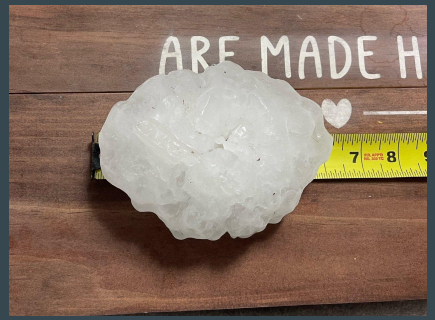
Resource Links from Workshop

Climate Prediction Center's Week 2-3 Tropics Hazards Outlook
National Hurricane Center's 7 Day Tropical Weather Outlook
South-Central TX Weather Briefing Page
New National Water Prediction Service Page
NWS Experimental Heat Risk Tool

Welcome!

2024
Austin / Capital Area
Integrated Warning Team Workshop



Agenda

8:30-8:40 AM	Welcome & Facility Information
8:40-8:45 AM	Workshop Goals and Introductions
8:45-9:00 AM	Updates from the National Weather Service
9:00-10:00 AM	Panel Discussion on How Weather Forecasts are Used in Decision Making
10:00-10:20 AM	Q&A with Panel
10:20-10:45 AM	Break and Networking
10:45-11:00 AM	Probabilistic Decision Support Tools in the Medium and Long-Range Forecast
11:00 AM-12:00 PM	Tropical Tabletop Scenario with Breakout Groups
	8-14 Days Out
	4-7 Days Out
12:00-12:25 PM	Brief Outs in Large Group Discussion
	Document Actionable Items
12:25-12:30 PM	Conclusion/Wrap-Up

Updates from NWS

Paul Yura
Warning Coordination Meteorologist
NWS Austin/San Antonio

Seasonal Hurricane Outlook - Atlantic

May 23, 2024

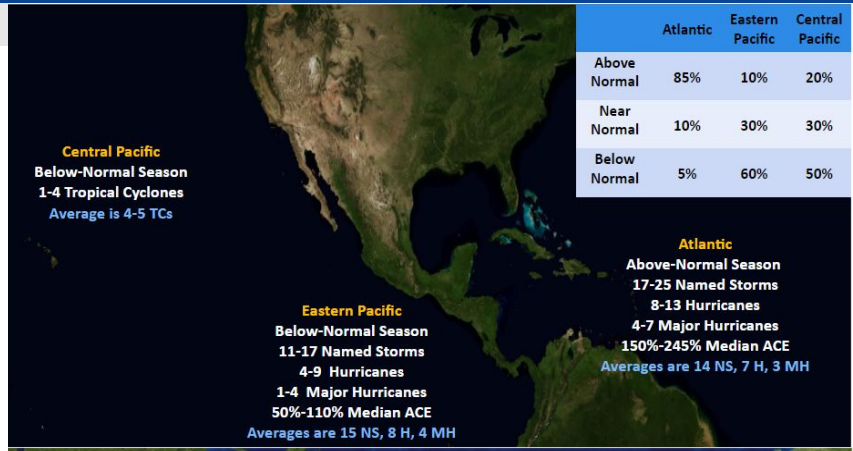
June through November, 2024

Key Messages

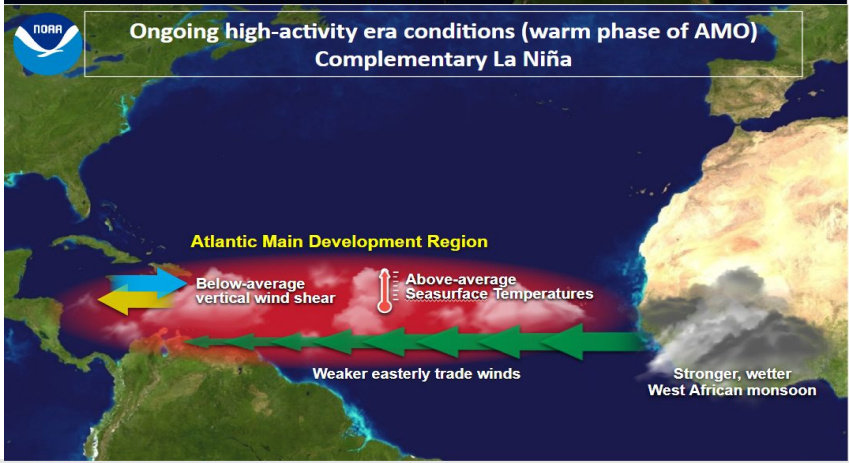
- 17-25 Named Storms (NS)
- 8-13 Hurricanes (H) , 4-7 Major Hurricanes (MH - Cat 3-5)
- 150-245% of normal Accumulated Cyclone Energy (ACE)
- Highest NS, H, MH values in May outlook. ACE 2nd (2010)
- Normals - 14 NS, 7 H, 3 MH

Detailed Points

- Warm Sea Surface Temperatures
- Low wind shear
- Weak Trade Winds
- Strong African Monsoon
- La Niña complementing, increases certainty
    - La Niña - Reinforce local Atlantic conditions by reducing wind shear (western part of Basin) and reduced stability.



	Atlantic	Eastern Pacific	Central Pacific
Above Normal	85%	10%	20%
Near Normal	10%	30%	30%
Below Normal	5%	60%	50%



The RTP product will be going away on July 1

Regional Max/Min Temp and Precipitation Table

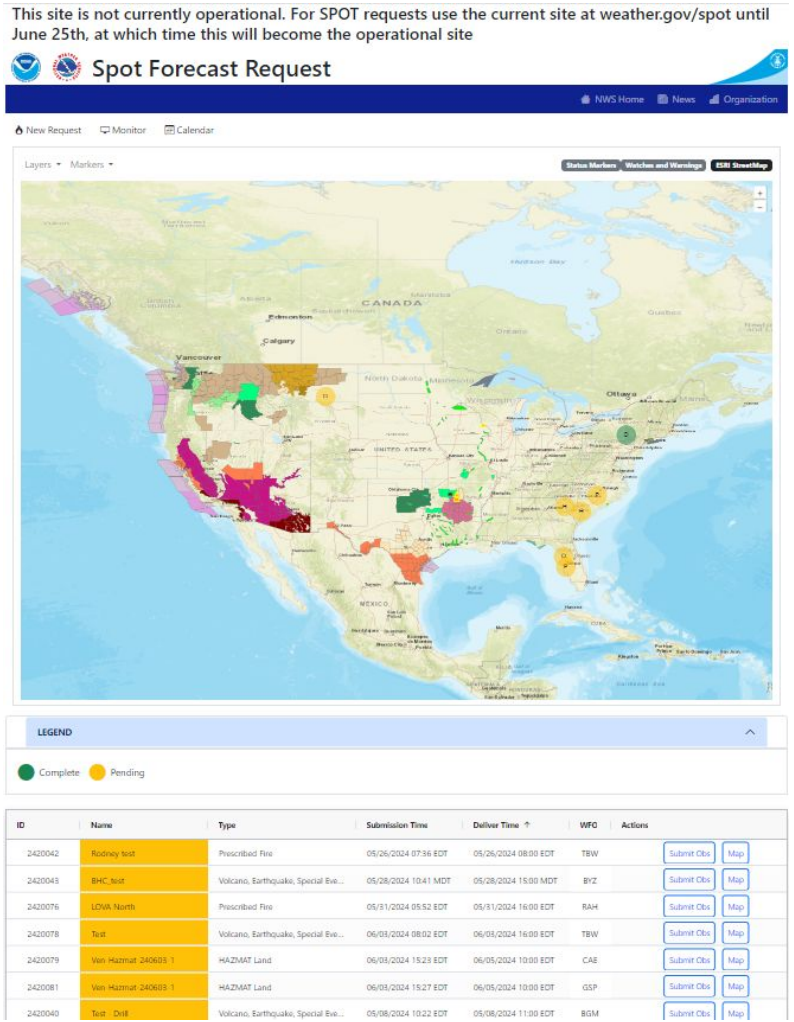
Issued by NWS Austin/San Antonio, TX


```
302
ASUS64 KEWX 031234
RTPEWX

Morning Temperature and Precipitation Summary for South Central Texas
National Weather Service Austin/San Antonio TX
725 AM CDT Mon Jun 3 2024

Values represent highs yesterday, lows over the last 12 hours,
and precipitation over the last 24 hours.


.BR EWX 0603 C DH01/TAIRZX/DH07/TAIRZP/PPDRZZ
:
:                              MAX   MIN
:ID       LOCATION            TEMP  TEMP   PCPN
:
K3TS: La Grange AWOS       :   92 /  79 /  0.00
K5C1: Boerne AWOS          :   91 /  77 /  0.00
K5T9: Eagle Pass AWOS      :    M /   M /  0.00
KAQO: Llano AWOS           :   91 /  77 /  0.00
KATT: Camp Mabry ASOS      :   94 /  80 /  0.00
KAUS: Bergstrom ASOS       :   94 /  80 /  0.00
KBAZ: New Braunfels ASOS   :   98 /  79 /  0.00
KBMQ: Burnet ASOS          :   91 /  77 /  0.00
KCVB: Castroville AWOS     :   99 /  79 /  0.00
KCZT: Carrizo Springs AWOS :   99 /  79 /  0.00
KDLF: Laughlin AFB ASOS    :  100 /  81 /  0.01
KDRT: Del Rio ASOS         :  100 /  83 /  0.03
KDZB: Horseshoe Bay AWOS   :   93 /  78 /  0.00
KECU: Rocksprings AWOS     :   93 /  75 /  0.00
KEDC: Pflugerville AWOS    :   91 /  79 /  0.00
KERV: Kerrville AWOS       :   95 /  77 /  0.00
KFTN: Faith Ranch AWOS     :   99 /  81 /     M
KGTU: Georgetown AWOS      :   92 /  79 /  0.00
KGYB: Giddings AWOS        :   92 /  79 /  0.00
KHDO: Hondo ASOS           :  100 /  80 /  0.00
KHYI: San Marcos AWOS      :   95 /  79 /  0.00
KPEZ: Pleasanton AWOS      :   99 /  82 /  0.00
KRND: Randolph AFB ASOS    :   99 /  79 /  0.00
KRYW: Lago Vista AWOS      :   91 /  77 /  0.00
KSAT: San Antonio ASOS     :    M /   M /  0.00
KSEQ: Seguin AWOS          :   97 /  80 /  0.00
KSKF: Kelly Field ASOS     :    M /  80 /  0.00
KSSF: Stinson ASOS         :  101 /  80 /  0.00
KT20: Gonzales AWOS        :   95 /  80 /  0.01
```

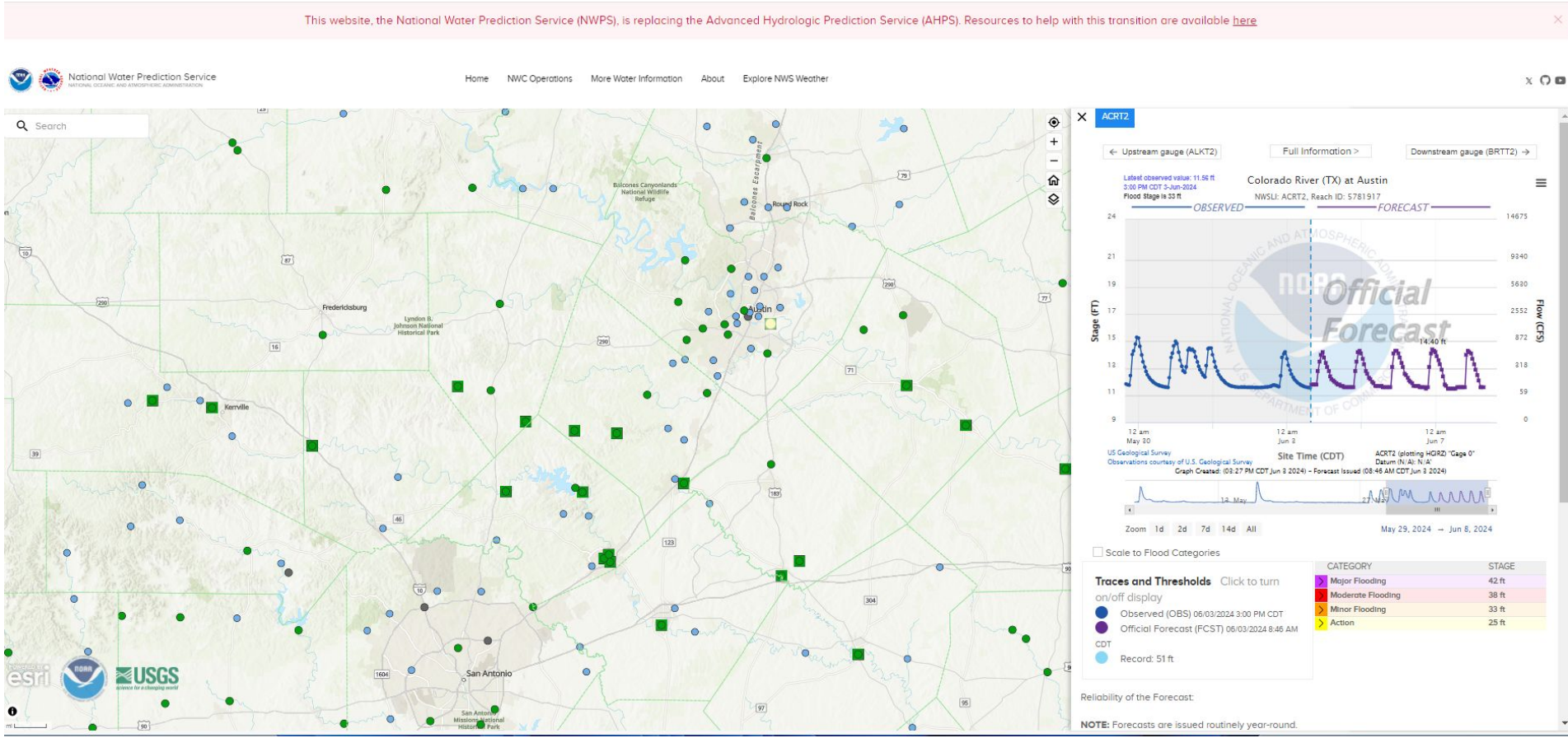
The SPOT forecast webpage is being revamped

