



# 2003 NWS Partners Report

## National Weather Service, Huntsville AL

January, 2004

### Inside This Issue:

- Page 2:**  
Weather Summary  
Forecast Verification
- Page 3:**  
Climate  
Hydrology  
Weather Radio
- Page 4:**  
Severe Overview
- Page 5:**  
Preparedness  
Skywarn
- Page 6:**  
Warning Verification
- Page 7:**  
Fire Weather  
New Products
- Page 8:**  
External Outreach  
School Outreach  
Aviation Activities
- Page 9:**  
COOP Program  
Training Activities
- Page 10:**  
Science Activities  
NASA Collaboration  
Radar Training
- Page 11:**  
Information Techn.
- Page 12:**  
Electronics  
Web Page
- Page 13:**  
Latest Forecasts  
The Huntsville Staff

## *Greetings from the MIC* **John Gordon** Meteorologist-In-Charge

### Why am I a Partner?

That may have been your initial reaction upon receiving this report. The answer is, "Yes, you are a partner with the National Weather Service (NWS)." As a taxpaying citizen of this country, you have invested in the Federal Government, of which the NWS is a part. The NWS was allocated \$754,659,894 for Fiscal Year 2003. That equates to an investment of \$2.23 per person. As a manager of your investment, I feel it is my duty to report how your "holdings" have fared. Your dividends come to you in the form of all products, services and data received from the NWS.

This report details activities of the Huntsville Weather Forecast Office and events in its county warning area (CWA) during 2003, its first year of operation. Since you are both a partner and a customer, I hope you find our activities have demonstrated the sort of stewardship you expect from your public servants. As always, I welcome your comments and suggestions as to how the NWS can be an even better investment for you.

### 2003 Highlights

Highlights for the year are many and varied. They could not have been done without the hard work of a dedicated staff. The NWS staff has endured many changes in the past year and I commend them for their professionalism and perseverance.

Notable accomplishments for the year include:

- **The most rapid spin-up of an NWS office in history, from a paper concept to fully operational in 14 months.** In no other case has an NWS development process taken less than 3 years to complete. The office has an intense focus applied to customer service, outreach and office teamwork, all of which can serve as a model for future NWS efforts of this type.
- Forecaster Priscilla Bridenstine initiated an attractive COOP Newsletter and developed a series of interactive presentations geared toward students and teachers.
- Student Career Experience Program (SCEP) participant Alys Blair developed an interactive weather calendar. (<http://www.srh.noaa.gov/hun/fact/weatherfact.php>)
- Each member of the HUN operations staff made a familiarization trip to 11 of our counties and visited each EMA office. Over 500 person-hours were logged in this effort.
- The office has developed a variety of communication methods for relaying weather information to the EMAs, including telephone, dedicated UHF radio, paging, e-mail and instant messaging.
- NWS Huntsville had an average lead time of 22 minutes during the May 5-7 tornado outbreak and nearly 45 minutes for flash flood warnings during the 100-year flood on May 6.
- First NWS office in the country to have every county Storm-Ready.
- Climate Program Leader Jason Elliott teamed with the Alabama State Climatologist to expand the Huntsville climate record from 1958-present to 1907-present. **Sixty percent of Huntsville's temperature and precipitation record values were adjusted due to this change.** Jason also added a second climate point at Muscle Shoals dating back to 1890.
- NWS HUN developed a strong partnership with the local meteorological research community. Science and Operations Officer Tom Bradshaw and Lead Forecaster Chris Darden continue to collaborate with NASA on several unique NASA modeling, lightning and satellite products.
- Aviation Program Leader Matt Zika made trips to all of the



MIC John Gordon stands next to the sign for the opening of the nation's 122nd NWS office.

## Weather Summary

**Bill Schaub, Lead Forecaster**  
**Jason Elliott, Forecaster**

The winter months of January and February were rather nondescript. There were several relatively minor events that all had a mix of wintry precipitation. Although accumulations were mostly light, slick roads were a problem at times.

Flash flooding and river flooding was common in February, especially during the 21st-23rd when ten of the north Alabama counties reported periods of street flooding.

A larger episode of severe weather took place in the transitional month of March. On the 19th, four tornadoes occurred: one in Madison

county and three in Jackson county.

April had only one day of severe weather on the 25th, when nickel to golfball sized hail was reported in Marshall, De Kalb and Jackson counties.

It seemed like the bulk of the severe weather waited to unload in May, when eight days had severe weather. On May 1st, damaging thunderstorm winds struck the northwest Alabama counties and Madison county. Then, on the 2nd of May, extremely large hail that rivaled that of the Plains States pounded much of north Alabama. Hailstones

up to baseball size fell in Lauderdale county. The biggest severe weather outbreak was on the 6th when flash flooding and nine tornadoes occurred. Flash flooding was especially bad in Madison, Jackson, De Kalb and Marshall counties. The tornadoes were relatively weak, with five rated F0 and the remainder as F1s. Through it all, there was a lot of property damage, but fortunately no loss of life.

Compared to May, the period from June - August was relatively quiet. June and July each had a day with widespread wind damage as a line of storms moved east across north Alabama. This was followed by no severe weather in September and October.

As expected, there was one

significant severe weather event in November. There were 14 reports of straight line wind damage, as a line of thunderstorms pushed east across the area.

Much cooler temperatures settled in later in November, followed by continued cool conditions in December. There were a few cases of patchy sleet and snow flurries early in December.

## Forecast Verification

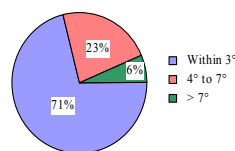
**Mike Richter, Forecaster**

Just how good are those forecasts we issue? Our office assesses the forecasts using a process called forecast verification. Forecast verification is necessary in order to monitor the accuracy of the forecasts and improve their quality and value. A particular forecast is compared, or verified, against an observation that actually occurred. These observations are taken from 2 representative sites for our forecast area. These sites are located at the Huntsville International Airport (HSV) and the Northwest Alabama Regional Airport in Muscle Shoals (MSL).

