



PARTNER'S REPORT 2004

NATIONAL WEATHER SERVICE

Huntsville, Alabama

January 2005

Greetings from the National Weather Service

As I stated last year, "you are a shareholder in 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 appropriated approximately \$820,000,000 for Fiscal Year 2004. That equates to an "investment" of \$2.79 per person. As the Meteorologist In Charge of your investment, I feel it is my duty to report to you how your "holdings" have fared.

This report details activities of the Huntsville Weather Forecast Office (WFO) and events in its county warning area (CWA) during 2004. Since you are both a shareholder 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. Our website and address are on the final page of this report.

2004 Highlights

Highlights for the year are many and varied. They could not have been done without the hard work of a dedicated staff. The WFO staff has en-

dured many changes in the past year, and I commend them for their professionalism and perseverance. Notable accomplishments for the year include:

WFO Huntsville and Birmingham won the NWS Bronze medal joint organization award for the staff's work during the severe weather and flooding of May 2003. The write-up on the plaque reads "For providing warnings and other advisories which resulted in no lives being lost despite an historic flooding event in Alabama."



Forecasters In Charge (FIC) Christopher Darden and William Schaub were presented with the prestigious National Isaac Cline Award for Meteorology, in recognition of their outstanding work during the May 6, 2003 tornado and flash flood event. http://www.srh.noaa.gov/hun/about_us/clineawards_040204.html.

New river forecast points have been added for the Elk River at Fayetteville, Big Nance Creek in Courtland, and this year one will be added for the Tennessee River at Decatur.

A 30th anniversary ceremony of the Super Outbreak of killer tornadoes from 4/3/74 was conducted at Athens State University. Our staff worked with the local media, EMAs, former NWS employees, and a host of dignitaries including Regional Director Bill Proenza, and the Deputy Regional Director for the Western Region of the NWS Jim Campbell, as well as legendary TV weatherman and former Weather Bureau colleague HD Bagley. For more info go to <http://www.srh.noaa.gov/hun/April1974/april74outbreak.html>.

Speaking of HD Bagley, COOP student Holly Allen and I spoke with the legend several weeks prior to his death in July 2004. Student volunteer Daniel Lamb took our videotaped interview and put together an outstanding web page link to HD. Please see <http://www.srh.noaa.gov/hun/hdbagley/>.

WFO HUN's 1st Science and Operations Officer Tom Bradshaw was promoted to be head of the Regional Meteorology Services Branch in Fort Worth TX. FIC Chris Darden was promoted on station. Chris continues

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Hello from the National Weather Service (cont'd)

to collaborate with NASA on several unique NASA modeling, lightning and satellite products.

With Chris being promoted, through a competitive process I selected Andy Kula to be our new FIC. Andy comes from Des Moines and has a wealth of experience with lightning and customer outreach.

An additional forecaster slot was also added to our staff complement. Met Intern Beth Carroll was promoted as our 10th forecaster, and she is now one of our 5 journey level forecasters.

With Beth being promoted, through a competitive process I selected Patrick Gatlin, who just graduated from UAH, to be our new Met Intern.

We were very fortunate to select Holly Allen to be our SCEP. Holly has put together an excellent weather poster for the December 31, 1963 snowstorm which can be found at http://www.srh.noaa.gov/hun/outreach_posters.html.

Electronic Systems Analyst (ESA) and Electronic Technician Lloyd Hill built an amazing Tornado Machine. The machine, called the F5, has been used at a variety of events including the Kids Count Expo at the Von Braun Center.

Tropical Storm

Ivan was the big weather maker this year. We held several press conferences, brought in extra staffing, and tried to provide even better customer service and innovation. We heard many compliments such as this one:

“We at Jackson County EMA continue to be pleased with the service the WFO in Huntsville provides constantly and especially during weather events. The weather event during Hurricane Ivan was disastrous to South Alabama and could have been for us as well. We were particularly satisfied with the two and sometimes three a day briefings that we had, even if no conditions had changed. We know that you are staying on top of things. You certainly pass along the needed infor-

mation before and during the event to help us prepare for whatever may come our way. We know that you are just doing your job as we are when these things arise, but it seems that you at the WFO do it with such ease.

Once again thanks for the great job with Ivan and all the other events we've experienced.”

Victor Manning,
Director,
Jackson County EMA

For a recap of IVAN go to http://www.srh.noaa.gov/hun/events/ivan/ivan_recap.html.

ITO Jason Burks overhauled the tornado database on the web and Met Intern Kurt Weber researched all

tornadoes for the three new Tennessee counties. This can be found at: <http://www.srh.noaa.gov/hun/tornadodatabase/index.htm>.

Forecaster Priscilla Bridenstine spoke to over 2000 kids during the previous school year.

The Weather Picture on our web page has grown to a once a week feature. We want your weather picture from the Tennessee Valley. <http://www.srh.noaa.gov/hun/pictures.html>.



National Cline Award Winners Chris Darden (left) and Bill Schaub (right) receive awards for their outstanding service during the May 6, 2003 severe weather and flooding event across the Tennessee Valley.

“Thanks for the great job with Ivan and all the other events we have experienced.”

**- Victor Manning
Jackson EMA**

Weather Summary

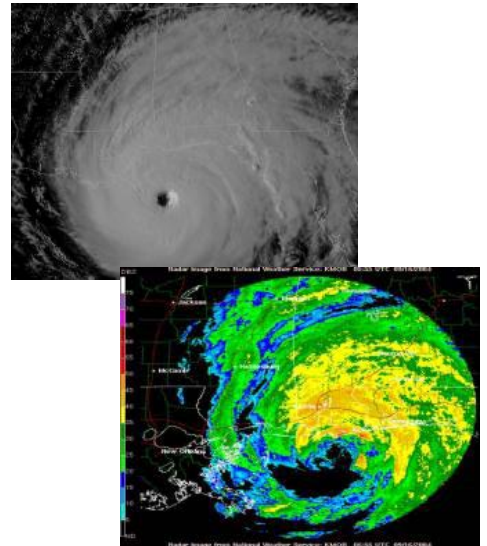
The weather of 2004 demonstrated how much variability can occur from year to year. Seasonal normals for northern Alabama and parts of southern middle Tennessee were defied in many ways.

