

2026 Hurricane Season Product Review and Preparedness Information

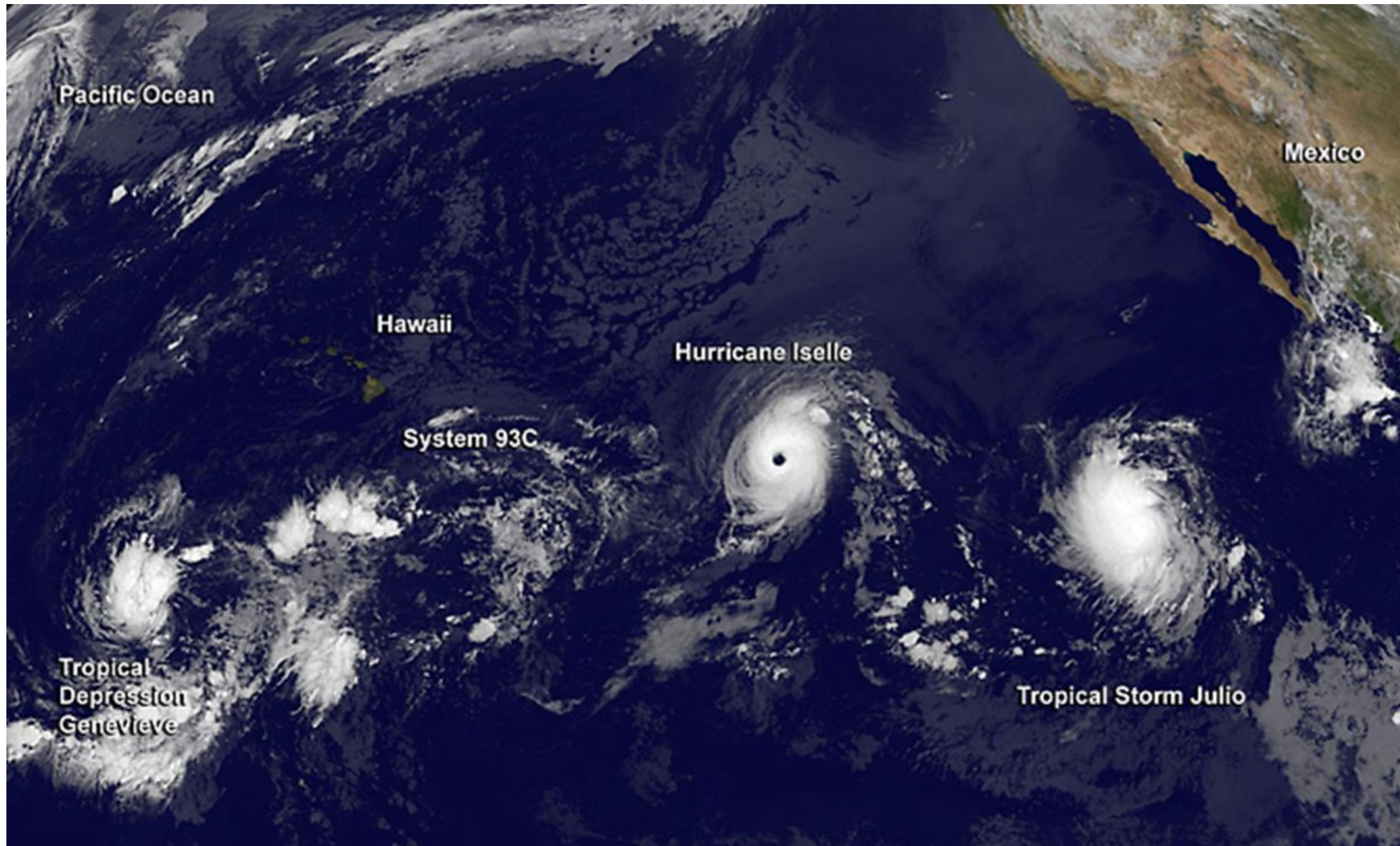
Be Ready Manoa – May 30, 2026

John Bravender, Warning Coordination Meteorologist
NOAA/NWS Weather Forecast Office Honolulu
john.bravender@noaa.gov



What is a Tropical Cyclone?