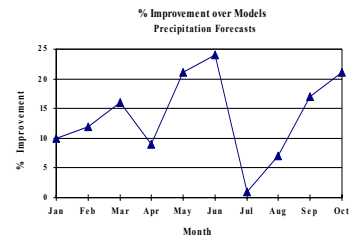
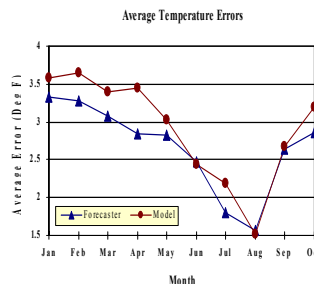
Temperatures are verified through an evaluation of the daytime high temperatures

and overnight low temperatures. The following pie chart shows the percentage of office forecasts within 3° F of the observed temperatures at HSV and MSL since the office began making official forecasts in January 2003. This includes the first four periods of each forecast (two days and two nights). **Overall, forecasts were within 3° F of the observations 71% of the time.**

Temperature Forecast Errors



We also compare our temperature forecasts against those of the computer model forecasts. The following graph shows a comparison of the forecaster and computer model temperature errors during our first 10 months of existence during 2003.



Our precipitation forecasts are also compared to those of the computer model forecasts. The following graph shows our percentage of improvement over the computer models for precipitation forecasts. Overall, forecasters showed improvement over the models in every month. **Specifically, the months of May, June and October showed over a 20% improvement over the models.**

## Climate

### Jason Elliott, Forecaster

Climate services in north Alabama took a major step forward in 2003.

A major project to extend the climatological record at Huntsville was completed in late 2002, and implemented on January 14, 2003. This extended the period of record back to 1894 for precipitation and 1907 for temperatures, compared to only 1958 beforehand. Over 60% of our temperature records changed as a result of this extension.

We also established a climate point at Muscle Shoals Airport, with data going back This gives north Ala-

bama two long-standing locations to compare today's weather to history.

A great deal of our climate information has been placed on our website, and we update this data every day with the latest preliminary data.

In 2004, we plan to provide additional methods of viewing climate data on the Internet, as well as making even more historical data available. For climate info, log onto <http://www.srh.noaa.gov/hun/climate/index.html>.

## Hydrology

### Jason Elliott, Forecaster

Exciting changes are underway within the NWS Hydrology program, and some of these are beginning to be seen locally.

This year, NWS personnel visited every river gage in our service area, and took photos of the sites and equipment. With help from our partners at the U.S. Geological Survey, we also added an important river gage on the Flint River at Brownsboro.

We have already launched our new AHPS (Advanced Hydrologic Prediction Service) on the Internet. Users can view graphs of river

stage for ten locations in the Huntsville service area, and forecasts for our three daily forecast points at Chase and Woodville Alabama and Fayetteville, Tennessee. These three points will soon have additional info - with long-range forecasts coming soon!

In 2004 we also plan to survey at least one new location for a river forecast point and continue our close work with our partners in emergency management, TVA and USGS to provide top-notch services to the people of the Tennessee Valley!

## NOAA Weather Radio

### Beth Carroll, Meteorologist Intern

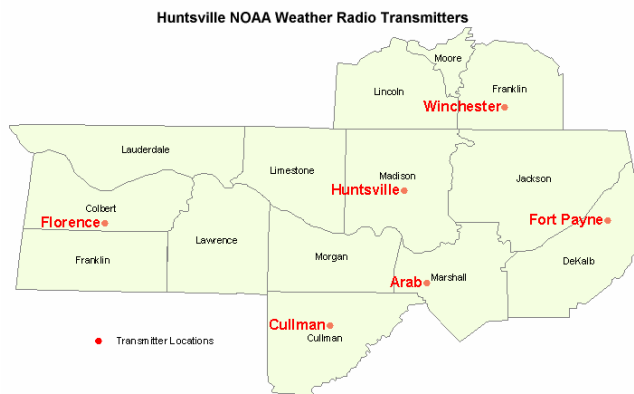
NWS Huntsville currently operates six NOAA Weather Radio transmitters in its CWA. Four of these in Alabama, located in Huntsville, Florence, Cullman and Ft. Payne, have been in service for several years. The transmitter site at Arab, AL was established in July of this year, through a grant obtained by the Marshall County Emergency Management Agency (EMA) and the United States Department of Agriculture. NWS Huntsville also recently assumed responsibility for the NOAA Weather Radio transmitter in Winchester, TN. This site was established in February 2003, through a grant obtained by the Franklin County TN EMA and the USDA.

Other developments this year included the implementation of new and improved concatenated voices. These voices are used to broadcast weather information on NWR and consist of a male voice (Tom) and female voice (Donna). We also participated in a program this year in which weather radios were distributed at specific locations for each of the transmitters. Radios were mainly placed at law enforcement agencies that were open 24 hours a day to provide them with timely weather information.

These agencies also provide a service to the weather office by monitoring broadcasts and providing quality control of NWS products.



NOAA Weather Radio with SAME Technology. Radios are available at local electronic stores.



NOAA Weather Radio transmitters controlled by WFO Huntsville

## Severe Weather Overview

### Tim Troutman, WCM

The severe weather season of 2003 began for NWS Huntsville on February 15<sup>th</sup> with flash flood warnings issued and flash flooding later reported in the western part of north Alabama. The first two severe thunderstorm warnings also were issued during this severe event in Jackson and De Kalb counties. **These warnings were the first issued for north Alabama by NWS Huntsville since 1997.** A larger and more substantial flash flood event occurred on February 21<sup>st</sup>- 22<sup>nd</sup> with numerous reports of flooding received across all of north Alabama. The flooding was county-wide from Madison and Morgan counties, extending east to Jackson and De Kalb counties, with numerous county and state roads closed across these areas during and shortly after the flood event.

