

STORM COURIER

2024



Hurricane Awareness Tour Comes to WFO Charleston

By: Brian Haines, Meteorologist In Charge

On May 9, WFO Charleston, SC, hosted the Hurricane Awareness Tour (HAT) at the Charleston International Airport (CHS). Planning for the event started in November of 2023. The HAT event was closely collaborated with the South Carolina Emergency Management Division (SCEMD) and the Charleston Airport Authority. This event consisted of three different events all in one!

The primary event showcased the WC-130J "Hercules" and WP-3D "Orion" Hurricane Hunter aircraft. School children, media, emergency managers, and multiple VIPs,

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including the Governor of South Carolina, Henry McMaster, attended and toured the aircraft. The purpose of the HAT is to raise awareness of the impacts from tropical cyclone threats and the danger of being caught without a hurricane preparedness plan. SCEMD also used the HAT to promote South Carolina's new Hurricane Evacuation Zones.

The second part of this event was an office tour for several VIPs, including Congressional Staffers from five different congressional offices, the SCEMD Director, and the Governor of South Carolina. VIPs were given a brief presentation by Tropical Program Manager ERH Chris Birchfield, Science and Operations Officer (SOO) Carl Barnes, and Meteorologist-in-Charge (MIC) Brian Haines on WFO Charleston's unique challenges, including a rapid increase in coastal flood events. Next, the group went outside for a special 16z upper air balloon launch in support of an approaching squall line and severe weather operations. The balloon was even released by Governor McMaster himself! After the balloon release, the VIPs returned inside and received a special look into severe weather operations at WFO Charleston.

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NWS Charleston and Columbia staff after completing the 2024 HAT Charleston, SC stop. From left to right: (Back Row) Tropical Program Manager ERH **Chris Birchfield**, Lead Meteorologist **Blair Holloway**, Meteorologist **Steve Lavoie**. (Front Row) Lead Meteorologist **Brian Adam**, Meteorologist **Emily McGraw**, Lead Meteorologist **Emily Carpenter**, Forecaster **Chris Landolfi**, Meteorologist **Anna Dennis**, and Warning Coordination Meteorologist **Ron Morales**.

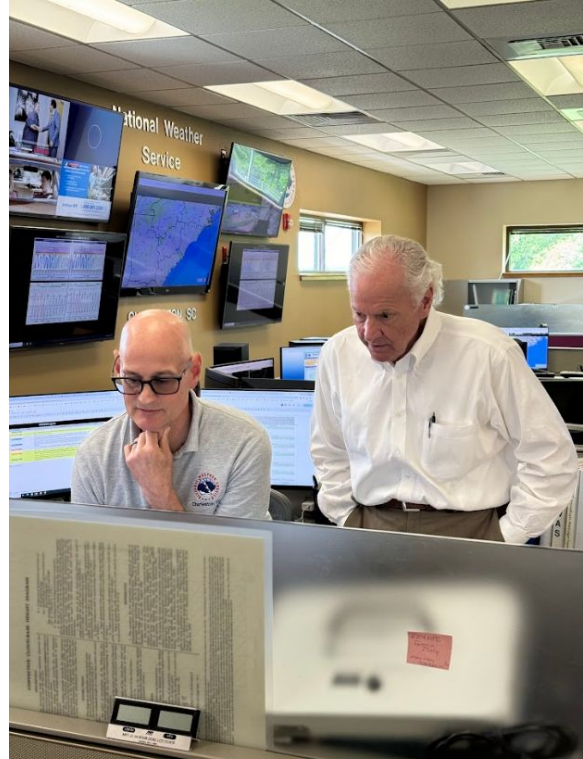
The final piece of this event was severe weather approaching from the Midlands of South Carolina. While forecasters were at the HAT, a contingent of forecasters were back at the office prepping for the severe weather. The congressional staffers arrived right as Lead Meteorologist Steven Taylor started issuing Severe Thunderstorm Warnings. This allowed the staffers a unique opportunity to see exactly what the National Weather Service does. In total, the office issued 13 severe thunderstorm warnings, two tornado warnings, and six special marine warnings to cover the severe weather outbreak. WFO Charleston staff did an excellent job balancing a challenging HAT event, VIP tour, and Severe Outbreak!

The CHS staff also greatly appreciated the help and service of the meteorologists from WFO Columbia, SC who assisted with running the HAT on the day of the event.

Top: Observing Program Leader **Dwight Koehn** (left) and South Carolina Governor **Henry McMaster** (right) discussing the 16z special sounding that was released.

Middle: Lead Meteorologist **Steven Taylor**, Science and Operations Officer **Carl Barnes** provide an office tour to multiple congressional staffers.

Bottom: Staff from WFO Charleston and Columbia in front of the WC-130J "Hercules" aircraft. From left to right: Lead Meteorologists **Brian Adam** and **Emily Carpenter**, Meteorologists **Emily McGraw**, **Courtney Maskell**, and **Anna Dennis**, Lead Meteorologist **Blair Holloway**, and Student Volunteer **Andrew Price**.



2024 Student Summer Volunteer Program

By: Neil Dixon, Lead Meteorologist

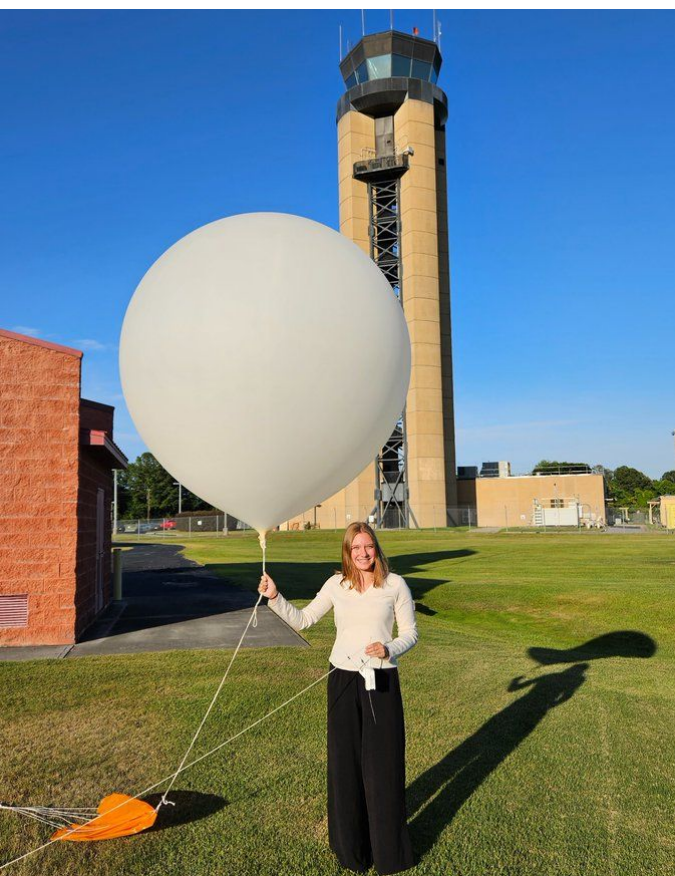
Colorado College student, Sienna Schaay, served as our 2024 summer volunteer. Sienna completed numerous training courses (including First Aid/CPR), learned about the mission and function of the NWS, participated in development of hydrological and meteorological products, severe weather verification, and aided in upper-air observations. Her main goal this summer was to complete a research project to help us better understand the influences on tidal departures at Fort Pulaski, GA.