Hurricane, Tropical Storm, Tropical Depression



GOES-West satellite image from August 4, 2014

<https://www.nasa.gov/content/goddard/iselle-eastern-pacific-ocean/>

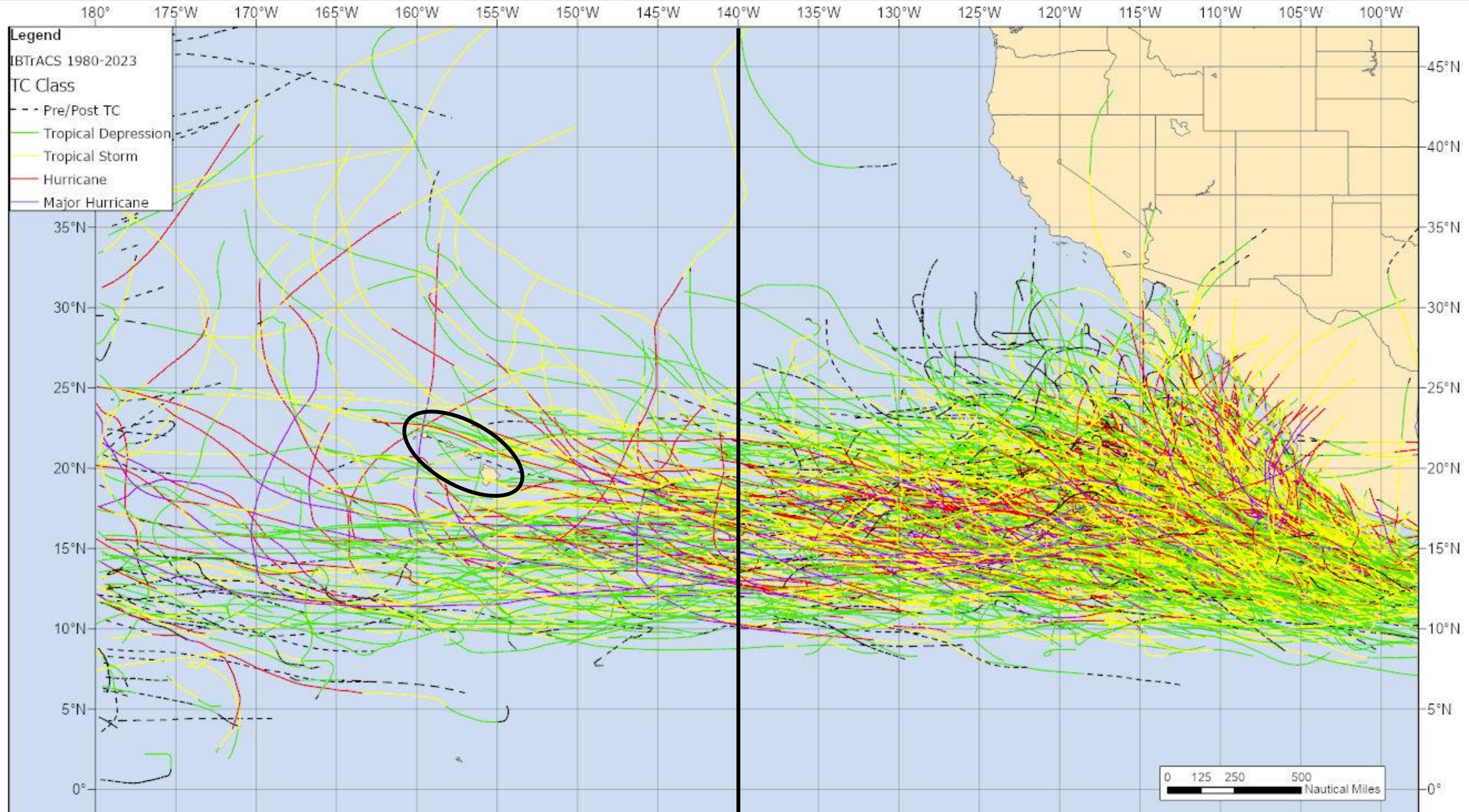
- Classified by maximum sustained surface wind speed (1-min average at 30 feet over open ocean)
 - Tropical depression:
<39 mph (<34 kt)
 - Tropical storm:
39-73 mph (34-63 kt)
 - Hurricane:
>74 mph (>64 kt)
 - Major hurricane:
>111 mph (>96 kt)