The main severe weather event of March was the outbreak on March 19<sup>th</sup>. Four separate tornadoes were reported during the severe weather event. An F-0 tornado occurred in Madison county, near Toney, Alabama, with wind speeds approaching 70 miles an hour. Three other tornadoes classified as F-1 on the Fujita scale with winds ranging from 80 to nearly 100 miles an hour, occurred in close proximity of each other in Jackson county from near Section to Rosalie, near Dutton and also near Flat Rock, Alabama.



Extremely large hail fell in Florence on May 2, 2003. Hail to the size of grapefruit was reported in Lauderdale County during this



Home damaged due to tree being uprooted and falling on residence in Underwood-Petersville community. Photo taken by WCM Tim Troutman.

April was fairly uneventful in regards to severe weather occurrences. The only severe weather event was a large hail event that occurred on April 25<sup>th</sup>.

The month of May characteristically turned out to be our most active severe weather month across north Alabama. **The extensive large hail event of May 2<sup>nd</sup> was one of the costliest hailstorms on record for north Alabama. Hail to four inches in diameter (grapefruit size) fell in Lauderdale county** and baseball size (2.75 inches in diameter) fell in northeast Cullman county during the event. In total, there were 54 separate reports of large hail across all 11 north Alabama counties on May 2<sup>nd</sup>.

An extensive flood and series of severe weather episodes occurred from early May 5<sup>th</sup> through late on May 6<sup>th</sup>. All of north Alabama was under a tornado watch for nearly 60 straight hours through this time period. The main severe weather event occurred during the early through late morning hours of May 6<sup>th</sup>. Eight separate tornadoes were reported across Colbert, Lauderdale, Limestone, Madison (twice), Jackson, Cullman, and De Kalb counties through a three hour time period. At least 27 homes and hundreds of trees were uprooted by the series of F-1 tornadoes with wind speeds ranging from 80 to 100 miles an hour. The main threat that occurred during the severe weather

event of May 6<sup>th</sup>, however, was flash flooding. Nearly 7 million dollars worth of damage was caused by the extensive flash flooding that occurred, accompanying the tornadoes across north Alabama. Over 500 homes and businesses were extensively damaged by the flash flooding, with a large portion of north Alabama declared a disaster by FEMA following the event.

The other severe weather event of May 2003 to note was the brief tornado event of May 17<sup>th</sup>. Two tornadoes touched down briefly as a line of severe thunderstorms moved across Lauderdale and Limestone counties. At least 18 homes were damaged in Lauderdale county and 85 damaged in Limestone county. The tornadoes were determined to be F-1 tornadoes on the Fujita scale with wind speeds ranging from 70 to around 90 miles an hour.

The only recorded slight injury across north Alabama due to lightning was on July 7<sup>th</sup>. On July 21<sup>st</sup>, there were at least 16 reports of large hail and wind damage across north Alabama as a line of severe thunderstorms moved across the area during the mid to late afternoon hours. On July 22<sup>nd</sup>, another line of strong to severe thunderstorms moved southeast through north Alabama during the morning hours with several

(cont'd on page 5)

## *Severe Weather Overview (cont'd)*

reports of wind damage across Lawrence, Madison and Jackson counties. One large severe weather related event occurred in the month of November. On November 18<sup>th</sup>, a line of severe thunderstorms moved across north Alabama and into southern middle Tennessee, resulting in scattered reports of wind damage in Lauderdale county at Rogersville, in a small area of Limestone county and across the southern portions of Huntsville in Madison county. A few scattered reports of wind damage were especially noted across Lincoln

and Franklin counties in southern middle Tennessee and in Cullman, Marshall, Jackson and De Kalb counties. Thunderstorm winds with this line of severe storms reached in excess of 80 miles an hour across Rogersville and the southern portions of Huntsville.



Major flooding on the Tennessee River near Lacey's Springs caused significant damage in May 2003.

### *Weather Preparedness* **Tim Troutman, WCM**

NWS Huntsville's entire CWA became StormReady, with a large ceremony commemorating the designation of all 11 north Alabama counties occurring on April 4<sup>th</sup>, 2003. Of the three counties in southern middle Tennessee transferred to NWS Huntsville on November 5<sup>th</sup>, 2003, Lincoln county is already Storm-Ready, having received this designation in 2002. Franklin county TN was designated as StormReady in December 2003 by NWS Nashville. WCM Tim Troutman is currently working with Moore county, TN to again complete the designation of the entire CWA.

The storm spotter training program at NWS Huntsville continues to flourish. During 2003, 21 spotter training sessions were completed across north Alabama and southern middle Tennessee in the spring and fall. 948 storm spotters were trained across the area from Jan. 1<sup>st</sup> through Nov. 25<sup>th</sup>. The next series of storm spotter classes will be taught in Spring, 2004.

### *Skywarn Program* **Robert Boyd, Lead Forecaster**

NWS Huntsville has a Skywarn position in the operations area. This enables weather spotters licensed as Amateur Radio operators to report via radio, weather phenomena to their local county SKYWARN coordinator, or directly to the National Weather Service. During periods of adverse weather, the Weather Service will activate the regional Skywarn network. This network consists of trained amateur radio operators who perform weather spotting and observing duties. There are several hundred amateur radio operators within the CWA.

This network is vital for receiving reliable ground truth reports at the Weather Service. These reports are relied upon by the Warning Forecaster to decide whether to warn for phenomena like tornadoes, severe thunderstorms, flooding, hail or wind damage.

