

## Looking Ahead to the 2024 Atlantic Basin Hurricane Season

*From  
Rex Ross Tropical Weather Updates  
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### Outlook for 2024

Following a moderate hurricane season in 2023 the initial outlook for 2024 appears to indicate that a busy tropical season is likely this year.

Colorado State University has emerged as one of the most respected institutions developing an annual forecast as to the likely level of tropical activity in the Atlantic/Gulf of Mexico basin.

The CSU 2024 forecast and the actual versus predicted results for their 2023 forecast are as follows:

	<b>2023 Predicted by Colorado State University</b>	<b>2023 Actual</b>	<b>30 Year Average</b>	<b>2024 Predictions From Colorado State University</b>
<b>Total Named Storms</b>	13	20	14	23
<b>Hurricanes</b>	6	7	7	11
<b>Category 3 or Higher (Major Hurricanes)</b>	2	3	3	5

As can be noted from the above recap, the number of named storms in 2023 (20) was substantially higher than the number predicted (14) although the forecasts for hurricanes (7) and major hurricanes (3) were in line with 2023 pre-season predictions.

2024 is currently forecast to be an above average year for named storms, hurricanes and major hurricanes.

While very speculative , Colorado State University projects a 54% chance that a hurricane will strike the Texas coast and a 25% chance that a major hurricane will strike the Texas coast. Both those percentages are up from last year.

### ***ACE (Accumulated Cyclonic Energy)***

**The ACE index is a different way to measure how active a season is.** Short for Accumulated Cyclone Energy index, it takes into account not just the number of storms in a season, but also the intensity and longevity of storms and hurricanes.

ACE seems to provide a more balanced assessment as to the intensity of one hurricane season versus another.

CSU's forecast for 2024 would rank as the fifth most active in the satellite era, or since 1966.

[Click here for a bit more detail on the ACE Outlook for 2024.](#)

### **When Does Hurricane Season Begin?**

The official onset of Hurricane Season in the Atlantic Basin is June 1, with the official season ending November 30.

However, there are numerous examples of tropical events in the Atlantic basin occurring prior to June 1 and after November 30.

## **2024 Storm Names**

Once a tropical system reaches tropical storm intensity (winds of 39 MPH or more), it will be assigned the next name from the following list

- Alberto
- Debby
- Gordon
- Joyce
- Milton
- Patty
- Tony
- Beryl
- Ernesto
- Helene
- Kirk
- Nadine
- Rafael
- Valerie
- Chris
- Francine
- Isaac
- Leslie
- Oscar
- Sara
- William

If there are more than 21 named storms this season, subsequent storms will take names from an auxiliary list of names. This use of Greek alphabet names was discontinued after the 2020 season brought to light multiple shortcomings with the use of the Greek alphabet.

## **Link to Our Tropical Weather Tracking Page**

The link to our 2024 Storm Tracking Home Page follows:

<http://www.rexross.com/StormTrack2024.html>

## **Definitions of Storm Categories**

The following chart shows the wind speed associated with each Category of tropical event.

<b>Storm Categories and Standard Parameters</b>		
<b>Hurricane Category</b>	<b>Wind Speed</b>	<b>Typical Storm Surge</b>
Tropical Storm	39 - 73 mph	
1	74 - 95 mph	4 - 5 feet
2	96 - 110 mph	6 - 8 feet
3	111 - 129 mph	9 - 12 feet
4	130 - 156 mph	13 - 18 feet
5	Over 156 mph	19 feet of higher

### **Hurricane Category Levels Remain Under Review**

It has become apparent in recent years that wind speed alone is not a definitive determinant of the destructive power of a tropical event.

The size and scope of the storm surge is equally, if not more important than wind speed. This view, while long known, came to the forefront as a result of hurricane Ike which struck the Galveston area in 2008. While the wind speed never got beyond a Category 2 event, the size of the storm's wind field produced an enormous storm surge more commonly associated with a Category 4 hurricane. The storm surge statistics for Ike were:

- Highest storm surge recorded on Galveston Island since 1915
- 12-15 foot Ike storm surge along the Galveston / Houston coastal area
- 15-17 foot Ike storm surge across Bolivar Peninsula

The National Hurricane Center is still working on how to better classify the potential effects of a storm beyond the simple wind speed-based Category designation. The NHC is also now publishing storm surge prediction maps as part of their forecast, but they remain a little hard to read and interpret for now.

The message here is to pay attention to all aspects of the forecast for a tropical event, not just the wind speed predictions.

