Carolina SkyWatcher

National Weather Service, Newport/Morehead City, NC

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Summer 2021 Edition

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The 2021 Hurricane Season: On The Heels of a Record-Breaking Year

By: Michael Lee, Meteorologist

The 2020 Atlantic Hurricane Season was one for the history books. The Atlantic Basin saw a record-breaking 30 named storms in total, including 13 hurricanes, six major hurricanes, and a total of 12 landfalling systems in the United States. The Eastern North Carolina area itself saw direct impacts from Tropical Storm Arthur in May and Hurricane Isaias in August. Additionally, we felt numerous indirect impacts, such as coastal flooding and rip currents, from distant or remnant tropical systems.

For the 2021 Atlantic Hurricane Season, NOAA's Climate Prediction Center is forecasting another above-normal year. The statistical numbers give us a 60% chance for an above-normal season with a 30% chance for a near-normal season and just a 10% chance for a below-normal season. The reasoning behind this is the El Niño Southern Oscillation (ENSO), better known as El Niño or La Niña, is currently neutral and may return to a positive phase, or La Niña. The ENSO phase, a recurring climate pattern involving water temperature patterns in the Pacific Ocean, provides us with a strong indicator of what to expect for the Atlantic Hurricane Season, as well as other weather patterns in the U.S. The neutral and positive ENSO phases are typically favorable for tropical activity in the Atlantic while a negative phase (or El Niño) is less favorable. Luckily, despite anticipating an above-average season, forecasters are not expecting another record hurricane season like last year. The 2021 outlook calls for 13-20 named storms, 6-10 hurricanes, and 3-5 major hurricanes.

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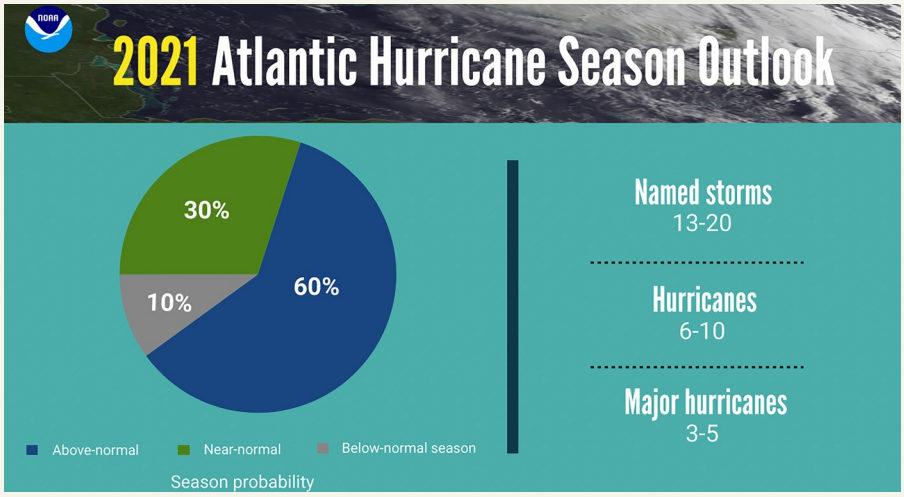


Hurricane Preparedness: The Category and Forecast Cone Only Tell Part of the Impacts Story

By Carl Barnes, Lead Meteorologist

Do you know what determines the category of a hurricane? Even though deadly hurricane hazards include winds, storm surge, rainfall, tornadoes, rip currents, and dangerous boating conditions, the maximum wind speed anywhere within the storm is the **only** hazard factored into the assigned category. Additionally, size and movement of a hurricane is not considered in the category. This means that **making your preparation and evacuation decisions based solely on the category of the hurricane could result in you missing a big part of the picture.**

The first step to hurricane preparedness is understanding your vulnerability. Do you live somewhere prone to storm surge or rainfall flooding? Flood.nc.gov and the storm surge threat viewer are great starting points for assessing your vulnerability to flooding. You can also take steps to reduce your property's vulnerability to wind and tornado damage, such as trimming trees back from your house, getting an insurance checkup, and having multiple ways to receive warnings during a storm. You should have a written plan covering evacuation and other emergency information, and have a kit with emergency supplies like flashlights, medications, cash, and everything you would need to survive for several days if the power goes out. For a more comprehensive overview of how to prepare for hurricane season, visit the NWS Morehead City hurricane preparedness webpage.

