This past April, a violent storm system swept across the American South, leaving a path of destruction stretching from the Great Plains to the Atlantic Coast. On Saturday, April 16, the system hit North Carolina head on, producing more than two dozen deadly tornadoes across the state. Carl Barnes, who graduated from NC State this May with a B.S. in meteorology, was working as a student intern that day in the National Weather Service office in Raleigh. The following is his account of that historic day.

During the April 16 tornado outbreak, I had the unique opportunity to sit in the National Weather Service (NWS) operations office as a student intern as part of a class offered in collaboration with NC State University. In this class, senior undergraduate and graduate meteorology students spend time each week gaining hands-on experience with some aspect of the Weather Service, which prepares us for possible careers with the NWS or elsewhere in the field of meteorology.

The exact time that the interns spend each week at the NWS office on Centennial Campus varies depending on the specific learning objectives for that week. I had been scheduled for Saturday, April 16, for about two weeks, when there was no way to predict what the day would have in store for me. While it was a complete coincidence I ended up working on that day, I feel very fortunate to have experienced such an incredible display of the power of nature.

As the day drew closer, it was becoming obvious that the risk for severe storms to develop was growing based on the computer model forecasts. When I left a seminar at the NWS office the night before the event, there was an undeniable buzz in the air with the anticipation for the next day. As is typical when the threat for severe weather exists, the NWS was taking the necessary precautions of
calling in extra staffing to ensure that their manpower meets the needs of the citizens within the County Warning Area (CWA), the area that a NWS office is responsible for.

The night before the event, I could hardly sleep because of my anticipation for the next day. While our primary role as meteorologists during severe weather is to ensure the safety of the public, severe weather is also what gets a meteorologist’s adrenalin pumping.

*The storm approaches*

When I arrived at the NWS office on the morning of April 16, I was immediately told that I would be following the storm system instead of working on the project I had planned for the day. Brandon Vincent, a forecaster with the NWS who does a lot of work with the student interns, was very generous in taking me under his wing and allowing me to observe him at his work station. The line of storms that produced the tornadoes initially entered the Raleigh office’s CWA around noon, although the cells were mostly just thunderstorms when they entered from the west. This slow start gave Brandon a chance to show me what to look for within the storms and to review how the NWS produced both severe thunderstorm and tornado warnings.

As the storms continued to push east of Charlotte, they developed into more defined supercells and the threat for tornadoes became increasingly imminent. At this point, Brandon set me up with a work station next to his, which allowed me to track the storms in unison with the NWS forecasters and better understand why they were issuing the warnings that they were.

As the storms continued to progress across the state, radar signatures signifying tornadoes began to appear; first in Davidson County to the south, then in Person County to the north. The key to the NWS remaining punctual with their warnings is delegation between forecasters to separate parts of the CWA. Seeing this teamwork in person was an invaluable experience for a student, and I very quickly realized that operating like a well oiled machine is essential to best ensuring public safety during a severe weather outbreak.

As the line of storms continued to progress eastward into central North Carolina, stronger tornado signatures began appearing on radar. The mesocyclones that produced most tornadoes can be seen on the radar as very strong inbound and outbound winds directly beside each other. It is a very surreal feeling seeing the tornado signature on radar and knowing that it could be causing devastation on the ground at that very moment. Although there is a network of storm spotters across the state, it is rare to get tornado damage reports until well after the storm has passed through a community.
Although the NWS forecasters were charged with issuing the actual warnings, the relative ease with which the storms were developing on this day necessitated that as many eyes as possible – even the intern’s eyes – should be monitoring the radar scans for new tornado formation.

Too close for comfort

As the system approached the Triangle, the day quickly became more intense. One supercell, in particular, had formed to the southwest of Raleigh and had developed a very strong tornadic signature on the radar, meaning it was very likely that a tornado was on the ground. As the storm continued to track to the northeast, it became clear that Raleigh was in its immediate path. Issuing a tornado warning for the majority of a large city is not something to be taken lightly, but thanks to the quick and accurate forecasting of NWS personnel, the warning of an impending tornado was sent out to the city well before its arrival.

As the storm continued to progress toward the city, its track and strength became even clearer: it was headed straight for Centennial Campus. We were given the order to be ready to evacuate to the tornado shelter. As nonessential personnel, I was one of the first to receive the order to get to the shelter as the storm was just minutes away from the city. I remember being filled with a mix of excitement and anxiety as I ran down the stairs to the shelter thinking about how this amazingly strong storm, which had fascinated me and taught me so much, now threatened to devastate the city and people that I care so much about.

Shortly after I arrived at the shelter, the last of the NWS personnel entered and confirmed that the storm still appeared to be headed our way. As is procedure in times like this, the Raleigh office was required to hand over control of the warnings within their CWA to the NWS office in Blacksburg, Virginia, until the immediate danger had passed. Just moments after the last of the forecasters entered the shelter, the power went out. The room went pitch black and was absolutely silent for what seemed like forever although, in reality, it was only a couple of seconds.

Soon after the generator kicked on and power was restored, we believed that the storm had passed. Quickly making our way back up to the operations room, the smell of fresh pine was in the air, a result of nearby trees being split by the force of the storm. When we could see no major damage out of the windows of the forecast office, we knew that we had been spared the worst of it.

Damage tracks later revealed that the tornado passed about a mile and a half to the southeast of the office, through downtown and finally across northeast Raleigh. Unfortunately, the tornado that
hit Raleigh did result in injuries and even fatalities, but I am confident those impacts were significantly reduced by the superior forecasting of NWS personnel.

*The storm passes, but the work is far from over*

As the storms began to move out of the Raleigh CWA, coordination with the Morehead City and Wakefield forecast offices became paramount for ensuring that all of the appropriate areas were warned. Finally, around 7:30 p.m., the last of the storms exited the Raleigh CWA. It had been a long, action-packed day. Being in the office for such a historic event in North Carolina weather history, especially as a student just starting my career in meteorology, was an experience that will stay with me throughout my life.

I am very thankful to Prof. Gary Lackmann in NC State’s Department of Marine, Earth and Atmospheric Sciences and National Weather Service meteorologists Jonathan Blaes, Brandon Vincent, and Ryan Ellis for creating a truly incredible program that offers meteorology students, like myself, the hands-on experience that will allow us to develop successful careers in meteorology.