New page will launch on June 25, 2024

- New layout/GIS design
- Watches/warnings displayed
- Elevations auto-filled
- Users can schedule update requests



For Hydro viewing….NWPS has replaced our AHPS website



Experimental HeatRisk Tool

National Weather Service
National Oceanic and Atmospheric Administration

Bookmark | Download KML | Graphics | En español

NWS HeatRisk

Identifying Potential Heat Risks in the Seven Day Forecast

Map | Overview | What's in HeatRisk? | Understanding HeatRisk | CDC-NWS Collaboration | Verification | Looking for Resources?

Mon 6/3	Tue 6/4	**Wed 6/5**	Thu 6/6	Fri 6/7	Sat 6/8	Sun 6/9

Click map for potential heat risks and NWS forecast for a location.

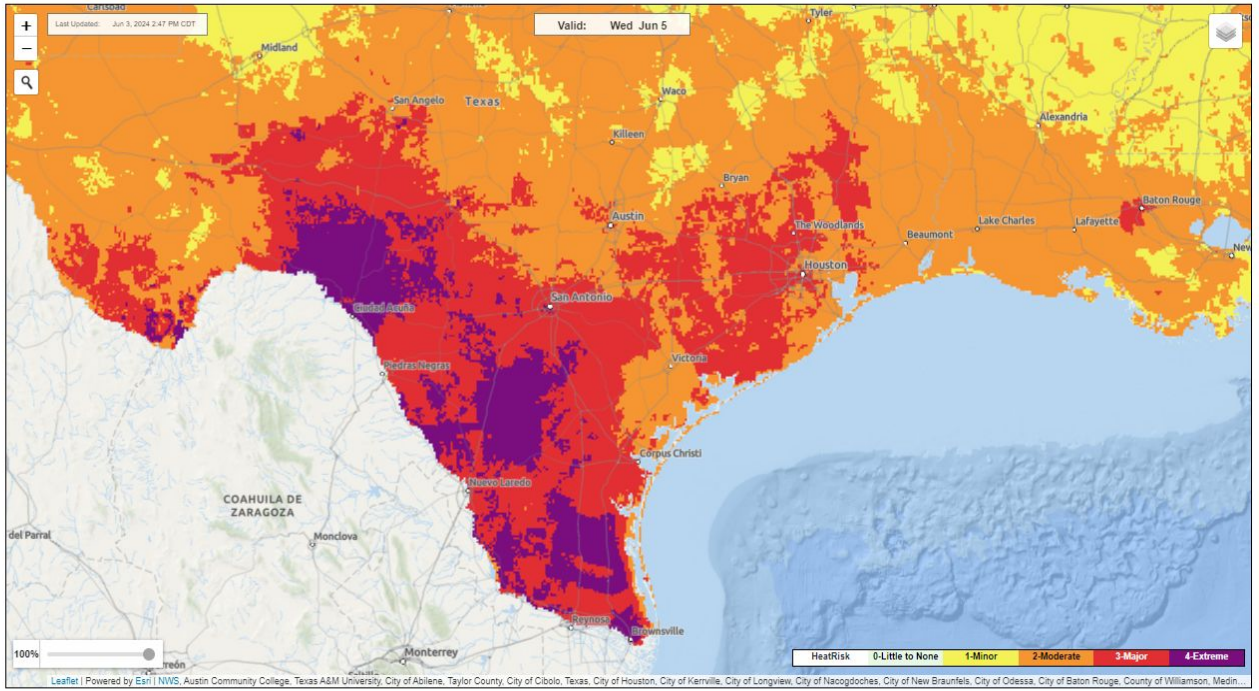
The NWS HeatRisk is an experimental color-numeric-based index that provides a forecast risk of heat-related impacts to occur over a 24-hour period. HeatRisk takes into consideration:

- How unusual the heat is for the time of the year
- The duration of the heat including both daytime and nighttime temperatures
- If those temperatures pose an elevated risk of heat-related impacts based on data from the CDC

This index is supplementary to official NWS heat products and is meant to provide risk guidance for those decision makers and heat-sensitive populations who need to take actions at levels that may be below current NWS heat product levels.

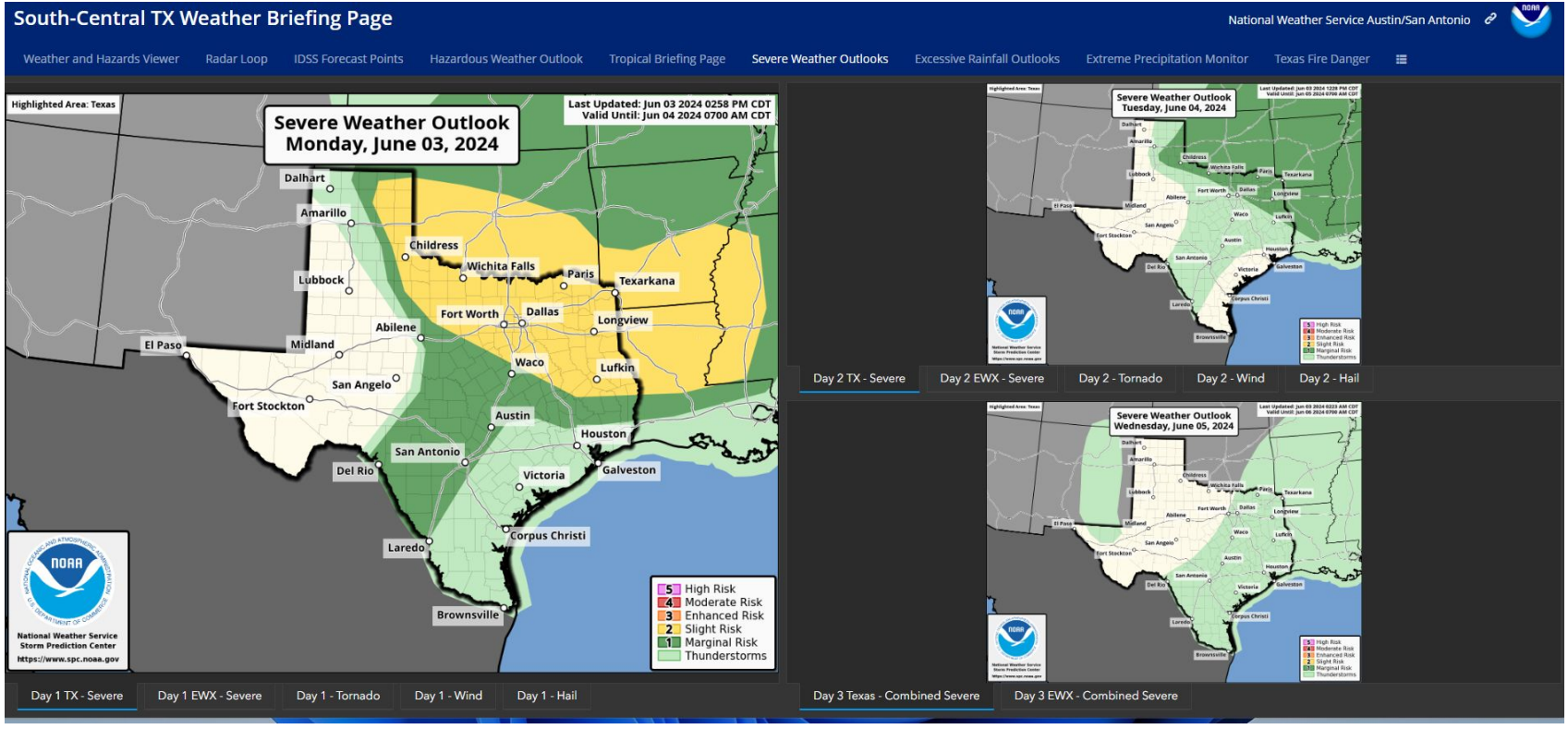
Category	Risk of Heat-Related Impacts
Green 0	Little to no risk from expected heat.
Yellow 1	Minor - This level of heat affects primarily those individuals extremely sensitive to heat, especially when outdoors without effective cooling and/or adequate hydration.
Orange 2	Moderate - This level of heat affects most individuals sensitive to heat, especially those without effective cooling and/or adequate hydration. Impacts possible in some health systems and in heat-sensitive industries.
Red 3	Major - This level of heat affects anyone without effective cooling and/or adequate hydration. Impacts likely in some health systems, heat-sensitive industries and infrastructure.
Magenta 4	Extreme - This level of rare and/or long-duration extreme heat with little to no overnight relief affects anyone without effective cooling and/or adequate hydration. Impacts likely in most health systems, heat-sensitive industries and infrastructure.

Comments? Questions? Please Contact Us.



Briefing Dashboard

https://arcg.is/15G0GH

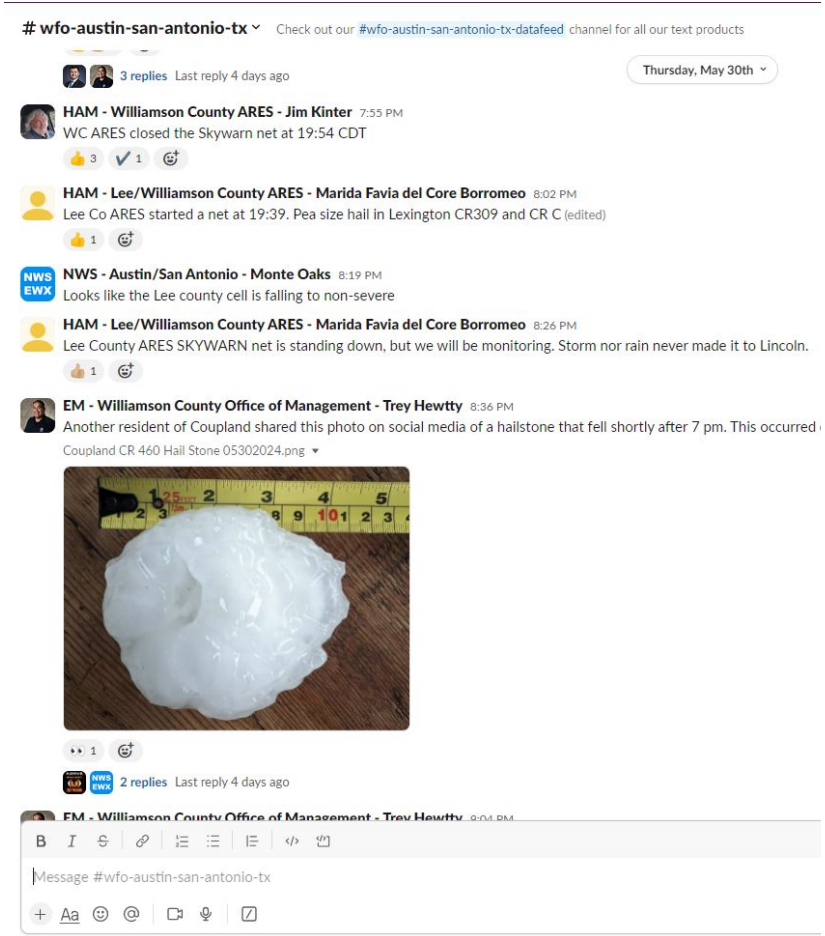


NWSChat 2.0

Powered by Slack

slack

- Chat with NWS Meteorologists 24/7
- NWS provides mesoscale and forecast discussions, real-time thinking during events
- Share reports and intel !