Predicted tide levels, or astronomical tide, are calculated based on astronomical factors such as the gravitational forces of the Moon and the Sun, as well as local topography and bathymetry at Fort Pulaski, GA. [NOAA Tides & Currents](#): “Those gravitational forces change as the relative positions of the Earth, Sun, and Moon change. We can visibly see these position changes in the rise and set of the Sun and Moon, the changing phases of the Moon, and the [changing seasons of the years](#).” However, the actual water level is typically greater than the astronomical tide level. The difference between the actual water level and the predicted astronomical tide level at a specific time is called the “tidal departure”. In essence, the National Weather Service Charleston is forecasting the value of the tidal departure within the total water level forecast.

Tidal departure is caused by several factors:

1. [Meteorological Conditions](#): Weather patterns such as low-pressure systems, strong onshore winds, and storms can influence tidal levels by causing storm surges or atmospheric pressure changes that affect sea level.
2. [Oceanographic Processes](#): Changes in ocean currents and/or coastal upwelling may modify tidal levels and result in departures from predicted astronomical tide values.
3. [Human Activities](#): [Ship-induced wakes](#), construction of coastal infrastructure (seawalls), and land reclamation can alter tidal dynamics and contribute to tidal departures.
4. [River Flooding](#): Following heavy rainfall events, river levels will likely increase along with increased streamflow rates. High river levels/discharge can coincide with high tides, leading to compound flooding events where river flooding and coastal flooding occur simultaneously.

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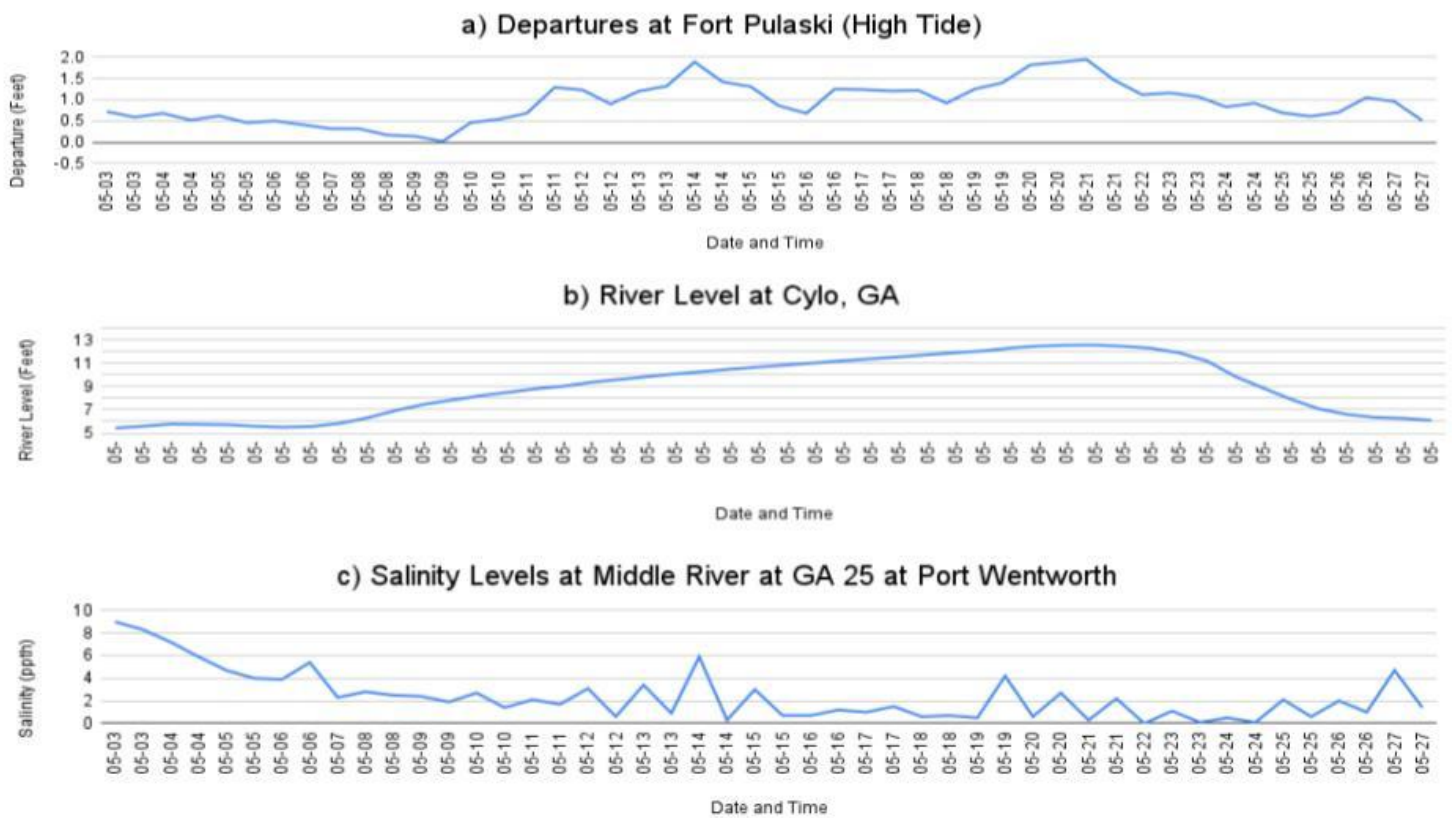


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My summer as a student volunteer was an incredible learning experience. I deepened my understanding of atmospheric processes while conducting a research project about tidal departures. One of my favorite moments was assisting in launching a weather balloon—I had never seen one in person before. Overall, this experience not only expanded my knowledge, but also gave me insight into the critical work of the National Weather Service.”

Sienna's project was designed to study the potential relationship between the Savannah River discharge/stage to the tidal departures at Fort Pulaski, GA. She collected every observed tide level and hourly wind observation at Fort Pulaski, GA, river stage from the Savannah River near Clyo, GA, and water salinity levels from the Middle River at Port Wentworth from July 2023 through June 2024. Within this timeframe, there were several flooding events to examine, the most significant occurred during the month of May 2024. Using a statistical analysis, Sienna was able to determine that there was a correlation between the stage on the Savannah River at Clyo, GA to the tidal departures on the Savannah River at Fort Pulaski, GA.

The graph below show the departures at Fort Pulaski, GA, river level at Cylo, GA, and salinity levels from the Middle River at Port Wentworth during May 2024.



The National Ocean Service's [Fort Pulaski, GA tidal gauge](#) is the representative tidal observation site for southeast Georgia and portions of the southern South Carolina coast. The NWS Charleston office produces [total water forecasts](#) for the Fort Pulaski, GA site and issues Coastal Flood Advisories, Watches, and Warnings when necessary.

Total water level forecasting is an extremely complicated task for NWS forecasters. We would like to thank Sienna for her hard work this summer. This study has helped our understanding of coastal flooding at Fort Pulaski, GA and surrounding areas.

If you are interested in our Summer Student Volunteer Program (currently accepting applications through February 21, 2025), click [here](#).