## **What Large Scale Factors Affect the Number and Intensity of Storms?**

Two significant factors which affect the number and intensity of storms that form are:

- The El Niño / La Niña Effect
- Sea Surface Temperatures

### **El Niño / La Niña Effects**

El Niño and La Niña are climate patterns in the Pacific Ocean that can affect weather worldwide.

The occurrence of an El Niño event typically results in increased wind shear in the Atlantic. Such wind shear often limits or suppresses the formation of storms. Without that El Niño driven wind shear, storms are more likely to form and strengthen as they cross the Southern Atlantic without their tops being blown off (which tends to cause them to weaken and/or dissipate).

### **2024 El Niño /La Niño Forecast**

Unlike last year, one factor that tends to keep the lid on hurricanes will be vanishing this season.

The current El Niño was described as "skin deep" by Phil Klotzbach, head of the CSU forecast team, in an April presentation at the National Tropical Weather Conference in South Padre Island, Texas.

NOAA's Climate Prediction Center is forecasting the current El Niño to dissipate and become La Niña by the heart of this hurricane season.

This matters because it's one of the strongest influences on hurricane season activity.

In general, La Niña Atlantic hurricane seasons have less wind shear that can otherwise rip storms apart, and rising, unstable air that is more conducive for thunderstorms, the building blocks of tropical storms and hurricanes.

So this means instead of El Niño acting as a possible brake on hurricane season, La Niña could instead facilitate stronger tropical systems.

## **Sea Surface Temperatures**

Warmer sea surface conditions in the Atlantic basin tend to provide energy to help form storms and increase the intensity of storms that do form.

### **2024 Sea Surface Temperature Forecast**

March marked the 12th month in a row that water temperatures in the North Atlantic Ocean were record warm for that time of year. As you can see in the map below, this unusual spring warmth stretches from the Gulf of Mexico to Africa.

It was recently noted that the strip of the ocean from the Lesser Antilles to West Africa, where stronger hurricanes can form, has as much heat content in early April as is typical for early July.

Since Atlantic Basin water temperatures in early spring correlate to a hurricane season's activity, this is one ominous sign.

### **What Does This Mean for the United States?**

There is no strong correlation between the number of storms or hurricanes and U.S. landfalls in any given season.

One or more of the 20 or so named storms predicted to develop this season could hit the U.S. or all may avoid land, remaining out to sea.

While probabilities of a strike along the lower east coast, the upper east coast and along the coast of the Gulf of Mexico are made each year, they are not very reliable and are not included here.

The uncertainty as to whether and where any storm might make a landfall is why residents of the coastal U.S. should prepare each year no matter what the overall forecast may be.

Remember:

- Regardless of the pre-season predictions, it only takes only one storm event impacting your area of interest to make the season an unpleasant one.
- So it is important for all those with interests along the Atlantic, Gulf of Mexico or Caribbean coastal zones to pay close attention to any tropical systems which may possibly affect those locations and to have a storm preparation and evacuation plan in place.

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## **Understanding ACE (Accumulated Cyclonic Energy) To Measure a Hurricane Season**

### **ACE Outlook for 2024 Ranks 5<sup>th</sup> in History**

**The ACE index is a different way to measure how active a season is.**

Short for Accumulated Cyclone Energy index, it takes into account not just the number of storms in a season, but also the intensity and longevity of storms and hurricanes.