First, the winter months had above normal temperatures and below normal precipitation. The area is usually prone to heavy rain and flooding during warm breaks in the winter, but there was just one heavy rain and flooding event in February. Snowfall was also well below normal, al-

though there was one close call with a snow storm in February. An upper low produced a swath of heavy snow across northern Mississippi and southern Tennessee. Snowfall of nearly a foot occurred in part of south-central Tennessee, while far northwest Alabama and the northern sections of Lincoln, Moore, and Franklin counties in Tennessee received up to 4 inches.

In the spring, even though temperatures started out above average, there was no peak in severe weather in May as

expected. Instead, the occurrences of severe weather increased from June into the summer months. During the summer, precipitation increased to above average, but the temperatures were cooler than normal. We are not aware of any location in the area that had a high of 100 degrees from June through August. At Huntsville, for example, the highest temperature was 94 in June, while the peak in Muscle Shoals was 95 in July.



Radar and satellite images from Hurricane Ivan on September 15, 2004, approaching the Alabama and Florida coasts.

(cont'd on page 4)

Science and Training Chris Darden, SOO

During 2004, the staff continued to build upon the momentum it had achieved in the previous year and maintained a level of motivation in striving to improve its forecasting and severe weather operations. Individuals and teams completed 13 major meteorological studies on events that occurred across the Tennessee valley. The completion of such case studies allows the staff to improve their warning and operational skills while also sharing this research information with other staff members and in many cases surround-

ing forecast offices.

In addition, there were three major training seminars held in the spring to prepare the staff in advance for severe weather that occurs in this area during the spring and summer months, with an additional three seminars held in the early fall to prepare for the fall and winter seasons. Meteorologists from WFO Huntsville were also active in presenting research materials at the Southeast Severe Storms Symposium in Starkville, MS, the Mississippi State

Broadcaster's Workshop in Birmingham, MS and the Severe Local Storms Conference in Hyannis, MA.

Examples of the studies conducted in 2004 include:

Icing Event of January 8th which brought a light glaze to the mountains.

Case of colder than forecast morning lows that occurred on January 14th.

A major flooding event that occurred on February 5th.

Severe thunderstorm and tornado events of May 30th, June 13th and July 4th.

A study of variations in low temperatures in northeast Alabama.

A review of the Huntsville snow storm of New Year's Eve 1963.

An event review of Hurricane Ivan.



Poster of the '63-'64 Snowstorm, developed by SCEP Holly Allen.

Weather Summary (cont'd)

Even the fall months showed considerable variability. As is well known, October is usually the driest month. But this year it was September for most of the area. Locations east of I-65 had a nearly 2-week long stretch of mostly sunny, rain-free days during the latter half of September. This was followed in October by several rainy days with

above normal rainfall. Elsewhere in northwest Alabama, above normal rainfall that started in the summer continued through the fall months. Joining the variability were temperatures, which were milder than normal. As a result, freezing temperatures were delayed until late in the season.

The mild conditions per

sisted into early winter, until there was a pattern change in the upper air flow over North America which allowed exceptionally cold air to move down from Canada. This brought bitterly cold temperatures to the area for the days leading up to and including the Christmas holidays. Then, in keeping with the variability shown all year, the flow pattern and temperatures reversed late in the month to bring springlike conditions for the last

week of the year. The mean temperature for December at Huntsville and Muscle Shoals was within one degree of normal, but the range was huge.

It spanned from a high of 70 at both locations to a low of 14 at Huntsville and 16 at Muscle Shoals!



Mid-September sunset, courtesy of approaching Hurricane Ivan.

Severe Weather Overview Tim Troutman, WCM

The 2004 severe weather season began for WFO Huntsville on the evening of February 5th through the early morning hours of February 6th with two severe thunderstorm warnings issued and several flash flood warnings issued and verified with flooding occurring across most of north Alabama. On the morning of February 26th, generally one to three inches of snow fell across Franklin county, Tennessee, and Jackson, Marshall and De Kalb counties in north Alabama.

March weather came roaring in like a lion, as a storm system produced several reports of wind damage with winds approaching 70 miles an hour across portions of

Limestone and Madison counties. Several counties reported extensive county-wide flash flooding. A small severe weather event marked the end of March on the 30th, with two reports of penny size hail occurring in Cullman and Marshall counties during the mid-afternoon.

April was again a relatively uneventful month in 2004 with regard to severe weather occurrences. The only episode was a small severe weather event that occurred on April 22nd. There were a few reports of penny to quarter size hail in Madison county and a roof was partially removed from a strip mall in Madison, Alabama as a scattered line

of severe storms moved through north Alabama. Several reports of large hail ranging from nickel to golf ball size occurred across Jackson, Marshall and Dekalb counties on April 25th.

The month of May started out with only two small severe weather events on the 8th and 18th, with a few reports of penny sized hail in north Alabama. However, during the late evening of May 30th through the early morning hours of May 31st, a line of severe thunderstorms moved rapidly east and southeast through the Tennessee Valley, with six tornadoes ranging from F0 to F1 and winds up to 100 miles an hour reported across the HUN county warning area.

