Shade Tree Meteorology, LLC

Shade Tree News

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Data Sources and Forensic Meteorology

"Are we making the measurements, collecting the data, and making it available in a way that scientist of both today and tomorrow will be able to effectively increase our understanding of natural and human-induced climate change?" It was this question, posed in 1999 by the National Research Council, that led NOAA to develop the United States Climate Reference Network (USCRN).

The USCRN is a network comprised of 114 stations deployed across the continental U.S., 2 stations in Hawaii, and 20 stations in Alaska (with 9 more still planned to expand the network to 29 in Alaska). The primary goal of the network is to provide future continuous, long-term observations of air temperature, precipitation, soil moisture and temperature, solar radiation, wind speed, surface temperature, and relative humidity. USCRN sites are located in open, pristine environments that are most likely to have stable land cover and usage conditions for

Fig. 1: USCRN Site in Grand Teton National Park, Wyoming. July 1, 2004 Credit: USCRN

years to come, such as National Parks and Wildlife Refuges. These observations will be utilized for both current climate applications, while also being coupled to past long-term observations for the detection and attribution of climate change.

The USCRN data is available for the public and has been widely used across government entities such as the Department of Agriculture to monitor drought, the Centers for Disease Control and Prevention to identify weather-related health crises, such as Valley Fever in the Southwest, as well as NASA and NWS. Forensic meteorologists also benefit from this reliable data source when cases occur in close

proximity to these sites. For example, uncovering the soil temperature in winter precipitation events is key in determining whether precipitation freezes or melts when it hits the ground. At STM, we are committed to uncovering and utilizing the best available data sources to reconstruct severe weather events and provide the highest quality analyses for our clients..

Source: https://www.ncei.noaa.gov/news/what-is-a-uscrn-station

Inside this issue:

Building a Weather-Ready Nation: World Tsunami Awareness

A tsunami is a large wave or series of waves most often generated by earthquakes and undersea volcanic eruptions. Large tsunamis do not happen often, but they pose a significant threat to coastal communities around the world. Since 1900, 115 tsunamis have resulted in more than 290,000 deaths. Recognizing the global threat that tsunami hazards pose, the United Nations designated November 5 as World Tsunami Awareness Day. While Tsunamis cannot be predicted nor prevented, there are things you can do before, during, and after a tsunami that can save your life.

Before A Tsunami: Know your risk and whether or not you live in a tsunami hazard or evacuation zone; understand the warnings, both natural and official; and have an evacuation plan and disaster kit ready;

During a Tsunami: Respond to a tsunami warning by staying out of the water and away from beaches and waterways; gathering more information from a NOAA Weather Radio and local officials; and evacuate if advised to do so.

After a Tsunami: Stay safe by staying out of the

Fig. 2: Natural and official Tsunami Warning Signs (NWS)

hazard or evacuation zone until local officials tell you it is safe; avoid and report fallen power lines; stay informed via your NOAA Weather Radio or local radio or television; and contact family and friends to let them know you are okay.

As a Weather Ready Nation ambassador, we at STM have committed to communicate National Weather Service messages about forecasts and ongoing weather hazards, as well as educate our clients on appropriate weather preparedness practices.

Source: https://www.weather.gov/news/tsunami-awareness-day

News from NOAA: The Aftermath of Hurricane Florence

At 7:15 AM, September 14, 2018, Hurricane Florence made landfall near Wrightsville Beach, North Carolina with sustained winds of 90 mph. Although Florence made landfall as a Category 1 hurricane, significant impacts were forecasted across the Carolinas. These impacts included life-threatening storm surge, hurricane-force winds, and intensely heavy rainfall. Nearly 36 inches of rain fell over Elizabethtown, North Carolina, with other towns reporting roughly 30 inch rainfall totals.

As of September 18, 16 rivers in North Carolina were at major flood stage, with three additional rivers forecasted to peak the following two days. 33 deaths have been attributed to Florence in North Carolina, South Carolina, and Virginia. In North Carolina alone, approximately 10,000 people are staying in shelters, more than 2,200 people and 578 have been rescued by first responders, 1200 roads are closed, and over 300,000 customers remained without power.
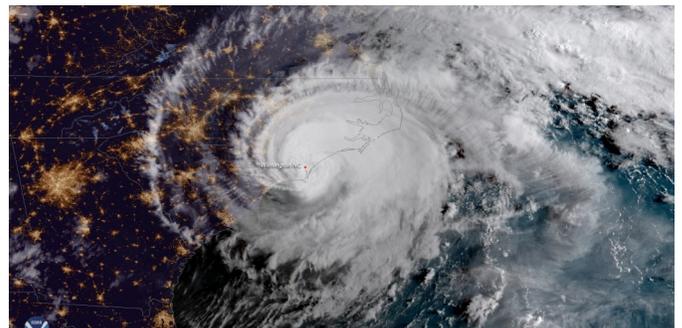

Fig. 3: Geocolor image captured by the GOES East satellite of Hurricane Florence making landfall. Credit: NOAA.

One economic consulting firm reports that Hurricane Florence may result in between $17 and $22 billion in lost economic output and property damage. That estimate puts Florence in the Top 10 of costliest hurricanes, although this estimate could grow significantly higher as more information comes in regarding ongoing inland flooding.