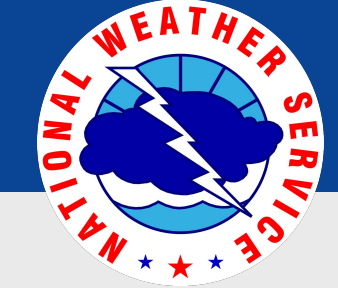




Tropical Cyclone Climatology

All tropical cyclone tracks from 1980-2023

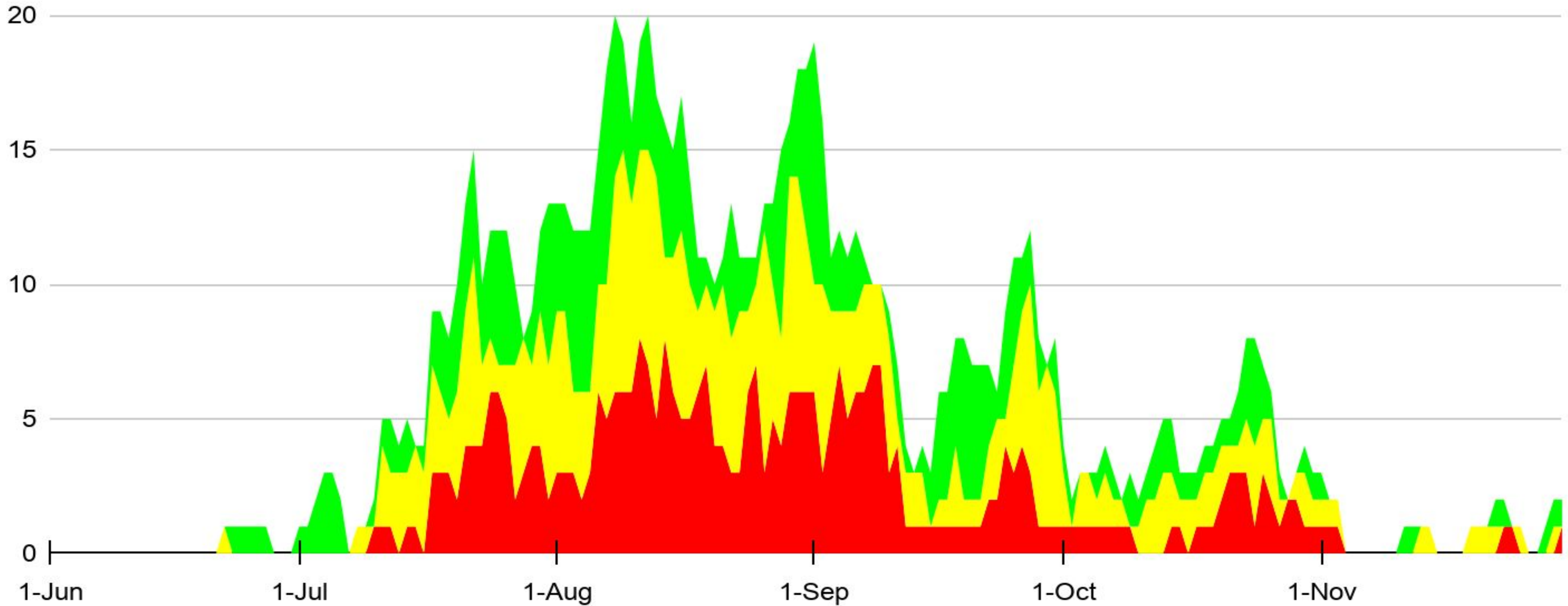




Tropical Cyclone Activity By Day – Central Pacific

Hurricanes/Tropical Storms/Tropical Depressions, 1950-2025

● Tropical Depressions + Tropical Storms + Hurricanes ● Tropical Storms + Hurricanes ● Hurricanes