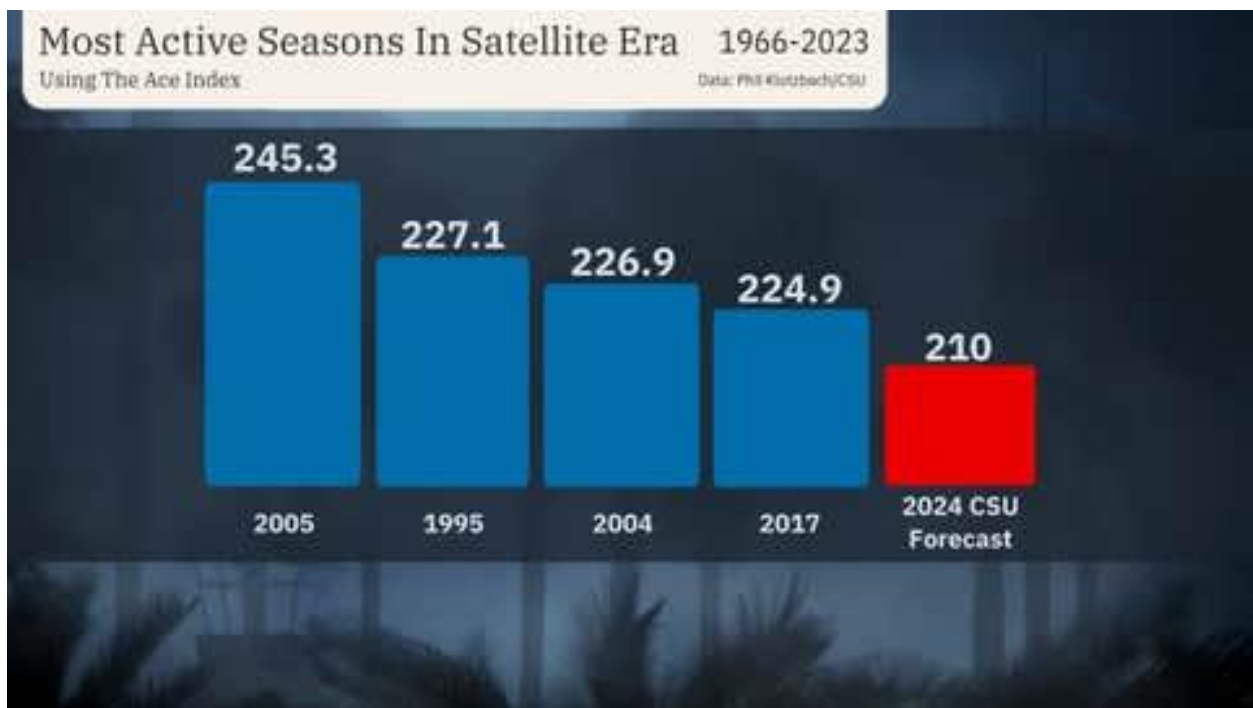
Long-lived, intense hurricanes have a high ACE index, while short-lived, weak tropical storms have a much lower ACE. The sum of the ACE for all the storms in a season determines how busy it was.

However, a season's ACE value doesn't necessarily reflect the severity of impacts to land in a given year.

**Colorado State University's forecast for 2024 would rank as the fifth most active in the satellite era, or since 1966.**

The calculated ACE forecast value for 2024 is 210, which only trails 2005, 1995, 2004 and 2017 using this measurement, based on data from CSU tropical scientist Dr. Phil Klotzbach.





**Why only use data from the satellite era?** This gives the most reliable information, since before then, observations of tropical storms and hurricanes were more sparse, especially over the open ocean waters.

**2005 was by far the most active season because of its large number of hurricanes.** Twenty-eight storms accounted for an ACE of 245.3. Helping to boost that ACE number so high is the fact the season had the most hurricanes (15) and Category 3-plus hurricanes (seven) in a season during the satellite era. A record four hurricanes reached Category 5 status, including Emily, Katrina, Rita and Wilma.

As explained earlier, the ACE index reflects the intensity and longevity of storms in a season, so it makes sense that 2005 is No. 1 given the number of hurricanes it produced.

More recently, 2020 had 30 named storms, which is more than 2005, but fewer of them became hurricanes (13) and major hurricanes (six). Therefore, it ranks as the sixth most active in the satellite era going into the 2024 season.

**The other seasons on the list had fewer storms than CSU is predicting this season, but higher ACE.** The 2024 forecast calls for 23 named storms, of which 11 are expected to become hurricanes and five of those attaining Category 3 or greater strength.

2004 and 2017 had 15 and 17 storms, respectively, and slightly fewer hurricanes than CSU's prediction.

So you might ask – how do they have a higher ACE than the 2024 forecast?

The 2004 season's high ranking is because it had the most days with a Category 3 hurricane roaming some part of the Atlantic Basin in the satellite era. 2017 ranks second in that metric. That speaks to the intensity and longevity portion of the ACE index, resulting in a higher ranking.

**2004 and 2017 shared something in common – two of the longest duration Category 5 hurricanes on record.** Hurricane Irma was the longest-lived Category 5 hurricane on record since the beginning of the satellite era in 1966, maintaining that intensity for 3.25 days, according to Klotzbach. It carved a path of damage from the northern Caribbean islands to Florida.

Hurricane Ivan in 2004 tied Hurricane Allen (1980) for the second-longest duration as a Category 5 – three days – in the Atlantic Basin. Ivan left a trail of destruction from the Caribbean to the southeastern United States and was a major hurricane throughout that time.

The ACE generated by those hurricanes alone was more than several entire seasons in the Atlantic Basin, including most recently in 2015.

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