Hurricane Preparedness (*continued*)

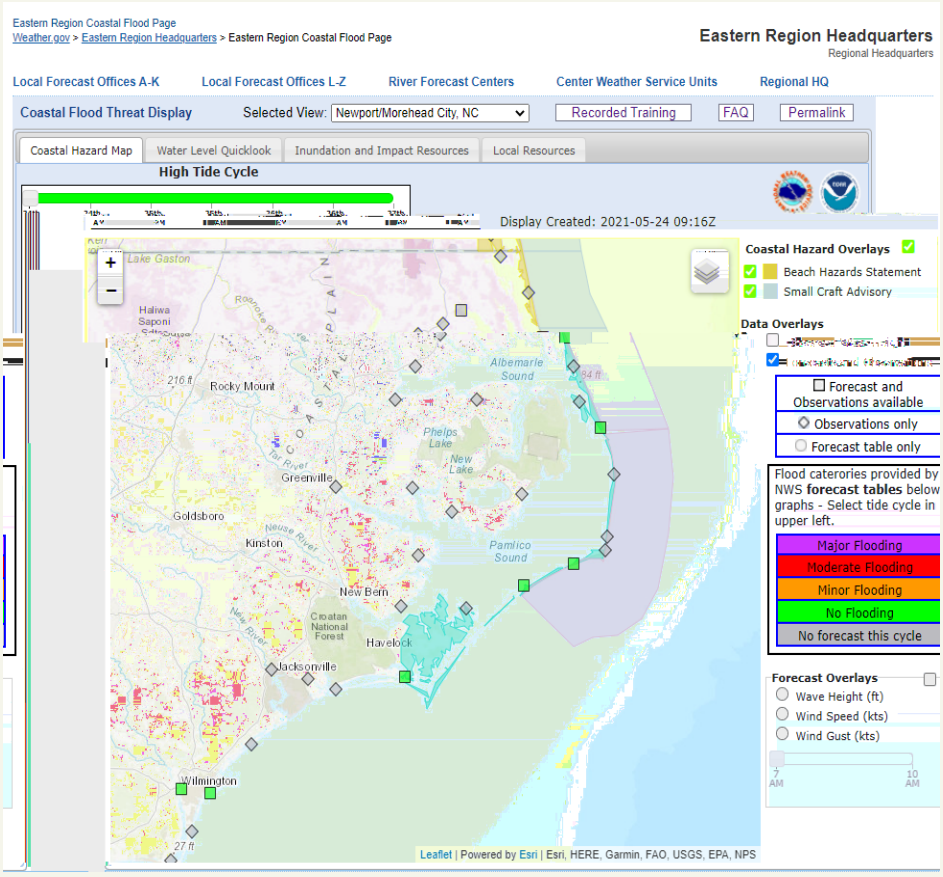
"...making your preparation and evacuation decisions based solely on the category of the hurricane could result in you missing a big part of the picture."

When a storm threatens the area, visit weather.gov/mhx/hurricanes to get the latest forecast information, including the storm-specific weather briefing, which will break down the individual threats to eastern North Carolina. Keep in mind that the forecast cone, which is commonly shown on social media and TV, is just the **most likely** track of the **center** of the storm... **significant impacts can still be experienced well away from the center of the storm/outside of the cone.** To learn more about how to use the forecast cone graphic, check out this video from the National Hurricane Center. Finally, always make sure to listen to local officials for evacuation orders and other emergency preparedness information.

New Regionally Consistent Coastal Flood Webpage

By: Casey Dail, Lead Meteorologist

Do you live in an area that's vulnerable to coastal flooding and storm surge? If so, we invite you to explore our new coastal flood webpage. Consistent coastal flood and water level information, from Maine down to South Carolina, can now be viewed on the new site.



You can view current water level observations, total water level forecasts, inundation resources, storm surge model guidance and so much more. There is also a wealth of local information available under the "Local Resources" tab, including a coastal flood climatology for Eastern North Carolina.

Click here to view a short video that highlights key features of the site. Please explore the new site and let us know if you have any questions.