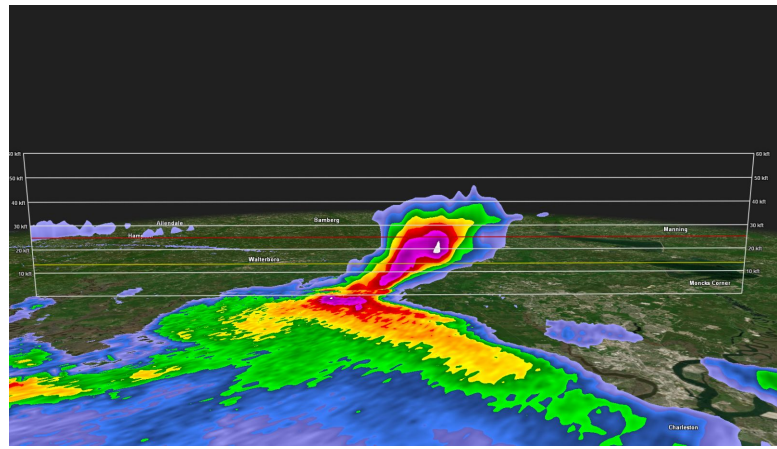
Here's Why You Should Take Straight-Line Winds as Seriously as a Tornado

By: Anna Dennis, Meteorologist

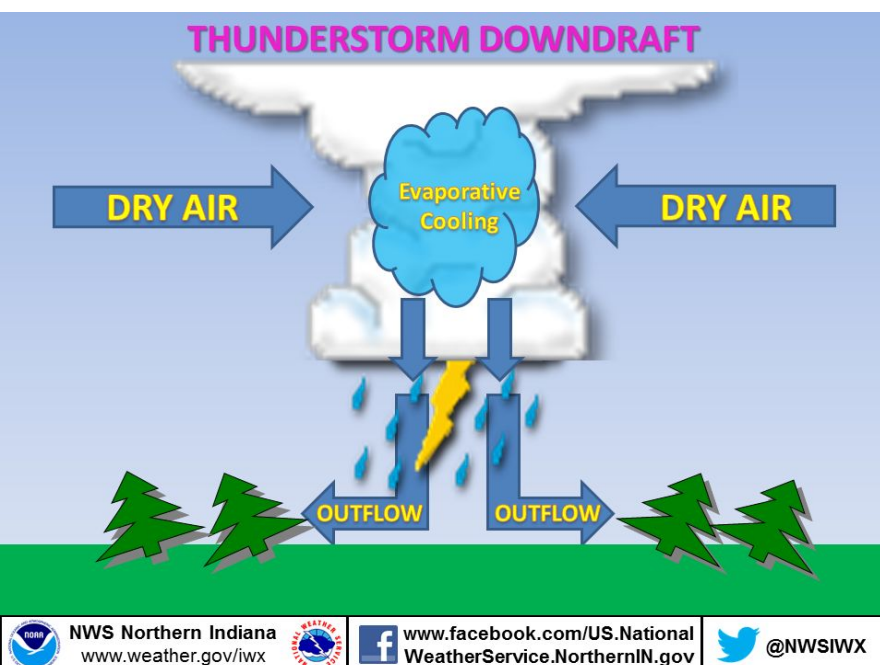
Living in the South Carolina Lowcountry and southeast Georgia, we are no stranger to severe weather, but most of us probably wouldn't take strong winds in the forecast as seriously as the potential for tornadoes. Typically thunderstorms aren't as destructive as tornadoes, or are they?

Earlier this year, a supercell thunderstorm developed near the Savannah River during the afternoon of Monday June 10th and tracked northeastward across the Charleston Metro through the early evening hours. The supercell produced up to 2 inch hail (the size of a hen egg) and peak winds of 80 to 85 mph. To put that into perspective, this wind speed is equivalent to a category one hurricane according to

the Saffir-Simpson hurricane wind scale. A significant amount of damage was reported for portions of Summerville, Ladson, and Goose Creek. The NWS storm survey found that the bulk of the damage consisted of large softwood trees snapped and uprooted and some hardwood tree limbs snapped. However, extensive damage was found around the Quail Arbor Neighborhood off Old Trolley Road and around Wisteria Street and the Tall Pines Neighborhood along I-26 on the north side of Ladson. Within these two areas, both soft and hardwood trees were observed to have snapped near the trunks, several of which fell on residences and vehicles. Additionally, some damage to residential property was observed, including shingles and siding blown off and privacy fences blown down. Sounds similar to tornado damage, right? However when out surveying, we found that the debris fell parallel to the outward wind flow, indicating straight-line winds were likely the culprit. Additionally, based on the degree of the damage and other damage indicators, it was confirmed that the damage was from straight-line winds, and not a tornado.



The radar cross section shows reflectivity values in excess of 72 dBZ (white) at 45 kft, 65 dBZ (purple) above 25 kft with values of 30 dBZ (green) at 40 kft when the storm was over portions of southern Dorchester County. (Radar reflectivity values greater than 65 dBZ is commonly associated with large hail).



You might be scratching your head, wondering what in the world straight-line winds are and why they occur. Simply put, straight-line winds refer to any thunderstorm wind that is not associated with rotation, serving primarily to distinguish it from tornadic winds. These winds are generated by thunderstorm downdrafts, which are small columns of air that rapidly descend toward the ground. When cool, dry air develops within a thunderstorm, it can become denser than the surrounding air, leading to a sudden downburst. As this burst of colder air reaches the surface, it disperses, producing fast-moving gusts that can exceed 100 mph, known as straight-line winds.

Diagram of a thunderstorm downdraft.



Aerial view of the straight line wind damage in Summerville shows debris, such as uprooted trees, laid out in parallel rows.

It's a common misconception to confuse straight-line winds with tornadoes: both can pack a punch and leave significant damage. When comparing straight-line winds to a tornado, it is important to remember that all wind can be hazardous, and it is not worth risking it. When you hear a Severe Thunderstorm Warning or a Tornado Warning, remember that both tornadic and straight-line winds can pose serious dangers. The best course of action is to seek shelter on the lowest floor of your building, away from windows and doors. Prioritize your safety, and don't hesitate to take precautionary measures—your future self will thank you!

WFO Charleston Visits KCHS Air Traffic Control Tower

By: Courtney Maskell, Meteorologist

On January 16, staff members at WFO Charleston, SC were able to take a tour of the Air Traffic Control (ATC) Tower at the Charleston International Airport (KCHS). The visit was organized by the Aviation Team Lead, Meteorologist Courtney Maskell.

WFO Charleston is located directly next door to the ATC tower, making the journey to the tower short. Staff members were able to tour the radar room and make a trip up the elevator to the top of the tower. While in the radar room, staff members were able to discuss possible improvements to the KCHS Terminal Aerodrome Forecast (TAF) with the ATC employees. The TAF focuses on hazards critical to aviation including low clouds, fog, winds, and thunderstorms. Discussions with the ATC employees mainly focused around the summer sea breeze/land breeze formation and onset time and the difficulties in forecasting exact timing in the KCHS TAF. At the top of the tower, staff members were able to take in the incredible views of the airfield. Conditions were overcast with reduced visibility, but on a clear day the tower can see all the way to the coastline.



Lead Meteorologist **Blair Holloway**, Observation Program Leader **Dwight Kohen**, Meteorologists **Courtney Maskell** and **Emily McGraw**, Warning Coordination Meteorologist **Ron Morales**, and Lead Meteorologist **Pete Mohlin**