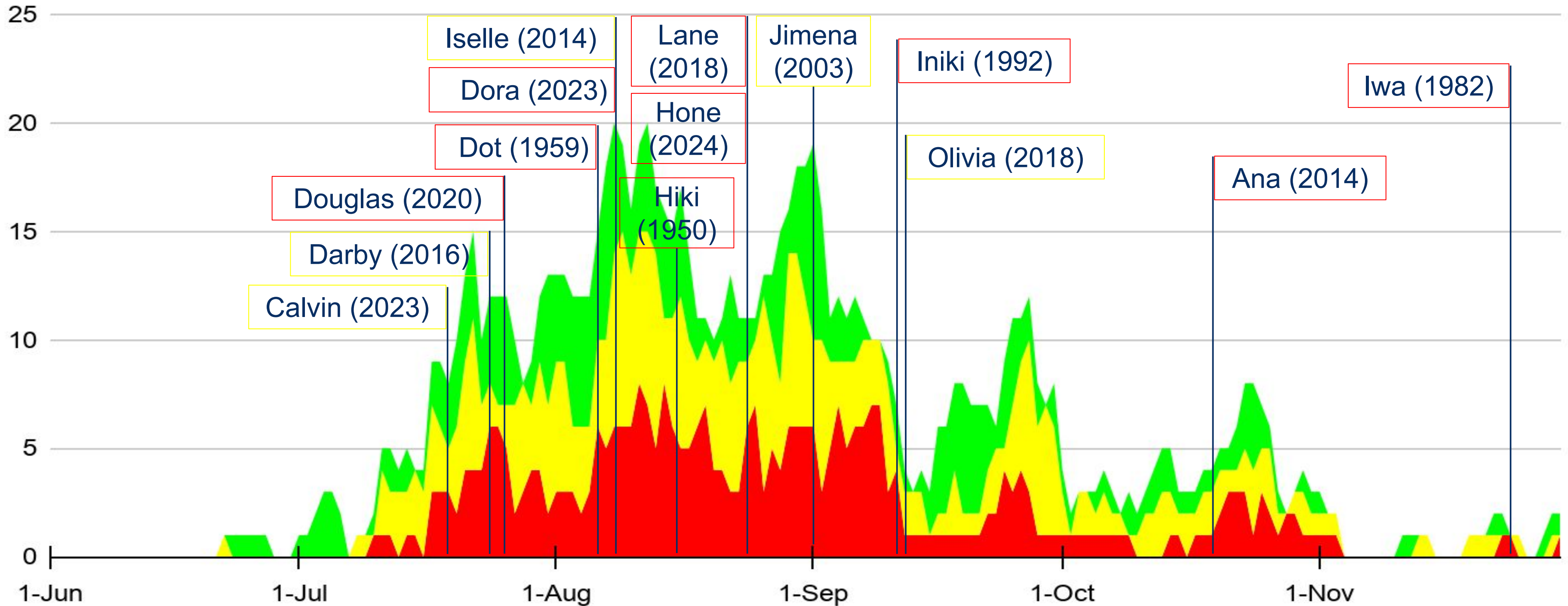


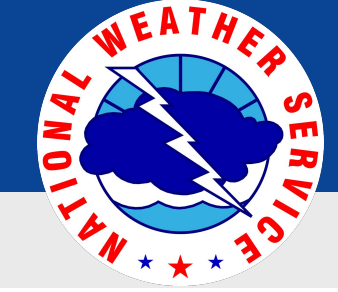


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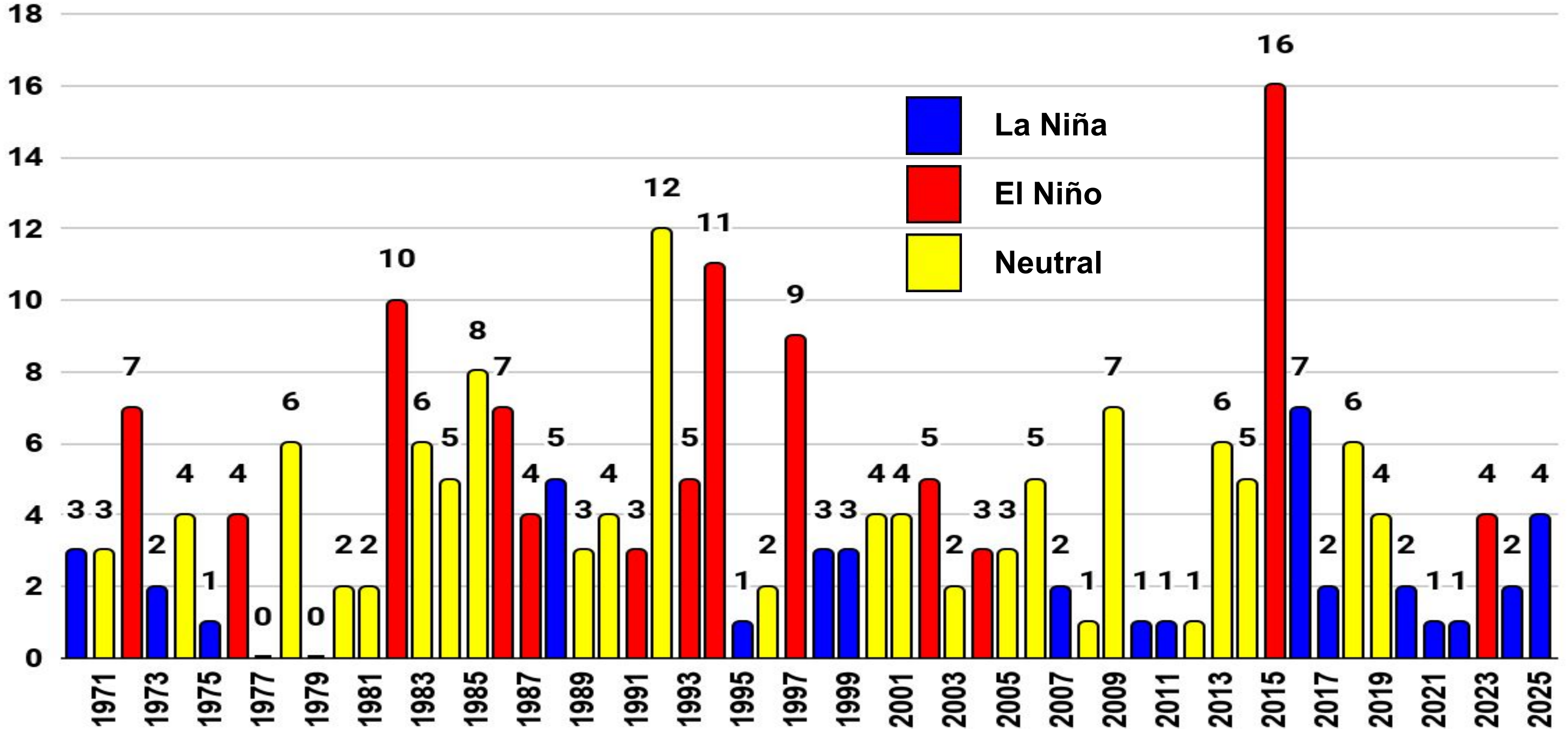