Why then, some are questioning, was this "only" a Category 1 hurricane? Many people assume that the category of a hurricane is all-encompassing, but hurricanes are actually categorized by the Saffir-Simpson Hurricane Scale, which uses a 1-5 rating system that is solely based on wind speeds. The categories estimate types of property damage that will be expected due to hurricane winds. However, as Florence has demonstrated, there are many other factors that contribute to property damage than winds. The major players in Florence were its storm surge, slow moving nature (it has been said that a person could have walked across the Carolinas in the same amount of time that it took Florence to progress across them!), and the catastrophic rainfall amounts that occurred as a result of the leisurely pace of the storm. These factors, along with the hurricane's projected path, were all well forecast by the National Hurricane Center.

Nonetheless, despite dire warnings of catastrophic damage that might take parts of the Carolinas weeks or months to recover, some people still might have let their guards down simply due to the category. As such, many are calling for an entirely new classification scale. One idea is to issue categories for each of the three main threats: wind, rain, and storm surge. This would provide local, state, and federal officials, as well as the public, with more detailed information, allowing them to make more informed decisions and plans. While there are currently no plans to revamp the classification system, it is certainly something that many are thinking about and that will spark an abundance of discussions and, possibly, long term changes to best protect life and property.

Source: Multiple news outlets, including CBS News and CNN News

Hazardous Weather Preparedness: Wildfire Safety

Wildfires have burned over one million acres in California this year, and fire season is far from over. According to the National Interagency Fire Center, a large majority of California is expected to see above-normal fire activity for the next 1-3 months. That means that if a fire breaks out in these areas, they will likely grow rapidly and be difficult to contain.

Wildfires can be catastrophic to life and property. While most often started by lightning or humans, there are certain conditions that can lead to wildfires spreading more rapidly, including dry vegetation, strong winds, high temperatures, and drought conditions. In anticipation of these conditions, local National Weather Service Offices will issue Fire Weather Watches, which alert land managers and the public that upcoming weather conditions could result in extensive wildland fires or extreme fire behavior A *Fire Weather Watch* means critical fire weather conditions are possible but not imminent or occurring. Conversely, a *Red Flag Warning* indicates that critical fire weather conditions are occurring now or will occur shortly.

If you see a wildfire, it is important that you evacuate the area quickly and then call 911. Do not approach wildfires as they can change direction and spread quickly. It is critical to remove yourself from danger before seeking help
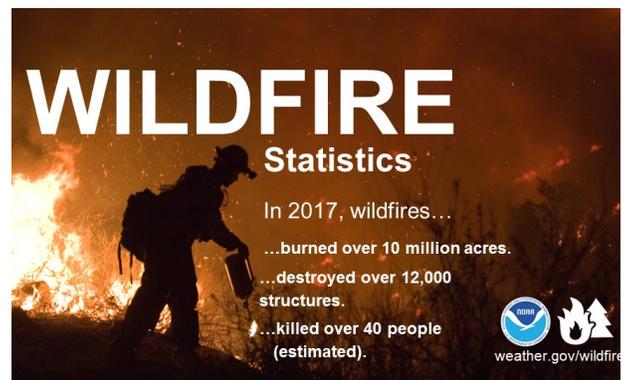

Fig. 4 Wildfire Statistics, 2017. Credit: NOAA

because exposure to wildfire smoke can harm you in multiple ways, including hurting your eyes, irritating your respiratory system, and worsening existing chronic heart and lung diseases. Dust masks are not enough to protect you during a wildfire, so it is best to stay indoors, with doors and windows closed. Smoke from wildfires can travel hundreds of miles. Visit https://airquality.weather.gov/ to get hour by hour predictions of wildfire smoke and other pollutants for your area.

Source: https://www.weather.gov/wrn/ fall2017-wildfire-sm

We do hope you have enjoyed a restful, relaxing summer. July and August brought a variety of weather events which have impacted us here in the northeast United States. Severe thunderstorms resulted in flooding and wind damage to trees and power lines several times over the summer. Additionally, alternating very dry and abnormally wet conditions have proven to be difficult for farmers and gardeners alike. Smoke from the wildfires in the western United States at high levels in the atmosphere cast a yellowish haze to the sky on many days as well.

Shade Tree Meteorology continues to grow and expand our services to meet the needs of our clients. We stay abreast of active weather conditions around the nation and post relevant National Weather Service updates to our Facebook page. Please follow us on Facebook and encourage your loved ones to do the same for the latest information from NOAA.

Perhaps the most exciting change to the company this summer is the unveiling of our new website! We trust that you will find it easy to navigate and full of helpful information and resources. As always, we ask that you kindly fill out our online conflict check form (https://shadetreemeteorology.com/forensiccaseconflictcheck.htm) for new cases. We will respond to you within 24 hours. We encourage you to check out our website for more information on the variety of meteorological services which we provide (https://shadetreemeteorology.com/). As always, we thank you for your business and look forward to serving you in the future!

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A Full-Service Forensic Meteorology Firm with a Team of Certified Consulting Meteorologists Specializing in Hazardous Weather Event Reconstruction

We have extensive experience issuing forecasts and radar-based severe weather warnings which translates into exceptional skill at reconstructing weather events as an expert weather witness. Our clear, non-technical (but scientifically sound) explanations of the what, where, when, and why in thunderstorm events, flooding events, and winter storm events have proven extremely useful to clients in pretrial and courtroom testimony.

Our associates' credentials include:
- **Over a decade of experience as a researcher and teacher in the field of meteorology**
- **Experience providing comprehensive, data-driven research to prepare customized reports based on stakeholder needs**
- **Four decades of experience as an operational weather observer, forecaster and forensic meteorologist**