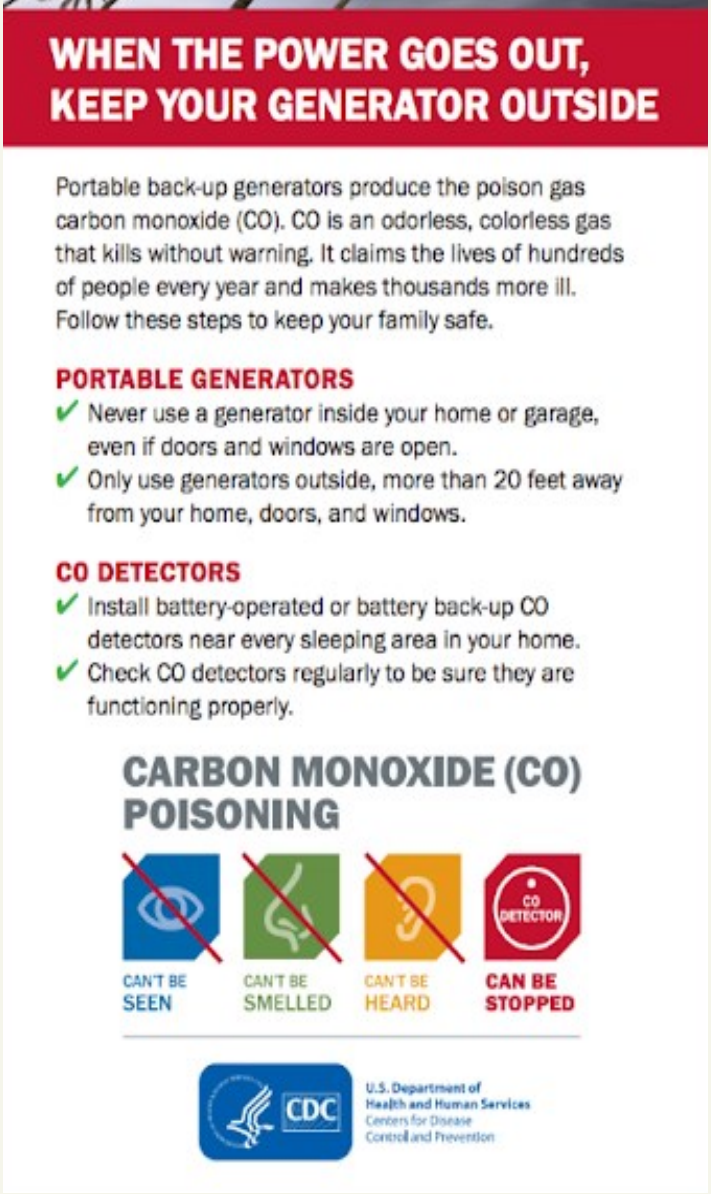
www.weather.gov/mhx/coastalflood

Post-Storm Dangers: Carbon Monoxide Poisoning

By Carl Barnes, Lead Meteorologist

Do you remember Hurricane Laura from last year (2020)? It made landfall in southwest Louisiana in late August, bringing hurricane force winds and a 17-foot storm surge to the coast. Thanks to an accurate forecast, prompt and effective response from public officials, and an active response from residents in the area, there were no direct hurricane related fatalities. However, after the winds and rain stopped, widespread power outages and the need to begin cleanup resulted in increased generator use. Unfortunately, **14 deaths occurred during hurricane recovery as the result of improper use of these emergency generators**. In fact, despite very active hurricane seasons, far more people have died in the US from hurricane recovery-related Carbon Monoxide poisoning (at least 39) than storm surge (7 people) since 2017.

Carbon Monoxide (CO) is an odorless, colorless gas that kills without warning. Many household items including gas- and oil-burning furnaces, portable generators, and charcoal grills produce this poison gas. The North Carolina Department of Health and Human Services says that "As North Carolinians prepare for hurricane season, officials with the North Carolina Division of Public Health caution you not to use gasoline-powered generators or tools, outdoor grills, and camp stoves in enclosed spaces. These devices should be used outside only and at least 20 feet away from windows, doors and air vents to avoid carbon monoxide poisoning." You can find their full press release here.



Post-Storm Dangers: Carbon Monoxide Poisoning (continued)

"...Far more people have died in the US from hurricane recovery-related Carbon Monoxide poisoning (at least 39) than storm surge (7 people) since 2017."

