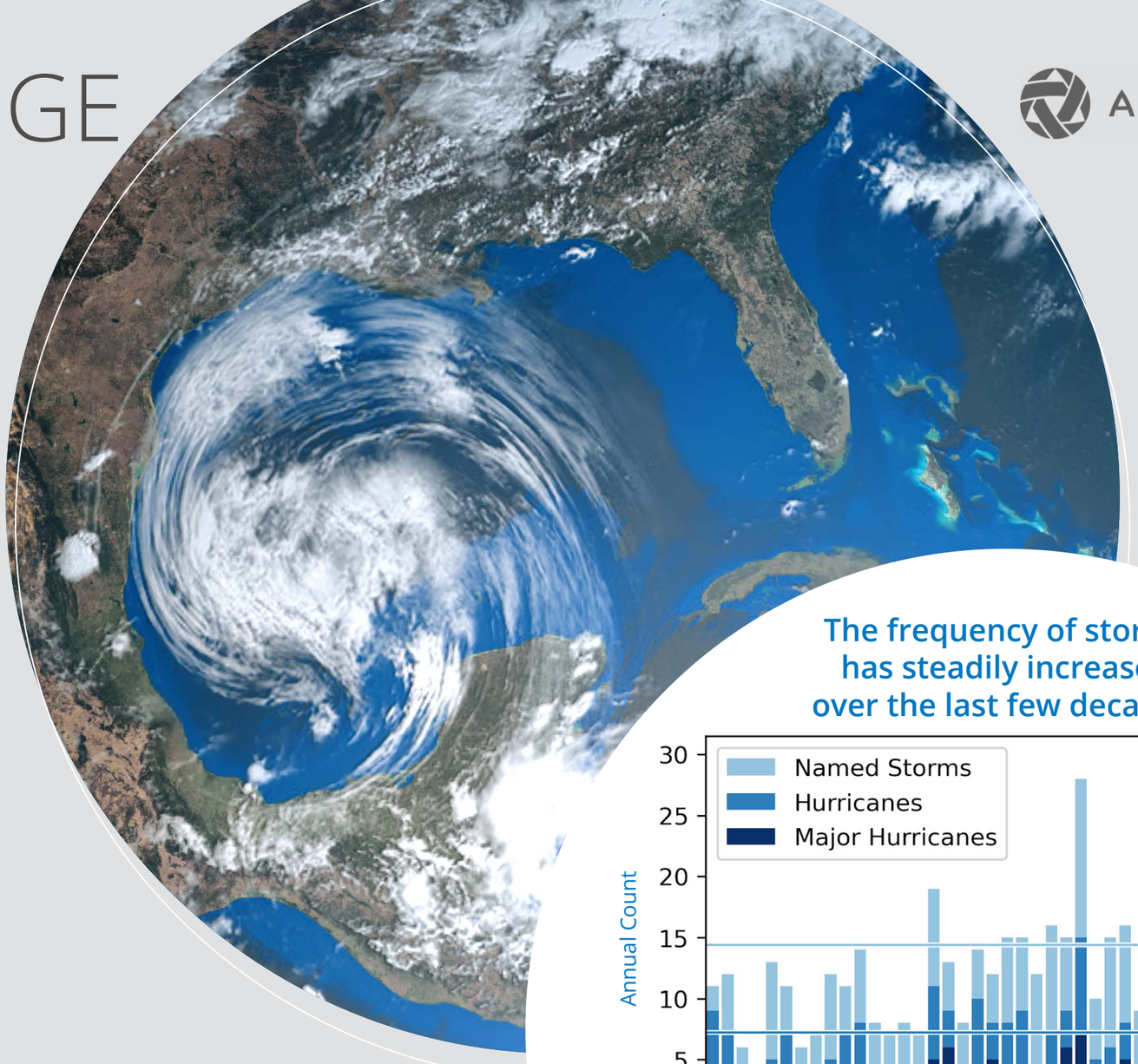
CLIMATE CHANGE

The Impact on our Industry

Assurant recognizes the serious risks and profound impact presented by climate change. The effects of climate change have seemingly increased the frequency and severity of natural disasters, especially hurricanes. Rising sea levels pose a host of problems, including damaging economies and causing extreme flooding. According to a report released by NOAA, sea level rise is accelerating rapidly, and they are predicting an additional 10-to-12-inch rise by 2050. With about 40% of the U.S. population living in a county along the coast, this could have catastrophic effects.

