creeks and rivers of the state. A report from the *Fayetteville Observer* noted that rising waters carried away bridges and dams along the creeks at several locales across Cumberland County. Upstream from Fayetteville at Haywood in Chatham County, where Deep and Haw rivers unite to form the Cape Fear, an unnamed correspondent penned a letter to the *Wilmington Daily Herald* describing conditions on September 1. "We are surrounded by water," he wrote. "The Rivers are higher than for several

years. The bridge across Deep River at Lockville, broke this evening at 3 o'clock and took off one of the arches of our bridge."

The heavy rains from this storm washed out the railroad embankment along the North Carolina Railroad near High Point. Farther west, between High Point and Salem, water damaged the Fayetteville & Western Plank Road to the extent that it was impassable to stages for a few days.

As the storm sped northeast across North Carolina, it spread its winds and heavy rains northward. New Bern was isolated from news from the rest of the state for at least three days due to the raging floodwaters of the Neuse.

Charlie Tiegen's Hurricane sped across the state, and was out of North Carolina by the end of the day on September 1, 1856.

The hurricanes of 1856 brought to a close the wild weather that had plagued the South for the entire year. In January, the southeastern U.S. experienced the

most intense winter weather outbreak ever recorded. Many rivers and lakes in the Carolinas froze over, and a snowstorm of epic proportions blanketed Virginia and North Carolina with more than two feet of snow. Ice flows were widespread on the Mississippi River as far down as Tennessee and Mississippi, and several people died from exposure in Florida.

This was followed by a severe drought that struck the Southeast and Midwest during the summer. Farmers might have welcomed the rains brought on by the hurricanes that broke the drought, but most of the crops that were eking out a living that dry summer were growing along the river bottoms and lowlands that were flooded by the deluges caused by these tempests.

For North Carolinians, 1856 went down as one of the most unusual years in the state's long history of wild weather.

John Hairr lives in Lillington.



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Having the nation's climate center in North Carolina is itself remarkable, but the NCDC headquarters also serves as one of the four World Data Centers for Meteorology (the other three are located in Russia, Japan, and China), designed to facilitate international exchange of weather data. In addition, the Asheville building also is home to the Defense Department's Air Force and Navy climatological centers, which share resources with NCDC.

Although the agency had a few related predecessors in the late 19th- and early 20th centuries, NCDC as it is today began with the establishment of the National Weather Records Center in 1951 and the consolidation of regional centers in the 1960s into a single national site that, a couple of name changes later, came to be known as the National Climatic Data Center.

An obvious question is "Why was Asheville chosen?" I'm guessing it had something to do with an influential congressman or an agency head from North Carolina, perhaps? "Asheville had a vacant federal building," is Angel's un-sensational answer. It was simple bureaucratic necessity, and the fact that the agency wanted to store the records away from D.C. and other major metropolitan areas in case of a catastrophic attack.

In an age when states and localities go to great lengths to attract sport teams, businesses, and government facilities, the fact that NCDC arrived here with no backroom deals or fanfare may seem unusual. But North Carolina is indeed fortunate that the climate was right for NCDC to call Asheville home. 

R. Kelly Coffey writes from his home in Watauga County.

to know more

As a public agency, NCDC encourages individuals and groups to tour its Asheville facility. Advanced notice is required. For information, call (828) 271-4237.

Data and data products can be accessed via NCDC's website at www.ncdc.noaa.gov.

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