There were many reports of wind damage across north Alabama and southern middle Tennessee,

with damage across the area exceeding an estimated 10 million dollars. Particularly hard hit areas included McFarland Park in Florence, Alabama eastward into Limestone and northern Madison counties, through Lincoln and Franklin counties in southern middle Tennessee. There was one death due to high winds in western Lauderdale county.

June started out very quiet across the Tennessee Valley, with an isolated severe thunderstorm reported in Lauderdale county on June 13th. This storm destroyed one storage building and damaged a restaurant in Cherokee, Alabama. A series of severe storms occurred during the afternoon hours of June 22nd through June 24th across north Alabama and southern middle Tennessee, with several reports of wind damage and large hail noted. Above normal rain-

(cont'd on page 5)

Severe Weather Overview (cont'd)

fall associated with daily afternoon thunderstorms resulted in an extensive flood event from June 24th through June 26th across the Tennessee Valley. Many roads were flooded across Lauderdale, Limestone and Madison counties in north Alabama and Lincoln and Franklin counties in southern middle Tennessee.

The active severe weather and heavy rainfall pattern continued into July, as there were several reports of wind damage on July 4th, 6th, and 7th across portions of southern middle Tennessee and north Alabama. From July 12th through July 14th, three separate extensive severe weather events occurred across the Tennessee Valley. The most notable severe weather event was on July 14th as a southward moving line of severe thunderstorms developed across middle Tennessee and moved south into north Alabama. Wind speeds along the line of severe storms exceeded 70 miles an hour, with extensive damage noted across southern middle Tennessee and into north Alabama. There were at least three F0 tornadoes in Moore and Franklin counties in southern middle Tennessee, and in Colbert and Lauderdale counties in north Alabama.

There were scattered reports of high winds and flooding on July 25th and July 31st across the area as

scattered, but short-lived, thunderstorms became severe during the afternoon hours on these two days.

During the month of August, there were four scattered reports of severe weather, with wind damage noted on August 11th and 20th as isolated severe storms developed during the afternoon hours.

September started out as a quiet month, however, there were scattered reports of flash flooding on September 12th and into September 13th. The main severe weather event for September was the affects that the Tennessee Valley felt from the remnants of Hurricane Ivan on September 16th into early September 17th. As Hurricane Ivan moved north through central Alabama into north Alabama and southern middle Tennessee, wind gusts approached 60 miles an hour across the area. Very heavy rainfall occurred, with several inches of rain and widespread flash flooding reported. Due to the saturated soil and continuous high wind speeds, many trees and power lines were downed across north Alabama and southern middle Tennessee.

The main severe weather

event during October was the combined tornado and flash flood event across north Alabama and into southern middle Tennessee. The damage that occurred across northwest Colbert and through Lauderdale county was determined to be primarily F1 tornado damage, with winds estimated to be at 100 miles an hour. The initial damage path of the tornado was determined to have begun about two miles east of the Riverton community in northwest Colbert County. The initial width of the tornado was determined to be at 200 yards. The F1 damage path was indicated to be at around one half mile.

The tornado quickly weakened to an F0, with winds estimated to be at around 60 miles an hour, with a 20 yard path width. The tornado lifted and then resumed its path, touching down along the Natchez Trace parkway in far southwest Lauderdale County. The path width was at 100 yards was rated and F1 with wind speeds of 90 miles an hour. The tornado continued its path for around five miles, increasing to a 150 yard path width and wind speeds at a maximum of 110 miles an hour near Central Heights.

The tornado lifted again and then touched down about two miles southwest

of Lexington, reaching F1 intensity with wind speeds of 90 miles an hour and a 150 to 200 yard path width. The tornado continued with F-1 intensity as it traveled east and northeast to the Alabama/Tennessee state line, then into Lawrence county, Tennessee. There were also numerous reports of flash flooding, as many roads were reported to be closed early on October 19th across much of north Alabama.

The severe weather events during the month of November were confined to two flash flood events that occurred on the 23rd through the 24th and also on November 30th.

In December, there were two large flash flood events that occurred on the 6th and into the 7th and also on December 9th as two storm systems combined to produce around ten inches of rain across the Tennessee valley. Many roads were closed, with flash flooding county-wide across the area.



The West Fork Little River in Desoto State Park turns into a raging torrent after T.S. Ivan moved through.

Hydrology

Jason Elliott, Forecaster

2004 was another year for expansion in the hydrology program at NWS Huntsville.

Early in the year, we established a new river forecast point on Big Nance Creek at Courtland. This is a flood-prone location, with a deep fast-moving river channel. We also began the process of establishing another new river forecast point on the Ten-

nessee River at Decatur. This point should be official in early 2005.

In September, in cooperation with the Lower Mississippi River Forecast Center, AHPS (Advanced Hydrologic Prediction Service) services were implemented at three of our forecast points: Flint River near Chase, Paint Rock River near Woodville, and Big Nance Creek at Court-

land. With AHPS, we now provide long-range 90-day forecasts of probability of the river reaching a certain height. You can find out more about AHPS and view these new products online at <http://weather.gov/riverstab.php>.

Our most challenging hydrology event of 2004 was Hurricane Ivan moving inland over the state. A 100-year rainfall occurred in DeKalb County, with significant flooding at DeSoto State Park on Lookout Mountain.

In 2005, we will continue to strive to provide you, our customers, with the best possible hydrologic services. Don't hesitate to contact us if you have any concerns.



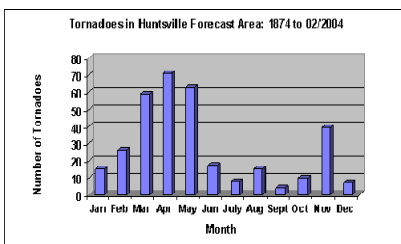
The Tennessee River inundates roads in Florence, including this intersection with AL Highway 20.