As the leading provider of LPI solutions, we are committed to protecting our customers while taking climate-related actions to improve global environmental sustainability. We frequently monitor climate change legislation, research and reporting for new developments, especially those specific to the insurance industry.



The frequency of storms has steadily increased over the last few decades.

Source: NOAA.gov

GOVERNMENT AGENCIES

Following a series of Executive Orders from the Biden administration, many government agencies and bodies have undertaken initiatives to address climate change, including key financial regulators:

- The Office of the Comptroller of the Currency is working to better understand how the financial risks associated with climate change may affect the safety and soundness of institutions. They will continue information gathering efforts and plan to conduct additional industry outreach to understand the effects of physical and transition risks, including the development of climate risk management frameworks and governance processes at the larger banks.
- The Federal Reserve recognizes the financial and economic risks associated with climate change, and their financial stability monitoring framework will broadly incorporate many key elements of climate-related risks. Although they believe climate change increases financial stability risks, they also feel more research and analysis is needed to incorporate these risks fully into financial stability monitoring.
- The National Credit Union Administration (NCUA) has committed to fulfill its safety and soundness obligations, in part, by measuring, monitoring and mitigating risks presented by climate change.
- The Federal Deposit Insurance Corporation (FDIC), as a bank supervisor, deposit insurer, and resolution authority, has undertaken numerous efforts to better understand and address potential risks posed by the climate, including incorporating climate change research as a corporate goal.
- The Federal Insurance Office (FIO) joined the Network of Central Banks and Supervisors for Greening the Financial System (NGFS).
- State and Local Municipalities are also working to address resiliency and mitigate risk through various programs that direct resources and coordinate legislation specific to climate change.

The Consumer Financial Protection Bureau recently cautioned homeowners and renters about negative impacts from a changing climate. The CFPB noted that the increased intensity and frequency of severe weather events impacts the probability of damage, cost of utilities, price of insurance, and potential resale value of homes.