NWS Morehead City encourages you to take the time now to plan where you will keep your generator outside to ensure appropriate ventilation, and make sure that you have battery operated Carbon Monoxide detectors in your house. To find out more information on Carbon Monoxide dangers, and how to protect yourself and your loved ones from them, visit the North Carolina DHHS safety webpage here, or the Center for Disease Control webpage here.

Drought Conditions Over Eastern NC Raise Concerns Heading Into Summer

By: National Weather Service Morehead City

April showers bring May flowers is typically how the saying goes but conditions have been anything but favorable for growing as eastern North Carolina is now considered to be in a moderate drought or D1 on the scale used by the Drought Management Advisory Council on the US Drought Monitor of North Carolina available at ncdrought.org.

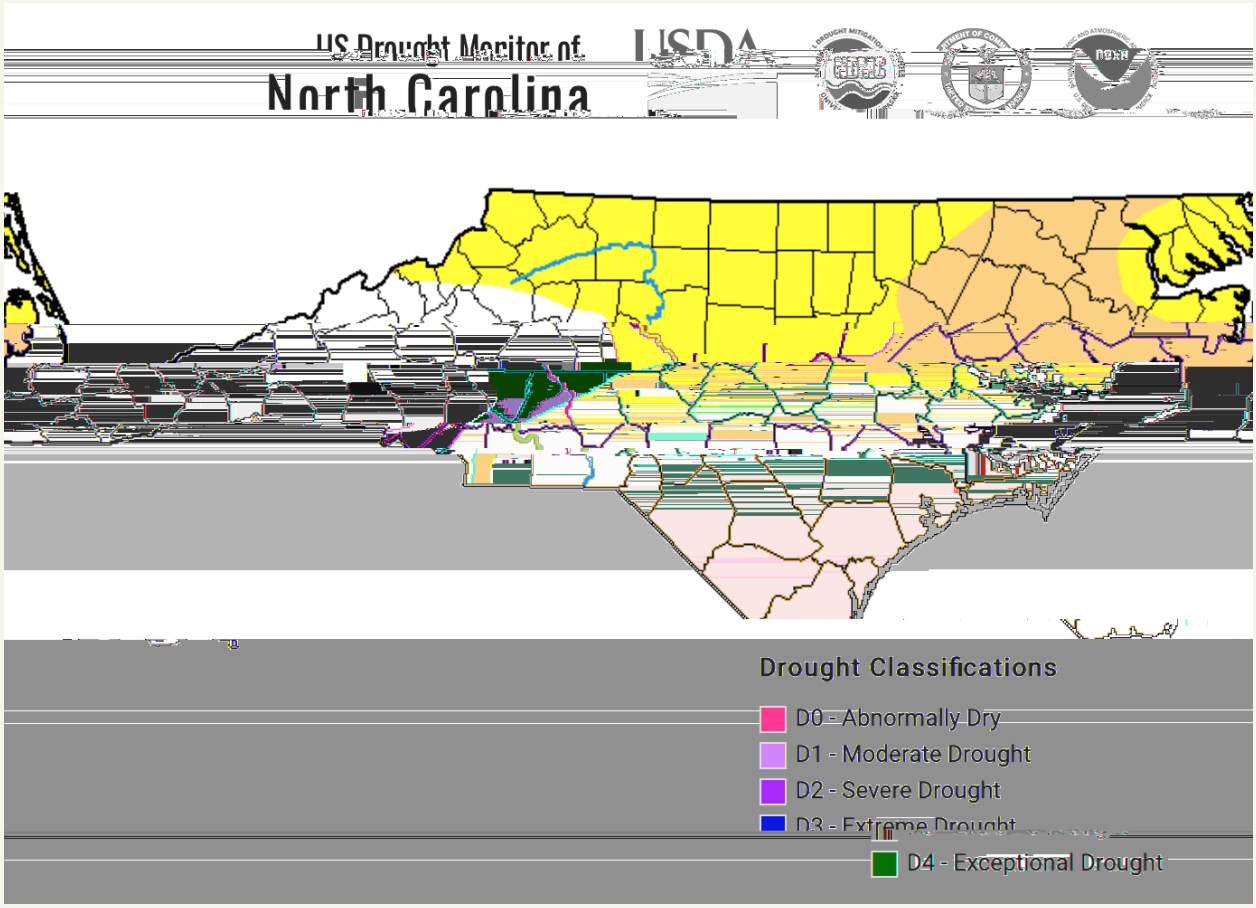


Fig. 1: US Drought Monitor of North Carolina highlighting Moderate Drought conditions over much of the eastern half of the state late May/Early June.