Tornado Database

Kurt Weber, Intern

The tornado database has undergone some changes over the last year to make access to data quicker and easier to read over the internet. A more dynamic web page developed with the expertise of volunteer Daniel Lamb made this possible.

A yearly, monthly, and hourly climatology of Southern Middle Tennessee and Northern Alabama was also added to the web page. The actual database was also expanded to include counties in Southern Middle Tennessee, as well as tornadoes that occurred over the summer.



Fire Weather

Steve Shumway, Lead Forecaster

The fire weather program at NWS Huntsville has been in operation since 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 southern middle Tennessee counties of Moore and Franklin are issued by the National Weather Service office in Morristown, TN. The National Weather Service office in Nashville will issue the fire weather products for Lincoln county TN.

The NWS office in 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.

Weather offices and various fire weather agencies from around the region will occasionally meet to discuss new products and technologies in fire weather. One such meeting was held this past spring in Birmingham where new computer software and operational changes were the topic.



Weather Preparedness Tim Troutman, WCM

WFO Huntsville's entire county warning and forecast area again became StormReady by July, when Moore county completed the designation process. As of this time, all 14 counties within the NWS Huntsville county warning and forecast area are StormReady.

The storm spotter training program at WFO Hunts-

ville continues to flourish. During 2004, 23 spotter training sessions were completed across north Alabama and southern middle Tennessee in the spring and fall. Nearly one thousand storm spotters were trained across the area from January 1st through November 4th. The next series of storm spotter classes will be taught in Spring, 2005.

NOAA Weather Radio Beth Carroll, Forecaster

NWS Huntsville currently operates 6 NOAA weather radio transmitters in its county warning area. Five of these transmitters are located in Alabama at Huntsville, Florence, Cullman, Hengars, and Arab. The other transmitter is located in Winchester, TN and covers NWS Huntsville's 3 counties in Tennessee, as well as 3 other Tennessee counties under NWS

Nashville.

NOAA Weather Radio uses concatenated voices to provide the best broadcast audio possible. These voices are continually worked on to improve pronunciation. The staff at NWS Huntsville also regularly participates in hands on training to ensure that all staff members are proficient with the NOAA Weather Radio system.

Skywarn Robert Boyd, Lead Forecaster

NWS Huntsville has a SKYWARN desk in our operations area. Trained weather spotters in the area licensed as Amateur Radio Operators are able to report via radio significant weather phenomena ~ either to their local Emergency Management Agency or directly to the National Weather Service in Huntsville. During periods of severe or adverse weather, the Weather Service will activate this network. The SKYWARN network consists of trained amateur radio operators who perform weather spotting and observing duties in the counties of Colbert, Cullman, DeKalb, Franklin, Jackson, Lauderdale, Lawrence, Limestone, Madison, Marshall, and Morgan counties of northern Alabama - and over Lincoln, Moore and Franklin counties of

southern middle Tennessee.

There are several hundred amateur radio operators living within the NWS Huntsville County Warning Area. One or two amateur radio operators man the SKYWARN desk at the Weather Service. This network is vital for getting reliable, ground truth reports back to the Weather Service. These reports are relied upon by the warning forecaster on whether or not to warn on radar based phenomena like tornadoes, severe thunderstorms, flooding, hail, wind damage, heavy snow, etc.

For radio communications, two radio antennas are on the roof of the National Space Science

and Technology Center (NSSTC). Our SKYWARN position has two Kenwood TM-D700 dual band FM transceivers. These transceivers permit voice communications on 144-148 MHz VHF and 440-445 MHz UHF. Communications to the Weather Service can be direct, or through various repeaters and repeater networks setup over the Tennessee Valley. These radios are capable of receiving and retransmitting Automatic Positioning System (APRS) data, including weather data. APRS allows the SKYWARN operators to view the Global Positioning Satellite (GPS) location of so equipped operators. APRS weather data from around the region is used by the Weather Service for routine forecasts and data inquiries.

Twice a year, the Warning Coordination Meteorologist or his designee conduct training classes at each county served by NWS Huntsville. These classes are taught during the late winter and early autumn, prior to climatologically known severe weather seasons that affect the Tennessee Valley. These classes delve into basic thunderstorm and tornado development, theory and related processes. Many examples of cloud formations which may represent severe weather are shown, as well as ways to pass this information to the Weather Service.



Warning Verification

Tim Troutman, WCM

WFO Huntsville issued 185 severe thunderstorm warnings in 2004, which is an average of at least 13 warnings per county across north Alabama and southern middle Tennessee. The most active month was May. As for forecast verification, we evaluate four principal Askill 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 .87 for severe thunderstorm warnings, .74 for tornado warnings and 1.0 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 .34 for severe thunderstorm warnings and .60 for tornado warnings. The false alarm rate for flash flood warnings was at .27. A zero FAR is optimal.

The Critical Success Index (CSI), a combination of POD and FAR, was at .66 for severe thunderstorm warnings, .30 for tornado warnings and .75 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 16.9 minutes for severe thunderstorm events, 5.6 minutes for tornado events and 52 minutes for flash flood events.

Here are specific statistics for severe thunderstorm, tornado and flash flood warnings issued by WFO Huntsville and severe weather events in 2004.



Damage from an F1 tornado that occurred during the early morning hours of May 31st. Mobile homes are stacked on top of one another in the Fort Hampton Area.



Damage from Tropical Storm Ivan 5 miles west of Boaz, Alabama.