CLIMATE EFFECTS

Spotlight on 2022

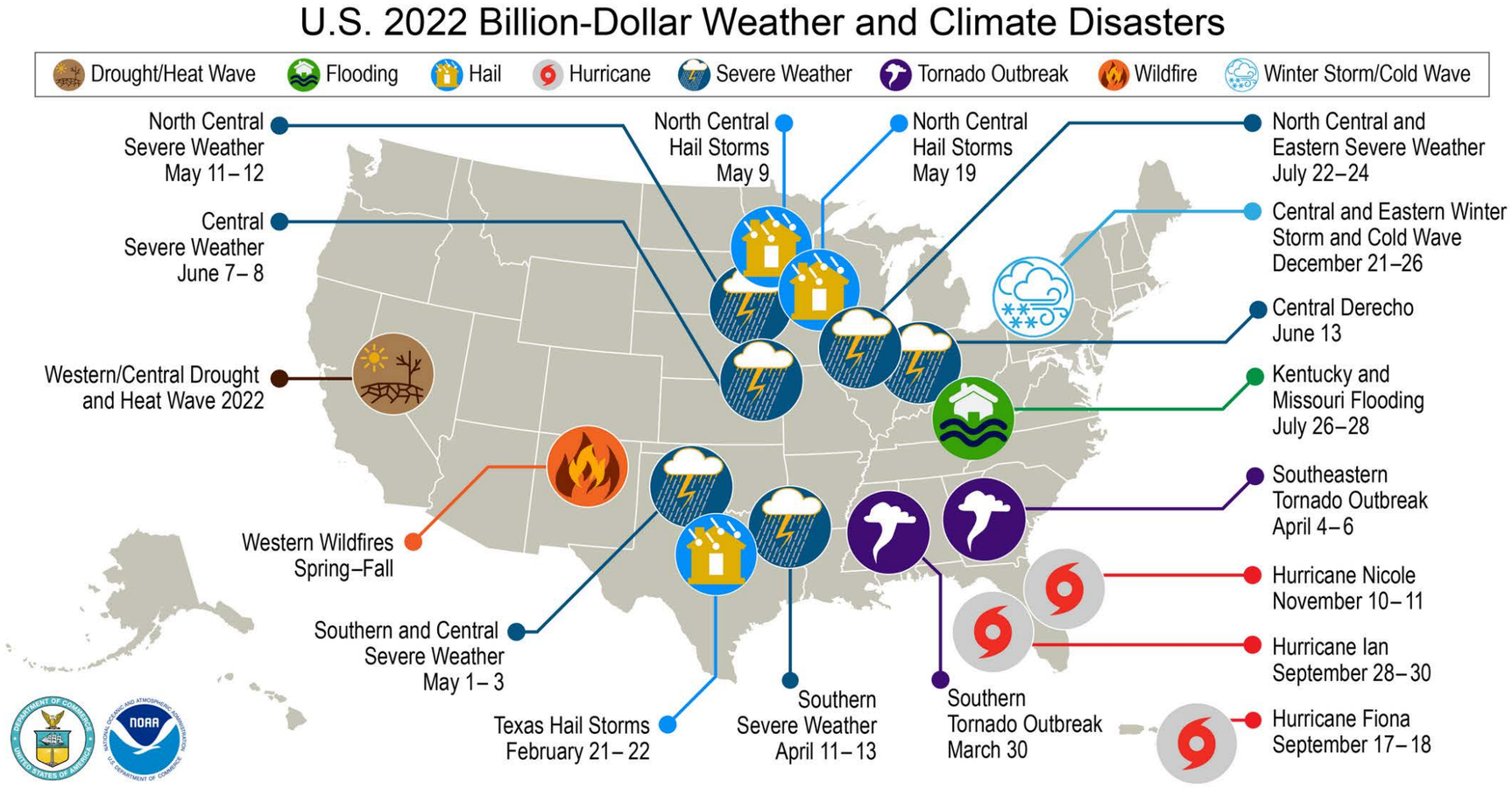
Third warmest year on record: Last year ended with the U.S. seeing the average yearly temperature across the country at 53.4° F. This was 1.4° above the average for the past 128 years.

Third driest year on record: Temperatures contributed to the U.S. only receiving an annual rainfall rate of 28.35", which is 1.59" below average.

Third costliest year on record: This was due to many memorable weather events, including the following:

- A destructive Hurricane Ian.
- An above-average tornado season.
- Wildfires in the western states.
- Artic blasts expanding into new territories.