NWSChat Discussion items:

wfo-austin-san-antonio-tx

wfo-austin-san-antonio-tx-datafeed

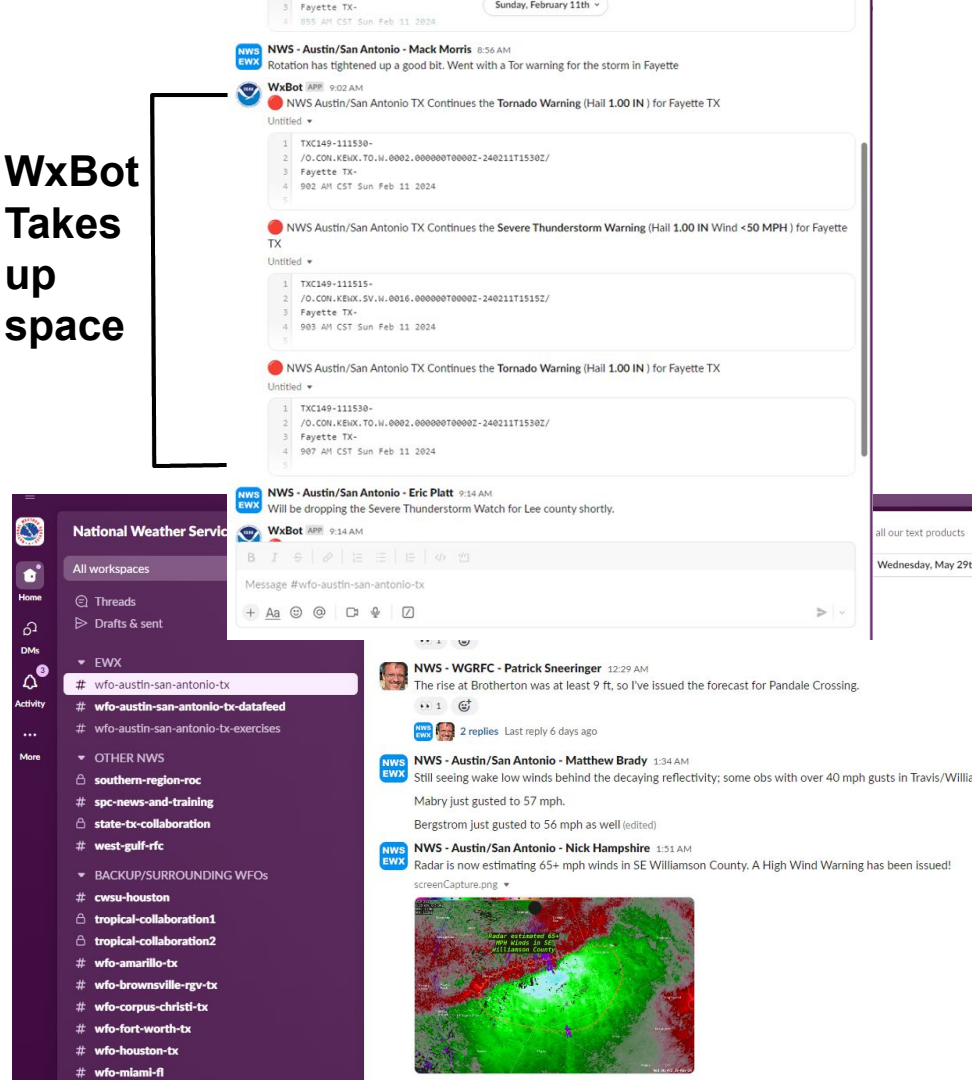
- WxBot Information (NWS Products)
  - Moved to “datafeed” channel
  - Agree, Yes or No?

- User Verification…every 6 months
  - Whitelist nws.partnersupport@noaa.gov

- Do we reply in threads ?

Any other Comments/Questions ?

WxBot Takes up space



IWT Stakeholder Panel Presentations

Education

Billy Atkins

ST. EDWARD'S UNIVERSITY

Utilities

Bob Rose

LCRA
ENERGY • WATER • COMMUNITY SERVICES

Transportation

Omar De Leon

Texas Department of Transportation

Government

Blake Clampffer

TRAVIS EMERGENCY MANAGEMENT COUNTY

Private and Education

Troy Kimmel

THE UNIVERSITY OF TEXAS AT AUSTIN

Health

Zac Glowczwski

BaylorScott&White HEALTH

Education

Billy Atkins

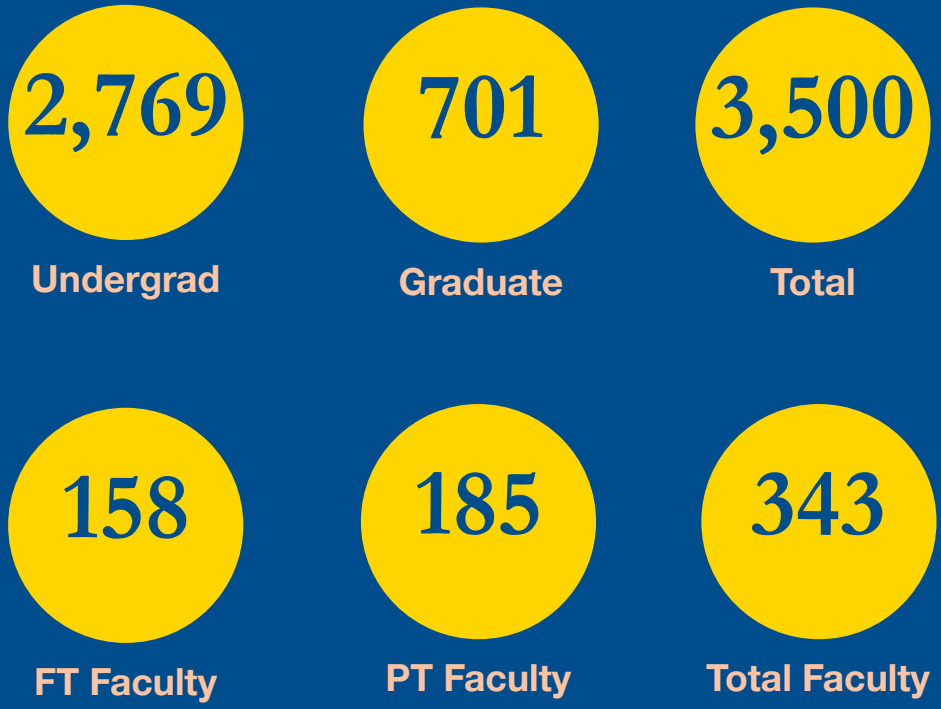
Director of Campus Safety

Austin, Tx

Founded 1885

ST. EDWARD'S UNIVERSITY

St. Edward's by the Numbers



St. Edward's by the Numbers

6

Residence Hall

3

Apartments

9

Total Residences

~50%

Students live on campus

NWS Products

- Web in general but specifically Weather Briefing Page
- Regular SitReps based on forecast conditions
- 213's for large scale events on campus
  - Conference calls if needed
- Dedicated staff on-site during recent Commencement
- Regular Climate Outlook calls
- Regional conference calls during severe weather events

THE END

Utilities

Bob Rose

Chief Meteorologist

Transportation

Omar De Leon

Director of Maintenance

Texas Department of Transportation

Government

Blake Clampffer

Chief Deputy Emergency Management Coordinator

TRAVIS
EMERGENCY
MANAGEMENT
COUNTY

Private and Education

Troy Kimmel
Meteorologist

Health

Zac Glowczwski

Emergency Manager

Integrated Warning Team Workshop

Zac Glowczwski
Emergency Manager – CTX Division
June 5, 2024

BSWH by the numbers

1,250+
health system care sites including hospitals, clinics, and surgery centers

3.1 million
MyBSWHealth accounts

3.5 million
customers

1.2 million+
covered lives
(Health Plan and ACO)

52,000
employees

$13.9 billion
total operating revenue

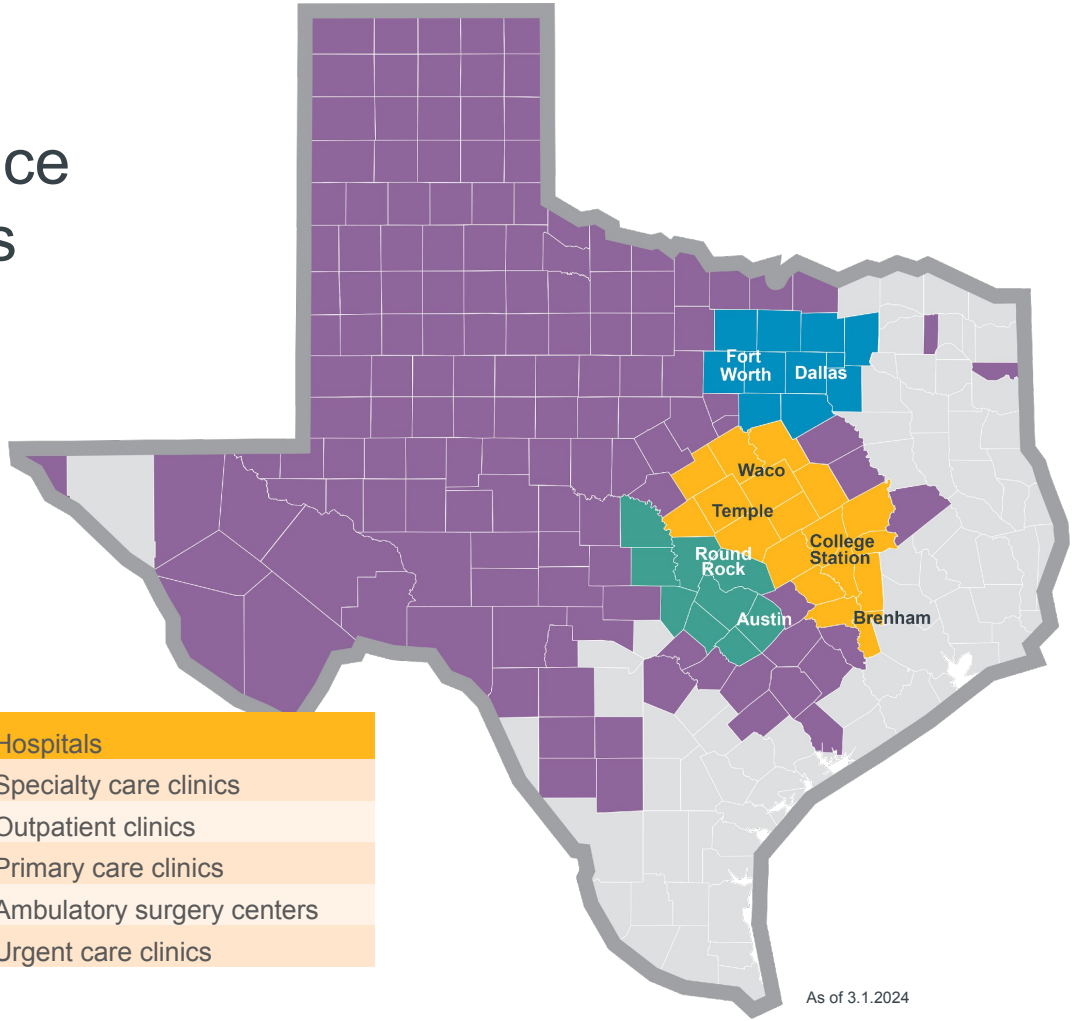
12 million+
professional encounters annually

7,100+
physicians

$997 million
community benefit

Operating revenue as of June 2023. Community benefit is as of June 2022.

Service areas



52	Hospitals
632	Specialty care clinics
260	Outpatient clinics
164	Primary care clinics
30	Ambulatory surgery centers
62	Urgent care clinics

DALLAS-FORT WORTH	
35	Hospitals
287	Specialty care clinics
178	Outpatient clinics
84	Primary care clinics
30	Ambulatory surgery centers
26	Urgent care clinics

CENTRAL TEXAS	
8	Hospitals
203	Specialty care clinics
34	Outpatient clinics
43	Primary care clinics
7	Urgent care clinics

GREATER AUSTIN	
9	Hospitals
100	Specialty care clinics
45	Outpatient clinics
37	Primary care clinics
11	Urgent care clinics

DIGITAL CARE	
254	Counties (available statewide)

HEALTH PLAN	
171	Counties

As of 3.1.2024

forecasts

share with leadership teams for impacted area

add to intranet page

decisions

maintenance & construction projects

functional & full-scale exercises

alerts

implemented automated WX alerts April 3, 2024

severe thunderstorm

- watch
- warning

tornado

- watch
- warning

response

tornado watch

- move non-essential equipment
- identify patients who will require assistance

tornado warning

- move patients to safe area

Baylor Scott & White HEALTH

Thank you!