After a very wet winter, the tables have turned over the last three months as what is typically a stormier pattern has resulted in less severe weather, which is a welcome side effect, but unfortunately that also means less precipitation. Looking back 90 days (Fig. 2), radar estimates show that a good portion of the eastern half of the state is at least 4 inches below normal rainfall with the immediate coastline from Hatteras Island south to the South Carolina state line about 6 to 8 inches below normal for that three month period.

Drought Conditions Over Eastern NC *(continued)*

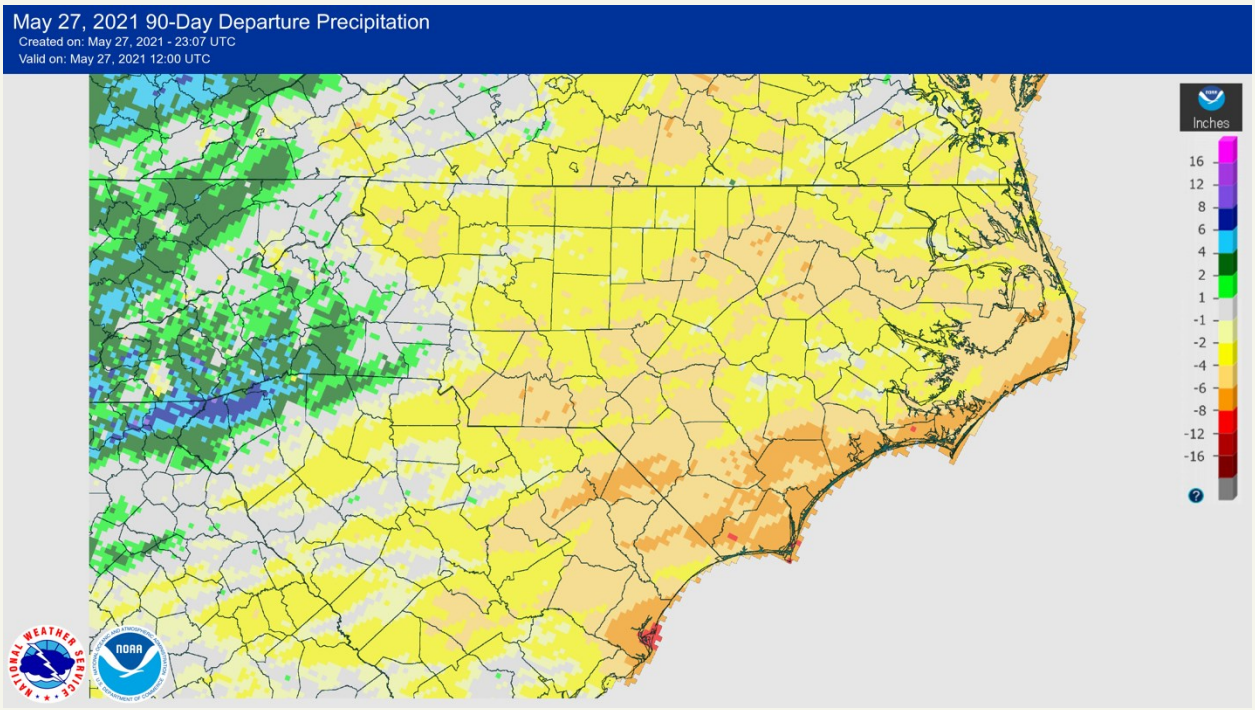


Fig. 2: 90-Day departure from normal precipitation in inches based on radar estimates.

Looking at this as a percentage of normal rainfall over the same three month period (Fig. 3), we see that the maps look very similar with the coastal areas only receiving between 50 and 75 percent of what they normally get over this timeframe or about half to three quarters of the normal rainfall.