For radio communications, two dual

band amateur radio antennas were installed on the roof of the National Space Science and Technology Center (NSSTC) during late March 2003. These antennas are connected to the operations area by a cable of almost three hundred feet. The Skywarn position is equipped with two Kenwood TM-D700 dual band FM transceivers.

These radios are capable of receiving and retransmitting Automatic Position Radio System (APRS) data, including weather data. Some of this real-time APRS weather data from remote sites around the region is ingested, and used by the Weather Service and Skywarn personnel to help with their duties.

## Warning Verification

Tim Troutman, WCM

NWS Huntsville issued 179 severe thunderstorm warnings in 2003 (i.e., 179 counties were warned) - an average of at least 16 warnings per county across north Alabama. The most active month was May. As for forecast verification, we evaluate four principal "skill scores" to gauge the quality of our warnings issued.

⇒ The Probability of Detection (POD), which measures our success at issuing warnings before damage occurs, was at .78 for severe thunderstorm warnings, .80 for tornado warnings and .94 for flash flood warnings. The optimum value is 1.00.

⇒ The False Alarm Rate (FAR), which tells the percentage of warnings not verified, was at .52 for severe thunderstorm and tornado warnings. The false alarm

rate for flash flood warnings was at .37. A zero FAR is optimal.

⇒ The Critical Success Index (CSI), a combination of POD and FAR, was at .42 for severe thunderstorm warnings, .19 for tornado warnings and .60 for flash flood warnings. A CSI of 1.00 is optimal.

⇒ The average lead time (the time between warning issuance and time of the first damage report) was at 13.7 minutes for severe thunderstorm events, 13.3 minutes for tornado events and 84.2 minutes for flash flood events.

Here are specific statistics for severe thunderstorm, tornado and flash flood warnings issued by NWS Huntsville and severe weather events in 2003.



Mobile home damage on County Road 330 in Jackson County. This was caused by an F1 tornado that touched down on March 19, 2003.

	Severe Thunderstorm	Tornado	Flash Flood
<b>Warnings Issued</b>	179	50	99
<b>Warned Events</b>	118	12	48
<b>Unverified Warnings</b>	93	40	37
<b>Missed Events</b>	33	3	3
<b>Total Events</b>	151	15	51
<b>POD</b>	.781	.800	.941
<b>CSI</b>	.424	.190	.603
<b>Average Lead Time</b>	13.7 minutes	13.3 minutes	84.2 minutes

## Fire Weather

### Steve Shumway, Lead Forecaster

The fire weather program at NWS Huntsville started in January 2003. The office has fire weather responsibilities for eleven counties across north Alabama. These counties include Lauderdale, Colbert, Franklin, Lawrence, Limestone, Madison, Morgan, Cullman, Marshall, De Kalb and

Jackson.

Fire weather products for the newly added southern middle Tennessee counties of Moore and Franklin will continue to be issued by the National Weather Service office in Morristown, TN. NWS Nashville will continue to issue fire weather

products for Lincoln county TN.

NWS Huntsville provides fire weather forecasts twice a day (6 am and 3 pm) throughout the year for the United States Forest Service, National Park Service, Wheeler National Wildlife Refuge and several state

parks around north Alabama. Non-routine products issued by the National Weather Service include Fire Weather Watches, Red Flag Warnings and Spot Forecasts.

## New Products from WFO Huntsville

### Brian Carcione, Forecaster

### Kurt Weber, Meteorologist Intern

#### Graphical Hazardous Weather Outlook

NWS Huntsville recently unveiled a new product that is designed to complement the existing text Hazardous Weather Outlook (HWO). This product is issued daily at 5:00 a.m. and 1:00 p.m. An additional HWO is issued at 9:30 p.m. for the period November through March.

The graphical Hazardous Weather Outlook, available through the office website, uses color-coded maps to alert emergency managers and the public of several potential weather threats during the next 24 hours.

Maps currently being generated in the graphical HWO include Storm Spotter and Emergency Manager Activation, Storm Threat Levels regarding severe weather, Flash Flood Threat Levels, Winter Weather Threat Levels and specific Weather Threats expected in the next

24 hours.

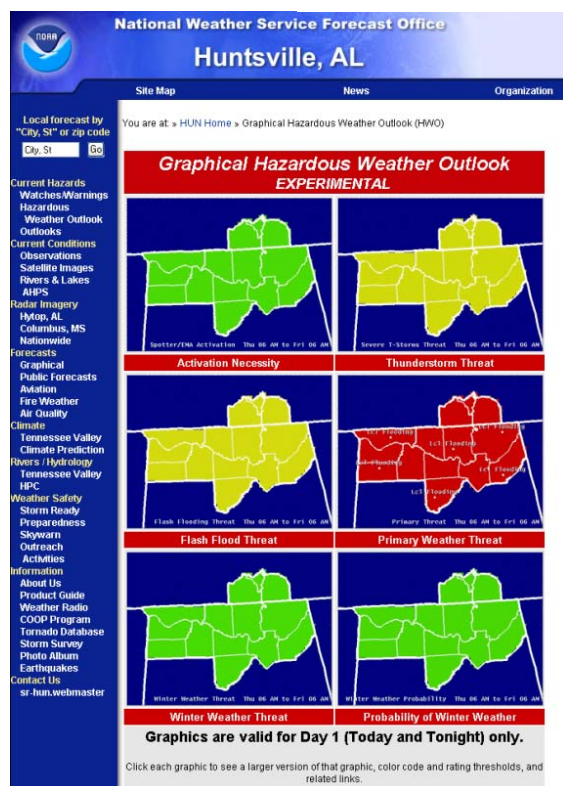
While the idea of a graphical HWO is not unique to Huntsville, the office is one of the first in the country to use the new Graphical Forecast Editor (GFE) to prepare it. Since the software is already used to produce public forecasts, forecasters are already familiar with the editor, thus the time necessary for training has been drastically reduced. The use of GFE also allows for a great deal of flexibility and makes any future expansion of the graphical HWO product much easier to implement.