Cold Weather Changes

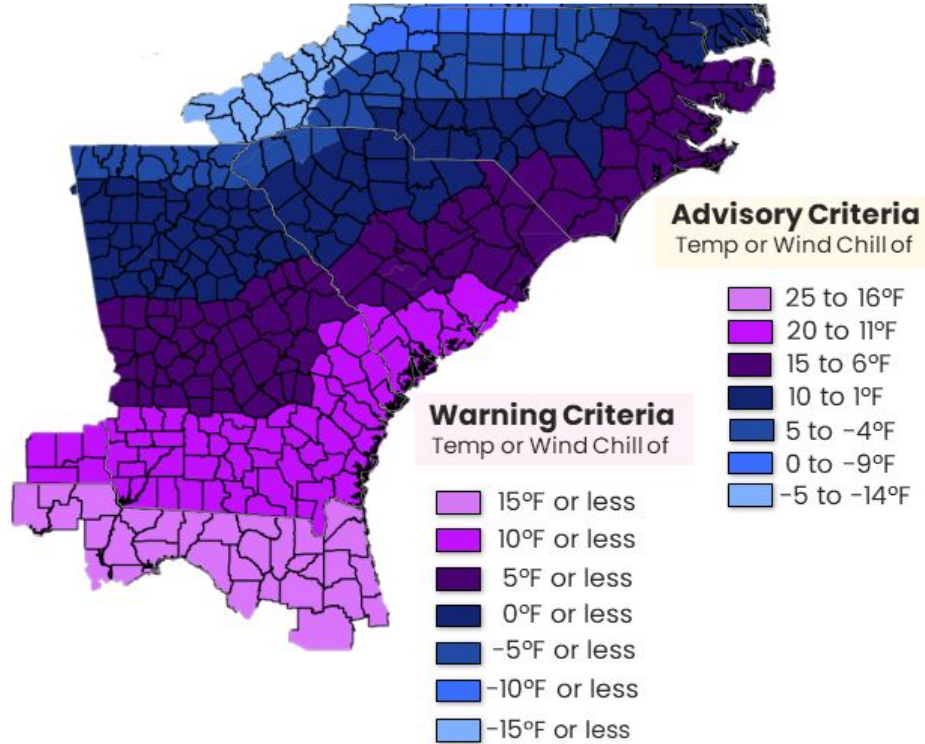
By: Neil Dixon, Lead Meteorologist

Starting fall 2024, the National Weather Service (NWS) implemented several changes to the cold weather products. These changes were made by NWS's ongoing Hazard Simplification project, intended to simplify the communication of cold weather hazards and improve the understanding of our cold weather headlines. Some of the more notable changes made to the cold weather products (right image) are as follows. Wind Chill Watches/Warnings have been consolidated to Extreme Cold Watches/Warnings. The issuance criteria was changed to 10 degrees for either wind chill or temperature across southeast Georgia and South Carolina. Wind Chill Advisory has transitioned to Cold Weather Advisory. The issuance criteria was changed to 20 degrees for either wind chill or temperature across southeast Georgia and South Carolina.

COLD CRITERIA

ADVISORY VS WARNING

See how **Cold Weather Advisory** and **Extreme Cold Warning** criteria differ across the region



These new products will allow us to highlight periods of cold weather that coincides with or without wind as the criteria applies to either wind chill or temperature. This criteria was also raised or “warmed” from the old criteria that was used for the Wind Chill Watches/Warnings/Advisories. In some cases, the criteria across our inland counties was warmed by 15 degrees. For this reason, starting this winter season, we could see more cold weather products than in recent years.

2024 Atlantic Basin Hurricane Season Recap

By: Brian Adam, Lead Meteorologist

The 2024 Atlantic Hurricane season officially came to an end on November 30 featuring above average activity with 18 named storms, 11 hurricanes (winds 74 mph or greater), and 5 major hurricanes (Category 3 or higher with winds 111 mph or greater). For comparison, an average hurricane season produces 14 named storms, 7 hurricanes, and 3 major hurricanes. The number of storms was fueled by persistent above normal sea surface temperatures in the Atlantic Basin along with a transition from El Nino to ENSO neutral conditions through the summer period, which is more conducive to tropical storm development. Here is a recap of the most notable storms of the season.

The season began in dramatic fashion when Hurricane Beryl formed in the tropical Atlantic in late June and quickly strengthened into a Category 5 storm on July 1 after entering the eastern Caribbean; the earliest Atlantic basin Category 5 storm on record. The storm weakened considerably before reaching the Texas Gulf Coast, but managed to produce significant storm surge flooding across parts of Texas and Louisiana,

as well as lengthy power outages in Texas. But despite the strong start, tropical storm activity diminished through the rest of July into early August.

Hurricane Debby began as a disturbance over eastern Cuba in early August before tracking northward through the eastern Gulf of Mexico and strengthening to a Category 1 storm. Debby made landfall near the Big Bend of Florida as a hurricane on the morning of August 5 before weakening to a tropical storm and moving very slowly along the Southeast coast through August 9. Prolonged heavy rainfall across southeast Georgia and southeast South Carolina brought widespread flash flooding, with considerable and prolonged flooding of creeks, streams, and main stem rivers which were exacerbated by additional rainfall. Several nighttime tornadoes occurred across the South Carolina Lowcountry, and scattered tree damage from near tropical storm-force winds resulted in power and communications outages.

Tropical activity increased dramatically toward the latter half of September with the development of Helene in the central Caribbean. The storm steadily strengthened while advancing northward through the eastern Gulf of Mexico and made landfall as a Category 4 storm in the Big Bend region of Florida. The large wind field associated with Helene produced widespread tropical storm-force winds/wind gusts across most of southeast Georgia and southeast South Carolina during the evening and overnight hours of September 26-27. A few hurricane-force wind gusts were also observed. Well inland, the storm produced catastrophic flooding across the southern Appalachians, widespread wind damage from the Gulf Coast to the North Carolina mountains and storm surge flooding along portions of western Florida.

The last major hurricane to impact the U.S. mainland was Hurricane Milton. Milton rapidly deepened over the southwest Gulf of Mexico, strengthening from a tropical storm late in the night of October 5, to a Category 5 hurricane by early afternoon October 7. Milton made landfall along the west-central Florida coast on October 9, before tracking off the east-central Florida coast on October 10, well south of our area, with the primary impacts occurring across Florida. Across southeast Georgia and southeast South Carolina, tropical storm-force wind/wind gusts were confined to the immediate coast, Atlantic waters, and the entrance of the Charleston Harbor. The highest winds began late October 9 over our southern area and then advanced northward across the rest of our coast and Atlantic waters on October 10. No significant rainfall was reported or forecast. There were also no reports of any wind damage. It was suspected that there was at least minor to moderate beach erosion over our entire coastline, but no direct reports were received.

Visible satellite imagery of Hurricane Helene over the Gulf of Mexico



New Additions to the

NWS Charleston Team



In 2024, NWS Charleston welcomed several new staff members. Carl Barnes (pictured left) joined as the Science and Operations Officer, Trey Horn (right) one of our Electronics Technicians, and Anna Dennis (below) is our newest meteorologist.



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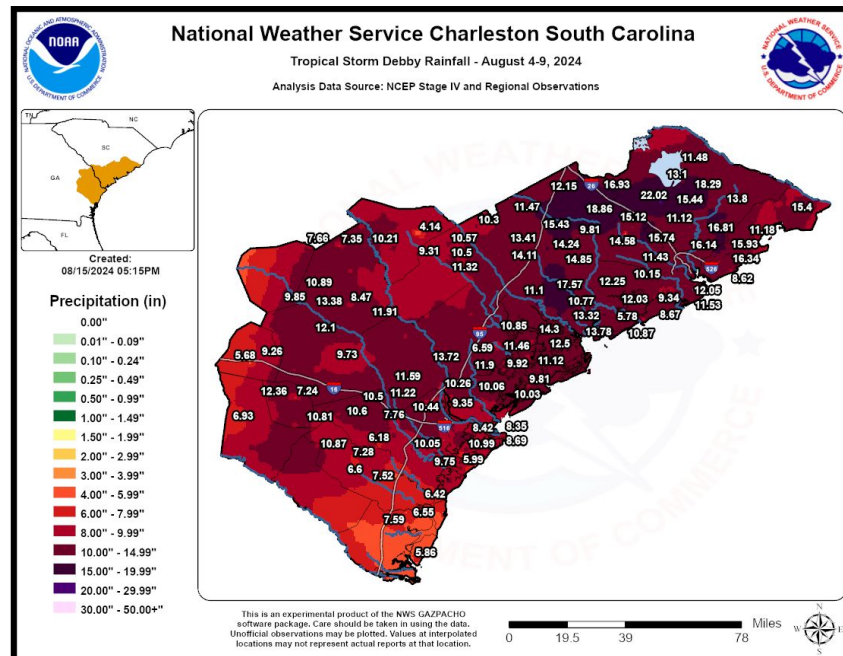
Hi, my name is Anna Dennis, and I'm from Louisville, KY. I received my BS in Atmospheric Science at the University of Illinois Urbana-Champaign and my MS in Atmospheric Science at the University of Miami RSMAS. While I was in Miami, I did a dual-internship with the NWS Miami and National Hurricane Center. I'm super excited to be part of the Charleston team.”