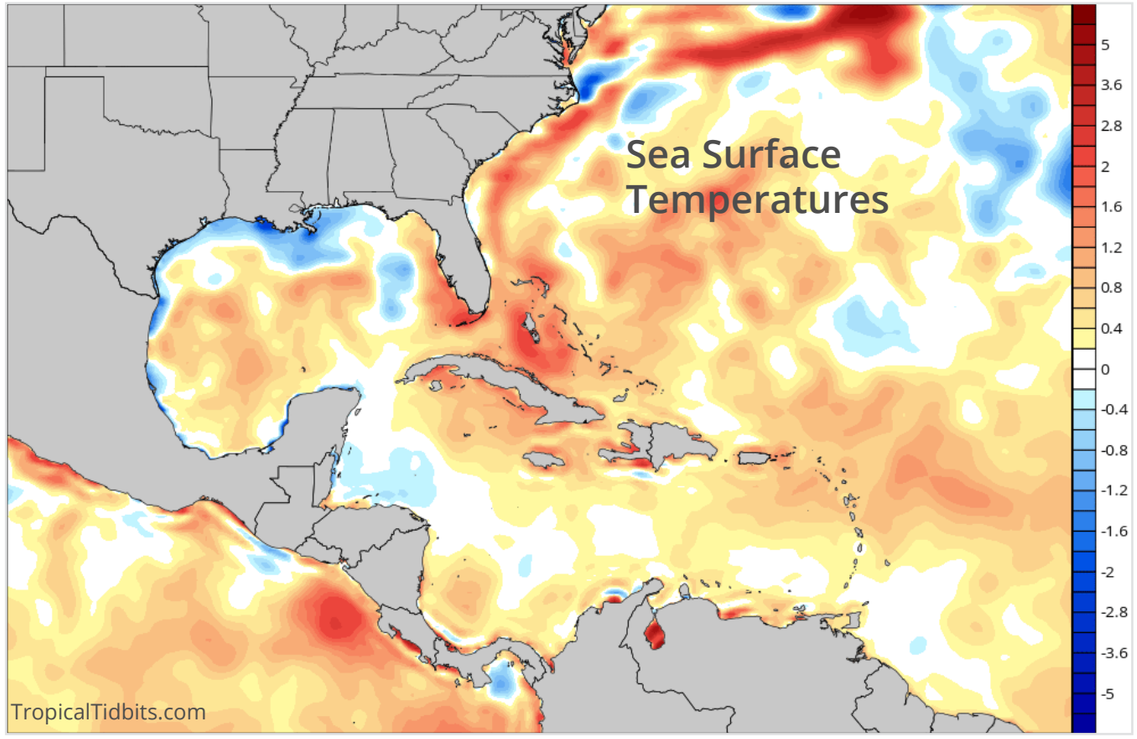
Source: NOAA



*This map denotes the approximate location for each of the **18 separate billion-dollar weather and climate disasters that impacted the United States in 2022.***

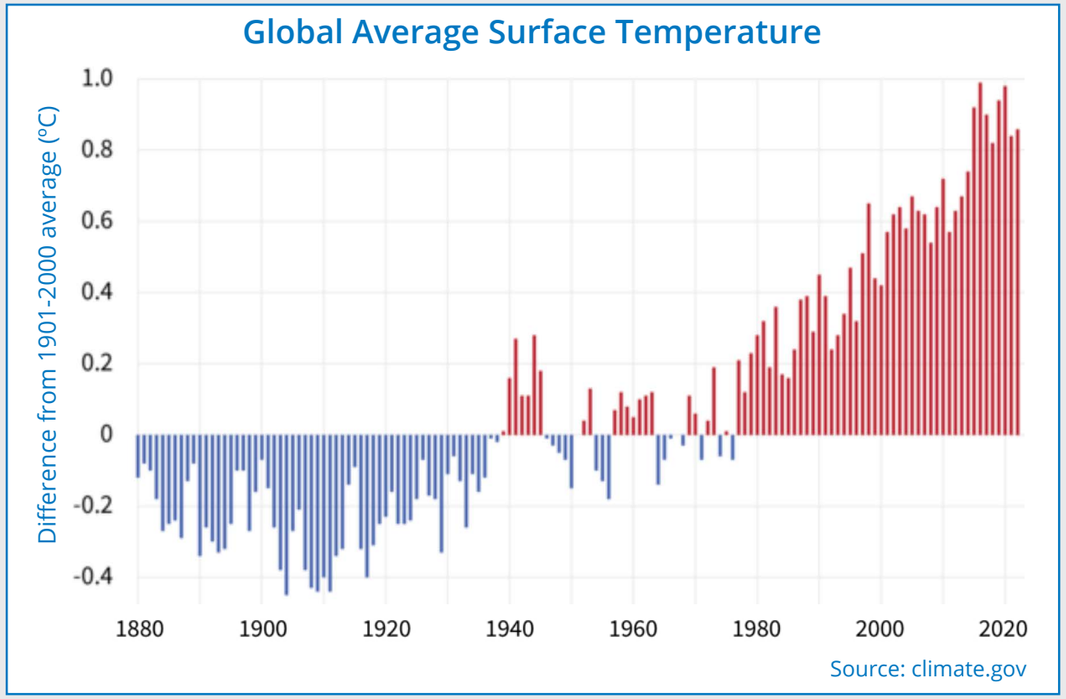
WARMER WATERS

As the Earth's temperature gets warmer, it helps feed the structure of hurricanes. Hurricanes need warm waters to develop and survive — it's their primary source of energy. Although it isn't agreed upon whether more storms will occur due to warmer planet temperatures, scientists all agree that warmer sea surface temperatures, sea-level rise, steering currents and areas affected by hurricanes will all play a role in how much hurricane damage will occur in the future.