● Tropical Depressions + Tropical Storms + Hurricanes ● Tropical Storms + Hurricanes ● Hurricanes





Annual Tropical Cyclones since 1970

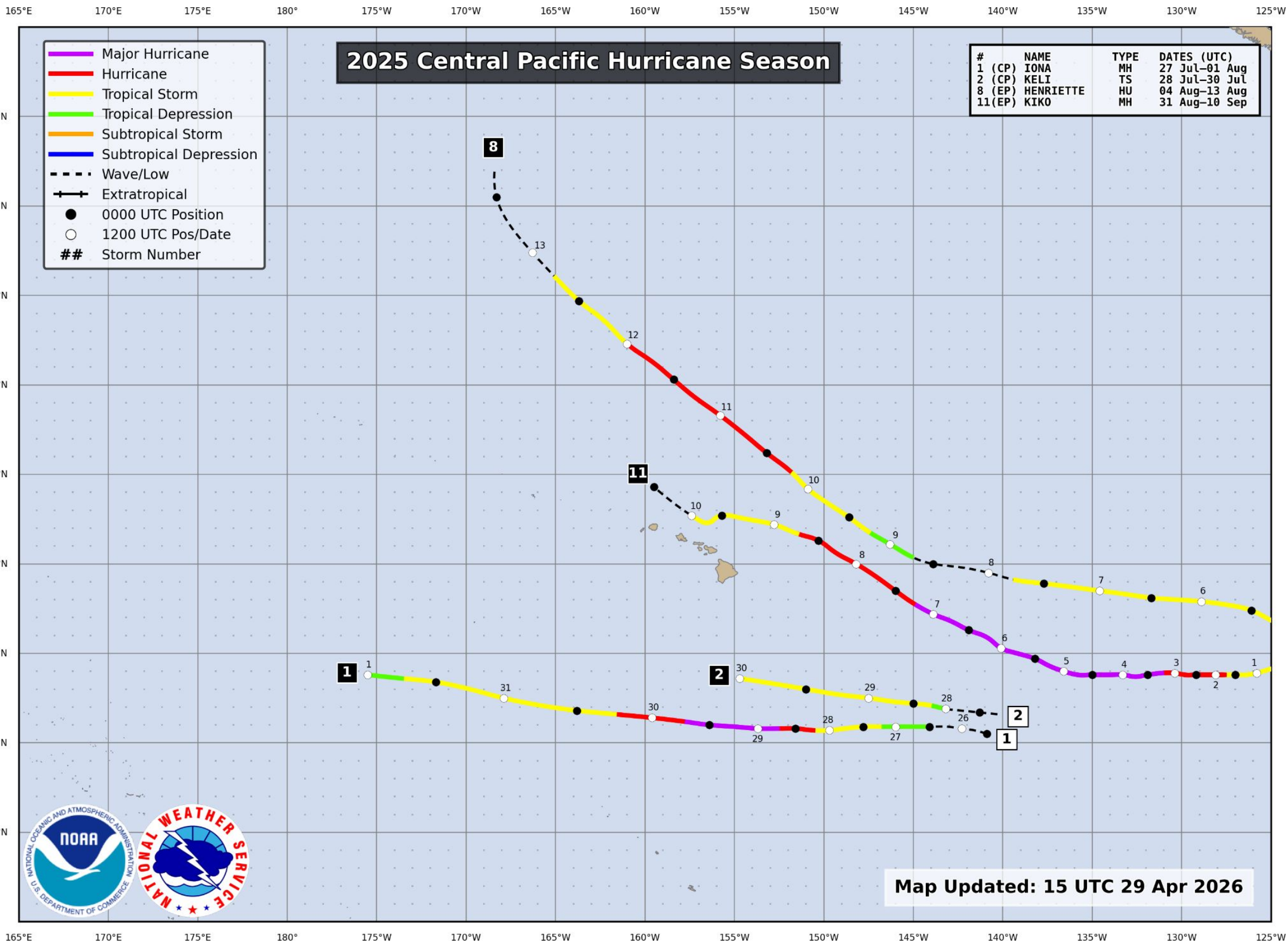
Central Pacific Tropical Cyclones (1970-2025)