IWT Stakeholder Panel Q&A

Billy Atkins

ST. EDWARD'S UNIVERSITY

Bob Rose

LCRA
ENERGY • WATER • COMMUNITY SERVICES

Omar De Leon

Texas Department of Transportation

Blake Clampffer

TRAVIS EMERGENCY MANAGEMENT COUNTY

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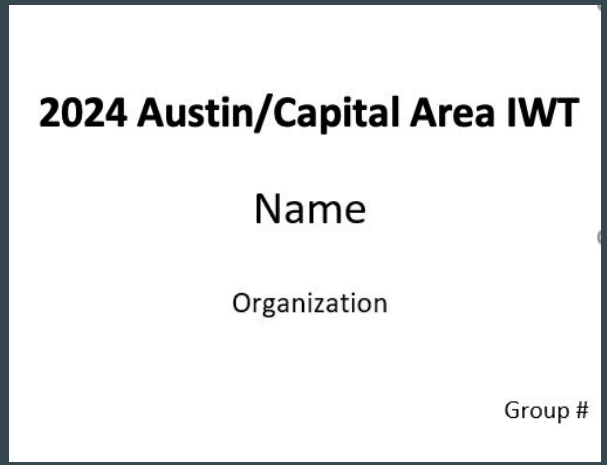
THE UNIVERSITY OF TEXAS AT AUSTIN

Zac Glowczwski

BaylorScott&White HEALTH

Break Time!

Be Back at Your Group Table by 1045 AM



Your Group # is on Name Badge

Probabilistic Decision Support Tools for Tropical Events

Medium and Long Range

Jason Runyen
Lead Forecaster
NWS Austin/San Antonio

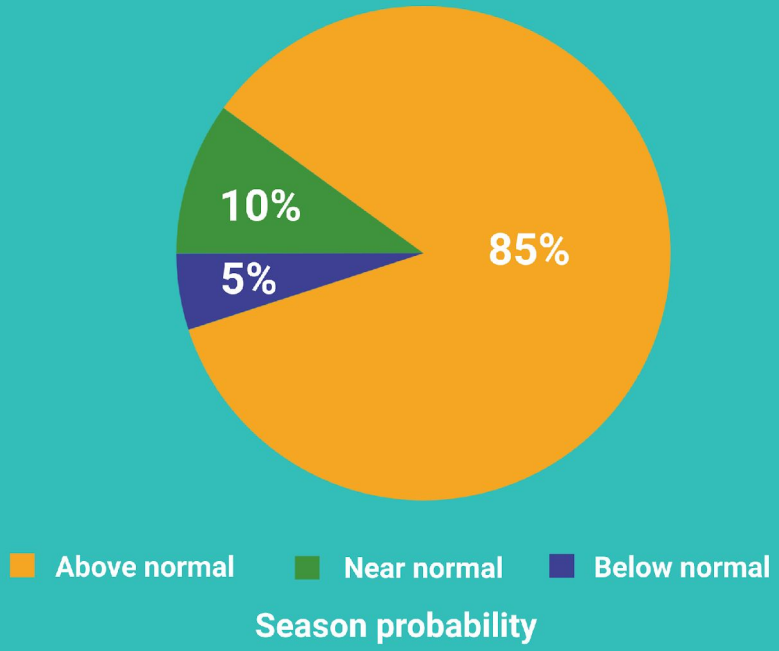
NOAA

National Weather Service

Tropical Events – Communicating What we Know and Don't Know

Messaging in the Day 4-14 Time Period

2024 Atlantic Hurricane Season Outlook



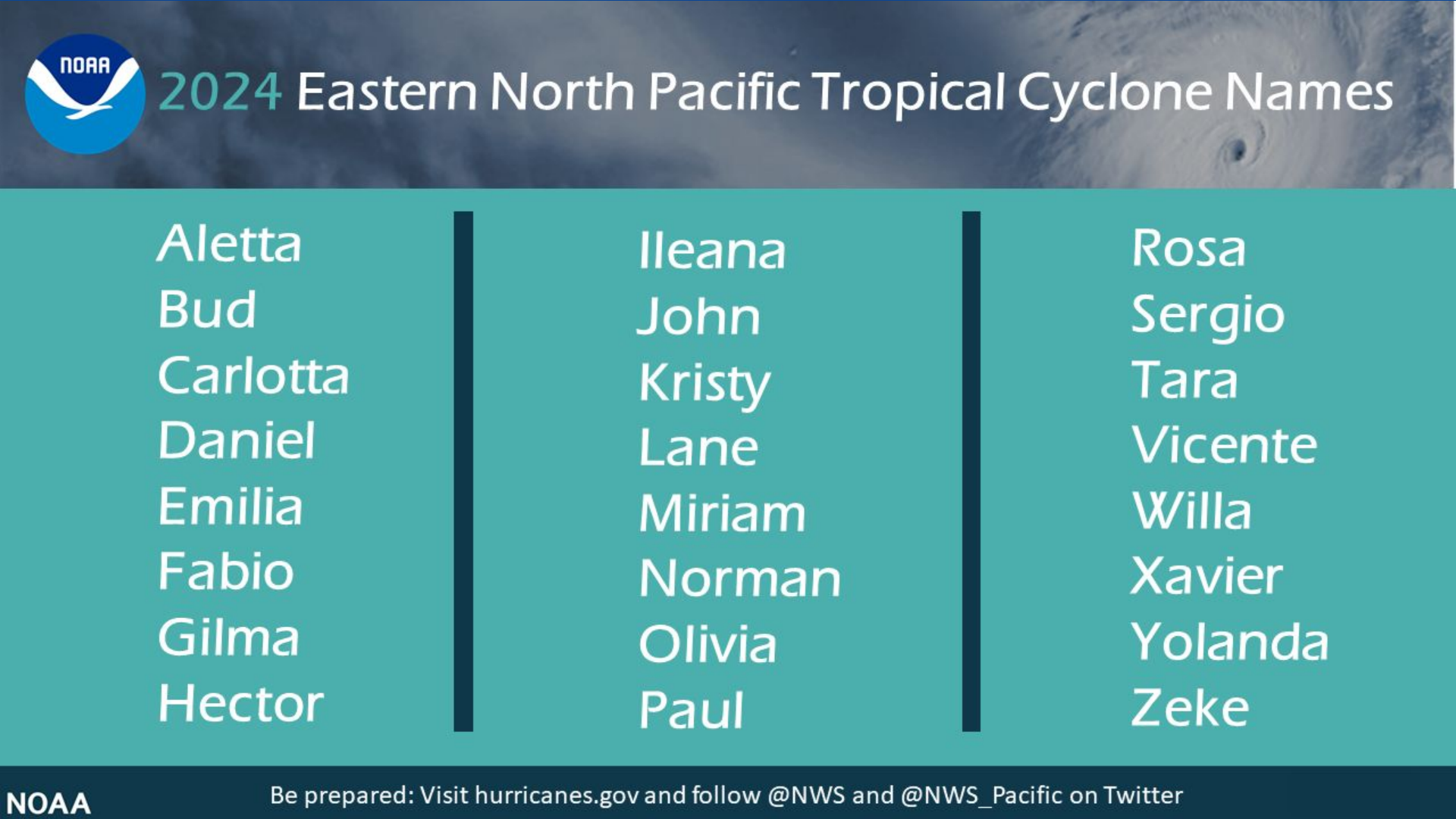
Named storms
17 - 25

Hurricanes
8 - 13

Major hurricanes
4 - 7

Be prepared: Visit hurricanes.gov and follow @NWS and @NHC_Atlantic on X.

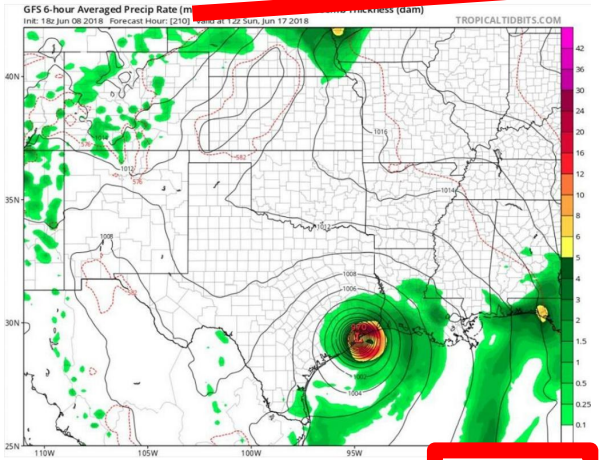
May 2024


2024 Eastern North Pacific Tropical Cyclone Names
Aletta
Bud
Carlotta
Daniel
Emilia
Fabio
Gilma
Hector
Ileana
John
Kristy
Lane
Miriam
Norman
Olivia
Paul
Rosa
Sergio
Tara
Vicente
Willa
Xavier
Yolanda
Zeke
NOAA
Be prepared: Visit hurricanes.gov and follow @NWS and @NWS_Pacific on Twitter

Reminders About Social Media

KPRC2 Frank Billingsley is with **James Taylor**.
3 hrs ·

The latest American (GFS) model run brings a Cat 2 104mph hurricane into the southeastern Texas Coast NEXT Weekend. Nothing has formed yet for the model to even really latch on to, but the Gulf is certainly worth our attention. Regardless, have a plan, make a kit, know your neighbor. https://click2houston.com/hurricane #KPRC2 #Click2Houston

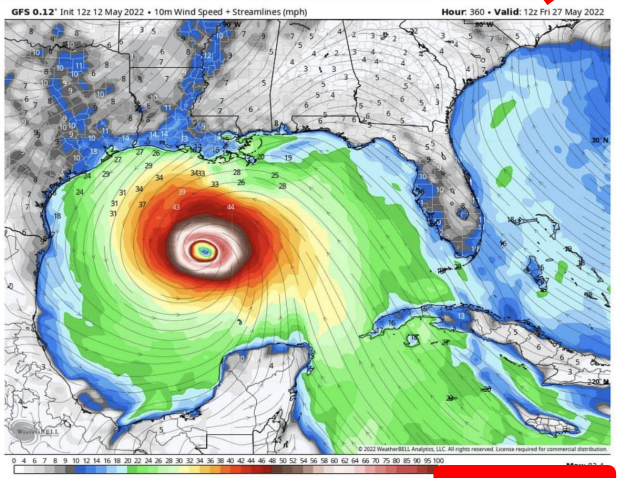


1.2K 3.2K Comments 9.4K Shares

Reminders About Social Media

Tropical Storm Central is with **Michael Smith.**
5h ·

5/12/22 @ 2:37pm
New GFS MODEL UPDATE brings a HURRICANE in the GULF OF MEXICO the last week of May!



2.5K 3.9K comments 11.6K shares

Hour: 360 • Valid: 12z Fri 27 May 2022

Tropical Storm Central
163K likes · 201K followers

Tropical Storm Central's post

Wayne Henson
Bring a storm to Texas Hill Country. A TD is good enough just lots of rain.
2h Like Reply 1

Tropical Storm Central's post

Savanna Bonney
Central Texas needs the rain. We're DRY out here

TENOR
5h Like Reply 22

Caitlin L Garrett
Savanna Bonney bring it on!!! Central Texas is desperate. I want to finish our arena and could use soft ground to move things around. 🙏
4h Like Reply

Reminders About “Invests” (Tropical Disturbances)

Opening an invest allows NHC to:

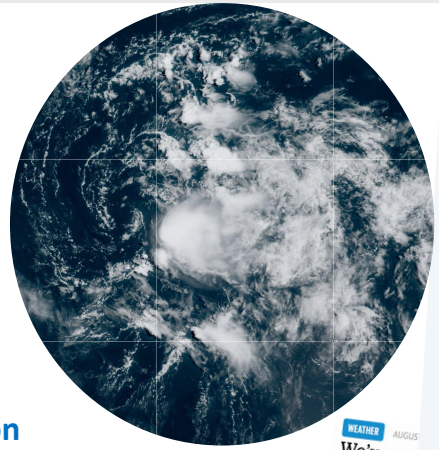
- Monitor disturbances more carefully
- Collect microwave satellite data
- Record “fixes” (circulation center location)
- Run model guidance

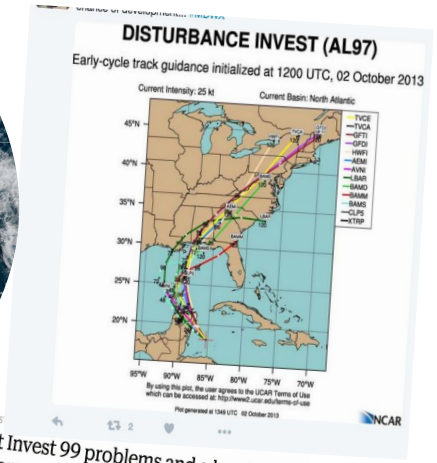
Caveats for invests:

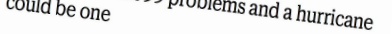
- No standard for opening one – up to forecaster discretion
- Invest information only has to be updated every 12 h
- Guidance typically run when a cloud system center is apparent

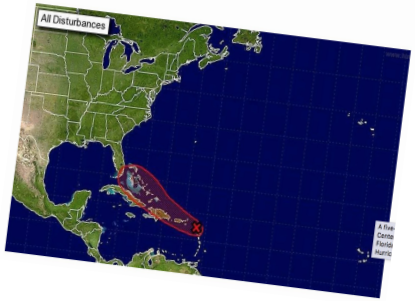
More meteorological uncertainty associated with invests!