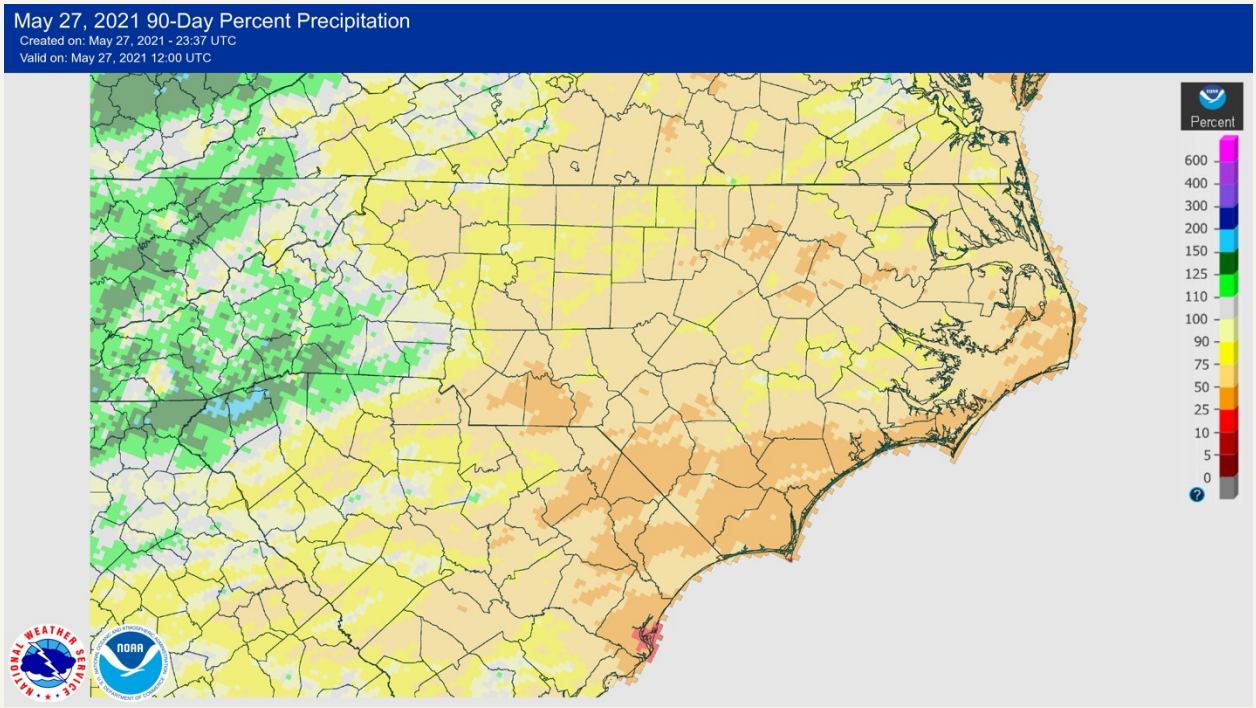


Fig. 3: 90-Day departure from normal precipitation.

Drought Conditions Over Eastern NC *(continued)*

Looking at our two official climate sites, New Bern and Hatteras the story is very similar with both sites 5 to 6 inches below normal since March 1st but with the wet winter, both sites are only about an inch and a half below normal since January 1st.

New Bern, NC (As of May 28, 2021)

Precipitation	Observed Value	Normal Value	Departure From Normal
Since March 1st	5.48 in	10.79 in	-5.31 in
Since January 1st	16.68 in	18.00 in	-1.32 in

Hatteras, NC (As of May 28, 2021)

Precipitation	Observed Value	Normal Value	Departure From Normal
Since March 1st	6.25 in	12.28 in	-6.03 in
Since January 1st	20.34 in	21.53 in	-1.19 in

So what does this all mean going forward? Typically, as spring turns into summer, stronger weather patterns give way to pop up showers and storms throughout the summer that form because of the heating of the day or on the sea breeze. Unfortunately for the coastal areas, this sea breeze typically moves inland a bit before kicking off the showers and storms which could possibly exacerbate this scenario.

The news is not all bad however. The current summer outlook from the Climate Prediction Center (Fig. 4) shows above normal precipitation favored over the next three months as larger scale patterns change.

