Peak of Hurricane Season is Here

NOAA Updated 2019 Hurricane Season Outlook

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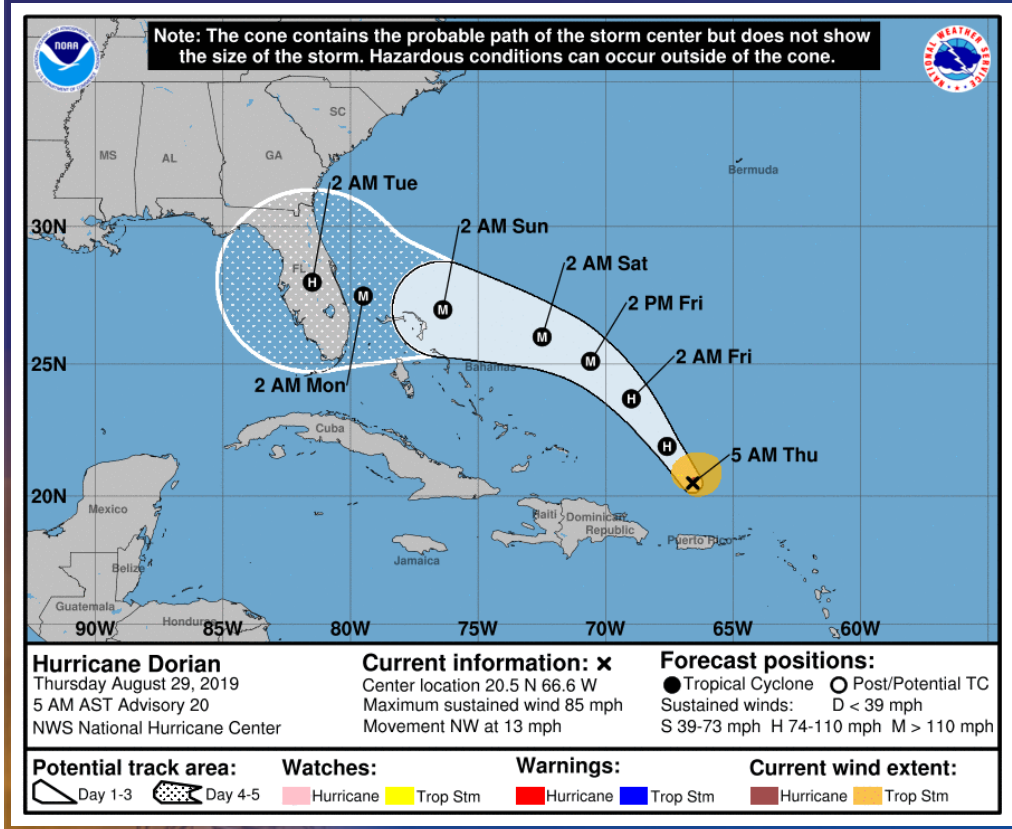
Collaboration With

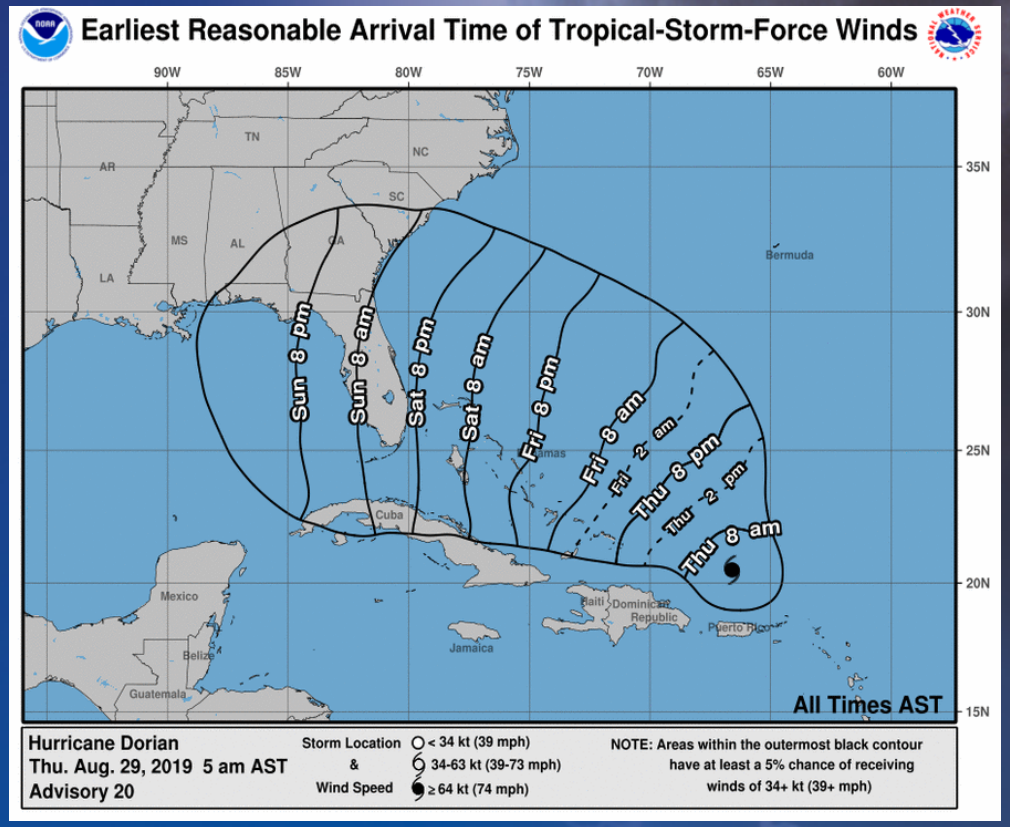
National Hurricane Center/ NOAA/ NWS/ NCEP

Hurricane Research Division/ NOAA/ OAR/ AOML/ HRD

Presented to NOAA Eastern Region Climate Services: 29 August 2019

Predicted Path of Hurricane Dorian





Rush Hurricane Preparedness Plans to Completion

Preparedness

Water/ food for several days
Batteries
Flashlights, radio
Medications
Kids and Pets needs
Cash

Evacuation Zone:

- Know where you will go
- Medications
- Important Documents
- Clothing
- Hygiene Items
- Gas for car

Web Links

Atlantic Hurricane Outlook

Outlook press release
https://www.noaa.gov/media-release/noaa-increases-chance-for-above-normal-hurricane-season

Outlook technical write-up and analyses
www.cpc.ncep.noaa.gov/products/hurricane

El Niño/ La Niña

Weekly update of tropical Pacific conditions:
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf

Tutorial (Technical):
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ensocycle/enso_cycle.shtml

Monthly Discussion/ Forecast
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/

Outline

1. Historical Atlantic storm tracks and counts
2. Updated 2019 Atlantic hurricane season outlook
3. Factors behind the updated outlook
4. Hurricane landfalls and preparedness
5. Summary