- Extreme caution should be used when looking at model guidance for invests









Why We Avoid Focusing on One Particular Model Before a Tropical Cyclone Forms

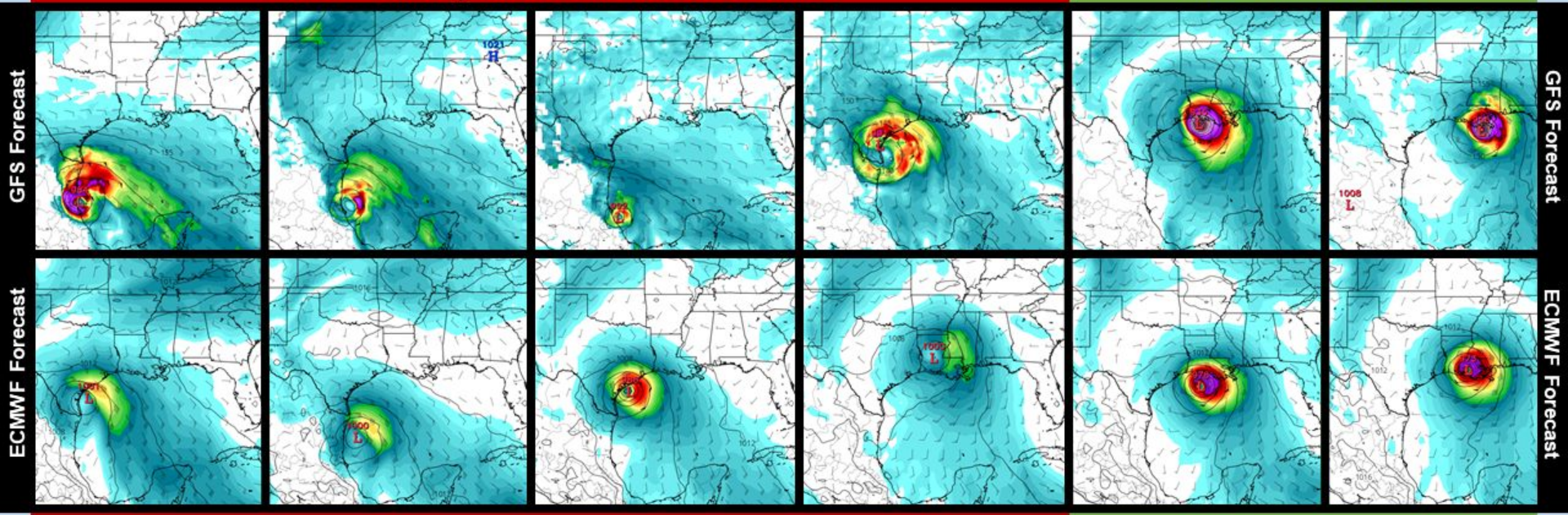
Weather Forecast Office
Austin/San Antonio

Model Performance with Tropical Cyclone Ida

There is Oftentimes Low Accuracy in Model Performance Until there is a Defined Center of Circulation

Center of Disturbance Had Not Formed Yet in Caribbean Sea
Models Incorrectly Initiate Center too Far Southwest

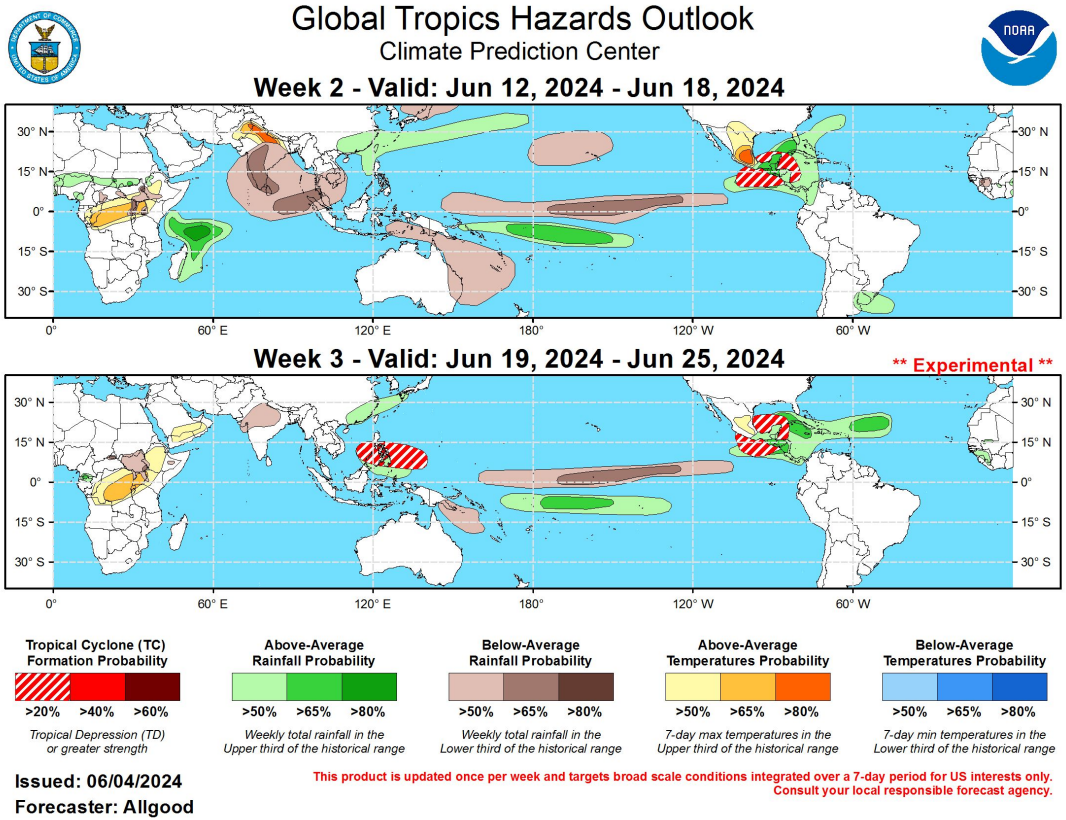
Center Forms in Caribbean Sea
Models Initialize Better



Model Archive Courtesy tropicaltidbits.com

Global Tropics Hazards Outlook

cpc.ncep.noaa.gov

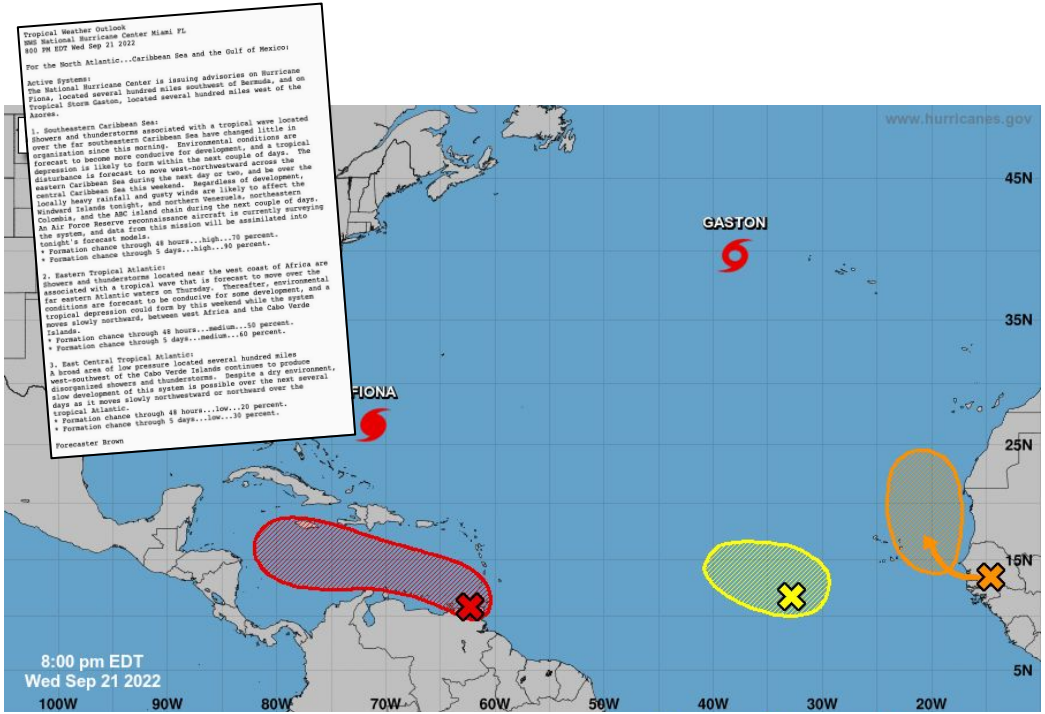


National Oceanic and Atmospheric Administration
U.S. Department of Commerce

Tropical Weather Outlook

hurricanes.gov

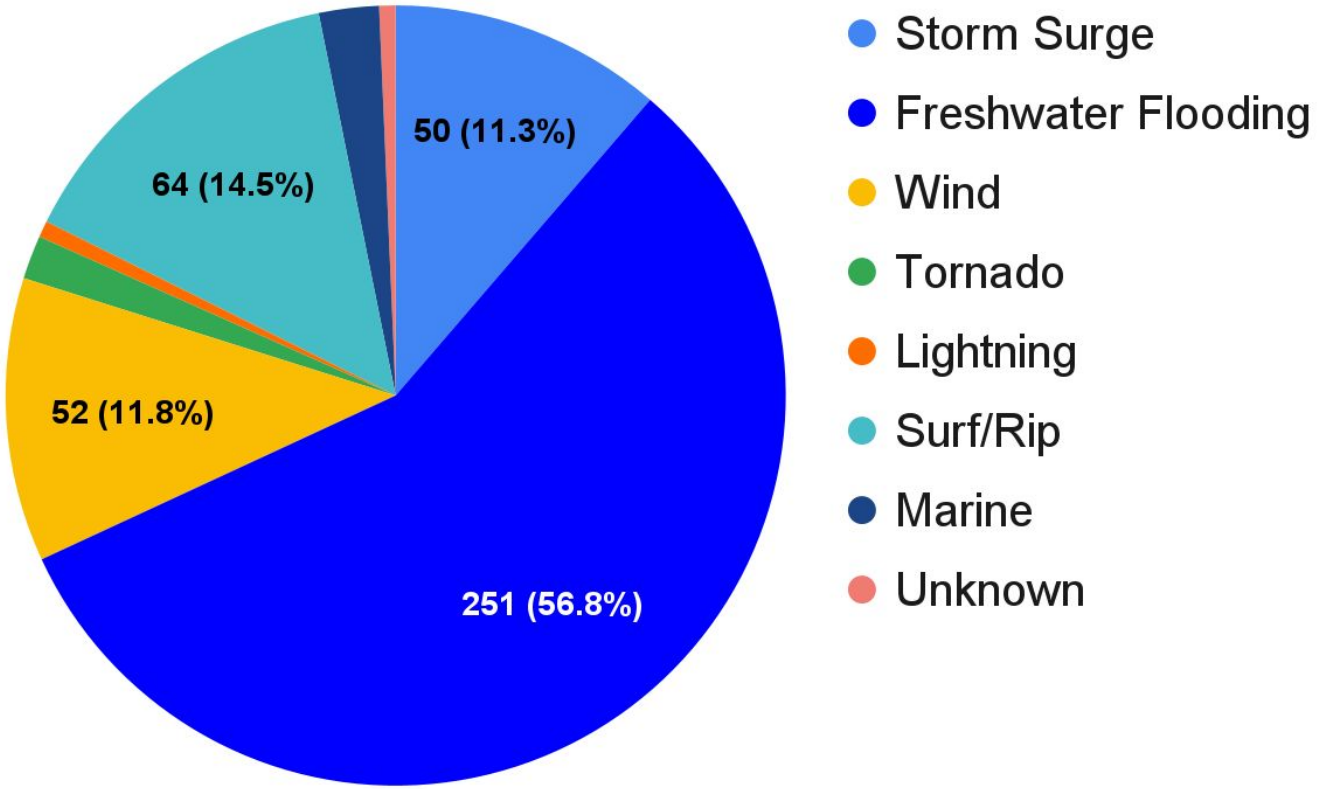
Tropical Weather Outlooks begin May 15



Provides probabilities of formation for the next 48 hours and 7 days

Routinely issued from 1 June - 30 November for the central North Pacific basin and from 15 May - 30 November in the eastern North Pacific and Atlantic basins