Drought Conditions Over Eastern NC *(continued)*

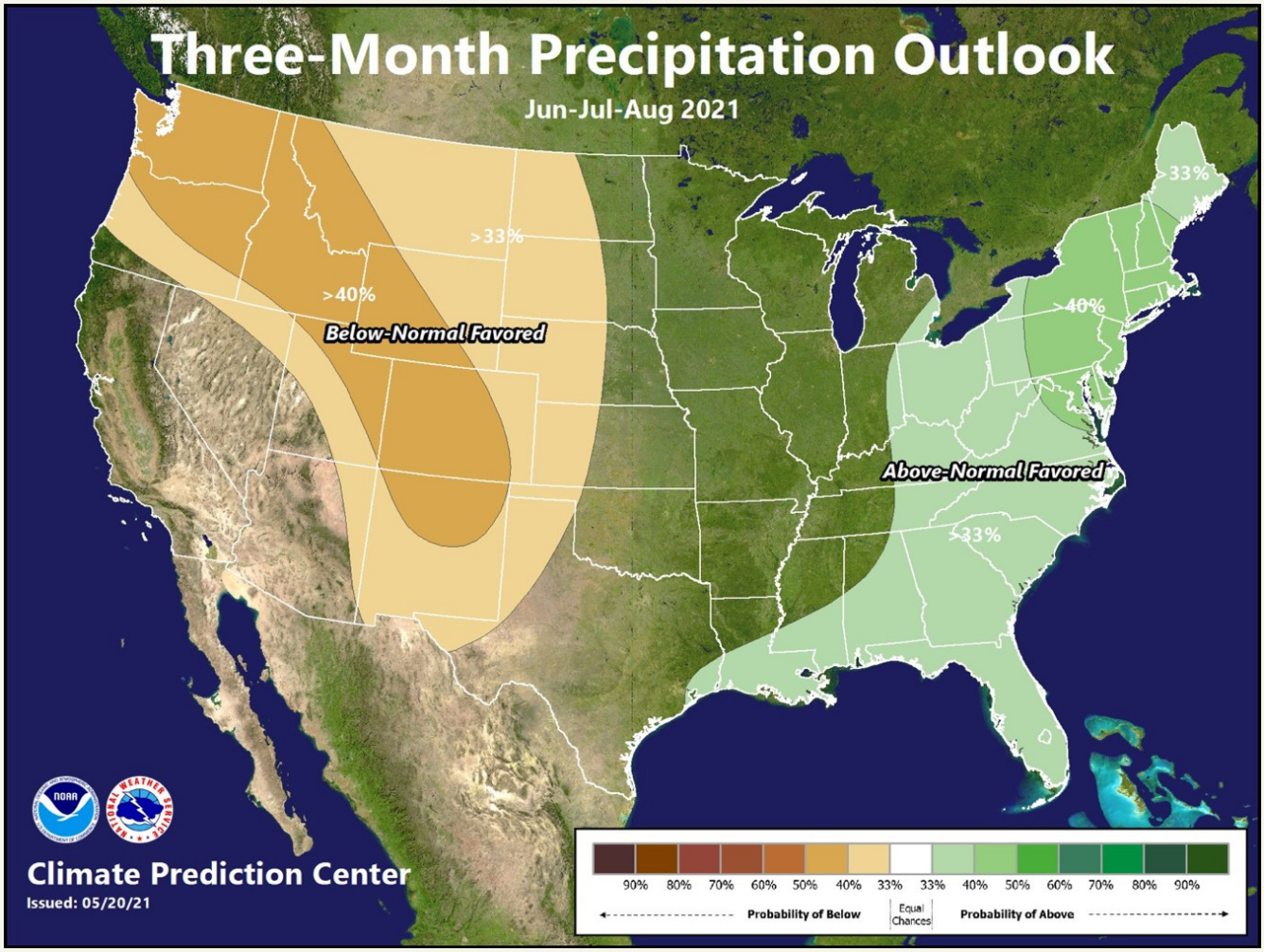


Fig. 4: Climate Prediction Center three month outlook showing above normal chances for precipitation over North Carolina.

Another final thing to look out for in favor of more precipitation is how the tropical season will affect the precipitation totals over the summer. While nobody wants the direct impacts of a hurricane, the return of tropical season also means the return of tropical moisture which is abundant whether or not hurricanes are forming. Sometimes high pressure offshore that typically develops in a summertime pattern can help bring that tropical moisture northward in the form of showers and storms across the Carolinas.