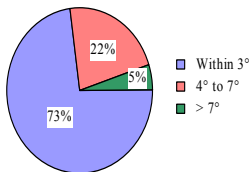
2004 Warning Stats	Severe Thunderstorm	Tornado	Flash Floods
Warnings Issued	185	35	122
Warned Events	122	14	91
Unverified Warnings	63	21	33
Missed Events	17	5	0
Total Events	139	19	91
Probability of Detection	.878	.737	1.0
Critical Skills Index	.659	.298	.745
Average Lead Time	16.9 min	5.6 min	52.0 min

Forecast Verification Mike Richter, Forecaster

The verification of weather forecasts remains an essential part of the forecasting process here at NWS Huntsville. We use forecast verification to monitor the accuracy of our forecasts, as well as ensuring that we continually improve on their quality and value through training. One way a forecast is verified is through comparisons with actual observations taken from 2 representative sites located at the Huntsville International Airport and the Northwest Alabama Regional Airport in Muscle Shoals. Once the actual observations are reported by each airport location, the data is then compared with that of the actual forecast in order to access the accuracy of the forecast.

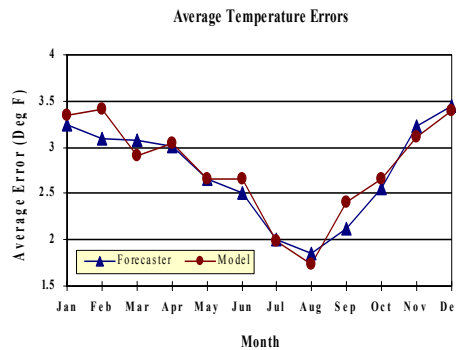
For our temperature forecasts, this includes both the daytime high temperatures and the overnight low temperatures. The following pie chart shows the percentage of office forecasts within 3 degrees (°F) of the observed temperatures at Huntsville and Muscle Shoals during 2004. This includes the first four periods of each forecast (two days and two nights). **Overall, forecasts were within 3° F of the observations 73% of the time. This is a 2% improvement over forecasts issued during our first year in 2003.**

Temperature Forecast Errors



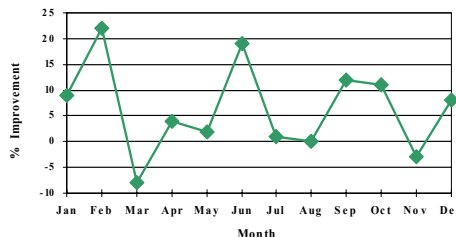
Our temperature forecasts are also compared against those of the computer model forecasts. The following graph

shows a monthly comparison of the forecaster and computer model temperature errors for 2004. For the second straight year, our temperature forecasts bested the computer models in nearly every month. **Overall, the largest improvements were shown during the months of February, June and September.**



Forecasts of precipitation are also verified at NWS Huntsville and measured against those created by computer models. The following graph shows our percentage of improvement over the computer models for precipitation forecasts. **Overall, our forecasters showed improvement over the models in all but two months. Specifically, the months of February and June showed at least a 20% improvement over the models, with over a 10% improvement in both September and October.**

% Improvement over Models
Precipitation Forecasts



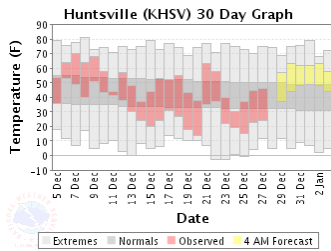
Aviation Matt Zika, Lead Forecaster

It was another busy year for aviation related activities across north Alabama. Occasional visits continued to be made throughout the year to local airports and FBOs in order to obtain valuable feedback from our important aviation customers. The thoughts and feedback received continue to go a long way in improving our aviation services.

The WFO HUN Airport Weather Warning (AWW) program also continued at both MSL and HSV airports. The WFO HUN provided advance notification of significant weather that was expected to impact local airport operations. Other outreach events included giving aviation weather related talks to area pilots. The biggest such event occurred at Madison Executive Airport (MDQ) where nearly 50 pilots (mainly G.A.) attended the event. Additional partners that were in attendance included members from the FAA, the local media, the Huntsville International Airport, and the private sector.



Climate Jason Elliott, Forecaster



Climate graph depicting observed temperatures for Huntsville versus normal/extreme values. It also gives the forecast temperature.

Numerous enhancements were made to provide easier access to climate information on our internet webpage during 2004. This included graphs that plot our daily forecast against the normals and records for those dates.

We are also extremely pleased to offer a new site from the Huntsville area on our Regional

Temperatures and Precipitation (RTP) product. This new data comes from equipment located just outside the NWS office in Huntsville, operated by the University of Alabama in Huntsville. Combined with sites at the Decatur Airport, Meridianville, and the Huntsville Airport, there are now four automated stations providing official temperature data in the

Huntsville metro area, and eight total in the Huntsville NWS area.

For information on how this year compared climatologically, check out the Weather Summary portion of this Partner's Report.

IFPS/GFE Brian Carcione, Forecaster

Forecasters at NWS Huntsville and the public alike have become more used to the full suite of forecast products available using the Graphical Forecast Editor. The new system has resulted in a whole new era of products and services, including graphics and point forecasts for thousands of locations across the Tennessee Valley (both available via the Internet at <http://www.srh.weather.gov/hun>.



With some of the more major hurdles behind us, the GFE team spent much

of 2004 striving to expand the system for new uses and services. GFE, for example, continues to be one of the most innovative ways to incorporate new science and technology into our forecasts, especially those products generated in our relationship with NASA and UAH.