Historical Atlantic Storm Tracks

Atlantic Basin
Storm Tracks 1980-2005

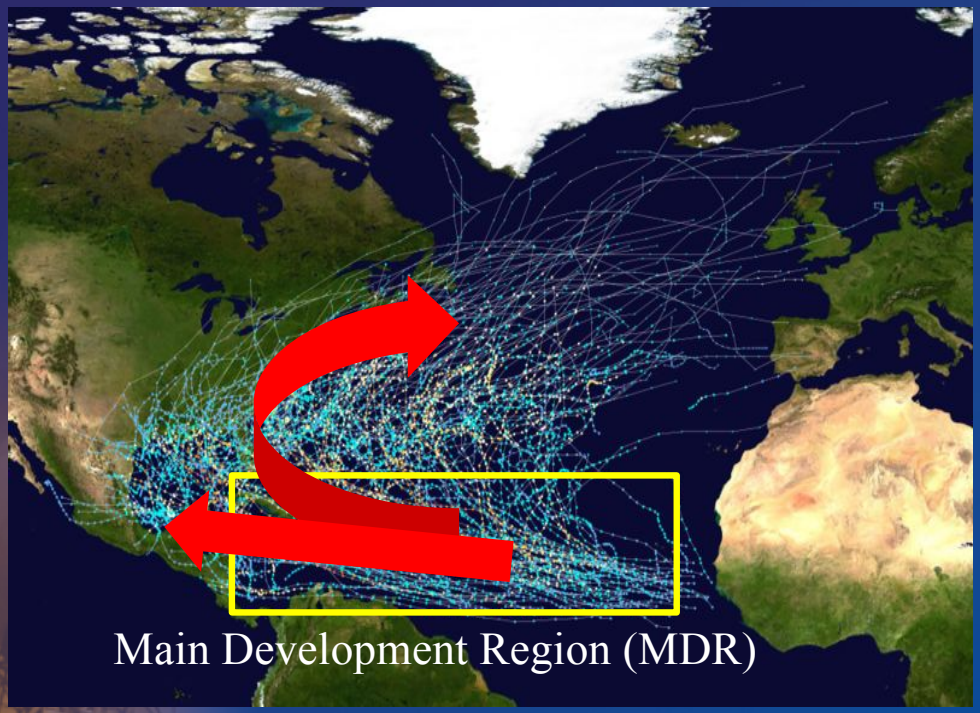


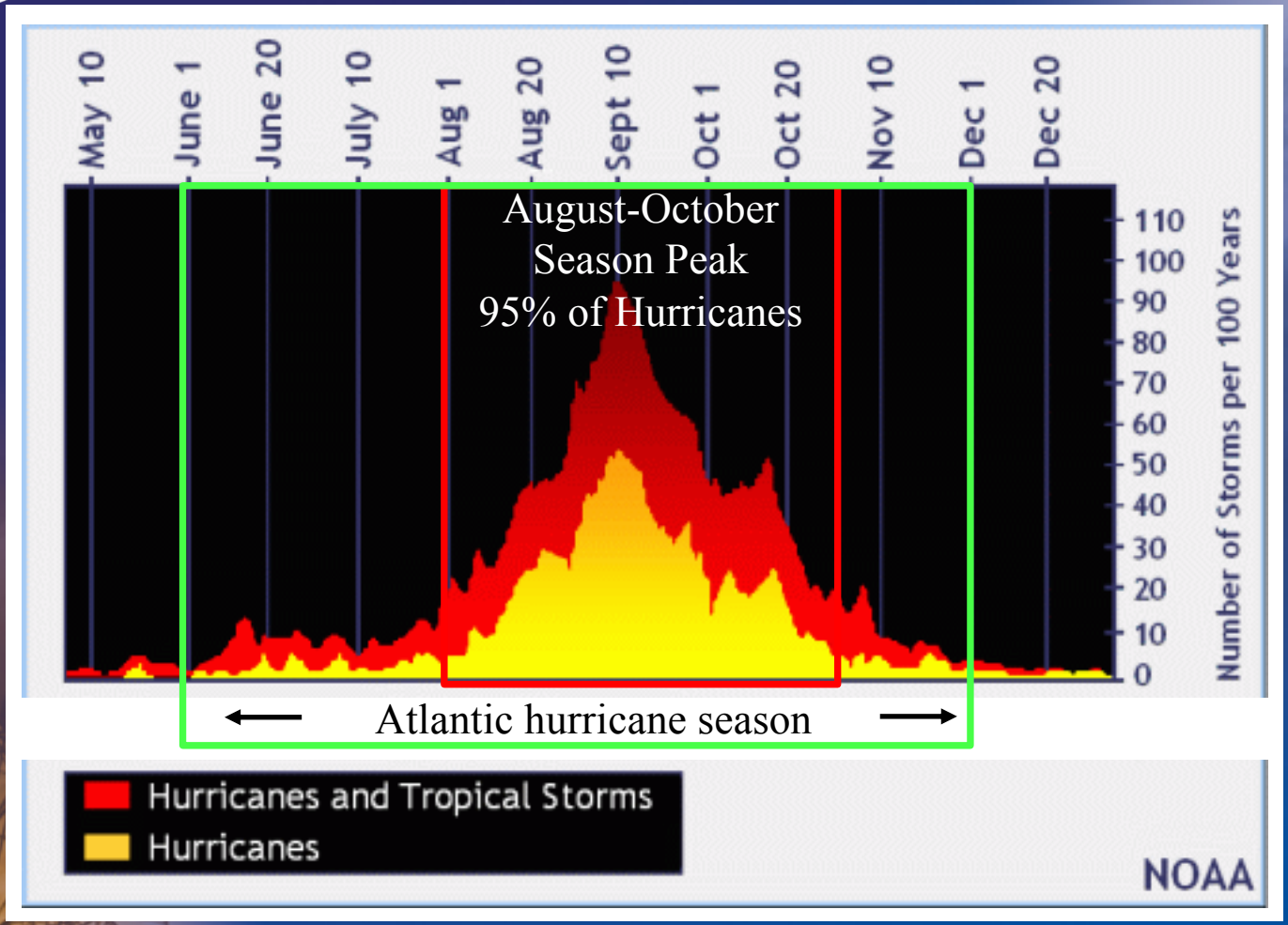
Figure Courtesy of Wikipedia

The activity in the Main Development Region (MDR) determines the strength of the hurricane season.

NOAA's seasonal outlooks are based on predicting conditions within the MDR.

During above-normal seasons, storms typically have longer westward storm tracks, which means an increased threat of landfall.

Historical Atlantic Storm Counts

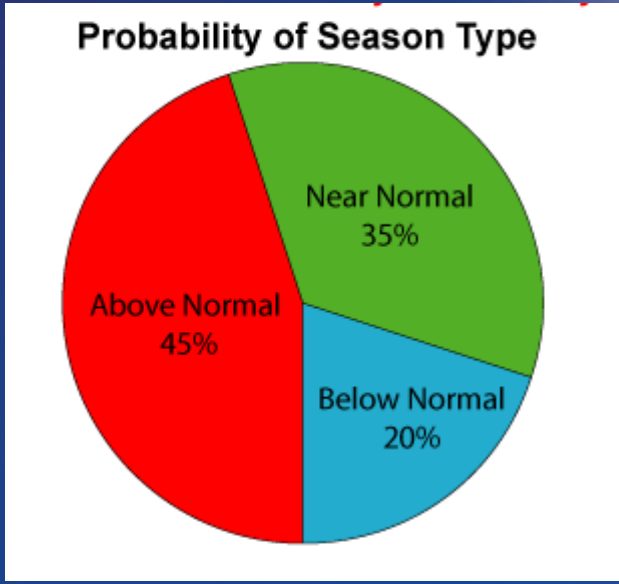


Average Season:
12 Named Storms
6 Hurricanes
2-3 Major Hurricanes

NOAA updates its Atlantic hurricane season outlook in early August, to coincide with peak months (August-October) of the hurricane season.

NOAA's Updated 2019 Atlantic Hurricane Season Outlook

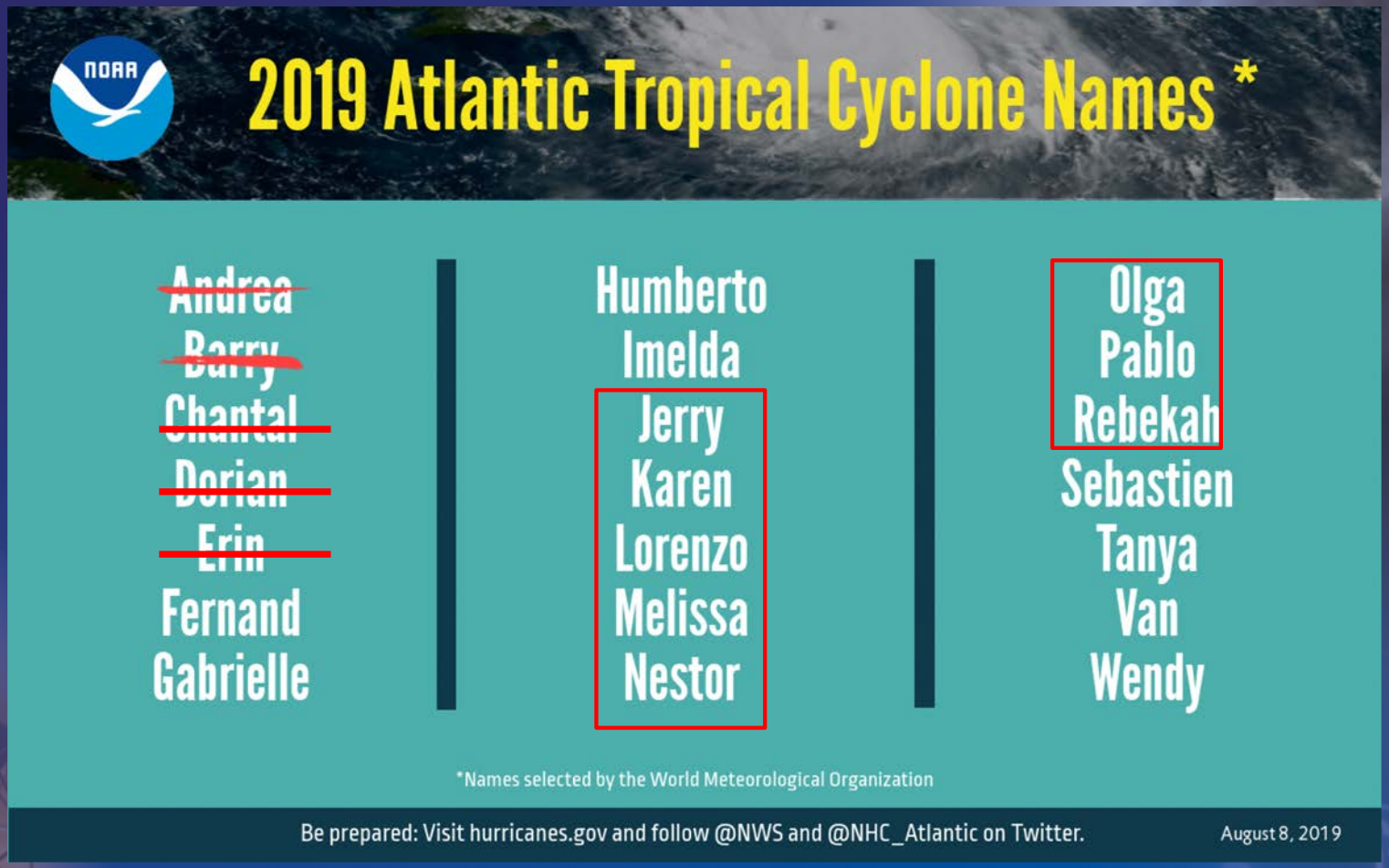
Forecasters increase Atlantic hurricane season prediction



A near-normal or above-normal Atlantic hurricane season is likely.