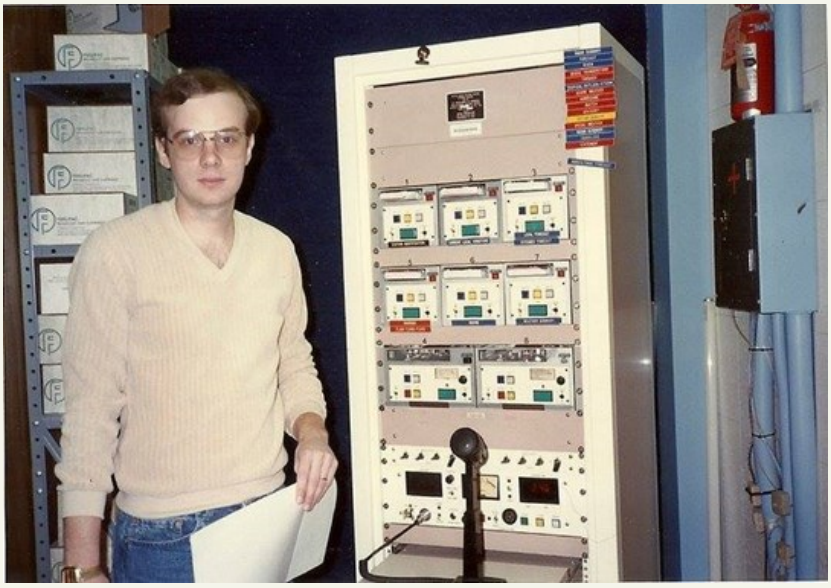
Hopefully over the next month or so, we can reverse some of this early season drought before heading into the hottest months of the summer.

Note: Since publication of this article, Eastern NC has received several inches of rain bringing us closer to normal conditions. Precipitation patterns over the next several weeks will help determine if we continue to remain dry for the season or continue to move towards more normal rainfall numbers. Visit https://droughtmonitor.unl.edu/ for the latest drought conditions in Eastern NC.

Senior Forecaster Chris Collins to Retire in August

By: National Weather Service Morehead City

After over 32 years in the National Weather Service, including the past 23 years in Newport, Senior Forecaster Chris Collins will retire at the end of August, 2021. Chris received his B.S. degree in Meteorology from Florida State University in 1986 and after spending 3 years in Broadcast Meteorology, began his NWS career in Tallahassee, Florida in 1989. Chris served as a General Forecaster in Columbia, South Carolina from 1994 through 1998, before being promoted to a Senior Forecaster in Newport in August, 1998. Chris has been an office Focal Point for Radar, Fire Weather, Climate, Outreach and Forecast Operations during his career.



Chris Collins in 1989 next to the old NOAA Weather Radio System.

"In my career, I have been fortunate to see many upgrades in technology," says Collins. "When I started, we were still using Teletype Machines and there was no Doppler radar. Today, we have high-resolution color satellite imagery from GOES-16, models that are run hourly and radar so sensitive that it can detect insects. The internet has totally changed how weather information is disseminated"

Chris has had the opportunity to work many high-profile weather events throughout his career, including the 1993 Storm of the Century while in Florida, the January 2003 snowstorm along the North Carolina coast and numerous hurricanes, including Florence, severe thunderstorm and tornado events, winter storms, Nor'easters and floods. "One of the things I have loved about working in Eastern North Carolina is that we get every type of weather, but not too much of any, with the possible exception of hurricanes. It is a great place to experience every type of weather."

During the career of Chris Collins, technology advanced from Teletype to Modern Computers.

Senior Forecaster Chris Collins to Retire in August (*continued*)

"One of the things I have loved about working in Eastern North Carolina is that we get every type of weather, but not too much of any, with the possible exception of hurricanes."

"I have enjoyed working with our many partners over the years, including Emergency Management and the media, being interviewed on numerous occasions by the local media and by The Weather Channel on a few occasions. Mostly, I have enjoyed serving the residents of Eastern North Carolina, providing forecasts and weather warning information. Lastly, I have worked with many great people in my career in the NWS and will miss the interaction and comradery with my co-workers."

Chris being interviewed by Jim Cantore/Stephanie Abrams on The Weather Channel.

We thank Chris for his 32 years of service at the National Weather Service helping protect life and property in North Carolina and around the country and wish him a happy, peaceful retirement!

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