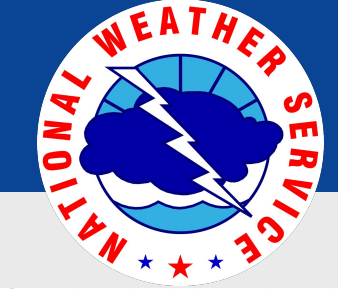


2025 Central Pacific Hurricane Season

4 Tropical Cyclones



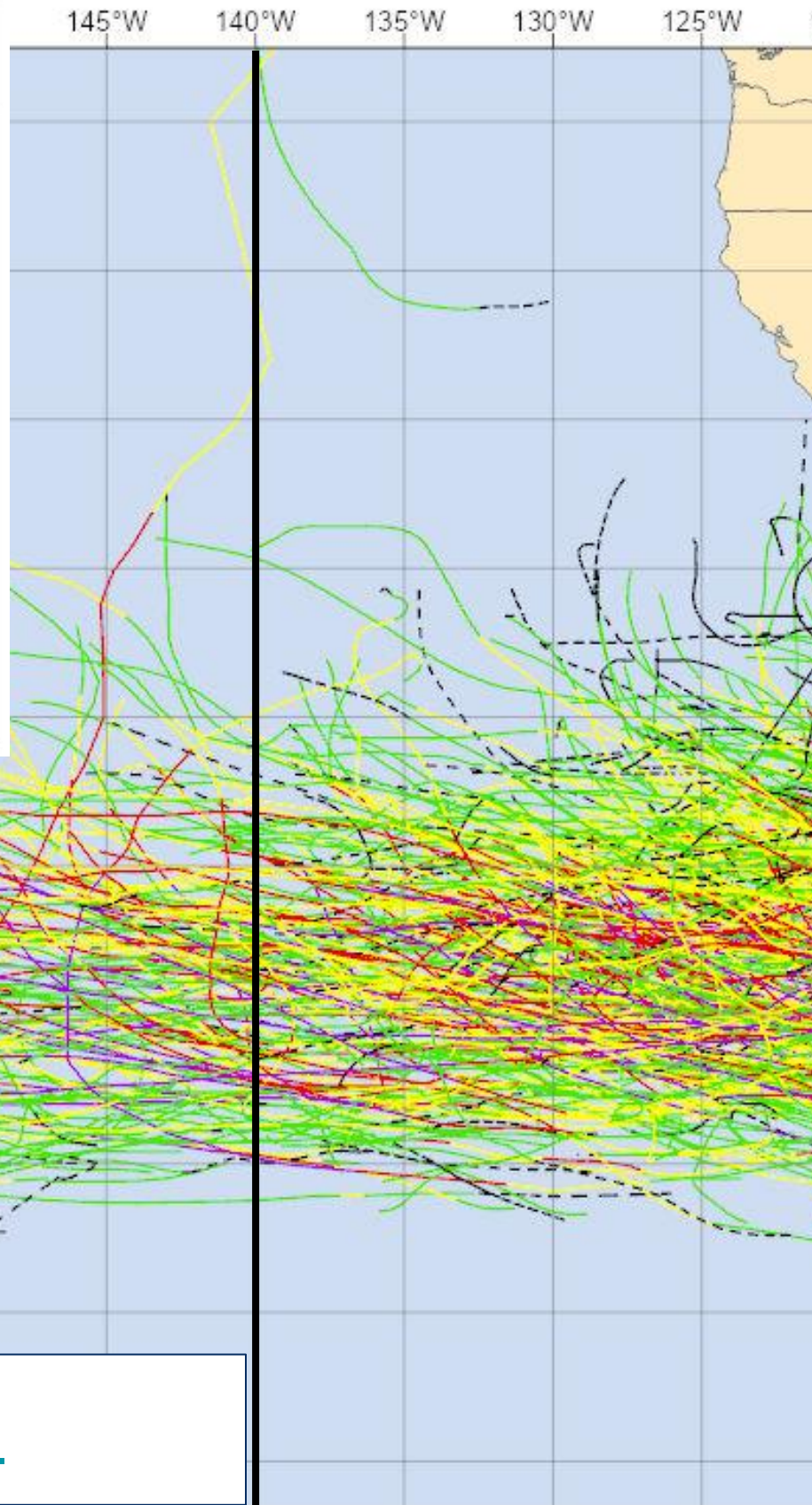
- Iona**
Peak: Major Hurricane (130 mph/category 4)
Sat Jul 26 to Fri Aug 1
- Keli**
Peak: Tropical Storm (50 mph)
Mon Jul 28 to Wed Jul 30
- Henriette**
Peak: Hurricane (85 mph/category 1)
Fri Aug 8 to Wed Aug 13
- Kiko**
Peak: Major Hurricane (140 mph/category 4)
Sat Sep 6 to Wed Sep 10



Tropical Cyclone Names

Named in the basin where it becomes a tropical storm

List 1	List 2	List 3	List 4
Akoni	Aka	Alika	Ana
Ema	Ekeka	Ele	Ela
Hone	Hene	Huko	Halola
Iona	Iolana	Iopa	Iune
Keli	Keoni	Kika	Kilo
Lala	Lino	Lana	Loke
Moke	Mele	Maka	Malia
Nolo	Nona	Neki	Niala
Olana	Oliwa	Omeka	Oho
Pena	Pama	Pewa	Pali
Ulana	Upana	Unala	Ulika
Wale	Wene	Wali	Walaka



2026	2027	2028	2029	2030	2031	Supplemental List
Amanda	Andres	Agatha	Adrian	Aletta	Alvin	Aidan
Boris	Blanca	Blas	Beatriz	Bud	Barbara	Bruna
Cristina	Carlos	Celia	Calvin	Carlotta	Cosme	Carmelo