Tropical Storm Debby: A Plethora of Impacts

By: Brian Haines, Meteorologist in Charge

Debby made landfall near the Big Bend of Florida as a hurricane on the morning of August 5 before weakening to a tropical storm and moving very slowly along the southeast coast through August 9.

Heavy rainfall overspread the southeastern two-thirds of South Carolina on August 5 and 6, as Debby slowly moved northeastward and the center emerged off the Southeast U.S. coast near the Georgia-South Carolina border during the evening on August 6. In addition to the heavy rainfall, multiple tornadoes occurred on August 5 and 6, along with the bulk of the wind damage associated with Debby. The center of Debby meandered off the South Carolina coast through August 7, then slowly moved northward and back inland during the early morning hours of August 8, making a second landfall near Bulls Bay, SC. Heavy rainfall continued across portions of the state on August 7 and 8, as the center of Debby continued to move slowly northward into North Carolina and weakened to a tropical depression during the afternoon and evening of August 8.



The remnant low pressure center associated with Debby accelerated northward through the Mid-Atlantic late August 8 and into August 9. However, a complex setup of stationary frontal boundaries and lingering tropical moisture resulted in additional heavy rainfall along coastal portions of South Carolina from the evening of August 8 into the morning of August 9. Dorchester and Berkeley counties were particularly hard hit during this period. One to two feet of water covered I-26 near the State Road 27 exit. A portion of I-26 eastbound near mile marker 192 was closed for several hours due to flooding. This closure caused major traffic jams for the morning commute on August 9.

Key Impacts

- 1) Heavy rainfall: A widespread 8" to 15" fell across southeast South Carolina and Georgia with isolated totals of 20".
- 2) Tornadoes ([summary write-ups](#)): In total eight (8) tornadoes affected the region. The strongest tornado was in Moncks Corner, SC and occurred in the early morning hours of August 6. A car was flipped and overturned on another car in a car dealership parking lot next to an Arby's which had a rooftop A/C blown off ([pictures from X](#)).
- 3) River Flooding: new records were set at six South Carolina gages and three Georgia gages.

Important Links

- [WFO Charleston Tropical Event Summary Webpage](#)
- [NWS Charleston Debby Event Recap Webpage](#)
- [NWS Charleston Post Tropical Cyclone Report](#)
- Heavy Rainfall Data [text](#) | [graphical map](#)
- Debby [Peak Wind Gusts](#)

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Aurora Dances Over the Lowcountry: A Rare Southern Show

By Brittany Schaller, Meteorologist

This year, residents across southeast South Carolina and southeast Georgia experienced an unusual treat: the aurora borealis lit up the night skies not once but twice—first on May 15 and again on October 11. Auroras reaching this far south are a rarity, made possible by two intense geomagnetic storms fueled by heightened solar activity. The unprecedented southern sightings of auroras this year are due to the ongoing peak of Solar Cycle 25. During this solar maximum, the Sun is more active than usual, frequently releasing solar flares and coronal mass ejections. These powerful bursts of energy travel through space and interact with Earth's magnetic field, triggering geomagnetic storms. This collision between the Sun's charged particles and Earth's atmosphere produces the aurora's vibrant colors—green and red from oxygen, and blue and

purple from nitrogen. Normally, auroras are confined to higher latitudes; however, the intensity of these geomagnetic storms has been lighting up skies in places that rarely see this phenomenon.

That said, spotting the aurora down here isn't without its challenges. Light pollution, weather conditions, and other factors can affect how well we see it. For both May and October, clear skies and locations with reduced city lights made for ideal viewing. Still, be sure to keep expectations realistic when these rare events arise. Even during the brightest southern auroras, they tend to be fainter than what you'd see up north, often appearing as a subtle green or pink glow near the horizon.

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Photo: Austin Hart, HAM Operator





Photo: Krey Lowther Jr., Effingham County Fire Rescue/EMA

Aurora Dances Over the Lowcountry... continued

For weather and aurora enthusiasts alike, seeing the northern lights over the Lowcountry is a truly special event—one that blends the beauty of space weather with our own skies, reminding us of the cosmic forces always at play above. For the residents who were lucky enough to witness it, the aurora was a beautiful, shared experience—a rare connection to the mysteries of the universe right in their backyard.

2024 Week of Service

By: Emily McGraw, Meteorologist

The National Weather Service (NWS) recently held its annual Autumn of Service. During this time, offices around the country make an effort to reach out to help those in need. This is the 14th year of giving back to the local communities and all of these events occur outside of normal working hours.

Hurricane Helene brought devastating impacts to much of the southeastern United States late September. For this year's Autumn of Service activity, we chose to support Hurricane Helene relief efforts. Our office was able to donate **\$2425** directly to various organizations assisting with Hurricane Helene recovery.

Check out the [2024 Week of Service](#) page to see what other NWS offices did as well as an event summary.

New Source For NWS Water Resources Information

By Blair Holloway, Lead Meteorologist

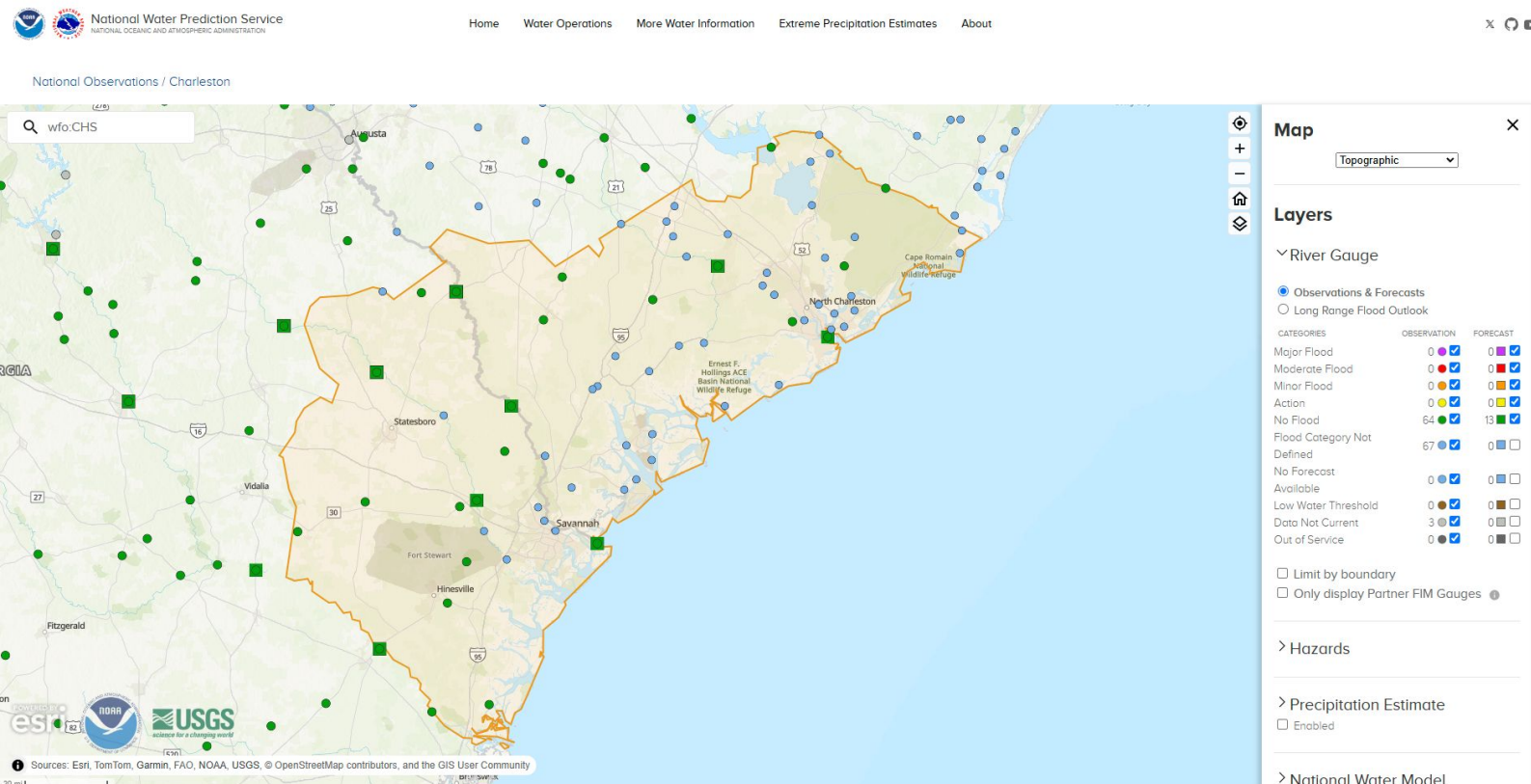
In May of 2024, the NWS introduced the National Water Prediction Service (NWPS) web interface as the new one-stop shop for critical NWS water resources information. NWPS replaced the legacy Advanced Hydrologic Prediction Service (AHPS) web page and offers a number of significant enhancements. The new national map offers a cleaner interface and allows the user to view real time river observations and forecasts, precipitation estimates, and other meteorological/hydrological data in one place. Perhaps the most significant change is how water information is presented on gage hydrographs.