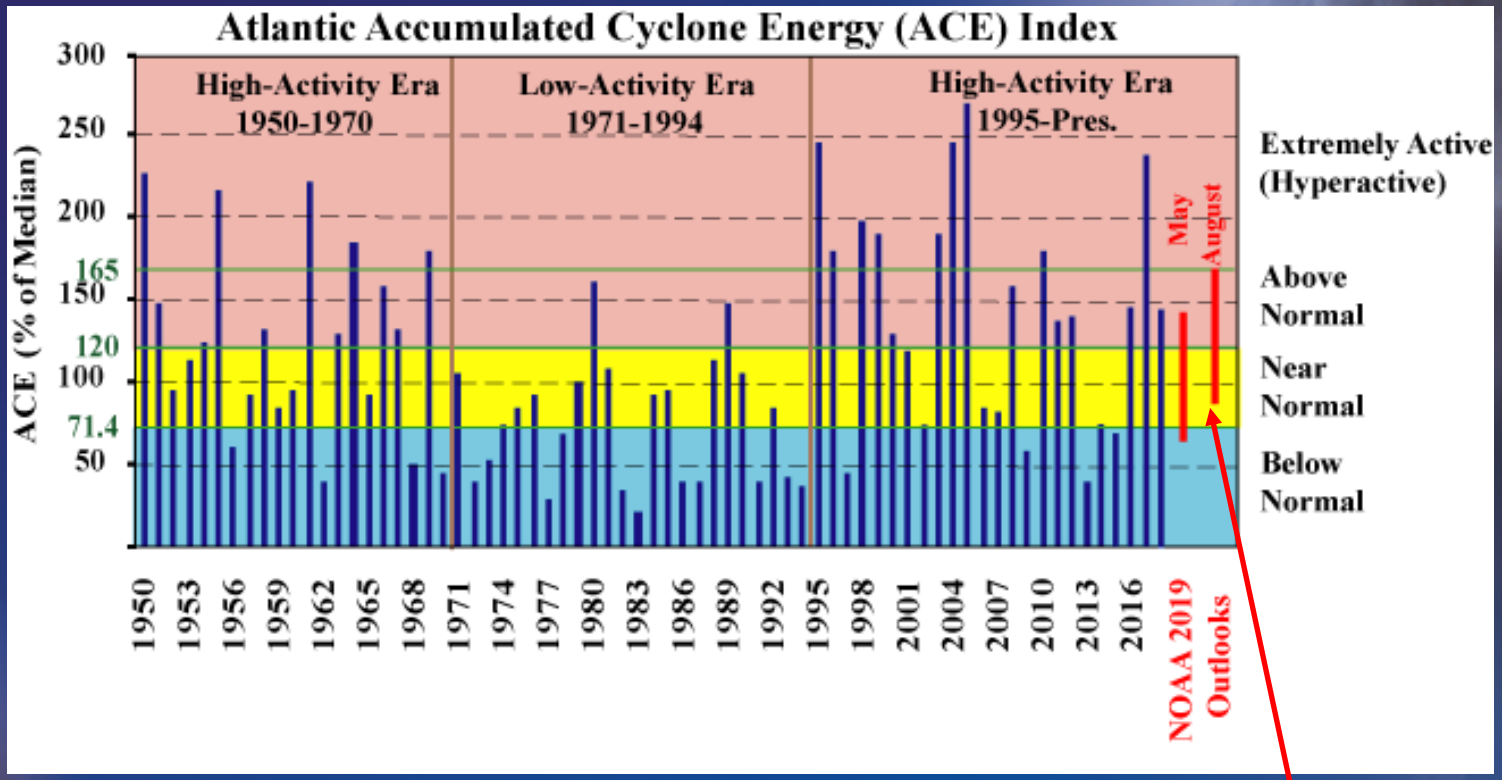
Outlook is for the overall seasonal activity. It is not a landfall forecast.

Activity	August 2019 Outlook	May 2019 Outlook
Named Storms	10-17	9-15
Hurricanes	5-9	4-8
Major Hurricanes	2-4	2-4



- 10-17 Named Storms Predicted (Jerry through Rebekah)
- Already had 5 storms to date. Still have a long way to go with this hurricane season.

The 2019 Atlantic Outlook in a Historical Perspective

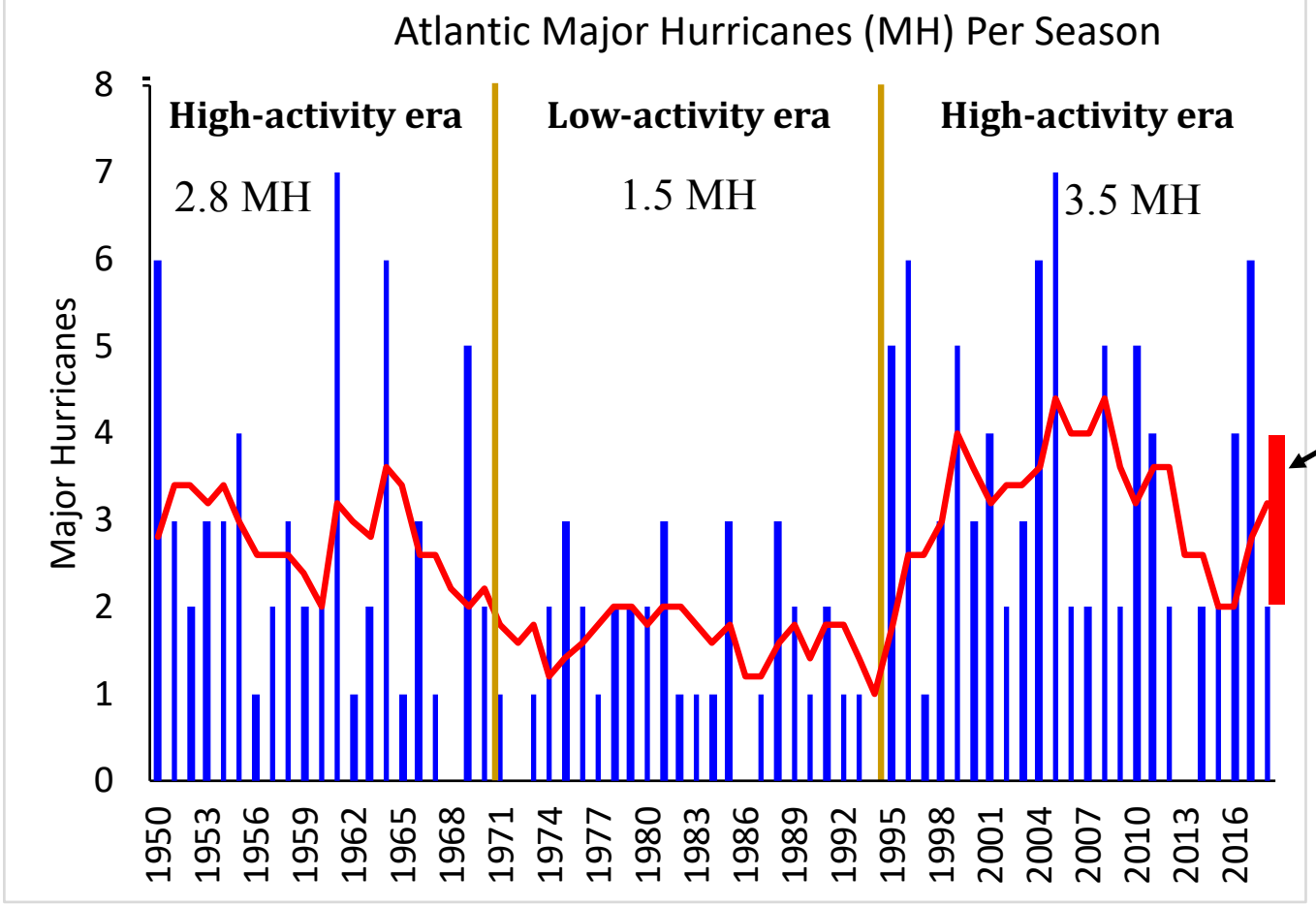


70% probability of ACE range 85% - 165% of the median.

Ongoing conditions associated with the high-activity era favor a more active season for 2019.