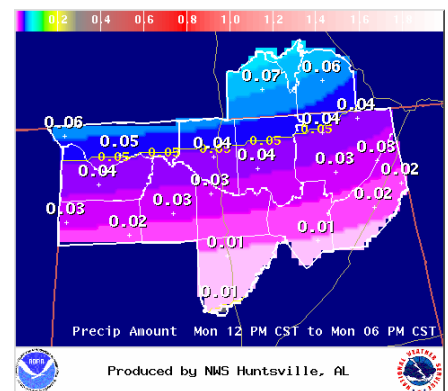
Forecasters frequently use a high-resolution temperature analysis generated by our partners to improve the first several hours of hourly temperature forecasts, and unique higher-resolution model data can be directly incorporated into the forecast as well. A multitude of new "smart tools" are also available that can infuse new research into the process.

The Graphical Forecast Editor has also allowed

the staff at Huntsville to represent terrain differences in more refined ways. While most offices across the eastern United States produce forecasts on a 5 kilometer (~ 3 miles) grid, Huntsville increased our resolution to a 2.5 kilometer (~ 1.5 miles) grid. In other words, a forecast is now produced for a point every mile and a half, rather than every 3 miles. This more refined resolution allows us to more accurately depict the vast terrain differences often seen across the forecast area, especially in north-east Alabama and southern middle Tennessee.

The new year promises to bring more changes to this rapidly-developing segment of the National Weather Service. The GFE team looks forward to finding new ways to enhance these forecasts for all our customers.

A forecast for the Tennessee Valley is now produced for a point every mile and a half, rather than every 3 miles as is typical for most forecast offices across the eastern United States.



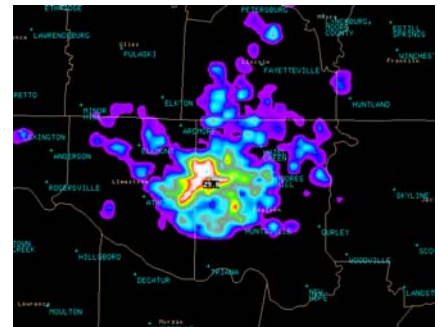
NASA Collaboration Chris Darden, SOO

NWS Huntsville continued to engage in numerous collaborative research activities with scientists from NASA's Marshall Space Flight Center. During 2004, the collaborative efforts brought a host of new modeling and observational datasets into the operational forecasting environment. These highly detailed data sets allow us to forecast on spatial scales that are not normally attainable by model data generated at national centers. This, coupled with high-resolution satellite data provided by NASA, allows us to formulate a more complete picture of

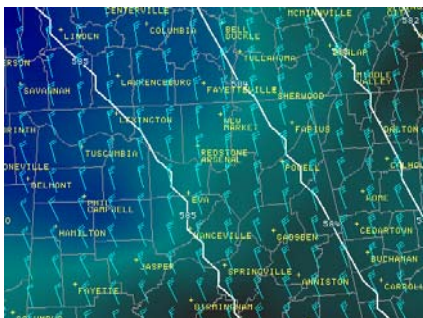
the ongoing and expected weather across the Tennessee Valley.

In addition, greater understanding of severe weather processes has been achieved through the utilization of real-time total lightning information at NWS Huntsville. NASA scientists maintain a total lightning monitoring network in north Alabama that can detect not only cloud to ground lightning strikes but also intracloud and cloud to cloud lighting. The Huntsville office was the first forecast office in the nation to have access to this unique and exciting dataset.

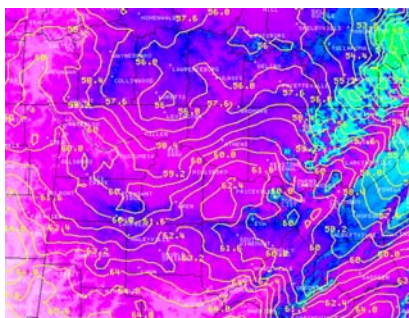
Subsequent case studies and research has shown a distinct correlation between total lightning flash rates and the onset of severe weather. Radar operators at the NWS in Huntsville (along with Birmingham and Nashville) are now utilizing this information in real-time to supplement available radar information in support of life-saving warning operations. To spread the word about the ongoing collaborative activities, NWS forecasters work closely with NASA scientists on applied research publications and conference presentations.



Total lightning data (courtesy of NASA) being utilized by WFO Huntsville in warning and forecast operations.



Model output from NASA's prototype of the Weather Research and Forecasting (WRF) Model. This model provides highly detailed data for the Huntsville forecast office.



High-resolution temperature data is provided by the NAS Local Analysis and Prediction System (LAPS) package. This data provides extensive detail across the higher terrain of the Tennessee Valley.

Weather Synopsis Brian Carcione, Forecaster

Listeners of NOAA Weather Radio have a new way to understand the big picture affecting their weather. In May, staff members began writing an area weather synopsis designed specifically for the radio.

The product, which replaced the hazardous weather outlook in the broadcast cycle, is updated frequently to keep listeners aware of what is driving the weather and how it may impact them.



Group Outreach

Tim Troutman, WCM

The WFO Huntsville Outreach team completed an extensive schedule of events in 2004. School outreach program leader, forecaster Priscilla Bridenstine completed 55 school presentations to area schools in north Alabama and southern middle Tennessee. Meteorologist-In-Charge, John Gordon, and WCM Tim Troutman, completed 37 public safety presentations during the year to rotary, Kiwanis and lions clubs, a real estate organization, the local Huntsville American Me-

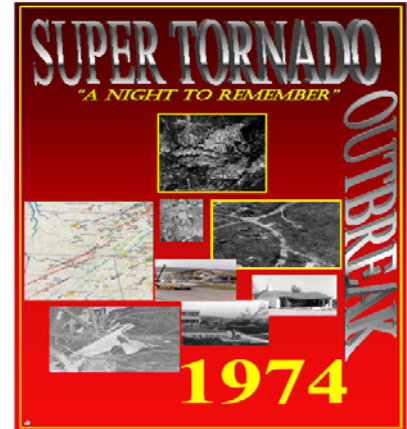
teorological Society (AMS) chapter and to personnel at Redstone Arsenal and Marshall Space Flight Center, educating around 1,850 people involving NWS Huntsville and weather safety.