With NWPS, hydrographs update more frequently while also allowing the user to view data dynamically as far back as 30 days. Also, NWPS was designed to provide a seamless integration of National Water Model (NWM) forecasts and analyses.

NWM data can be viewed for existing gage locations as well as creeks, streams, and rivers across the entire country where no observations currently exist. Finally, all NWPS data is available via an API which allows users to include NWPS information directly into their own applications and services.

Be sure to visit NWPS at water.noaa.gov to view water information across the entire country. To view gages and NWPS data specific to the NWS Charleston area, visit water.noaa.gov/wfo/chs.

A snapshot of the new NWPS website seen below.



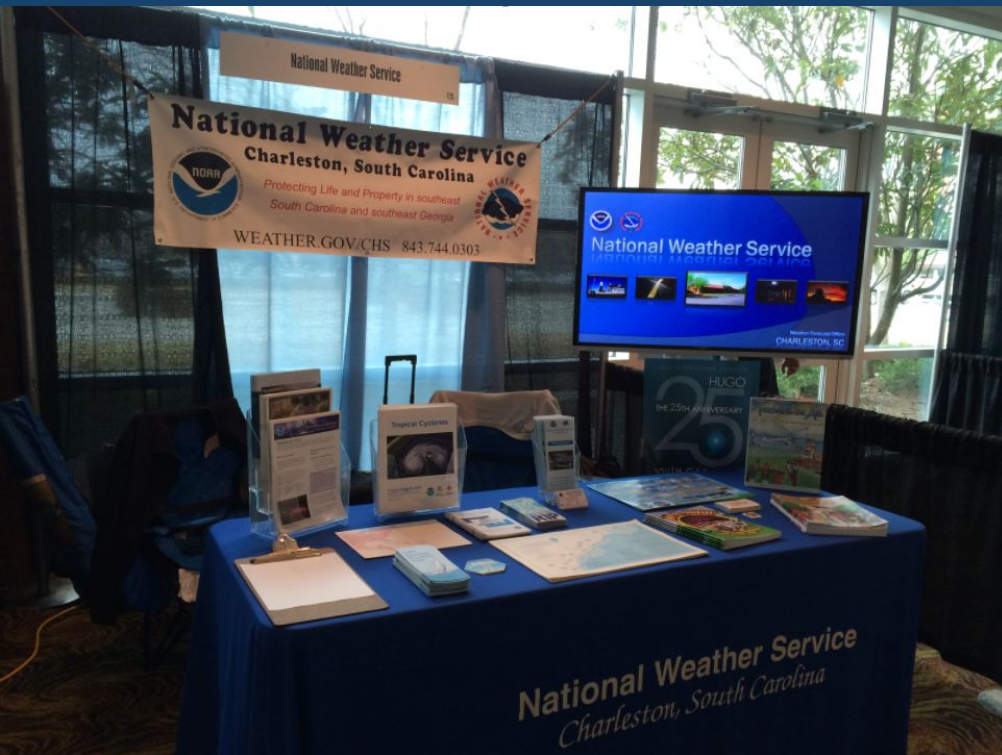
20-Year Length of Service Award

By: Dwight Koehn, Operations Program Leader

Feb 15th, 2024 Rocky Ford, GA: Brian Haines, Meteorologist-in Charge of the National Weather Service Forecast Office in Charleston, SC presented Mr. Herbert Jacobs a 20-year Length of Service Award for his dedication and service in the Cooperative Weather Observer Program (COOP). This site began recording data April 1st 1999. The site is currently located at the family storefront produce business, where Herbert and his son Don continue the Rocky Ford COOP site legacy. Thank you Herbert and Don, for your incredible dedication to providing timely and accurate daily temperature and precipitation measurements for Georgia and our nation!



Meteorologist in Charge Brian Haines and Herbert Jacobs



Stop by and chat with some of our friendly meteorologists. We have free handouts for both adults and children. Learn more about meteorology, weather, climate, who we are, and what we do. We can provide additional sources where you can obtain more weather info, forecasts, and data. And we are glad to accept comments, suggestions and feedback.

For more information about:

The National Weather Service Marine Program, visit weather.gov/marine

The Charleston Boat Show, visit thecharlestonboatshow.com

Visit Us at the Charleston Boat Show

By: Peter Mohlin, Lead Meteorologist

We are pleased to announce the National Weather Service in Charleston will be participating at the Charleston Boat Show January 24-26, 2025. The show will be held at the Charleston Area Convention Center, located at 5001 Coliseum Drive in North Charleston, South Carolina.

As in recent years we will be inside at Booth 158, which is near the end of the long hallway to the right of the main entrance to the building. We will be there during the following dates and times:

Friday, January 24, 2025: 10am - 6pm
Saturday, January 25, 2025: 10am - 6pm
Sunday, January 26, 2025: 11am - 5pm

NWS Director, Director of Public Affairs, and Director of Congressional Affairs Visit WFO Charleston, SC

By: Brian Haines, Meteorologist In Charge

On April 19, 2024, the annual Georgia Emergency Management (GEMA) meeting took place in Savannah, GA. Similar to past GEMA conferences, the National Weather Service (NWS) had a strong presence, including staff from numerous WFOs, regional and national headquarters, and national centers. Many members of NWS Leadership also attended, including NWS Director Ken Graham and Director of NWS Congressional Affairs John Sokich. Given that the conference was held in Savannah, GA, within the area of responsibility of WFO Charleston, SC (CHS), Ken and John took the opportunity to visit the office after the conference. Ken and John also met up with Susan Buchanan, the Director of NWS Public Affairs, for their office visit.

Ken, John, and Susan arrived early in the morning to start their visit. Ken immediately jumped in and helped a WFO CHS forecaster with the 12z balloon launch, streaming the launch on Facebook Live. Afterwards, Ken, John, and Susan had an informal discussion with the operations staff on the vision of the NWS.