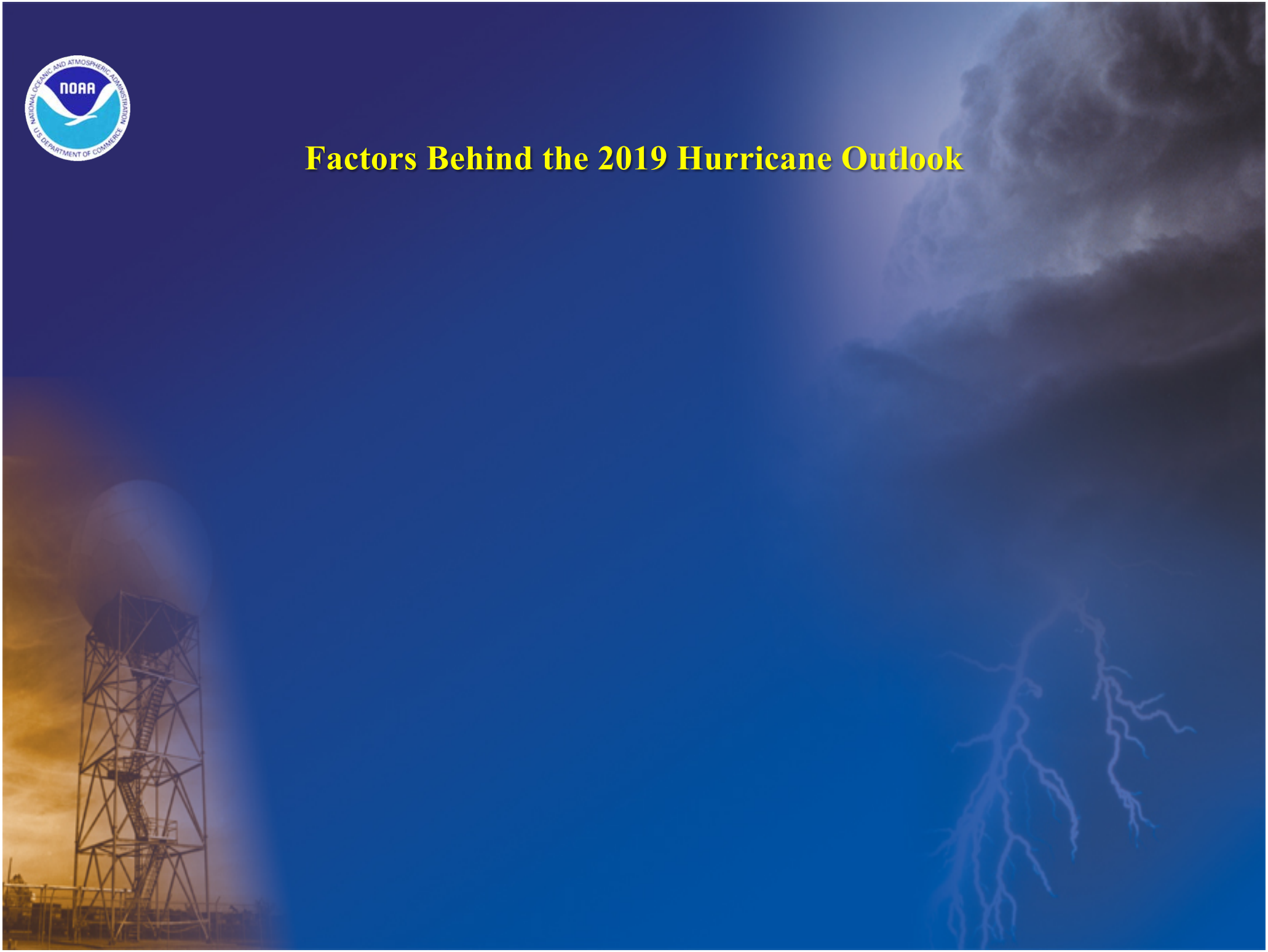
High- and low activity eras typically last about 25-40 years. The current high-activity era for Atlantic hurricanes began in 1995.

The 2019 Outlook in a Historical Perspective
Major Hurricanes



Much of the year-to-year and decade-to-decade variability is not random.

Factors Behind the 2019 Hurricane Outlook



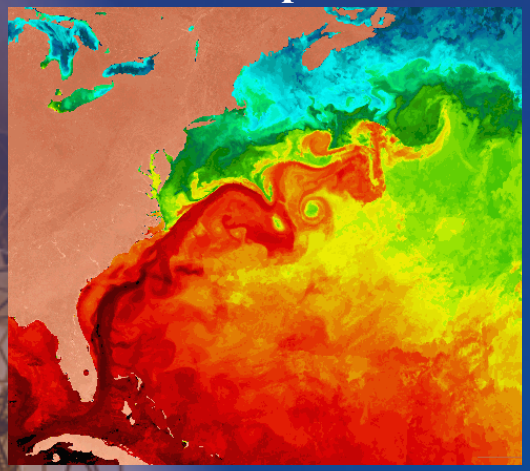
Underlying Concept behind Seasonal Hurricane Outlook

Hurricanes are ultimately a weather phenomena. **However**, seasonal hurricane activity is generally not random.

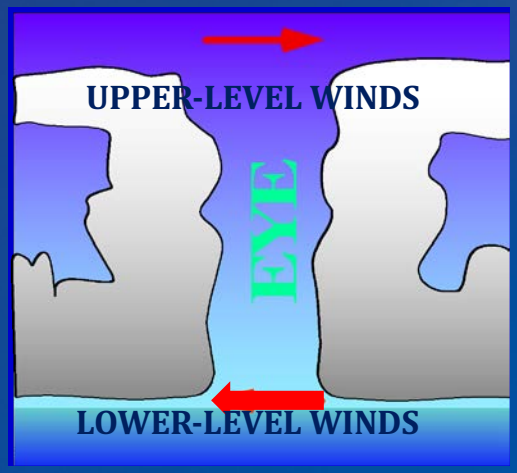
The regional conditions within the MDR (which largely control the number, strength, and duration of hurricanes) are often inter-related, often last for months or seasons, and often have strong climate links.

Some Regional Conditions That Influence Hurricanes

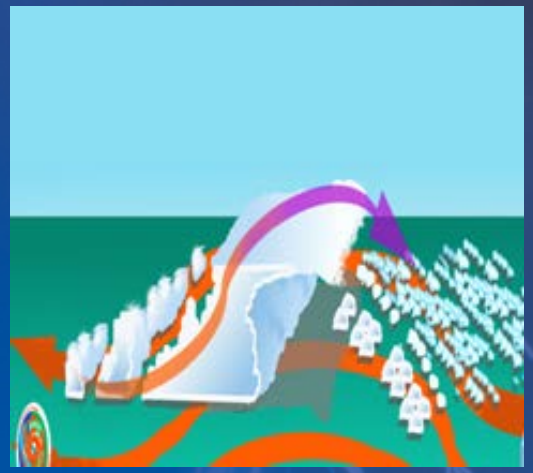
Atlantic and Pacific Ocean Temperatures



Wind Shear



African Easterly Waves Pre-Existing "Trigger"



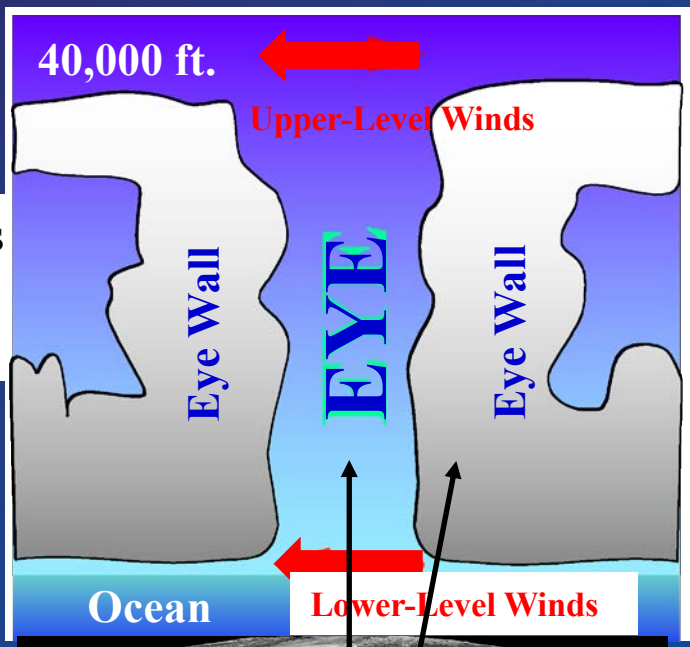
By predicting the key climate patterns and their combined impacts, we can often predict the strength of the hurricane season.

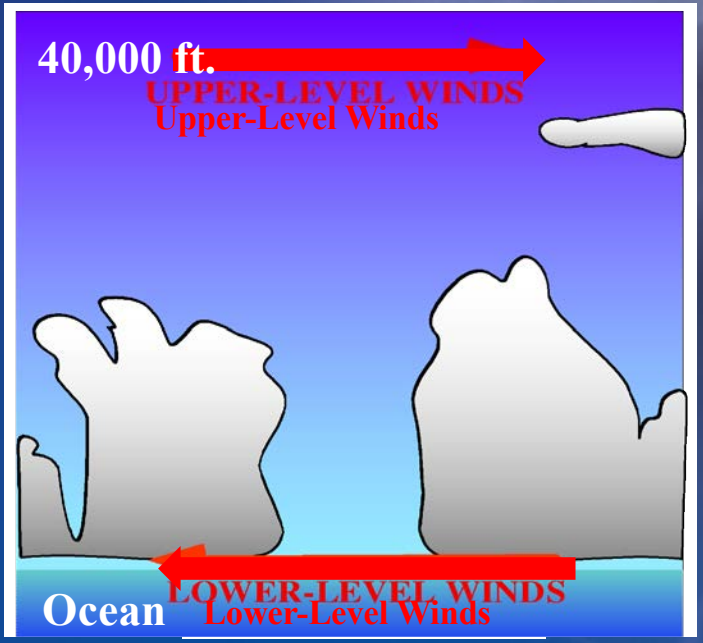
Hurricanes Require Weak Vertical Wind Shear

Vertical wind shear refers to the change in wind speed and direction going up through the atmosphere.

Hurricanes need weak shear-little change in winds.