WATER KILLS IN TROPICAL CYCLONES



442 Direct Fatalities 2013-2022

THE BIG CHALLENGE

All Tropical Cyclones Have Rain

"So what?" factor
Already obvious

Many produce localized "hot spots"

Tough to motivate large response
Placement is difficult days in advance

Few with widespread, catastrophic rain

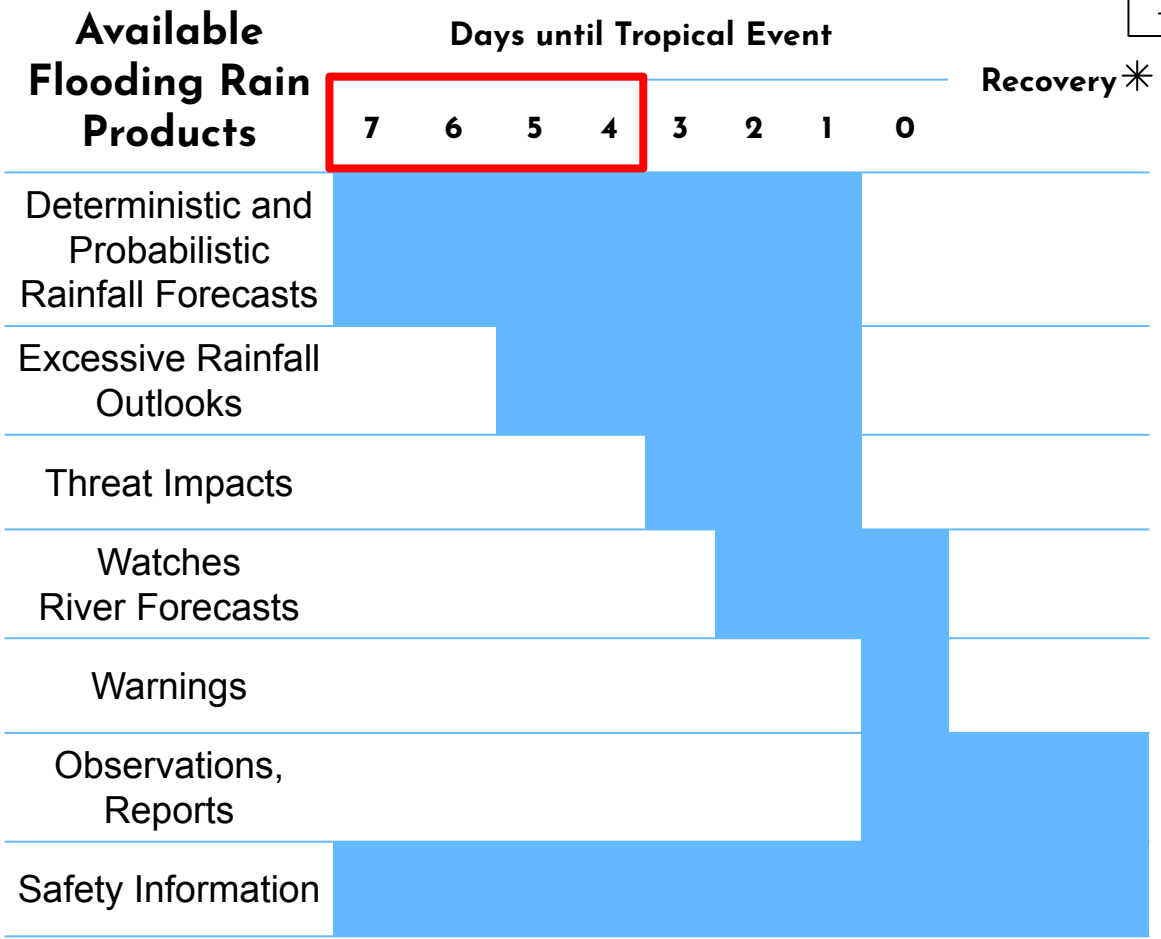
People want us to get these right
Need to minimize false alarms

Ordinary

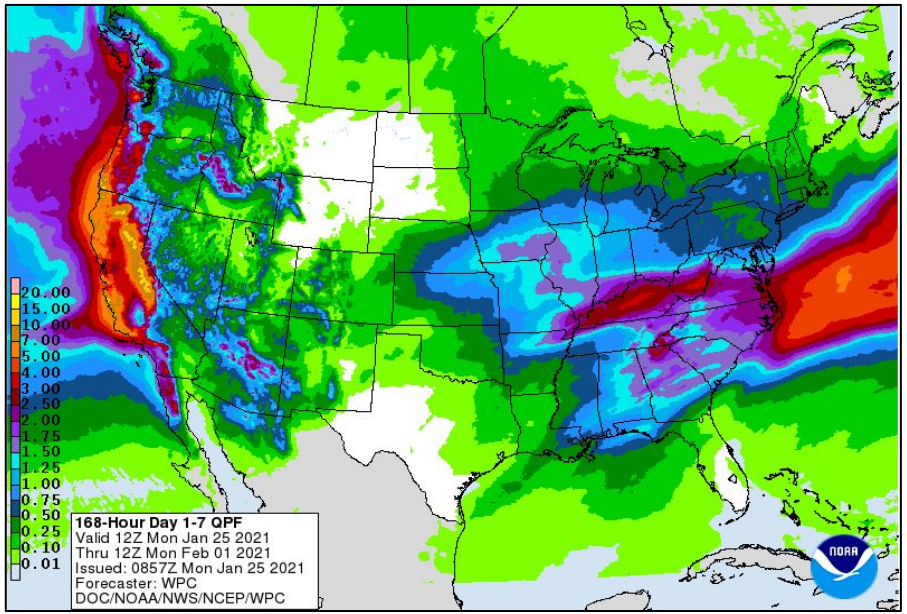
Extraordinary

Need to differentiate storms along this spectrum!

WE SHARE WHAT WE KNOW, WHEN WE KNOW IT



What You Need To Know About Deterministic Rainfall Forecasts



Most Likely Outcome

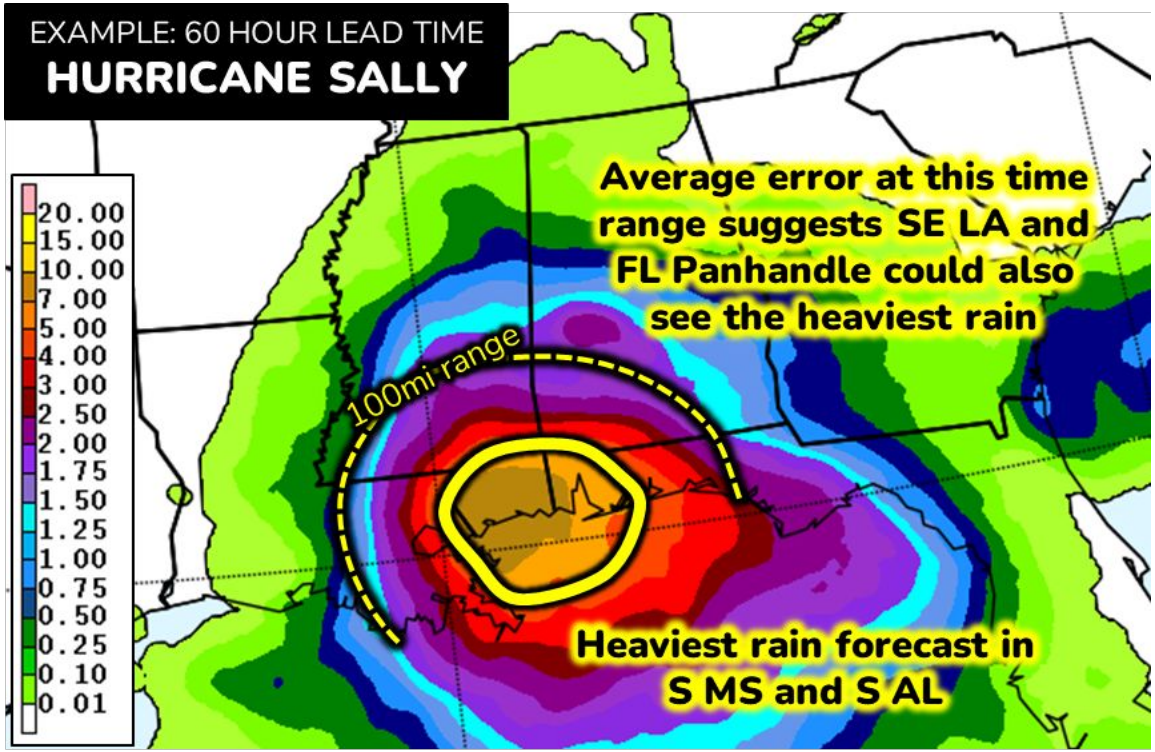
Our “best guess” for liquid equivalent precipitation over the next week

Errors With Deterministic Rainfall Forecast

Official rain forecast is the “most likely”, but can end up displaced from what you see on the map!

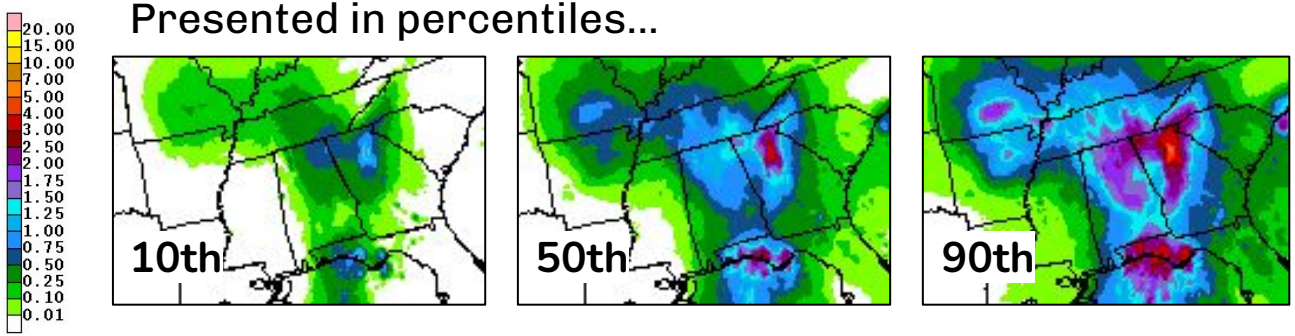
2016-2022 Displacement Error of 2” Rainfall Forecast Contour

Lead Time	Avg. Error
12 hours	54 miles
36 hours	70 miles
60 hours	98 miles
84 hours	132 miles
108 hours	159 miles

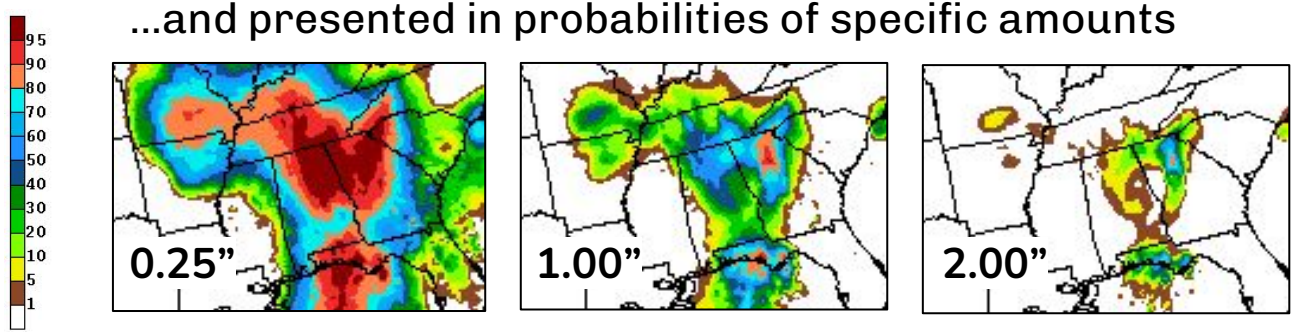


How we use Probabilistic Rainfall Forecasts

Presented in percentiles…

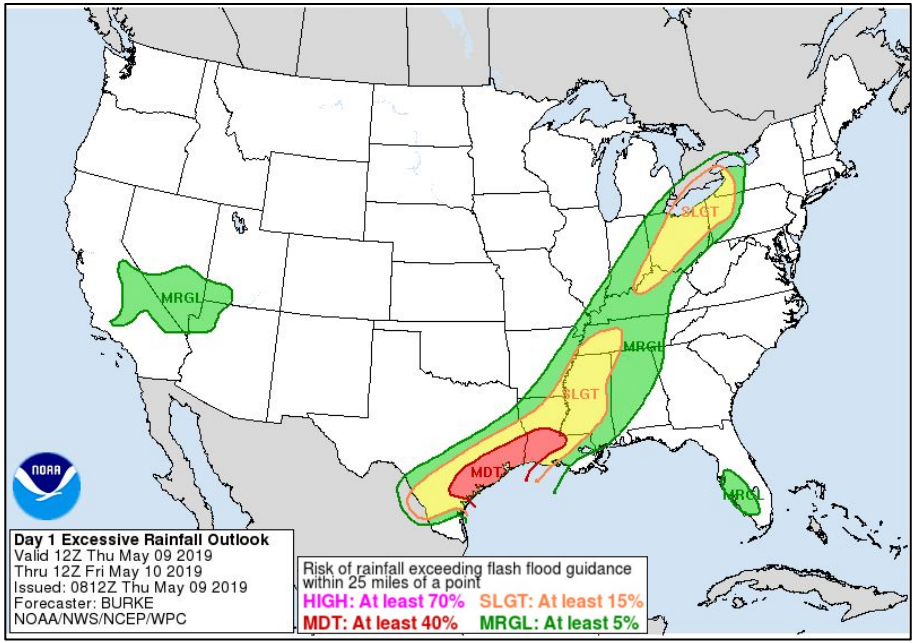


…and presented in probabilities of specific amounts



- Accounts for error
- Provides a sense for the range of reasonable possibilities for rainfall amounts
- Public doesn’t understand percentiles
- “Most Likely” scenario (50^{th})
- “Up to this Amount” or “Reasonable Worst Case” scenario” (75^{th} or 90^{th})

Excessive Rainfall Outlook (ERO)



Answers the question:

What are the chances of rainfall intense enough that it would be expected to cause flash flooding?