Douglas	Dolores	Darby	Debora	Daniel	Dalila	Daniella
Elida	Enrique	Estelle	Eugene	Emilia	Erick	Esteban
Fausto	Felicia	Frank	Fernanda	Fabio	Flossie	Flor
Genevieve	Guillermo	Georgette	Greg	Gilma	Gil	Gerardo
Hernan	Hilda	Howard	Hilary	Hector	Henriette	Hedda
Iselle	Ignacio	Ivette	Irwin	Ileana	Ivo	Izzy
Julio	Jimena	Javier	Jova	Jake	Juliette	Jacinta
Karina	Kevin	Kay	Kenneth	Kristy	Kiko	Kenito
Lowell	Linda	Lester	Lidia	Lane	Lorena	Luna
Marie	Marty	Madeline	Max	Miriam	Mario	Marina
Norbert	Nora	Newton	Norma	Norman	Narda	Nancy
Odalys	Olaf	Orlene	Otilio	Olivia	Octave	Ovidio
Polo	Pamela	Paine	Pilar	Paul	Priscilla	Pia
Rachel	Rick	Roslyn	Ramon	Rosa	Raymond	Rey
Simon	Sandra	Seymour	Selma	Sergio	Sonia	Skylar
Trudy	Terry	Tina	Todd	Tara	Tico	Teo
Vance	Vivian	Virgil	Veronica	Vicente	Velma	Violeta
Winnie	Waldo	Winifred	Wiley	Willa	Wallis	Wilfredo
Xavier	Xina	Xavier	Xina	Xavier	Xina	Xinia
Yolanda	York	Yolanda	York	Yolanda	York	Yariel
Zeke	Zelda	Zeke	Zelda	Zeke	Zelda	Zoe