CLIMATE CHANGE: Cause & Effects on Hurricanes

Warmer Waters	Rising Sea Levels	Steering Currents
Storms Developing Earlier in Season, Rapid Intensification	Catastrophic Flooding	Northward Shift



Data from NOAA National Centers for Environmental Information (NCEI) indicates that the Earth is getting warmer each year — so much so that the rate of warming has almost doubled since 1981.

WIND SPEED

Warmer water also breeds the potential for rapid intensification in both wind speed and rainfall amounts. Rapid intensification is classified as 35 mph increase in wind speeds in just 24 hours.

In addition, recent studies suggest that warmer waters have increased the likelihood of storms developing earlier in the year, as indicated in the table to the right.

From 2015 to 2021, named storms have appeared before the official start of hurricane season — June 1.

Season	1st Named Storm	1st Hurricane	1st Major Hurricane
2015	May 8	August 20	August 21
2016	January 12	January 14	August 28
2017	April 20	August 9	August 25
2018	May 26	July 6	September 5
2019	May 20	July 13	August 30
2020	May 17	July 25	August 26
2021	May 22	July 2	August 21

Source: @SteveBowenWx (Aon)

According to NOAA, in the early 1980s, the likelihood of having a hurricane intensification event of 35 mph or more in 24-hour period was about 1 in 100. Thirty plus years later, this has gone up by a factor of five to about 1 in 20. Here are some examples from recent hurricane seasons:

- Hurricane Ian (2022) – 35 mph increase in wind speed in 24 hours.
- Hurricane Ida (2021) – 35 mph increase in wind speed in just 6 hours.
- Hurricane Eta (2020) – 80 mph increase in wind speed in 24 hours.
- Hurricane Delta (2020) – 85 mph increase in wind speed in 24 hours.
- Hurricane Laura (2020) – 65 mph increase in wind speed in 24 hours.

SEA LEVELS

Rapidly rising sea levels are another result of climate change. According to the Center for Science Education, in the next century, sea levels are expected to rise between one and three feet. This may cause more frequent coastal flooding as the ocean is pushed further inland. Coastal damage after Hurricane Sandy is an example of the potential catastrophic effects of rising sea levels.

A study by Climate Central predicts the top 25 cities most vulnerable to coastal flooding, by 2050, based on population and coastal floodplains. **The list is comprised of twenty cities in Florida, but eye-opening locations, such as New York City and Boston, are also on the list.**

Northeastern states have been noticeably shifting further into the floodplain — another suspected result of climate change. This is due in part to steering currents, global temperatures, and rising sea surface temperatures. In 2021, Rhode Island was hit by two tropical storms, an uncommon occurrence in New England. The last time this area had a direct hit by a storm was Hurricane Bob in 1991.

With countless studies on how climate change has impacted hurricane activity, there are common themes that we should take note of during the coming season. We may see hurricanes form more rapidly, with higher winds, more rain and track at a slower pace.

Cities Most Vulnerable to Coastal Flooding

Top 10 cities and their populations at risk (thousands) within FEMA's 100-year coastal floodplain.