Hurricanes destroyed by strong shear-large change in winds





Looking sideways through storm clouds

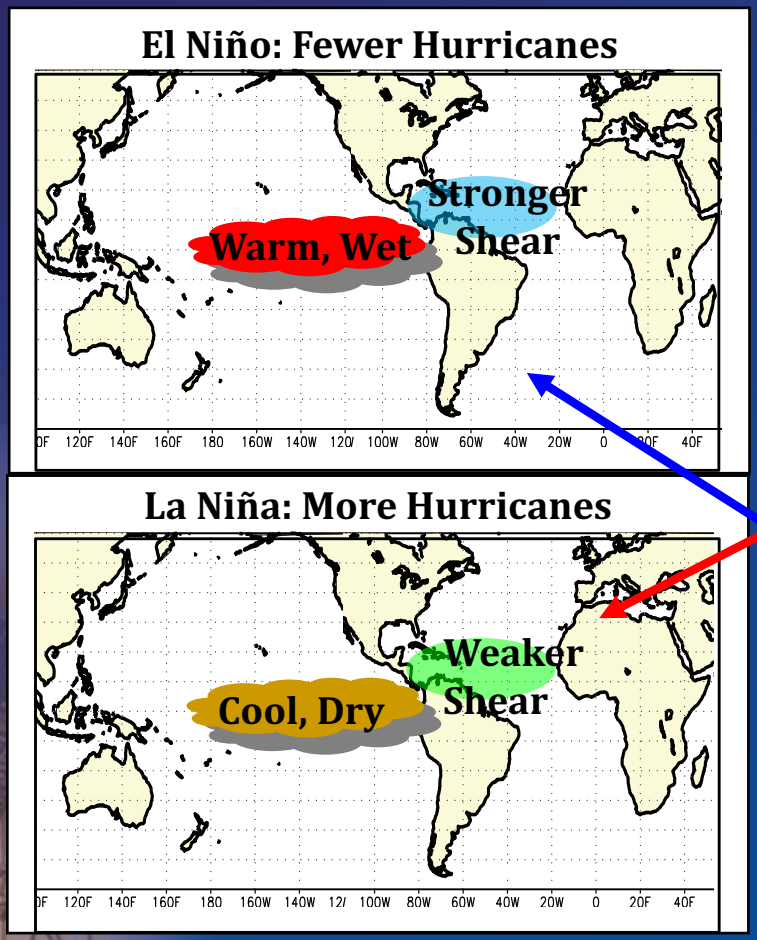
Looking down on storm clouds

Lower clouds and circulation

Upper clouds

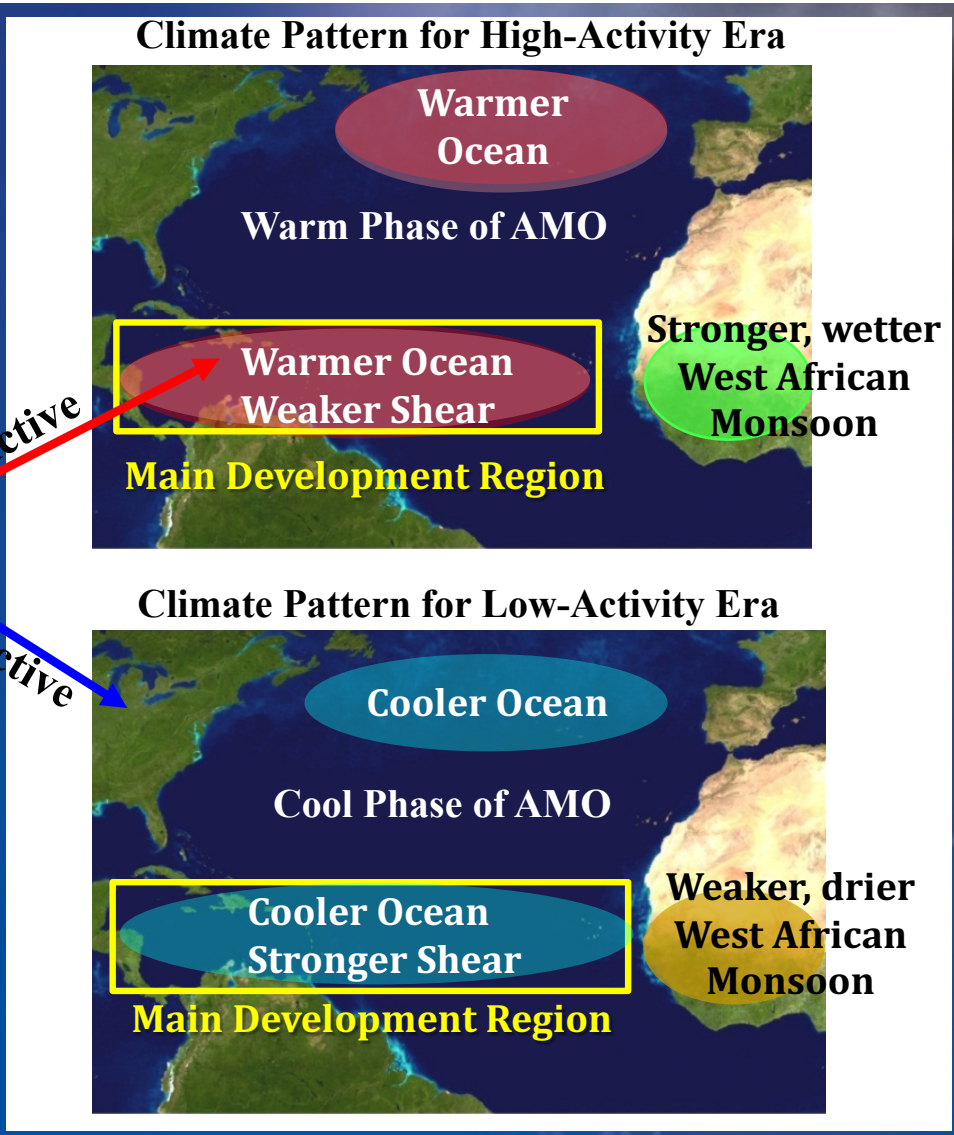
These Climate Patterns Strongly Influence Atlantic Hurricane Season

El Niño/ La Niña: Year-to-year changes in Atlantic hurricanes



Predicting these climate patterns and their combined impacts is the basis for making NOAA's seasonal hurricane outlook.

Atlantic Multi-Decadal Oscillation (AMO): Multi-decadal cycles in Atlantic hurricanes



Four Reasons Why the Season Could Be More Active

1. El Niño dissipated during July----- In May, forecasters predicted a 60% chance of El Niño during August-October.

2. Reduced duration and strength of El Niño's lingering, suppressing impacts (vertical wind shear and sinking motion) are now predicted.

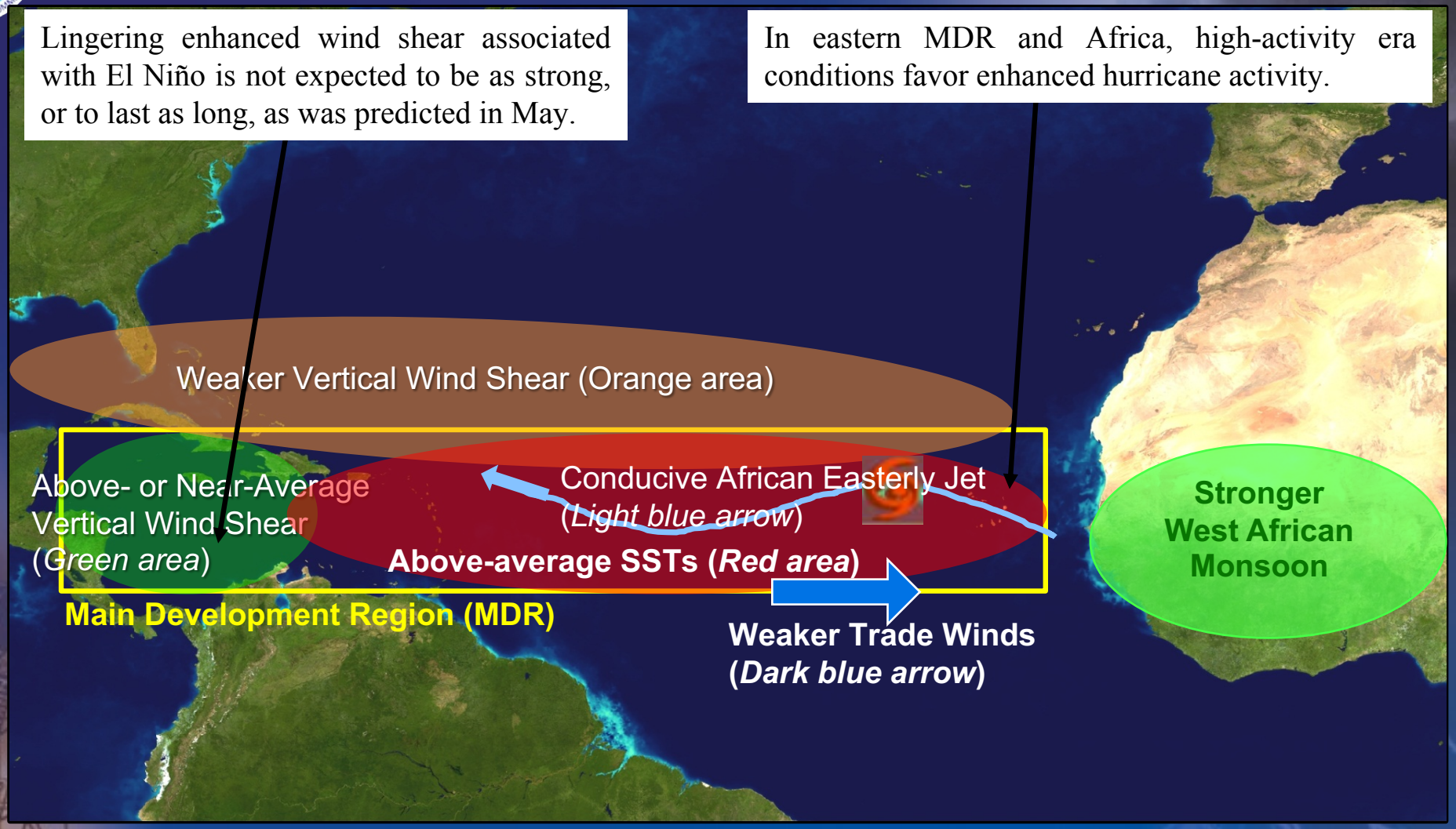
3. Conducive conditions have developed across the eastern tropical Atlantic and western Africa, as predicted in May--Associated with ongoing high-activity era.