#### Recreational Product

Development continues on a new recreational product, which would be prepared by NWS Huntsville. The intent of this product is to provide useful information to plan outdoor/recreational activities in north Alabama and southern middle Tennessee.

Current information that is being researched for this product include an Ultraviolet (UV) forecast, air quality forecast, water temperatures and cloud opacity forecasts

for stargazers. Three-hour forecasts of wind speed, wind direction and heat indices for selected points along the Tennessee River are also projected for this product.



An example of WFO Huntsville's newest product: the Graphical Hazardous Weather Outlook. The graphics are color-coded based on expected weather threats and are valid for the next 24 hours. The text product of the HWO follows the graphics. Both can be viewed at [www.srh.noaa.gov/hun/graphical\\_hwo/](http://www.srh.noaa.gov/hun/graphical_hwo/)

## External Outreach

### Tim Troutman, WCM

The NWS Huntsville Outreach team completed an extensive schedule of events in 2003. School outreach program leader, forecaster Priscilla Bridenstine, and WCM Tim Troutman, completed 23 school presentations to area schools in north Alabama. Nearly 1000 school age children from first grade through high school were educated on severe weather safety, and basic fundamentals of weather. Meteorologist-In-Charge, John Gordon, and WCM Tim Troutman, completed 26 public safety presentations during the year to Rotary, Kiwanis and Lions clubs, the Huntsville Association of Realtors, the local

Huntsville American Meteorological Society (AMS) chapter and to personnel at Redstone Arsenal and Mar-

shall Space Flight Center. Around 800 people were educated regarding NWS Huntsville and weather safety.



Two youngsters are captivated by the tornado in a bottle experiment, performed at Kid's Count Expo 2003.

## Aviation Activities

### Matt Zika, Lead Forecaster

It was an exciting year for aviation related activities across North Alabama. In an effort to obtain valuable feedback from our important aviation customers, the aviation program leader visited every airport and FBOs across our forecast area. The thoughts and feedback received will go a long way in improving our aviation services.

NWS HUN also instituted an Airport Weather Warning (AWW) program at MSL and HSV. This allows each airport to receive advance notification of significant weather that will affect their operations. The AWW criteria was developed by the operations staff at each airport.

The biggest highlight of the year was the I-65 Aviation Workshop which was held in Huntsville in August. Nearly 150 pilots (mainly G.A.) attended the event geared at being an aviation weather refresher. The organization of the workshop was a group effort with members from surrounding National Weather Service offices, the private sector, the FAA, the local media, and Huntsville International airport involved. The workshop was a huge success receiving excellent reviews from the attendees. Huntsville International Airport FAA Tower Manager Ray Palmer said it was one of the most professional events he had attended.

## School Outreach

### Priscilla Bridenstine, Forecaster

The school outreach program came to life in the spring of 2003. Many school-age students (grades 1-8) across the Tennessee Valley were taught the basics of weather, along with lessons in weather safety. Besides learning about meteorology, students were also shown experiments in which weather-related concepts were applied to real life. The outreach team visited Boy Scout and Girl Scout troops across the area to help youngsters earn weather badges.

During the summer months, the National Weather Service participated in the Alabama Math, Science and

Technology Initiative (AMST) with schools throughout north Alabama. Staff visited with sixth grade science teachers during a two-week workshop and trained them on the finer aspects of meteorology. The professional expertise provided by the meteorologists benefited the teachers in implementing and supporting their Catastrophic Events Curriculum.

Perhaps the most successful school-related outreach experience during 2003 was the National Weather Service's participation in the Kid's Count Expo in January. This annual event is held in Huntsville every

winter over a three-day period. Thousands of kids and their families attend the event for food, fun and to learn about the latest activities occurring across the region. The office staffed a booth for the three day show and helped heighten the NWS's presence in the community. Not only were parents given brochures on how to protect themselves from various weather hazards, but kids were also given the opportunity to see how exciting weather can be.



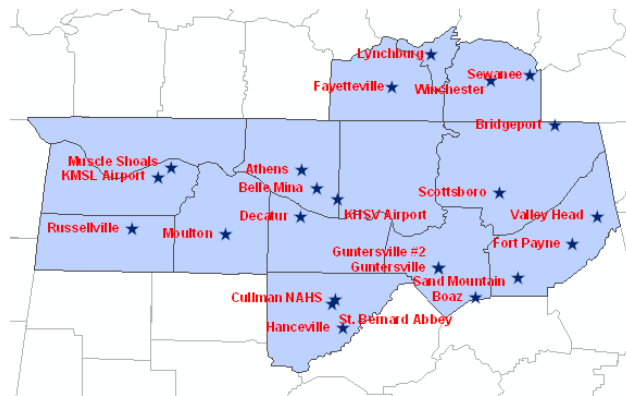
## Cooperative Observer Program

### Lary Burgett, Hydro Meteorological Technician Priscilla Bridenstine, Forecaster

This was a transition and development year for the NWS Huntsville COOP program. This office assumed responsibility for 17 COOP sites from NWS Birmingham in January and in November assumed responsibility for an additional 4 COOP sites in southern middle Tennessee from NWS Nashville. Replacement of the old Max/Min Temperature Sensor (MMTS) display units continues with over 50 percent of the new MMTS display units installed.

Mr. John M. Kelly of Moulton, Alabama and a cooperative observer for 46 years, was selected to receive the prestigious Thomas Jefferson Award. This award is presented to only 5 cooperative observers per year on a nationwide basis.