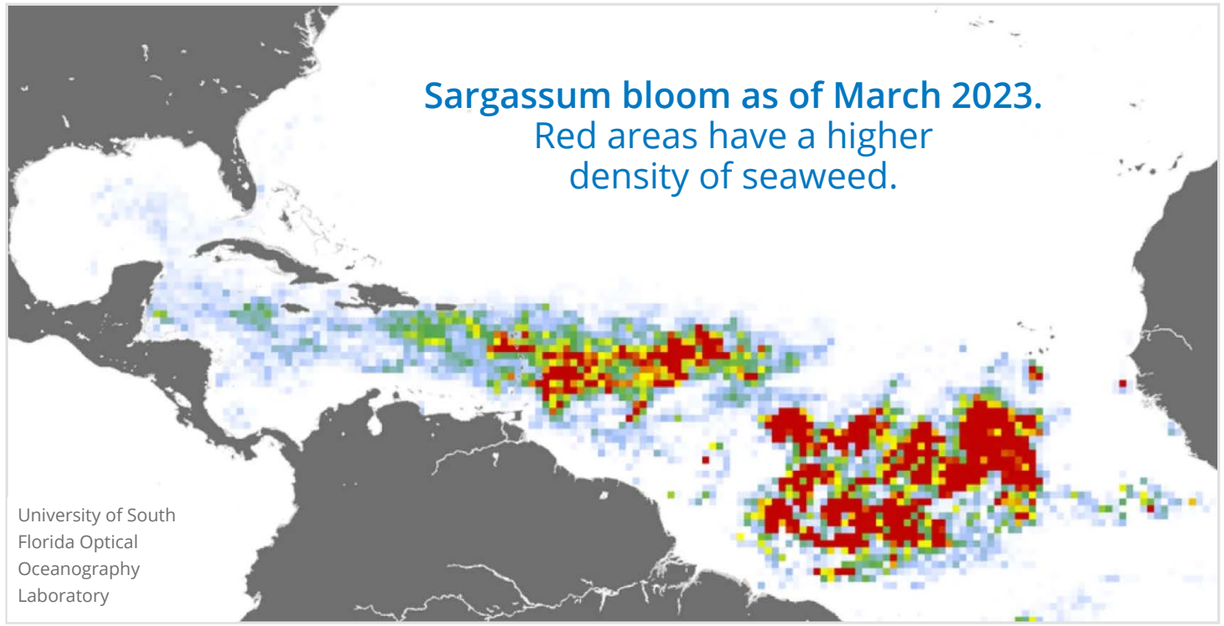
1.	**New York, NY**	**426**
2.	Hialeah, FL	204
3.	Miami, FL	154
4.	Fort Lauderdale, FL	127
5.	Pembroke Pines, FL	120
6.	Coral Springs, FL	119
7.	Miramar, FL	100
8.	St. Petersburg, FL	91
9.	Davie, FL	90
10.	Miami Beach, FL	87

CLIMATE CENTRAL

SEAWEED

The Great Atlantic Sargassum Bloom Sets New Records

Imagine the sun has risen at the hotel on the sunny beaches of Miami and as vacationers go to the beach, they are met with seaweed all over the sand. That has been a reality in 2023.



The Great Atlantic Sargassum Belt hit a new record for March 2023 when it contained about 13 million tons of seaweed sprawled across the Gulf of Mexico to west Africa. Experts agree, this increase is a result of climate change and human interference. The warm ocean waters for this time of year have created the perfect breeding ground for this seaweed. In addition, fetilizer runoff and sewage dumped into the ocean further contributes to the seaweed flourishing.

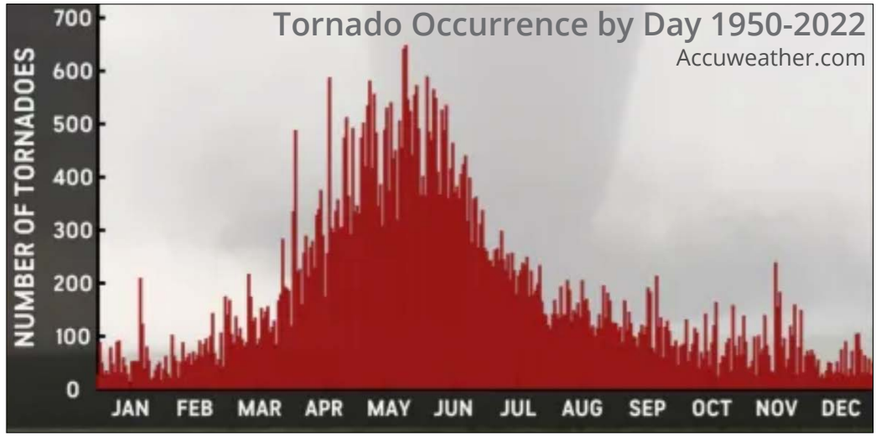
The state of Florida took action well before hurricane season to clean its beaches, although the peak season is still ahead. Sadly, many counties dispose of the seaweed by tossing it into their quickly filling landfills. Since this is not a long-term solution, alternatives, such as composting, are being considered for the future.