To commemorate the 30th anniversary of the April 3, 1974 tornado outbreak, the staff at WFO Huntsville participated with members of WFO Birmingham in a memorial ceremony for the survivors of the super

tornado outbreak on April 3rd. This large outreach event recounted the event and served as a reminder that we need to continually improve our preparedness to mitigate the loss of life and property.

In mid November through December 1st, a series of media workshops were completed at NWS Huntsville in an effort to improve the warning and communications process with the TV meteorologists at the three main television stations in Huntsville.

SUPER TORNADO OUTBREAK
APRIL 3-4, 1974
30TH ANNIVERSARY



NATIONAL WEATHER SERVICE
HUNTSVILLE, ALABAMA
BIRMINGHAM, ALABAMA
NASHVILLE, TENNESSEE

ATHENS STATE UNIVERSITY
ATHENS, ALABAMA
APRIL 3, 2004
10 AM TO NOON



www.srh.noaa.gov/hun/April1974/april74outbreak.html
www.srh.noaa.gov/bmx/April1974/april74outbreak.html



Cooperative Observer Program

Lary Burgett, Observation Program Leader

During the past year two additional cooperative observer sites were established. Anderson in Lauderdale County of northwest Alabama provides important weather information in the northwest corner of the state. In southeast Madison County, Owens Cross Roads provides valuable temperature and precipitation information in a flood zone.

Two cooperative observers were selected to receive the prestigious Thomas Jefferson Award. Mr. James McCravy of

Hanceville, Alabama and Mr. William Crow of Vallley Head, Alabama received their Jefferson Awards in early December.

Also during the past year, replacement of the remaining old Max/Min MMTS display units was completed. The new NIMBUS PL2 temperature display unit has now been installed at all WFO Huntsville cooperative sites.



Mr. McCravy receives his award from John Gordon on December 8th. Mr. McCravy has been a cooperative observer for 43 years, and has been at Hanceville since 1973.

Mr. Crow receives his award from MIC John Gordon on December 9th. He has been a cooperative observer for 42 years and continues the tradition of daily weather reports at the oldest COOP site in WFO Huntsville's area. It was established in 1885.



School Outreach

Priscilla Bridenstine, Forecaster

The 2003-2004 school year was very successful for the National Weather Service in Huntsville. Nearly 2000 kids were visited by an NWS meteorologist and taught the basics of weather. Safety tips and weather-related experiments that mimicked real life were a hit with all the students. Many Boy Scout and Girl Scout troops were visited by forecasters as part of the requirement to earn Weather Merit Badges.

Not only were children taught the importance of weather safety, but adults as well. A roundtable discussion was held with Boy Scout Troop Leaders

to provide basic weather training for the adults. The most dangerous aspects of weather were discussed in-depth to foster a greater respect for Mother Nature. The main objective of this discussion was to teach safety tips to help mitigate disaster when participating in outdoor events.

The overall goal of the school outreach program was to enhance awareness of weather-related events and to encourage proactive measures to reduce the risk associated with outdoor activities.



Many visitors stopped by the NWS booth during Kids Count Expo 2004. Lead Forecaster Robert Boyd talks to visitors about severe weather safety.



Radar

Bill Schaub, Lead Forecaster

One big improvement in our ability to assess radar returns over northwest Alabama was the installation of a much faster communications line between our office and the radar in Columbus, Mississippi. The new line is like the one that we have had all along from the radar at Hytop in north-east Alabama, and enables us to obtain double the number of radar products.

Other major improvements are provided by developers at the Radar Operations Center in

Norman, Oklahoma, who release a few new radar products every 6 months. These help us analyze thunderstorm structure in more detail. Therefore, training continues as an important ongoing process to familiarize the staff with new weather radar products as they become available.

A few of the new radar products include:

- A coverage pattern that has additional low-level sweeps. This enables us to see more of the winds in the first few thousand feet off the ground. Since

most of the thunderstorms in the Tennessee valley are smaller than those that occur in the plains, the increased detail of low-level winds will be a big help in identifying dangerous circulations.

- More sophisticated and more rapidly generated alerts for significant circulations.

These new products are designed to identify significant circulations more accurately, and can be viewed at any time during a sweep cycle, rather than just at the end of the cycle as before.

- A coverage pattern that can be used in some cases to eliminate areas where the winds could not be

estimated by the radar.

Sometimes the radar has trouble estimating the wind direction and speed. This happens in areas where winds are very strong or cloud cover is limited, and also at times when there is widespread activity.

This new coverage pattern was used successfully during Hurricane Ivan to retrieve wind data that would have otherwise been missing.



Web Page

Brian Carcione, Forecaster

Our presence on the internet continues to expand and flourish. The web site, available at <http://www.srh.weather.gov/hun>, has continued to evolve over the past year, offering several new and innovative products and features, while setting the standard for significant weather event updates and reviews.

Some of the most popular new pages included:

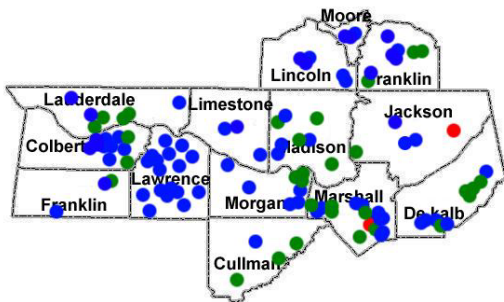
- A tribute to Huntsville meteorologist H.D. Bagley, who died this past summer. Mr. Bagley helped set up the original Huntsville Weather Bureau office in 1958 but was better known as a meteorologist on a local TV station.
- An online spotter report form, which allows users to submit their severe weather reports directly into the NWS AWIPS computer system.