4. Model guidance now predicts more activity than it did in May.

Expected Conditions During the Peak Months (August-October) of the 2019 Atlantic Hurricane Season

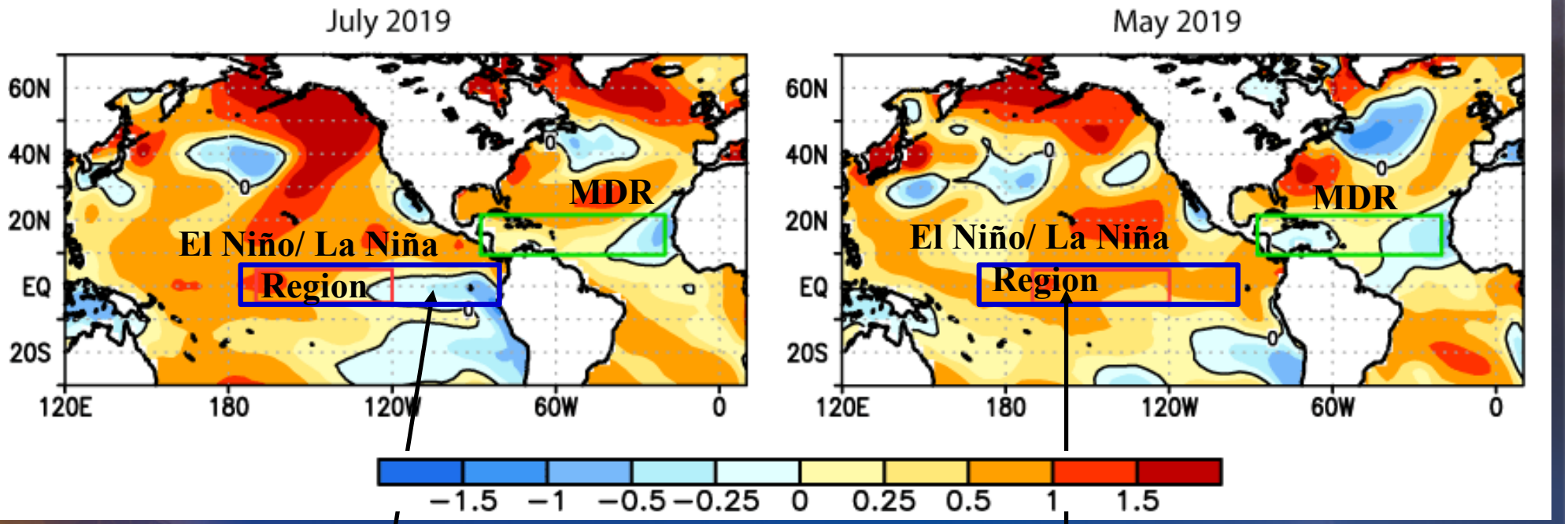
Lingering enhanced wind shear associated with El Niño is not expected to be as strong, or to last as long, as was predicted in May.

In eastern MDR and Africa, high-activity era conditions favor enhanced hurricane activity.



ENSO Evolution and Forecasts

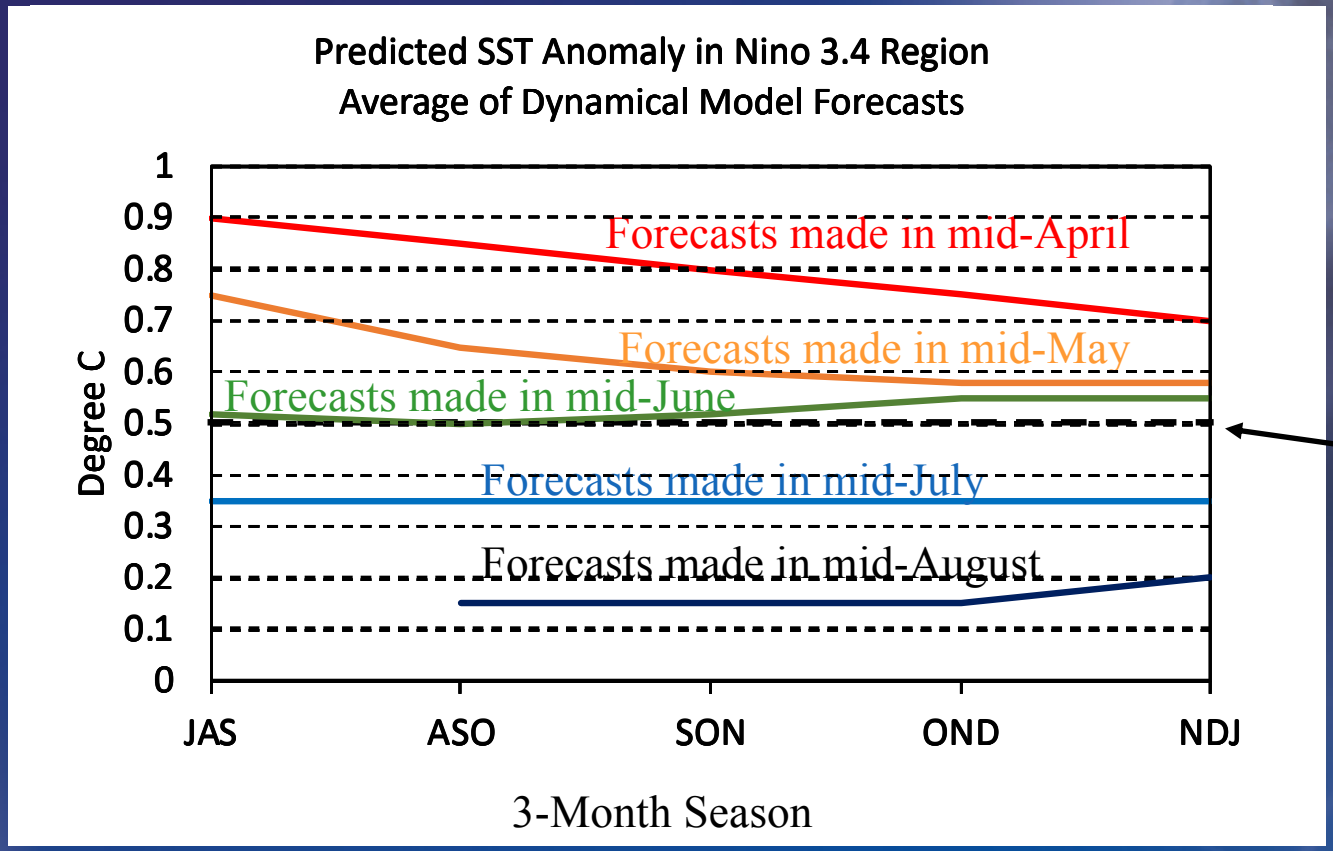
Recent Sea Surface Temperature Anomalies (ºC)

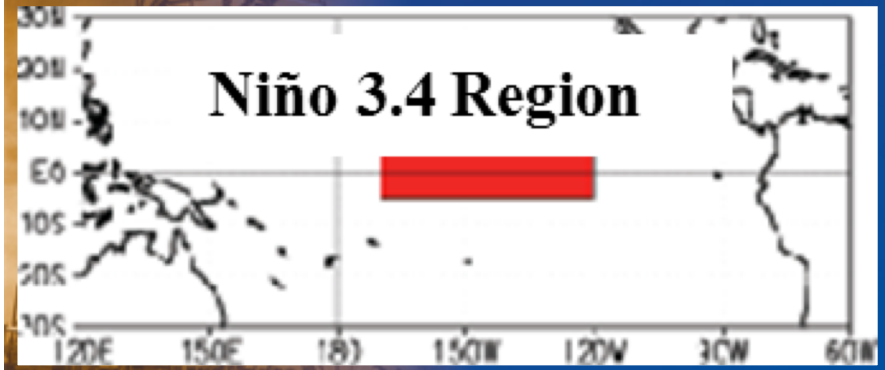


- El Niño dissipated during July
- Currently no El Niño or La Niña.