Source: WUSFNews

TORNADOES

Is Tornado Alley Shifting East?

Today, the U.S. is home to the greatest number of tornados on Earth, averaging about 1,200 a year. In order for a tornado to form, the atmosphere has to be unstable with warm, moist air near the ground with cool air aloft. It also needs the wind to change direction in height or wind shear.



Tornado season typically lasts from March until May due to the clashing of the incoming Spring/Summer season with the outgoing Winter season. Warmer weather earlier and/or for longer time periods results in a longer tornado season, providing the potential of increasing the annual number each year.

As the climate continues to warm, it increases the components needed to form a tornado in places where they do not typically occur. In 1952, the term tornado alley primarily referred to the Plains. This is where the conditions were conducive for the vast and strongest tornadoes to typically form. However, in the last 20 years or so, we have seen a decrease in the number of tornados in the Plains and an increase in the South/Southeast due in part to climate warming.

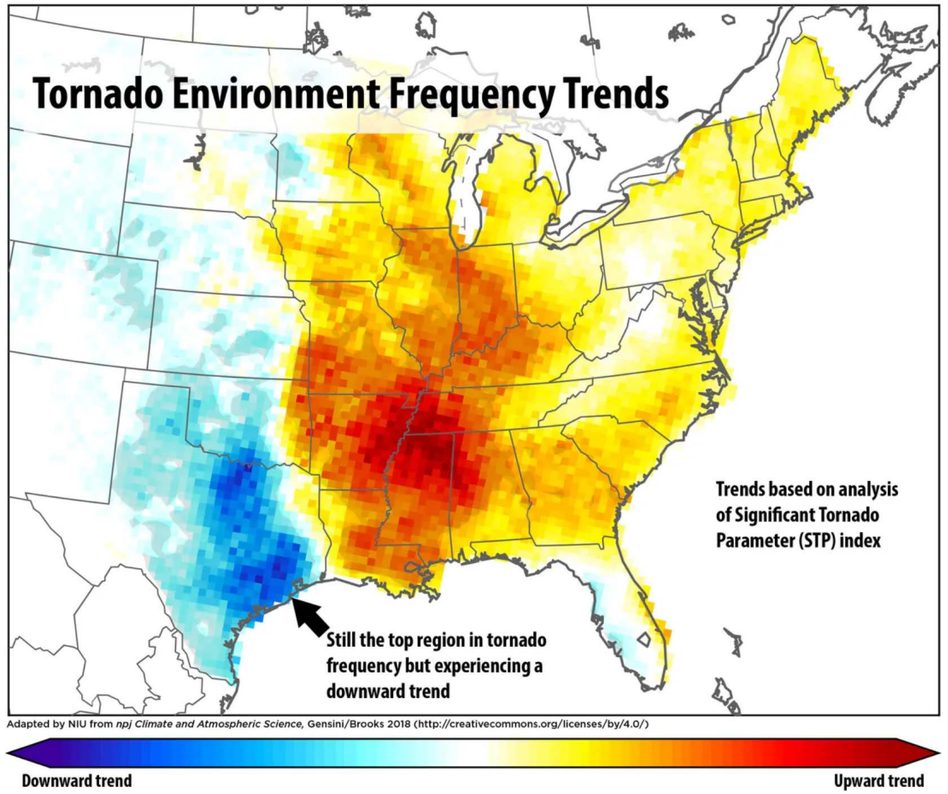
Warmer climate = warmer temperatures. Especially in the South, these higher temperatures help provide the available energy needed for tornados to form. As tornadoes start hitting more populated cities like Atlanta, Nashville, and Charlotte, there is the potential for increased devastation in these more populated areas.

570
As of April 2023

Tornado Reports

394
Historical Average

+144% increase



Sources: USAToday.com, SubjectToClimate.org

CONCLUSION

At Assurant, we will continue to monitor both scientific discoveries and developments that may impact our industry. No matter what the future holds, we are dedicated to actively working with clients and stakeholders to develop strong policies to help protect our customers and the planet.

Click to learn more about Assurant's Environmental, Social and Governance priorities.