Mr. Ellis Burgess retired on December 19<sup>th</sup> and had been a COOP observer at Belle Mina since the spring of 1988. He has worked with Auburn University since 1967.



Twenty-one cooperative observing sites are located in WFO Huntsville's CWA.

## Training Activities

### Tom Bradshaw, SOO Bill Schaub, Lead Forecaster

The year 2003 has been a very active one for training at NWS Huntsville. Office professional development activities began shortly after the arrival of the first forecasters in Huntsville in the early fall of 2002. These early training efforts focused on team building, customer service, and the strengthening of interpersonal communication skills among the staff. As NWS Huntsville approached its activation date, the training focus shifted toward applied warning and forecast issues. During the late fall, the forecast staff participated in a week long severe weather warning workshop, conducted by instructors of the NWS Warning Decision Training Branch (WDTB). Winter weather forecasting

skills were also reinforced through an extensive drill and review of previous heavy snowfall case studies.

Severe weather training took center stage once again during the spring and summer months of 2003. The forecast staff completed a thorough review of severe storm and tornado formation theory, and brushed up on the latest tornado warning guidelines provided by the WDTB. The staff also reviewed several severe thunderstorm case studies using a computer system known as the "Weather Event Simulator", or WES. This software enables forecasters to simulate radar displays of actual severe weather events, and allows them to compose and issue mock warnings and

statements. This repetitive training helps the forecasters to maintain their radar proficiency through the course of the year - even during extended periods when no severe weather is occurring. As the spring turned into summer, emphasis shifted to the prediction of "microbursts", the isolated damaging wind events that often accompany severe thunderstorms during the warmest months of the year.

Forecasters received theoretical and WES-based training.

on the theories surrounding the formation and detection of these elusive, yet deadly phenomena. Fall annually marks a return to cooler temperatures, and with it, the renewed threat of tornadoes. To meet this challenge, the meteorologists at NWS HUN completed another brief series of severe weather training elements. Additional instruction was given in the science of fire weather forecasting, as well as aviation forecasting.



NASA scientists work with NWS forecasters to deliver the latest technology to the operational environment.

## Science Activities

### Tom Bradshaw, Science and Operations Officer Bill Schaub, Lead Forecaster

In addition to the training which took place at NWS HUN during 2003, a variety of science-related activities also occurred. Chief among these was the completion of a severe weather climatology for northern Alabama. This comprehensive database incorporated tornado reports dating back to the late 1800's, as well as hail and wind reports extending

well back into the 1950s. Much of this data is now available on the HUN web site. Studies were also completed on the following topics: **a)** a severe thunderstorm that occurred in east-central Alabama during the spring of 2003; **b)** an extended episode of tornadoes, flooding and large hail that occurred in northern Alabama during May 2003; and **c)** nighttime

temperature differences induced by terrain variations across northeast Alabama. The May severe weather episode was presented as a case study at the National Weather Association Annual Meeting in Jacksonville, Florida during the fall of 2003.

Through the balance of the year, all of the meteorologist interns and one of the journey-level meteorologists completed a comprehensive course given by the Warning Decision Training Branch in Norman, Oklahoma that covered all aspects of radar. Also, a newly assigned journey-level forecaster received the in-house basic training, followed by training from the experts in Norman.

To provide the staff with quick reference procedures for various radar situations, instruction sheets were created and assembled into a radar notebook. These provide the key steps to take in case of radar system problems, and also steps on how to optimize the radar performance or obtain special radar images.

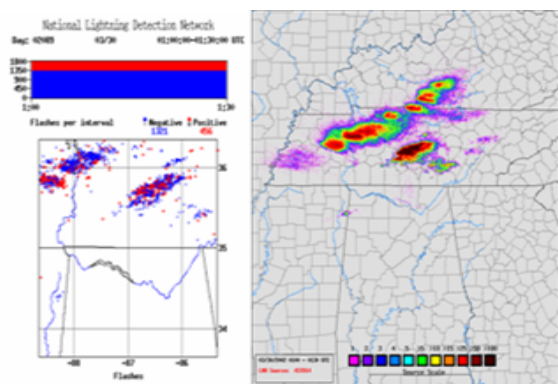
Thanks to our electronics staff, and the Operational Support Facility in Norman, Oklahoma, the Hytop radar has had negligible down time during active weather. The electronics staff works closely with the operational meteorologists to track the overall radar performance and schedule routine maintenance during quiet weather.

## Collaborative Activities with NASA

### Tom Bradshaw, SOO

NWS Huntsville engaged in extensive collaboration with local NASA weather researchers during the year 2003. These efforts centered on the role of high-resolution satellite data, model data, and lightning observations in the improvement of short-term weather forecasts and warnings. NASA and NWS personnel established a process for easily ingesting and displaying NASA observational

products in the NWS computer systems. These data sets are currently being utilized by the forecasters at NWS Huntsville, as well as personnel at NWSs in Birmingham, AL and Nashville, TN. Preliminary assessments of the NASA data have also been completed by the research partners during the past year, and results have recently been published and presented.



Lightning data currently being used in forecasting and warning operations is available to WFO Huntsville via NASA.

## Radar

### Bill Schaub, Lead Forecaster

Radar training was the main focus. From September 2002 through December 2002, the entire staff was trained on a new computer system for operational interaction with the radar. Also during that time, all meteorologist interns and journey-level meteorologists received in-house basic training on radar velocity interpretation and radar signatures of severe thunderstorms.

In the first few days of January 2003, before the office officially began issuing forecasts for northern Alabama, the entire staff received one-on-one training on all of the items on the radar checklist. The checklist can be completed in 10 minutes or less by each shift, and it provides a concise summary of the operational status of the radar.