Meanwhile, the vast majority of the pages on our website have been updated and refreshed with new weather data and information over the past year, including the popular online photo al-

bum, which is updated every 7 to 10 days.

One of the web team's primary goals this year was improving our response to significant weather events, and we met that goal. Maps, photographs, and satellite and radar images were on the website within a day or two of the more memorable weather events this year, such as the February 15th snowstorm and the Memorial Day severe weather outbreak. Local web coverage of Hurricane Ivan both before and after the storm received regional and national accolades, especially a new damage report map developed by a student volunteer.

More improvements are in the works for the web site during the upcoming calendar year, including a more regular, automated damage report map, interactive web-based games and programs, and a more interactive "weather fact" database.



Web page damage map developed by student volunteer Daniel Lamb during TS/TD Ivan.

Electronics

Brian Burgess, ESA

This year has been extremely challenging for the electronics section at the Huntsville Office. The electronics systems have undergone major equipment changes to keep pace with the advance in technology and to better serve our customers. There have also been communication upgrades to increase the speed of data to and from the office systems. Management has added a new member to the staff during severe weather. An Electronics staff member will be present during the event to assist the forecasting staff and to resolve any equipment failures.

ASOS (Automated Surface Observing System):

The Decatur and Muscle Shoals ASOS have been upgraded from the older two processors to a new single processor. These new processors allow the systems to be upgraded with newer and more accurate sensors. The Decatur ASOS was upgraded with a new Dew Point sensor. The Huntsville ASOS is on the schedule to receive the new processor this coming spring along with the new Dew Point and Weighing Rain Gage.

AWIPS (Advanced Weather Interactive Processing System):

AWIPS has gone through several minor and major upgrades. There were two major software upgrades

- Build 3 and Build 4. These builds updated the overall AWIPS software and added several new components, one of which was added radar products. Several minor upgrades were installed to update application software. There were three major hardware upgrades that replaced aging equipment, the workstations, the text workstations, and routers for network communications. There were several minor upgrades that increased our data input, one being new Digital Video Receivers for our satellite downlink.

WSR-88D Radar NEXRAD (Next Generation Radar):

NEXRAD has gone through 2 software upgrades and several minor hardware upgrades. These were installed to allow two more Volume Coverage Patterns to be accessible on AWIPS and to access the DOD radar products through a network connection. These have been very successful and give increased forecasting tools to our meteorologists.

NWR/CRS (NOAA Weather Radio / Console Replacement System):

There have been some great strides in the NWR program. CRS had two major software upgrades. These have helped pave the way to the new Emergency Alert System's Event Codes.

Information Technology

Jason Burks, ITO

In the previous shareholder's report the focus in IT was on installing and configuring computer and network infrastructure. Now that we have our base computer and network needs met we can focus on IT development.

HUNTV Update

HUNTV is a computer program used to display our forecasts, observational data, satellite, radar, and warnings on a public T.V. channel that does not have access to weather data including the National Weather Service watches and warnings. HUNTV is made available for download to the public via our website. Over the last year we have made many updates to HUNTV including: being completely configurable. The application can receive

and modify it's look and action if a watch or warning has been issued by the National Weather Service. HUNTV has been in use at E-TV, the Huntsville City Schools closed circuit T.V. network, Huntsville City Government Cable Access Channel, Cullman Cable Access Channel, internally within WFO Huntsville, AL, along with the National Weather Service Southern Regional Headquarters. Other National Weather Service offices are beginning to distribute HUNTV to groups in their areas. Huntsville has been working closely with the Birmingham, AL and Shreveport, LA offices to help them deploy this technology in their area. HUNTV is helping to get our warnings to people who may not have received them during

emergency situations.

Tornado Database Update

Last year we put the Tornado Database on our webpage. The Tornado Database allows anyone to search and sort the tornadoes of the Tennessee Valley all the way from 1874 to the present. This webpage has received many accolades and is used by many groups in the Tennessee Valley from university students, to EMAs, to private citizens. We redesigned the webpage to make it more appealing and better organized along with updating the information. During the last year we have also added data for our new Tennessee counties. The Tornado Database is available at the following website:

<http://www.srh.noaa.gov/hun/tornadodatabase>

Verification Software

We are in the process of developing two types of verification software. This verification software will help us improve our forecasts across the entire Tennessee Valley. Once completed our forecasters will be able to interrogate in real-time how their forecasts are verifying. The system will also help them in assessing the biases of the numerical models they use to make forecasts. This is just another way we can continue to improve and provide the best products to the people of the Tennessee Valley.

Administrative

Pearline McCauley, ASA

We are losing our MIC, John D. Gordon to NWS Louisville, Kentucky, his last day with us will be 1/07/05. Tom Bradshaw our SOO, transferred to Southern Region Headquarter in Fort Worth, TX. Both will truly be missed. We gained one employee, Andy Kula, Senior Forecaster from Des-Moines, Iowa.

Staffing Overview at Year's End

1 Meteorologist In Charge	2 Meteorologist Interns
1 Warning Coordination Meteorologist	1 Administrative Support Assistant
1 Science and Operations Officer	1 Electronics Systems Analyst
1 Information Technology Officer	1 Electronics Technician
5 Senior Forecasters	1 Observation Program Leader
5 General Forecasters	1 SCEP Student

www.srh.noaa.gov/hun

Huntsville, Alabama



2004 NWS Partners Report

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