Other things to know:

✓ A situational awareness and planning tool that “gets your head in the game”

✗ Not an explicit forecast of flash flooding at a specific location

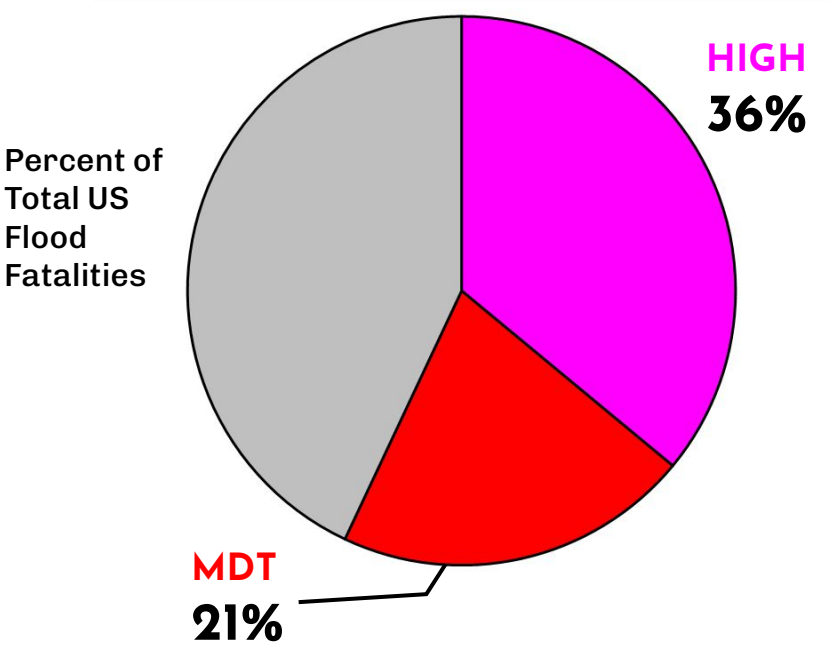
✓ Accounts for uncertainty in placement, timing of intense rainfall and summarizes the larger scale risk factors

⚠ Know your vulnerability! Lower risk categories may still be meaningful decision thresholds.

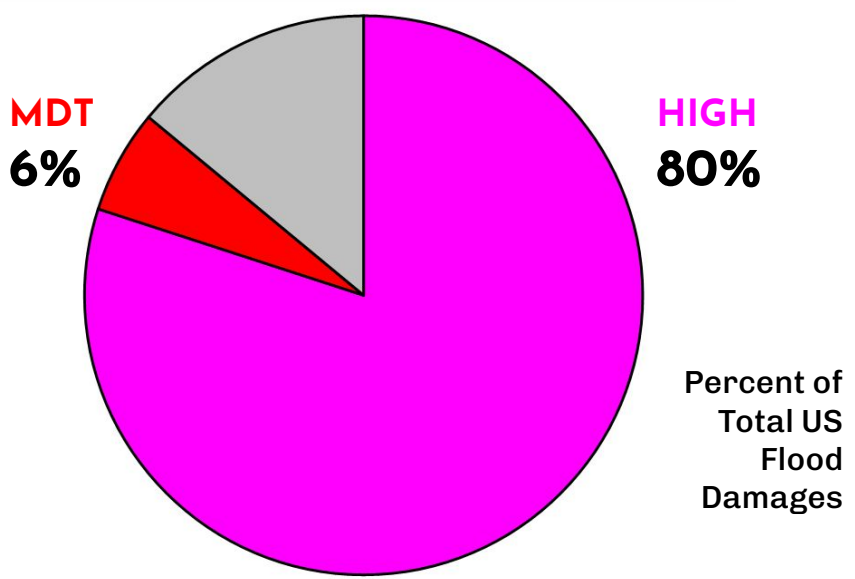
WPC High Risk Days are a <u>BIG DEAL</u>

High Risks are only issued by WPC on ~4% of days, but "High Risk Days" have accounted[1] for:

1/3 of ALL Flood-related **Fatalities**



4/5 of ALL Flood-related **Damages**



[1] From 2010 to 2022. Includes flood, flash flood, heavy rain, and debris flow Storm Data. Excludes Oso, WA landslide which occurred well after rainfall and on a sunny day.

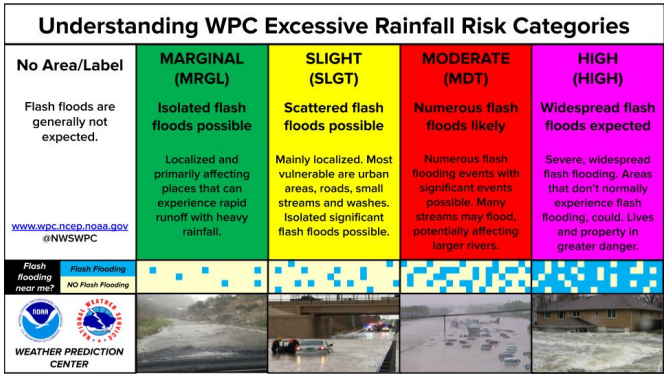
ERO Infographics

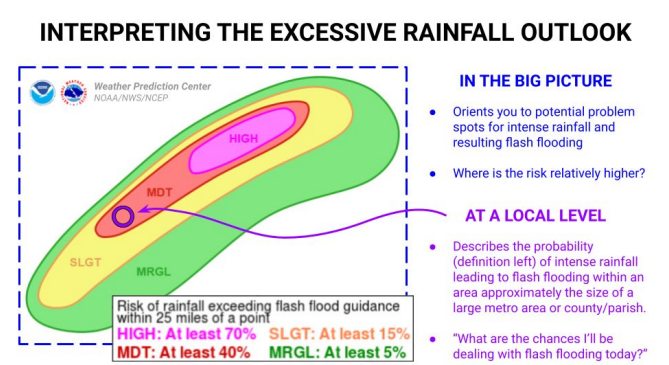
WPC now has a series of graphics that can be used to accompany the ERO

Two graphics, one in English, one in Spanish, describing the different risk categories

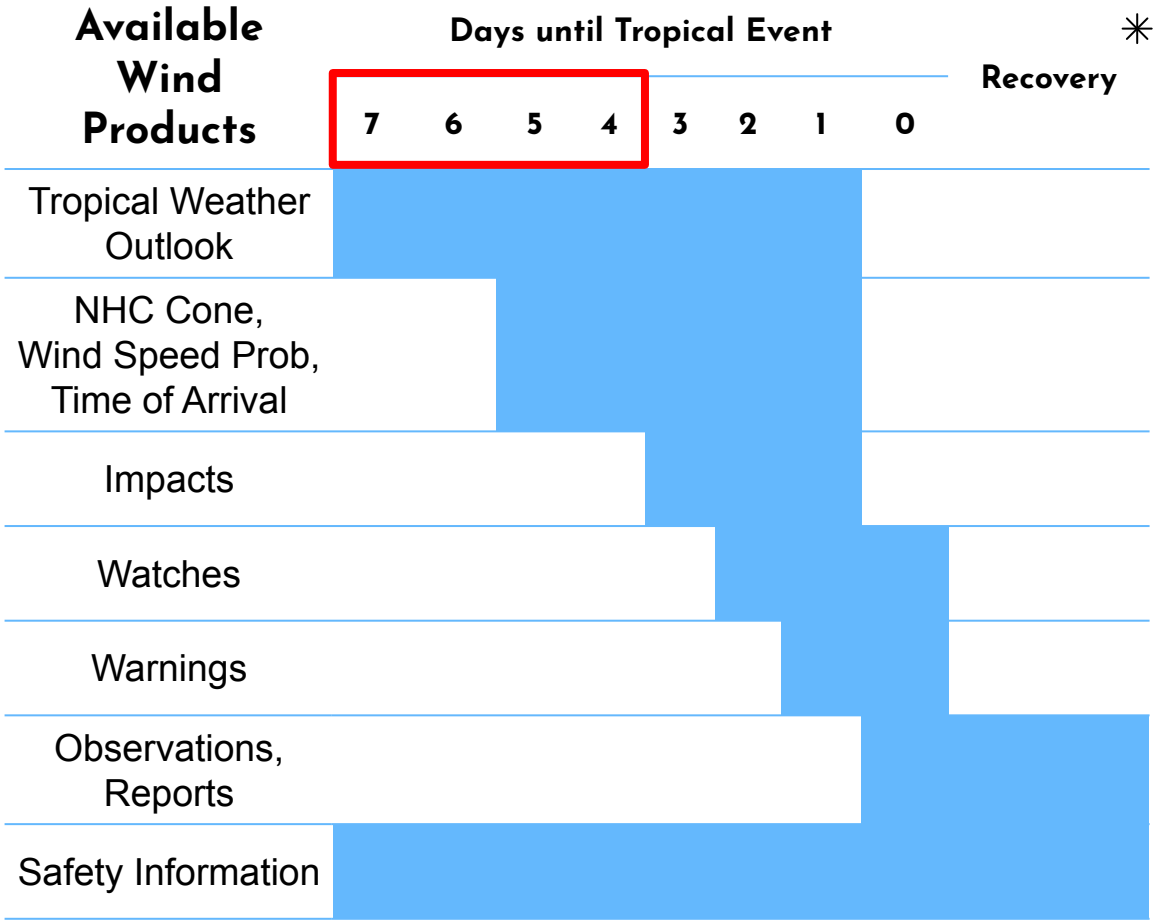
One graphic with some suggested actions during High Risk situations

One graphic providing an interpretation guide





WE SHARE WHAT WE KNOW, WHEN WE KNOW IT



Track Forecast/Cone Graphic

How the Cone is Developed

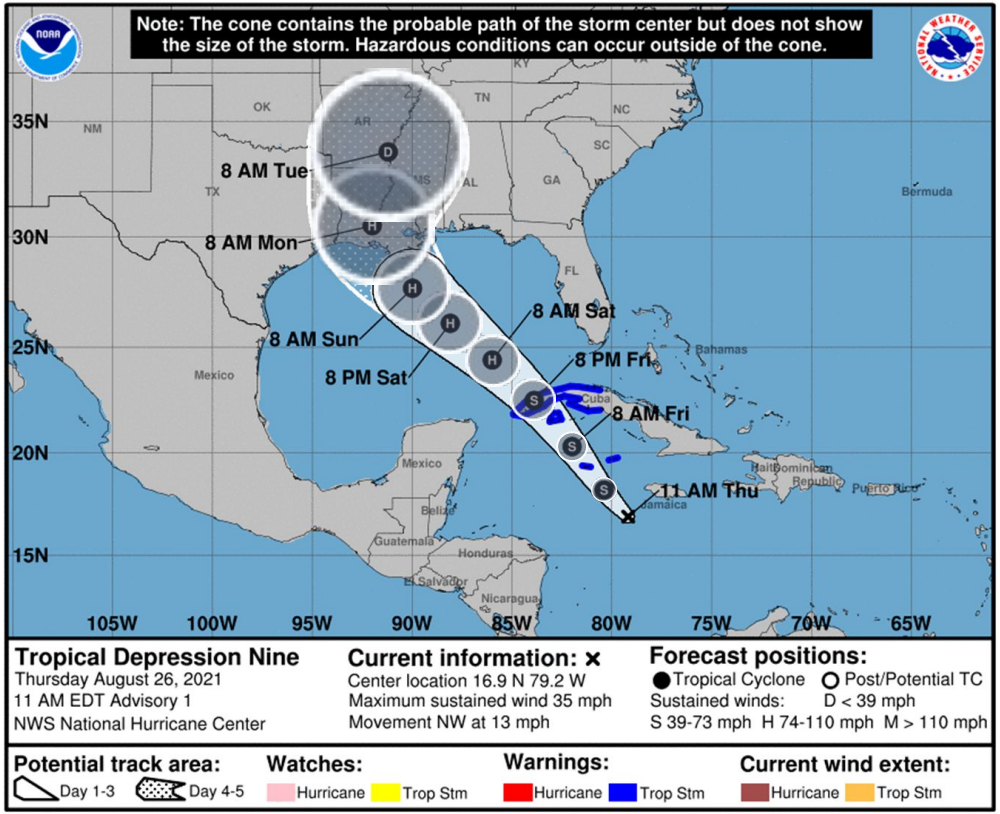
Conveys the most likely track of the center of the storm