From left to right: (Back Row) Director **Ken Graham**, Lead Meteorologist **Neil Dixon**, SOO **Carl Barnes**. (Center Row) WCM Ron Morales, Lead Meteorologist **Douglas Berry**, MIC **Brian Haines**, Meteorologist **Jonathan Lamb**, ESA **Arthur Patrick**, Director Congressional Affairs **John Sokich**, and OPL **Dwight Koehn**. (Front Row) Meteorologist **Courtney Maskell** and **Brittany Schaller**. Photo: Susan Buchanan.



From left to right: Director **Ken Graham** interviewing WFO CHS Meteorologist **Brittany Schaller** during a Facebook Live event. Lead Meteorologist **Neil Dixon** ran the Facebook Live event with the office cell phone. Photo: Susan Buchanan

NWS Implements New Chat Technology Into Operations

By: Steven Taylor, Lead Meteorologist

The National Weather Service (NWS) implemented a new chat technology in Summer 2023 as part of a national initiative to replace the aging NWSChat chat software that was becoming increasingly unreliable. The new chat software, aptly named NWSChat 2.0, was implemented nationwide in August of this year and is powered by Slack, a nationally renowned messaging application that is used throughout the private and public sectors. The purpose of NWSChat 2.0 is to provide a modern and reliable tool across multiple platforms to enrich connections and promote collaboration between NWS forecasters and core partners such as local, state and federal emergency management officials, broadcast meteorologists and others during weather, water, and climate events.

The system that would become NWSChat 2.0 was initially piloted in 2021 and was greatly improved upon after testing by a select number of NWS Forecast Offices in 2022. In early 2023, a regional implementation occurred across NWS Forecast Offices serving Hawaii, American Samoa, Guam, and the Marianas. It was then expanded to include the remainder of the United States in August, 2023. The legacy NWSChat system was decommissioned two weeks after NWSChat 2.0 was launched nationwide.

NWS Charleston has used NWSChat 2.0 to actively coordinate with local emergency management officials and broadcast meteorologists in both the Savannah and Charleston markets during several high-impact events. One such event was Hurricane Idalia, in 2023, which was responsible for producing significant flash and storm surge flooding across the region and spawned several tornadoes as it weakened into a tropical storm. Forecasters and core partners extensively used NWSChat 2.0 to coordinate during the height of the storm with forecasters relaying radar trends and various core partners sending near real time videos, static images and social media posts of damage.

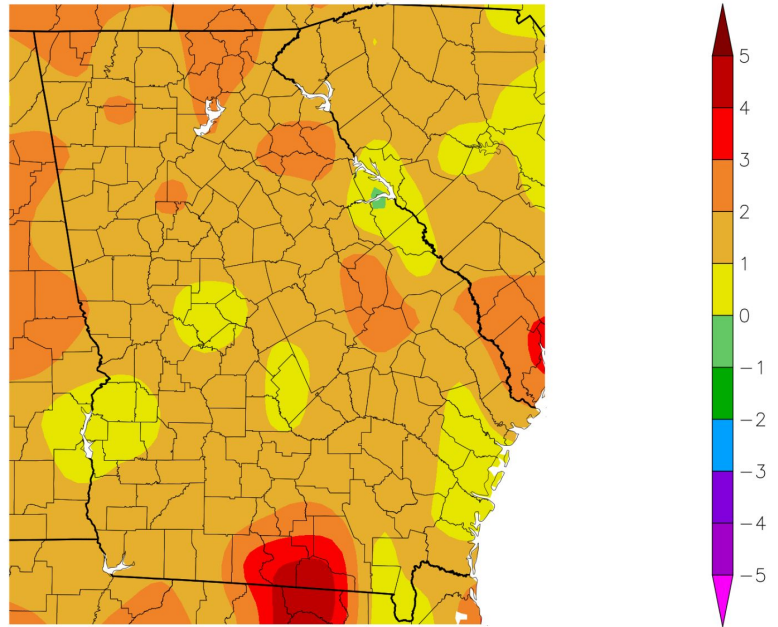
2024 Climate Summary - Georgia

By: Eleanor Partington, Service Climatologist, State of Georgia

In 2024, Georgia experienced hurricanes, tornadoes, excessive heat, and rapid-onset droughts, as well as many days of normal weather. Overall, 2024 was the 2nd warmest year in Georgia on a record extending back to 1895. The vast majority of the state received above average precipitation, especially in the path of Hurricane Helene. The year began in El Nino conditions and transitioned to ENSO-neutral in May. ENSO-neutral conditions remained for the rest of the year.

The first three months of the year were slightly warmer than average, except for January which was normal. January and March were both wetter than normal, starting the year out with plenty of rain. A severe weather outbreak on January 9th spawned five tornadoes. Additional severe weather in February and March brought flooding and more tornadoes, bringing the tornado count for the three-month period to 10 tornadoes on 3 separate days. Drought conditions covered just over half the state at the beginning of January, including large areas of Severe Drought (D2). These conditions steadily improved until the state was completely drought free in mid-to-late March.

Departure from Normal Temperature (F)
1/1/2024 - 12/31/2024

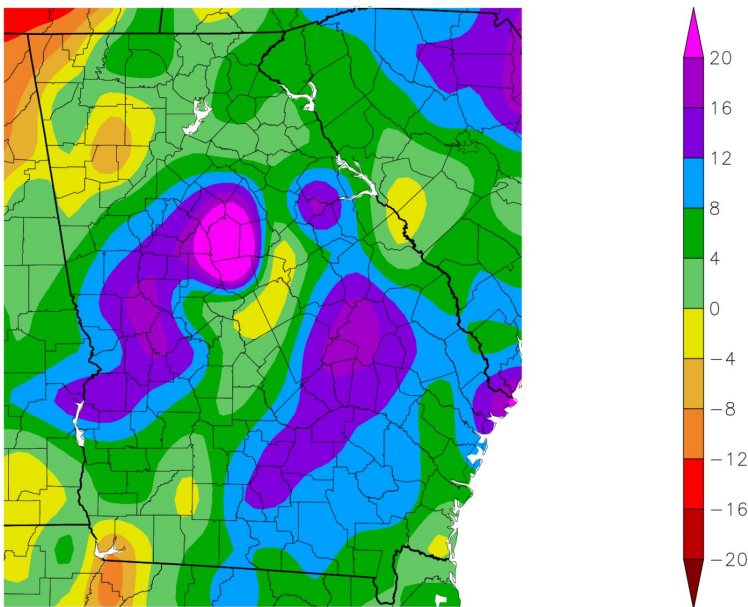


April, May, and June were all warmer than average. The three-month period was the 4th warmest such period on record. Precipitation was variable over these three months. In April, Georgia experienced near normal precipitation, but in May the state received 6.44 inches of rain (+2.73 inches) and was the 8th wettest May on record. The state was mostly drought-free in April and May. In June, however, soil moisture conditions dried out quickly. The state received 2.29 inches of rain, falling 2.20 inches below normal and resulting in the 4th driest June on record. Combined with the warmth of the past few months, June's dryness resulted in a flash drought. By June 18th, 34.6% of the state was experiencing Abnormally Dry (D0) conditions or worse, and by June 25th, only one week later, 93.9% of the state was experiencing D0 conditions or worse. By the end of June, farmers and cattle operators reported loss of non-irrigated corn crops and being forced to use wintertime hay supplies to feed cattle. Pond and creek levels decreased, and grass turned brown. June also brought some severe weather to southeastern Georgia when on the 9th and 10th, a stationary front led to thunderstorm development. These storms caused wind damage, downed trees, and significant hail reports.