WSR-88D at Hytop, AL used in warning and forecasting operations by WFO Huntsville.

## Information Technology (IT)

### Jason Burks, Information Technologist

The IT work over the last year has included building the computer and software office infrastructure, development of new and innovative software to help with our mission, and integrating unique NASA datasets into our operations.

#### Office computer and software infrastructure:

Just before we moved into our new office in the NSSTC Annex, we had to install and set up the office computers and network. This required the configuration of approximately 20 computers, several network devices, and a security firewall. All of this had to be accomplished before the first employee moved over to the new office. All of the software we need to accomplish our mission, from word processing, to anti-virus, to specialized software had to be installed and configured.

The AWIPS (Advanced Weather Interactive Processing System), our system for displaying meteorological and hydrological data and issuing our products, was installed on September 27, 2002. Once the installation was completed by the contractor, our work to configure and localize AWIPS for our area of responsibility began.

#### Innovative development:

HUN-TV is a software application to display our forecasts, observational data,

satellite, radar, and warnings on a public TV channel that might not otherwise have access to weather data. The software was developed and placed where interested parties could obtain the information. The HUN-TV display is bringing current weather information to the Huntsville City School system through E-TV, and the Huntsville City Government Channel on cable. This is providing the public with access to our products, including life-saving warnings, where they would not normally be available.

#### Tornado Database:

Meteorologist intern Kurt Weber has inventoried all of the tornado events across our the Tennessee Valley and entered them into a database. Software was developed to format the data so that it could be broken down by year, month, county, intensity, number of injuries, and number of fatalities and produce maps of each tornado path. These statistics and plots can be found through our website at: <http://www.srh.noaa.gov/hun/tornadodatabase>

#### VOC (Voice of the Customer):

We are always interested in the needs and opinions of our customers. We want to be able to respond to their needs, and provide them the service they deserve. Voice of the Customer (VOC) allows us to collect that infor-

mation and process and investigate it.

VOC, a software application being developed locally, allows us to collect comments and place them into a central database. Once in that database we can interrogate the comments and sort and process them in various forms. This will allow us to correctly assess needs of our customers and determine where improvement is required.

#### NASA datasets:

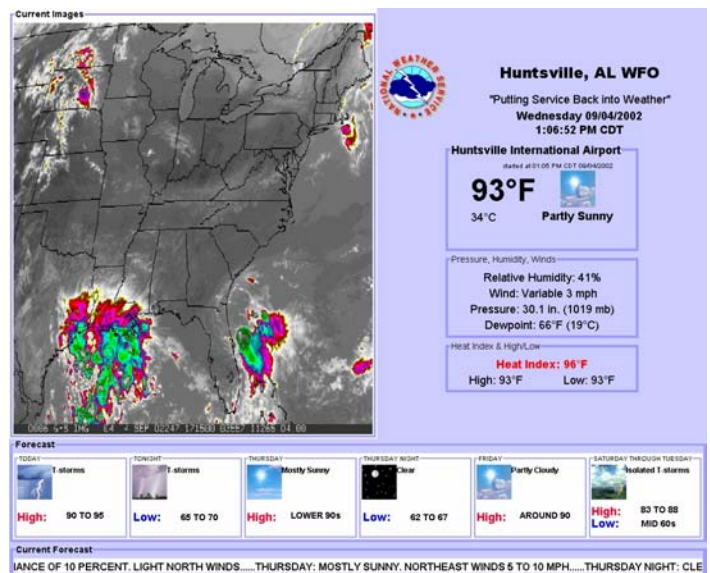
Our co-location with the National Space Science and Technology Center (NSSTC) has proved to be fruitful. We are incorporating several datasets from the NASA group in NSSTC into our AWIPS system for use in our daily operations. This includes datasets that had

previously never been provided to a forecast office before.

These datasets include the Lightning Mapping Array (LMA), MODIS satellite, and a numerical model run here in the NSSTC building. The LMA data is being incorporated to help with severe weather lead times.

The MODIS data has helped with forecasting of nighttime fog. The inclusion of these datasets does not stop at our office. We have worked on installing these data ingests and displays at NWS Birmingham, and NWS Nashville.

We are working hard to utilize our unique co-location with this superb research facility. We evaluate these datasets and provide feedback to the researchers so that they can improve the effectiveness of the data.



HUNTV displays weather information to the city schools and to the public via the Huntsville City Government channel.

## Electronics

### Brian Burgess, Electronics Systems Analyst

This has been a very bountiful year for the electronics section at the Huntsville Office. Since this is the first Shareholders Report, I would like to go back to September of 2002, when we began equipment installations. Advanced Weather Interactive Processing System (AWIPS) was installed and tested the week of September 22<sup>nd</sup>. The Console Replacement System (CRS) of NWR was installed in October. In November the electronics staff installed the Radar Product Generator (RPG) to communicate with the Hytop NEXRAD. From the middle of November 2002 to January 2003 we completed all system, software, and communication testing for the January 14<sup>th</sup>, 2003 commissioning.

**ASOS:** There has been no change in the ASOS program this year for our sites. There are proposed changes coming in 2004 that will include a new temperature / dew point sensor, weighing rain gage, and a new single processor. **AWIPS:** In 2003, AWIPS received two major upgrades Operational Build 1 (OB1) and OB2 and minor patches. The Interactive Forecast Preparation System (IFPS) has gone through three upgrades. We have also tested a new generation LINUX workstation with 3 flat panel displays that will be deployed late 2003. **WSR-88D Radar:** In April we added the Transition Power Source (TPS) to the radar complex at Hytop. This is a battery power backup system that allows

the backup generator to come online without losing power to the radar. We have also completed major software upgrades to the RPG. The aging AC units were replaced and duct work added to provide cooling to the transmitter. Preventive maintenance scheduling has also been reinstated to improve the reliability of the radar for operational use.