El Niño

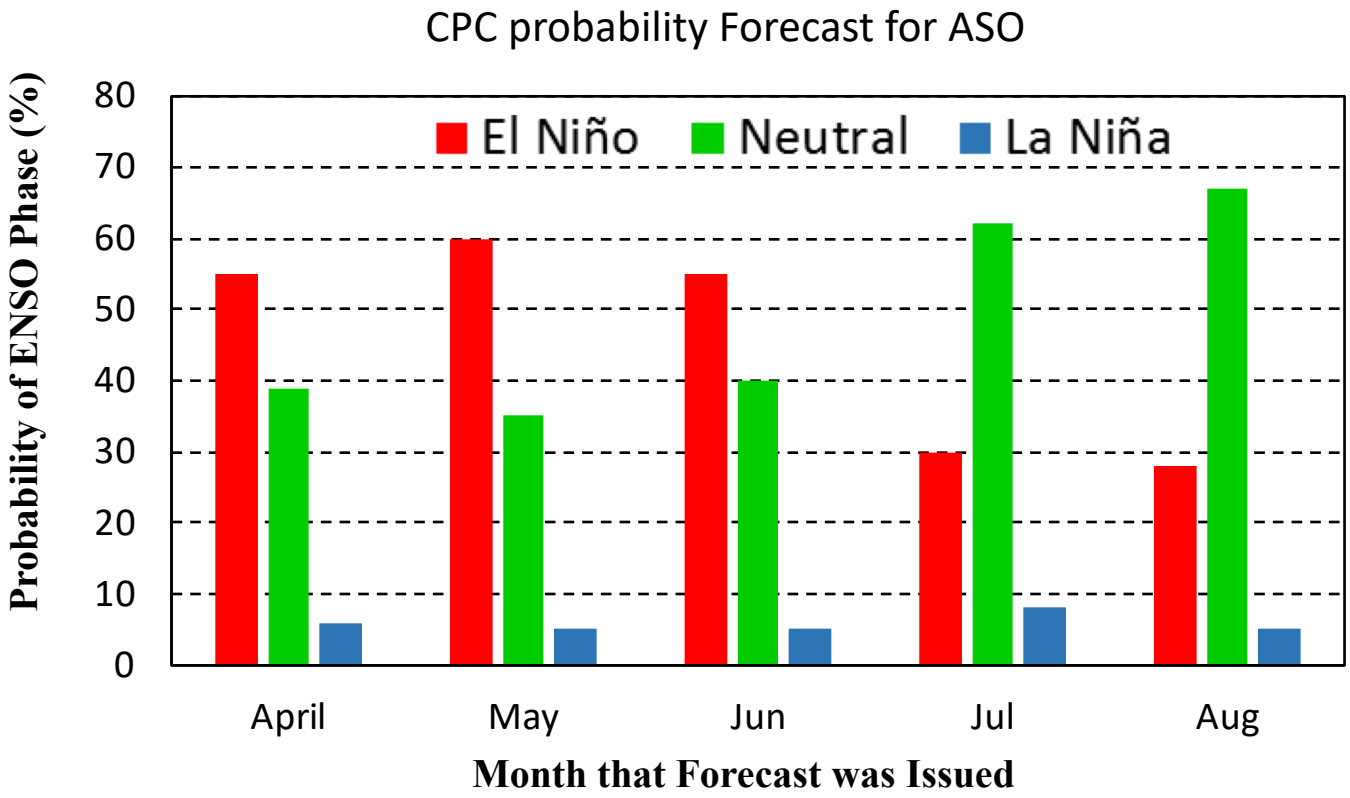
Dynamical Model SST Anomaly Forecasts: Niño-3.4 Region





Model predictions from April, May, and June failed to predict the summertime dissipation of El Niño.

CPC/ IRI ENSO Probability Forecasts for Aug-Oct

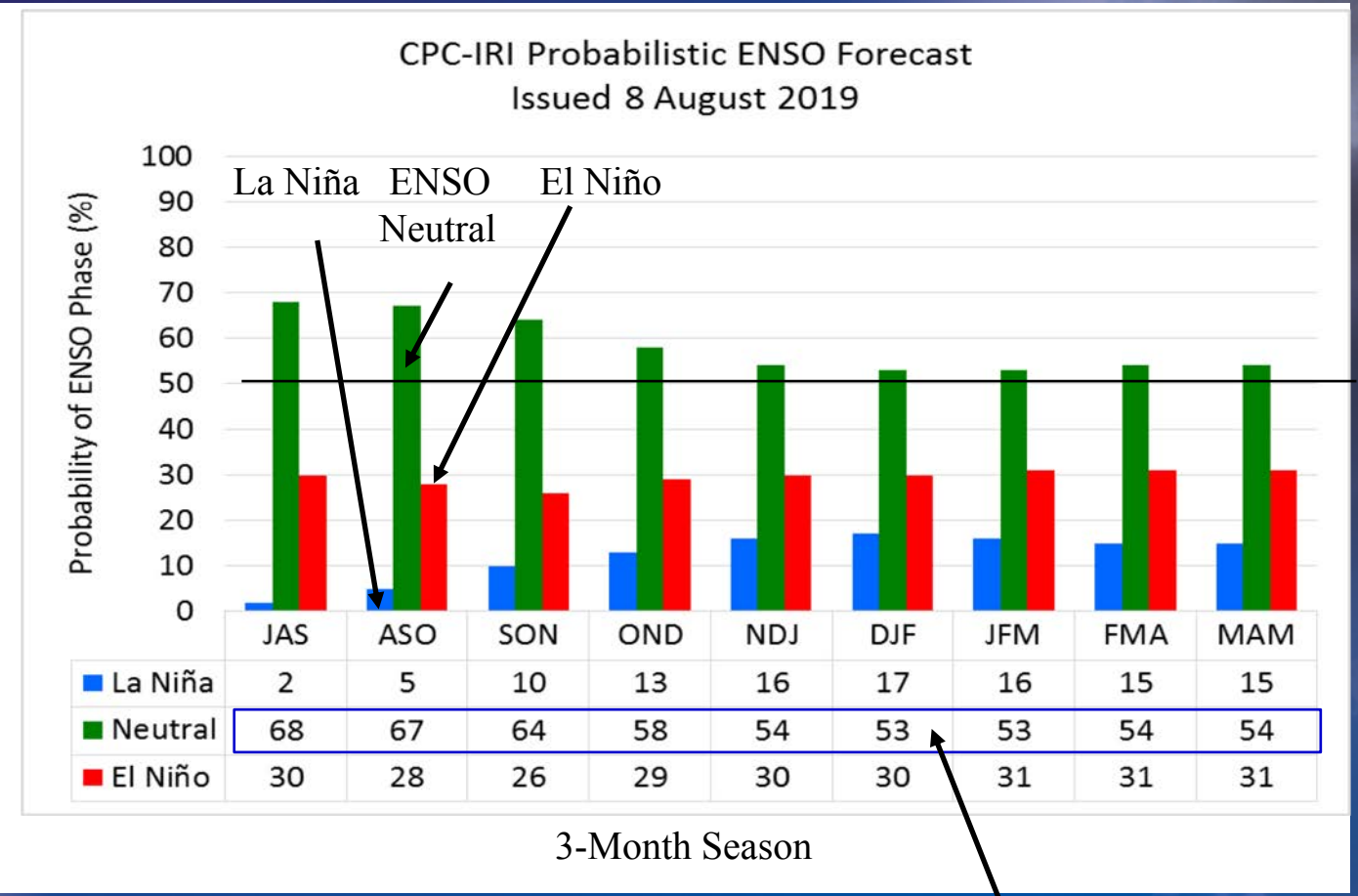


The CPC/ IRI forecast now indicates about a 65% chance of ENSO neutral during ASO 2019, whereas in May and June the forecast was for a 55%-60% chance of El Niño.

The unpredicted dissipation of El Niño is a main reason why the hurricane outlook ranges were raised.