July, August, and September were all warmer than normal, but August and September were both only slightly warmer than normal (+1.4F and +1.0F, respectively). July's heat was a bit more extreme, with an average temperature of 82F (+2.3F) making it the 11th warmest July on record. In contrast to June, July was wetter than normal, with the state receiving an average of 7.36 inches (+1.76 inches). August would have been a relatively dry month if not for Hurricane Debby, which crossed through southern Georgia and pushed the statewide average rainfall for the month to near normal. Macon recorded its driest August on

record, while some areas of southeast Georgia received upwards of eight inches above normal rainfall. September was a very wet month. The state received an average of 8.45 inches of rain (+4.53 inches) making it the 4th wettest September on record. Most of this excess rainfall can be attributed to Hurricane Helene. At the beginning of July, most of the state experienced Abnormally Dry (D0) to Severe Drought (D2) conditions, but conditions were improving going into August. Conditions then started to worsen again as August was dry in Georgia except for along the path of Debby. Drought continued to worsen through September, with the northern half of the state experiencing D0 to Extreme Drought (D3).

Departure from Normal Precipitation (in) 1/1/2024 – 12/31/2024



Two hurricanes entered Georgia in 2024, Debby and Helene. Hurricane Debby made landfall as a Category 1 storm in the Big Bend region of northern Florida on August 5th. It weakened to a tropical storm as the center slowly lifted northeast allowing significant rainfall to accumulate and flooding to take place. Georgia ASOS stations in the path of Debby recorded wind gusts from 45-49 mph. Hurricane Helene made landfall near Perry, Florida on September 26th as a Category 4 storm. Helene entered Georgia on September 27th as a Category 2 hurricane. It moved through the middle of the state, tracking east of Atlanta, until it entered western North Carolina. The most extreme wind and rain occurred on the east side of the storm. Atlanta received its highest 48-hour rainfall total

on record of 11.12 inches (POR 1878-present). Two days of heavy rainfall preceded the hurricane, which contributed to flash flooding in multiple Georgia cities. Wind damage and some tornadic wind damage was the worst in Savannah and Augusta, and power outages were widespread.

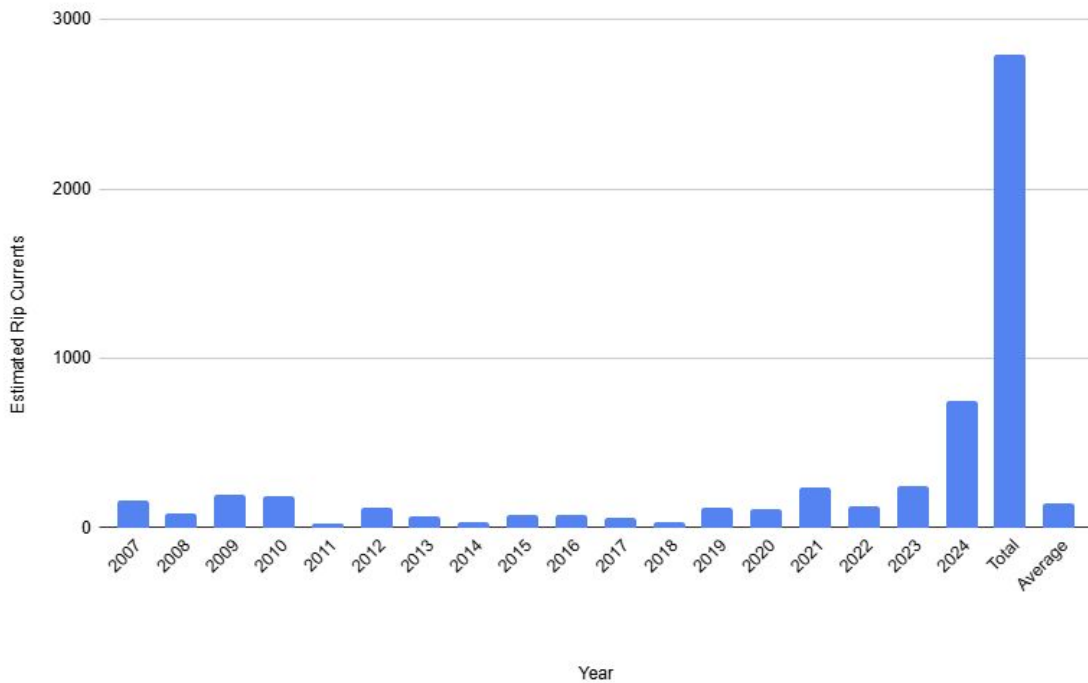
October through December was the 7th warmest such period on record, with November being especially warm – the 2nd warmest November on record with an average temperature +7.1F above normal. The rainfall rollercoaster continued with a very dry October. Atlanta only received trace amounts of rainfall, and the average statewide rainfall was only 0.16 inches, 2.57 inches less than normal, making this October the 2nd driest on record. Precipitation levels returned to near normal in November and December. Drought conditions spread slowly across the state through October after being wiped out by Hurricane Helene at the end of September. At least five locations throughout the state, including Atlanta at 41 days, set records for their longest dry streaks. Drought conditions worsened in November, with some areas experiencing Severe Drought (D2), but by the end of the month, D2 had vanished from the map and the areas of Moderate Drought (D1) started to shrink. In December, drought conditions improved in North and Central Georgia, but D1 conditions expanded in Southwest Georgia.

2024 Rip Current Summary

By: Peter Mohlin, Lead Meteorologist

The greatest amount of rip currents since we started keeping records in 2006 occurred during the 2024 beach season. Thanks to the reports from lifeguards and others, there were an estimated 750 rip currents at the WFO Charleston beaches during the season. The most reported were at Tybee Island, where an estimated 726 rip currents occurred. This amount is about the same as all total rip currents at all beaches in southern South Carolina and southeast Georgia during the previous 4 years.

Estimated Rip Currents vs. Year



The number of rip currents is an estimate, since some rip current reports we receive had wording such as “several”, “numerous”, “multiple”, etc. So it’s actually uncertain how many there were, but for consistency, the same estimated amount is used as follows for each season:

- “A couple” - 2 rip currents
- “Few” - 3 rip currents
- “Several” - 4 rip currents
- “Numerous” - 6 rip currents
- “Multiple” 7 rip currents
- “Countless” -12 rip currents

We also determine how many days each season that rip currents occur. We had reports of 102 days at the various beaches this past season, or 3 times the average of each season. As seen in the chart below, the most rip current days typically occur at Tybee Island in Georgia, and at Folly Beach in South Carolina. However, rip currents can occur at all of our beaches at any time of the year. And even though there have never been any days with rip currents at Sapelo Island, that only means we never received any reports of rip currents at that location, not that there have never been any rip currents.

Over the years that we have been gathering data, we have found a direct correlation between the strength of the longshore (or parallel) current to the number of rip currents. This past season, anytime the lifeguards reported rip currents, 85% of the time they occurred with a “moderate” or “strong” longshore current.

If you plan on going to the beach this upcoming season, or any season, here are some excellent safety reminders:

- Check water conditions by looking at the local beach forecast before leaving for the beach.
- Before entering the water, talk with a lifeguard or beach patrol. No one will know the current water conditions better than they will.
- Only swim at beaches with lifeguards. The chances of drowning at a beach with lifeguards are 1 in 18 million (U.S. Lifesaving Association).
- Don't assume! Great weather for the beach does not always mean it's safe to swim or even play in the shallows. Rip currents often form on calm, sunny days.
- Don't go in the water if you can't swim or don't know how to escape a rip current.

Click [here](#) to learn more about rip currents. If you're interested in becoming a rip current spotter, please email our office at nws.charlestonsc@noaa.gov and leave your contact information.



2024 STORM COURIER



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