Does NOT convey impacts

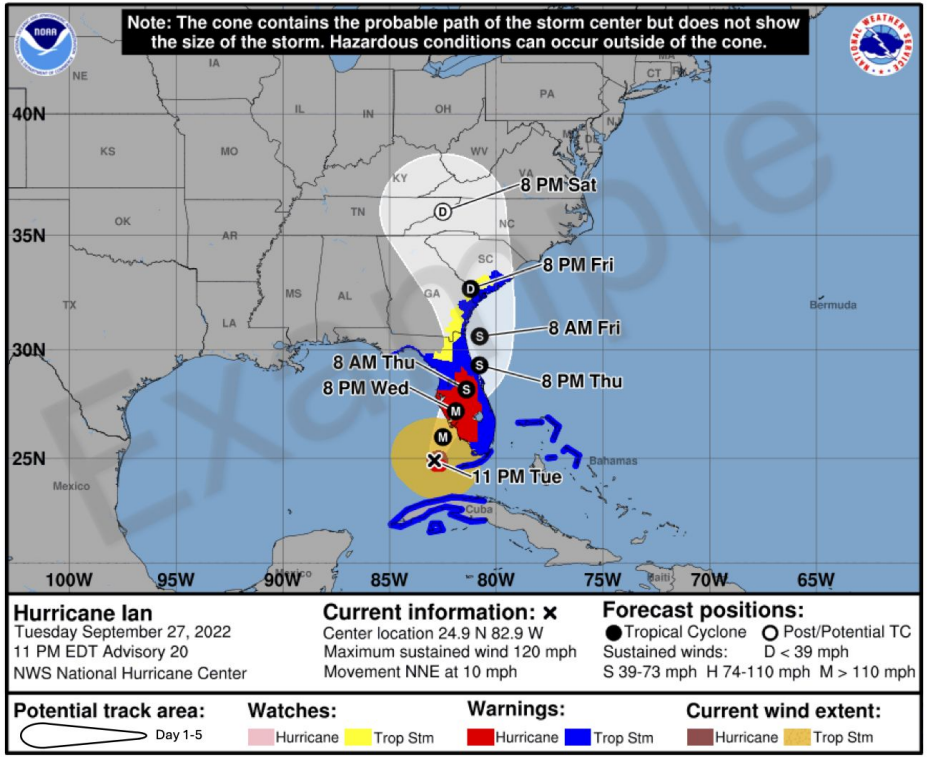
Based on the 2/3rds track error from the past five years

The cone size does not change through the season

Information about the NHC cone and reminders



Cone Graphic with Inland Tropical Wind Watches/Warnings



New experimental cone graphic depicting inland U.S. tropical storm and hurricane watches and warnings will become available mid-season in 2024

Will help convey wind hazard risk over land

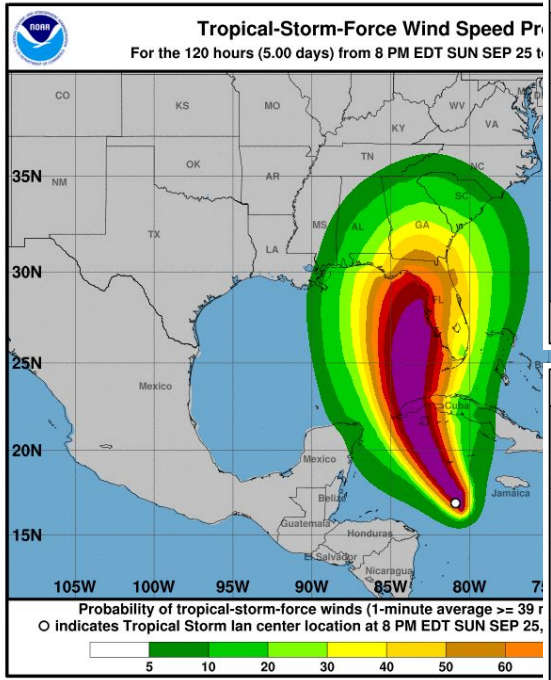
The 5-day cone will be depicted as all white instead of the current solid 1-3 day cone and hatched 4-5 day cone

Graphic may not be available as soon as the current cone graphic due to the time need to compile complete inland watch and warning information

Will be available beginning on or around August 15, 2024

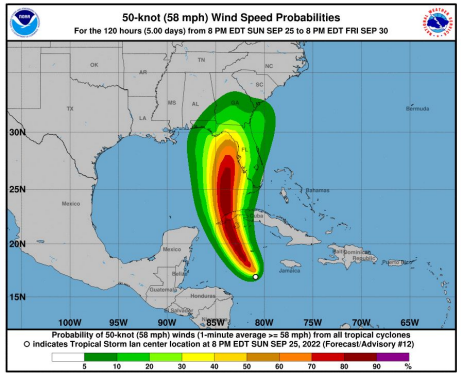
Available at hurricanes.gov along with the current operational version of the cone graphic

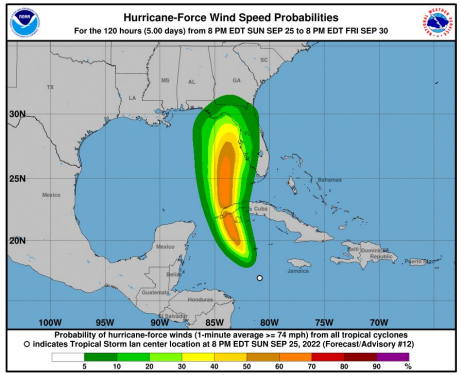
Wind Speed Probability Graphics



Tropical Storm Force

Strong Tropical Storm Force





Hurricane Force

Depicts cumulative probability of tropical storm force (39 mph), strong tropical storm force (58 mph), or hurricane force winds (74+ mph) for a specific location over the next 5 days

Takes into account more than just the center of the storm, it includes typical track, intensity, and size errors

Wind Speed Probabilities

Based on 1,000 realistic alternative scenarios created using:

- Official NHC track and intensity forecast
- Historical NHC track and intensity forecast errors
- Climatology and persistence wind radii model

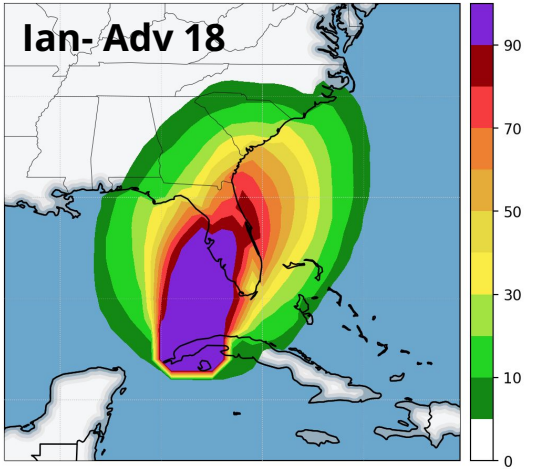
Uses model spread to account for track uncertainty

Next Generation Wind Speed Probability Model

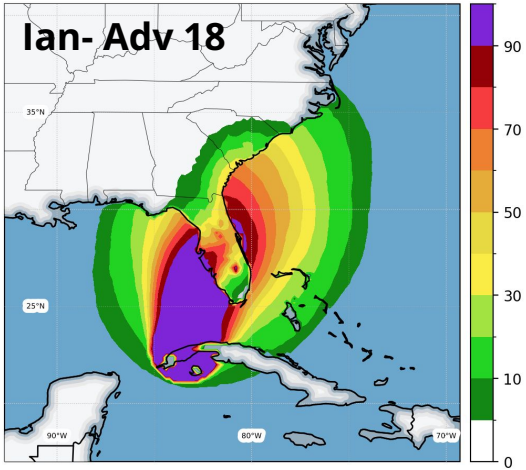
WSP 2.0 will be implemented no earlier than 2026

A new Wind Speed Probability Model (WSP 2.0) is being

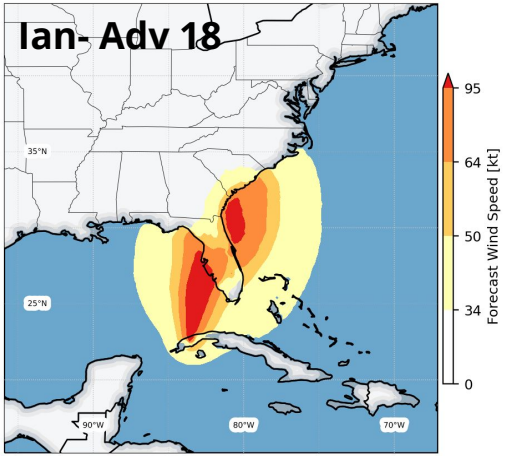
Prob > 34 kts - Legacy



Prob > 34 kts - WSP 2.0



10% Exceedance Map

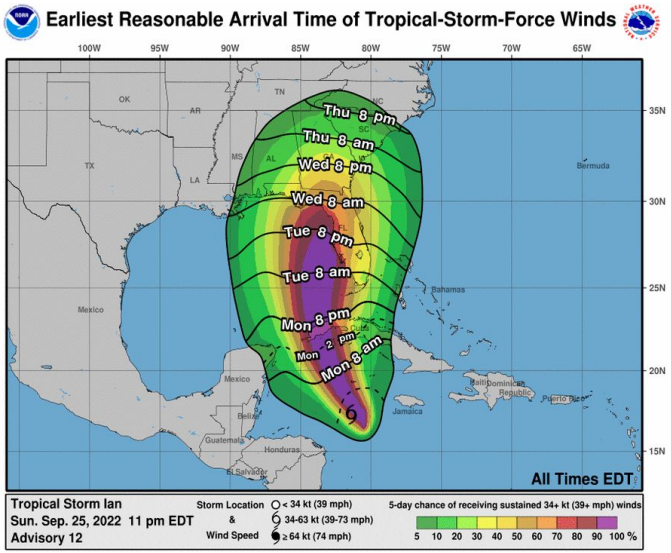


Can reduce wind probabilities over land by up to 40%

- More accurate, especially over land as it uses high-resolution surface wind reduction scheme over land
- Consistent with other NWS TC wind products
- More options for potential output products including: wind exceedance, wind gust probabilities, and the possibility for thresholds other than 34-, 50- and 64kt

Tropical Storm Force Wind Speed Time of Arrival Graphics

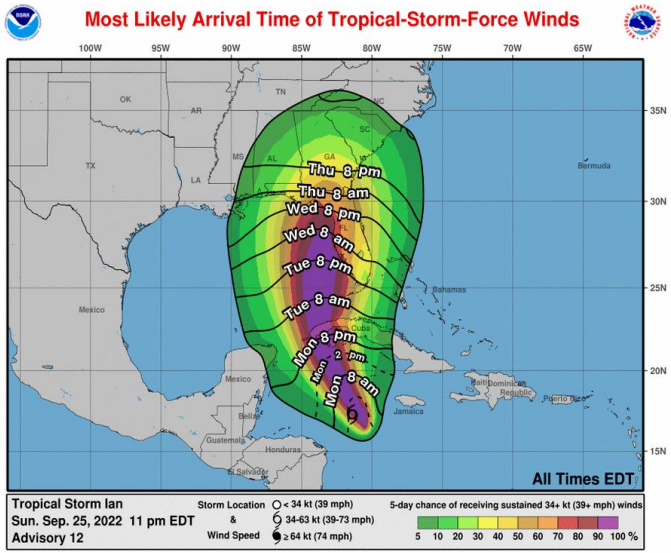
Earliest Reasonable



Only 1 in 10 chance of tropical storm force winds arriving earlier than noted time

Best for users with low risk tolerance

Most Likely



Equal chances of tropical storm force winds arriving before or after the time listed

Preparations should be completed by this time

NOAA

National Weather Service

Questions Before our Exercise?