CPC/ IRI ENSO Probability Forecast

Forecast Issued August 8th

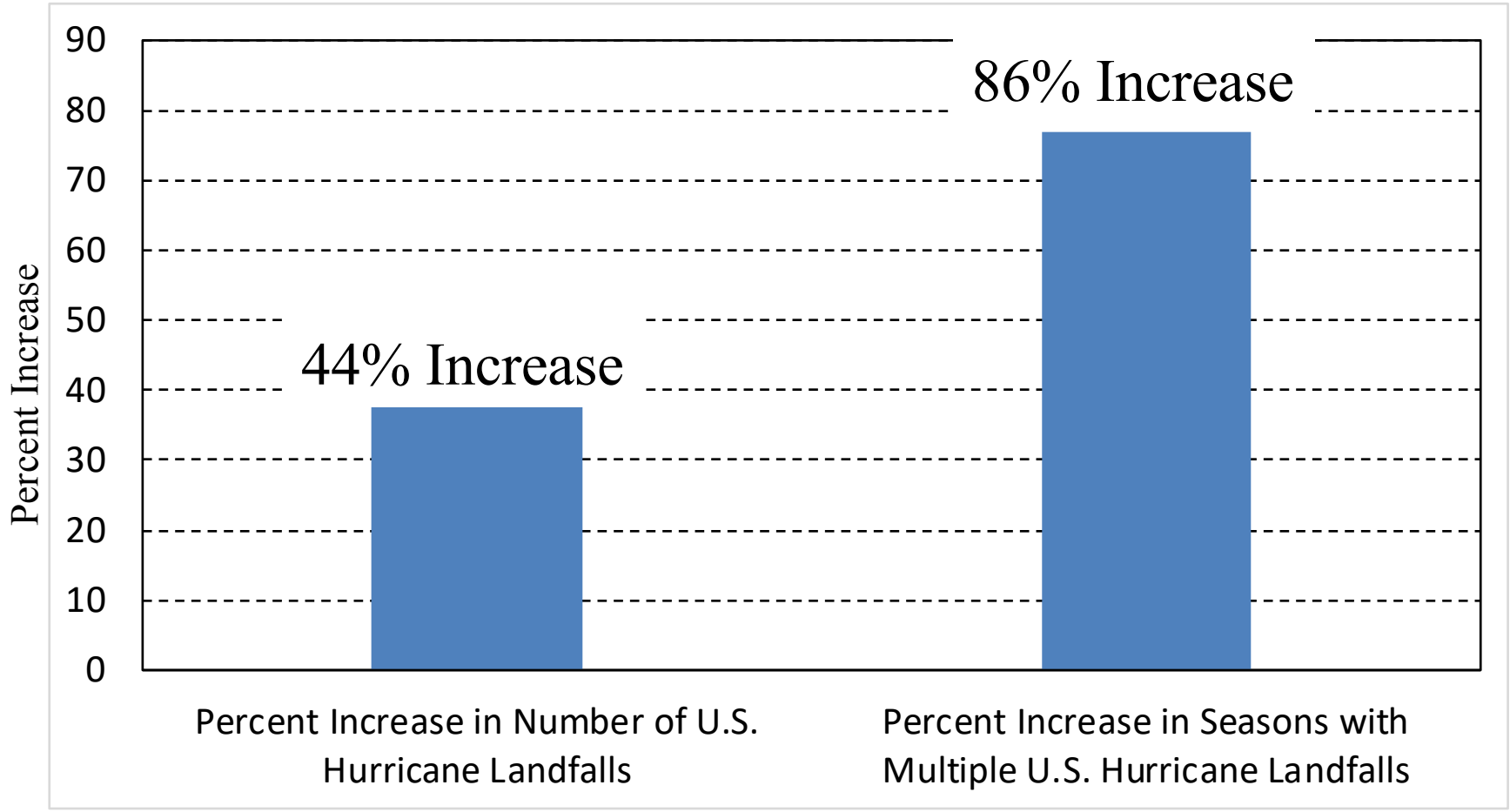


	JAS	ASO	SON	OND	NDJ	DJF	JFM	FMA	MAM
La Niña	2	5	10	13	16	17	16	15	15
Neutral	68	67	64	58	54	53	53	54	54
El Niño	30	28	26	29	30	30	31	31	31

Latest forecast predicts about a 50-55% chance of ENSO-neutral through remainder of year.

Hurricane Landfalls, Preparedness and Planning

The U.S. Sees More Landfalling Hurricanes During High-Activity Eras



Did you know?

80+ million people are Atlantic or Gulf Coast residents that can be impacted by a tropical storm or hurricane.

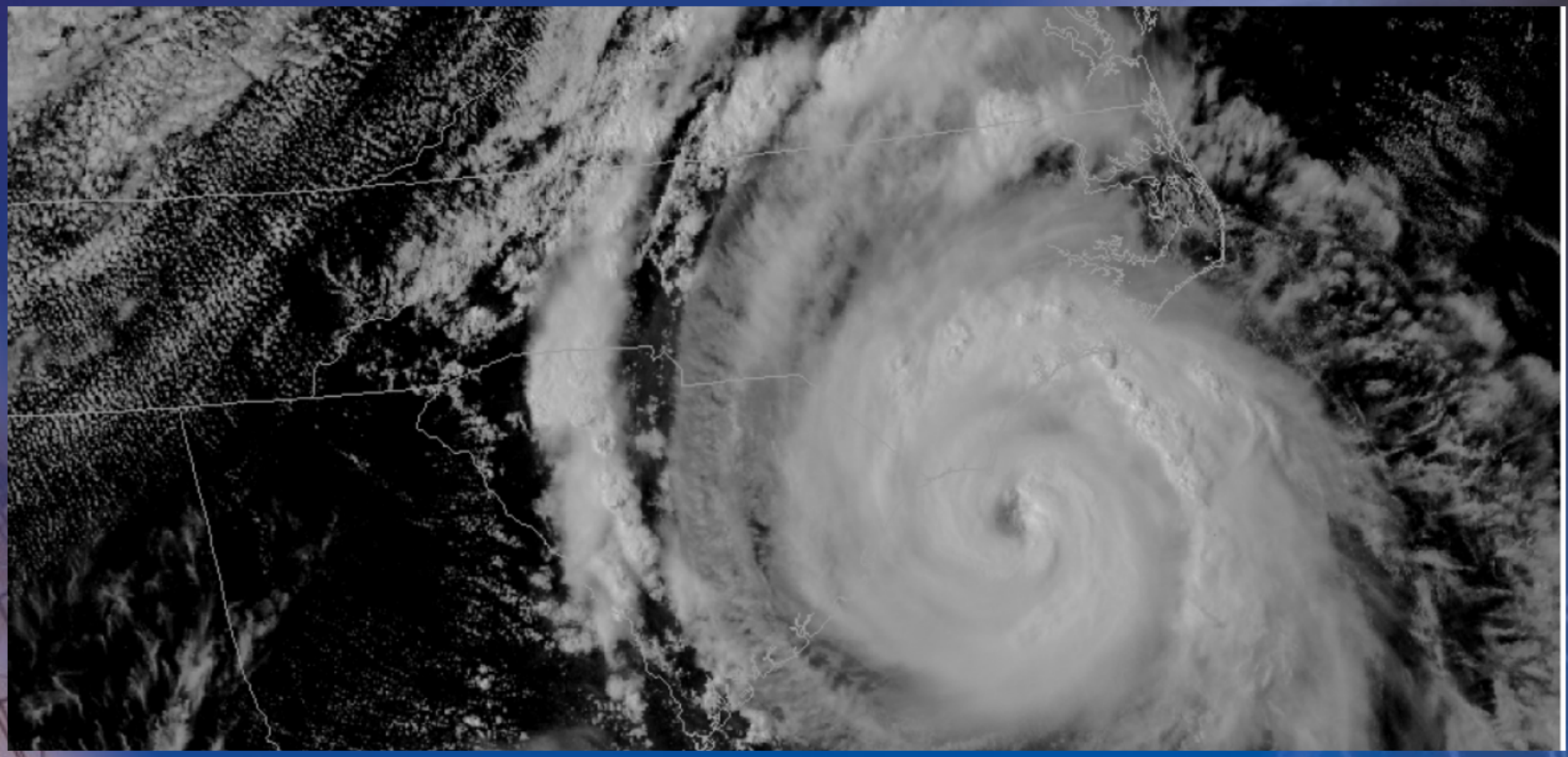
Remember…
It Only Takes One!

Be Ready! Take Action!

Prepare for every hurricane season regardless of seasonal outlook

Great web sites for hurricane preparedness

Ready.gov
Hurricanes.gov



You are your first line of defense if a hurricane strikes

Hurricanes are NOT just a coastal event.

Your hurricane preparedness plans must reflect both your personal situation and the storm conditions you might expect.

Storm surge

Inland flooding

Tornadoes

Devastating Winds

Rip Currents

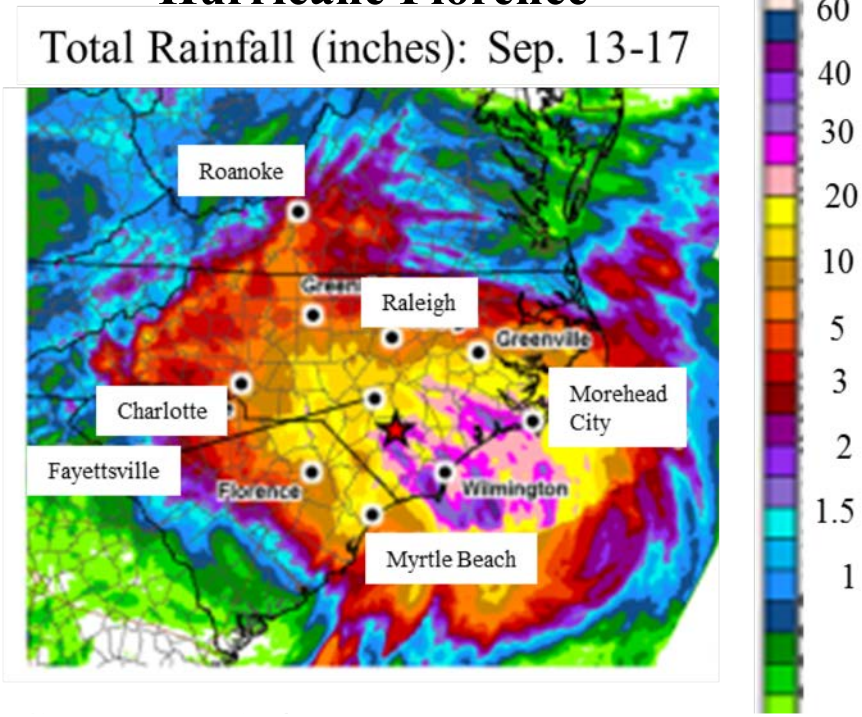
Downed Trees and Power Lines

U.S. Landfalling Hurricanes Last Year

Hurricanes Florence and Michael
Caused $50+ Billion in Damage, 100+ lives lost

Each had different characteristics and impacts.

Hurricane Florence



Massive inland flooding.

Typical of a slow-moving tropical storm or a hurricane with long overland track.

Hurricane Michael (160 mph winds)

Significant coastal impacts: Storm surge, sometimes complete destruction.

Pre-storm preparedness and evacuations saved un-tolled number of lives

Summary

- We are now in the peak three months (August-October) of the Atlantic hurricane season.
- Increased likelihood of above-normal activity, with 10-17 named storms, 5-9 hurricanes, 2-4 major hurricanes, and an ACE range of 85%-165% of the median.
- The main reason for the change from May outlook is that El Niño has dissipated, and its suppressing influence is expected to be weaker and less extensive---ENSO forecasts issued in spring tend to have little skill.

- High-activity era for Atlantic hurricanes continues—more hurricanes and more landfalling hurricanes
- Coastlines continue to build up—80+ million people have the potential to be impacted by a tropical storm or hurricane.

Remember…

It Only Takes One!

Be Ready! Take Action!