The Electronics Team works hard to improve the Decatur ASOS site.

## Web Page

### Brian Carcione, Forecaster

The NWS Huntsville web page has come a long way in the past year: like the rest of the office, the web site had to be constructed from the ground up. The web team's initial goal was to produce a basic site that would adequately represent the office on the Internet. Since then, the team has worked to drastically expand the information offered through the web page, while redesigning many of the existing pages to provide a fresh look to the site. Some of the more notable additions include:

- **Tornado Database:** Cataloguing every tornado to strike the Huntsville area of responsibility since 1871, the database allows users to sort through the tornadoes by county, year, month, intensity (according to the Fujita scale), and number of fatalities.

- **Photo Gallery:** The gallery features weather-related photographs taken by members of the general public across the Tennessee Valley. A selected photograph is featured on the home page and is changed every 10 days.

- **Product Guide:** The vast array of products issued by the NWS can sometimes be confusing and overwhelming for the general public. The product guide sorts through the various products based on category, and explains their purposes in clear, concise language.

- **Climate Graphs:** Offering a graphical representation of observed, normal, and record maximum and minimum temperatures, the climate graphs supplement an already impressive offering of local climate information on the web page.

Statistically, the number of visits to the Huntsville web page averages around 5,000 per day each month. The exception to this was in early May, **when the severe**

**weather and flooding event increased the number of hits to more than 15,000 per day.** Some of the most frequently-visited portions of the site include the photo gallery, the climate page, public weather forecasts, and the recently-added tornado database.

The web team has even bigger plans for the Huntsville web site during the upcoming calendar year. Current plans for the site include a web-based storm report form, additions to the SKYWARN and weather preparedness information pages, an inside look at how the office works, grid forecasts, and graphical short-term forecasts.



NWS Huntsville's web site is available at [www.srh.noaa.gov/hun](http://www.srh.noaa.gov/hun).

## *Latest Forecasting Techniques*

### **Chris Darden, Lead Forecaster**

In years past, the National Weather Service has focused on issuing text based forecasts and statements for dissemination to the public and other strategic partners. These products often provided a general overview of expected weather conditions, but lacked specifics that were needed or required by our core customers. To address these needs, the NWS has embarked upon an effort to generate high resolution (spatial and temporal) forecasts in a variety of graphical and digital forms. The forecasters now use the Graphical Forecast Editor (GFE) to create a gridded forecast database from which a wide range of

Products and datasets can be quickly and efficiently created.

Would you like to know what the temperature is going to be next Tuesday at 3 PM? What about the relative humidity Saturday at noon? How much rain are we expecting with the weather system coming in a couple of days? All these questions, and many more can now be answered by the suite of products available on the Huntsville web page. Simply type in [www.nws.noaa.gov/hun](http://www.nws.noaa.gov/hun) and click on the "Public Forecasts" or "Graphical" links on the left hand side of the page.

This type of information is not

only useful for the family who may be planning an outdoor outing for the weekend, but also in support of local emergency management activities, homeland security missions, and a host of other needs and activities. The NWS is excited about the transition to a gridded database and its positive impact upon our forecasts and most importantly the level of service we can provide our customers. We are constantly looking for suggestions on how to improve or enhance the products we issue, and welcome any type of comments you may have.

## *The Staff at WFO Huntsville*

<b>NAME</b>	<b>POSITION</b>	<b>PREVIOUS OFFICE</b>
JOHN GORDON	METEOROLOGIST-IN-CHARGE	NASHVILLE, TENNESSEE
TOM BRADSHAW	SCIENCE AND OPERATIONS OFFICER	BIRMINGHAM, ALABAMA
TIM TROUTMAN	WARNING COORD. METEOROLOGIST	SOUTHERN REGION HQ, FORT WORTH, TX
JASON BURKS	INFORMATION TECHNOLOGY OFFICER	WESTERN REGION HQ, SALT LAKE CITY, UT
BRIAN BURGESS	ELECTRONICS SYSTEMS ANALYST	PEACHTREE CITY, GEORGIA
LLOYD HILL	ELECTRONICS TECHNICIAN	PEACHTREE CITY, GEORGIA
PEARLINE MCCAULEY	ADMINISTRATIVE SUPPORT ASSISTANT	FIRST POSITION IN NWS
ROBERT BOYD	LEAD FORECASTER	MIDLAND, TEXAS
CHRIS DARDEN	LEAD FORECASTER	MEMPHIS, TENNESSEE
WILLIAM SCHAUB	LEAD FORECASTER	JACKSON, KENTUCKY
STEVE SHUMWAY	LEAD FORECASTER	SPRINGFIELD, MISSOURI
MATT ZIKA	LEAD FORECASTER	MEMPHIS, TENNESSEE
PRISCILLA BRIDENSTINE	FORECASTER	GRAND FORKS, NORTH DAKOTA
BRIAN CARCIONE	FORECASTER	SCEP - STATE COLLEGE, PENNSYLVANIA
JASON ELLIOTT	FORECASTER	MEMPHIS, TENNESSEE
MIKE RICHTER	FORECASTER	WSC, BOSTON, MASSACHUSETTS
LARY BURGETT	HYDROMETEOROLOGICAL TECHNICIAN	WSO HUNTSVILLE, ALABAMA
BETH CARROLL	METEOROLOGIST INTERN	FIRST POSITION IN NWS
KURT WEBER	METEOROLOGIST INTERN	WSO HUNTSVILLE, ALABAMA

Huntsville, Alabama  
“Keeping Service in Weather”  
[www.srh.noaa.gov/hun](http://www.srh.noaa.gov/hun)



# 2003 NWS Partners Report

---

National Weather Service  
320A Sparkman Drive  
Huntsville, AL 35805