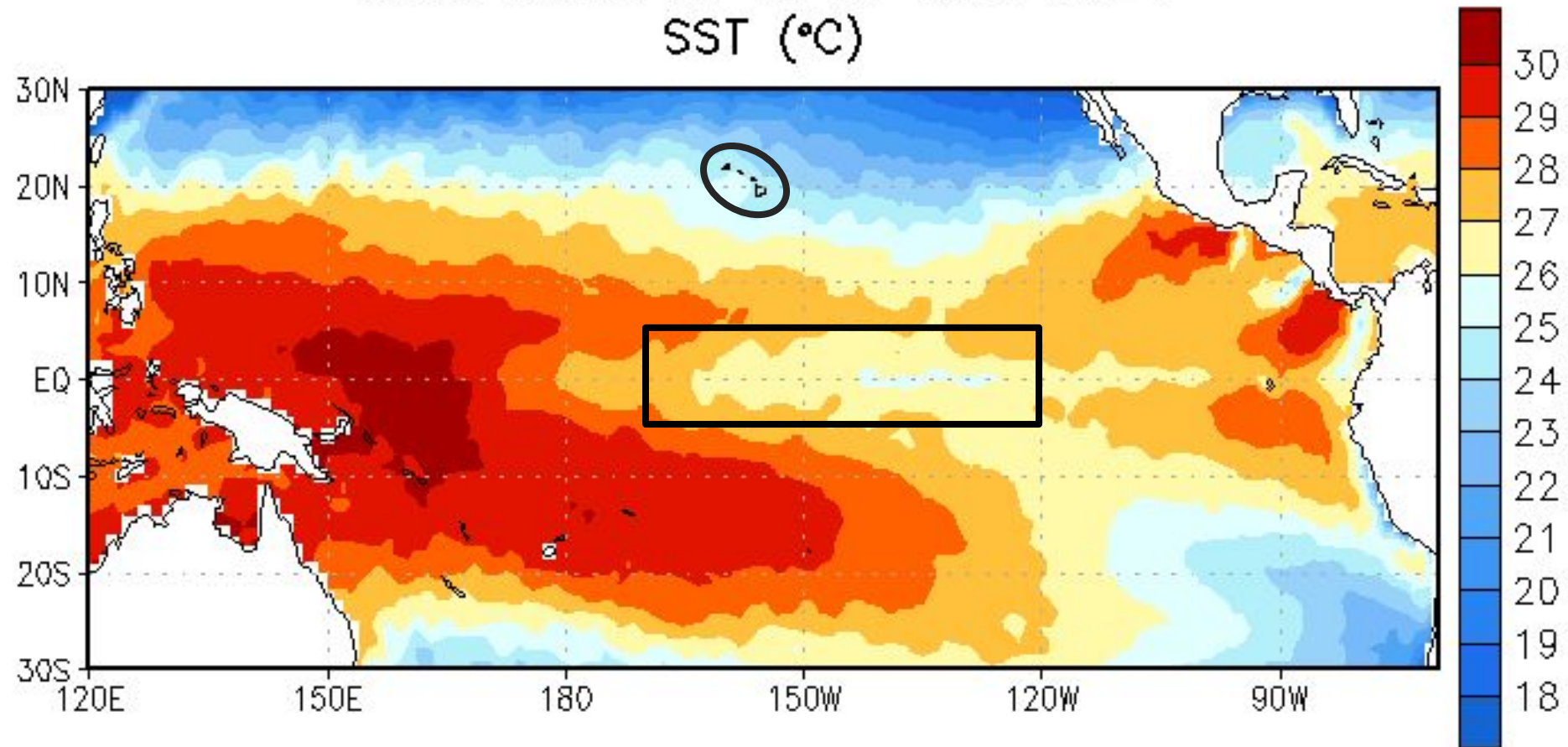
<https://hurricanes.gov/aboutnames.shtml>



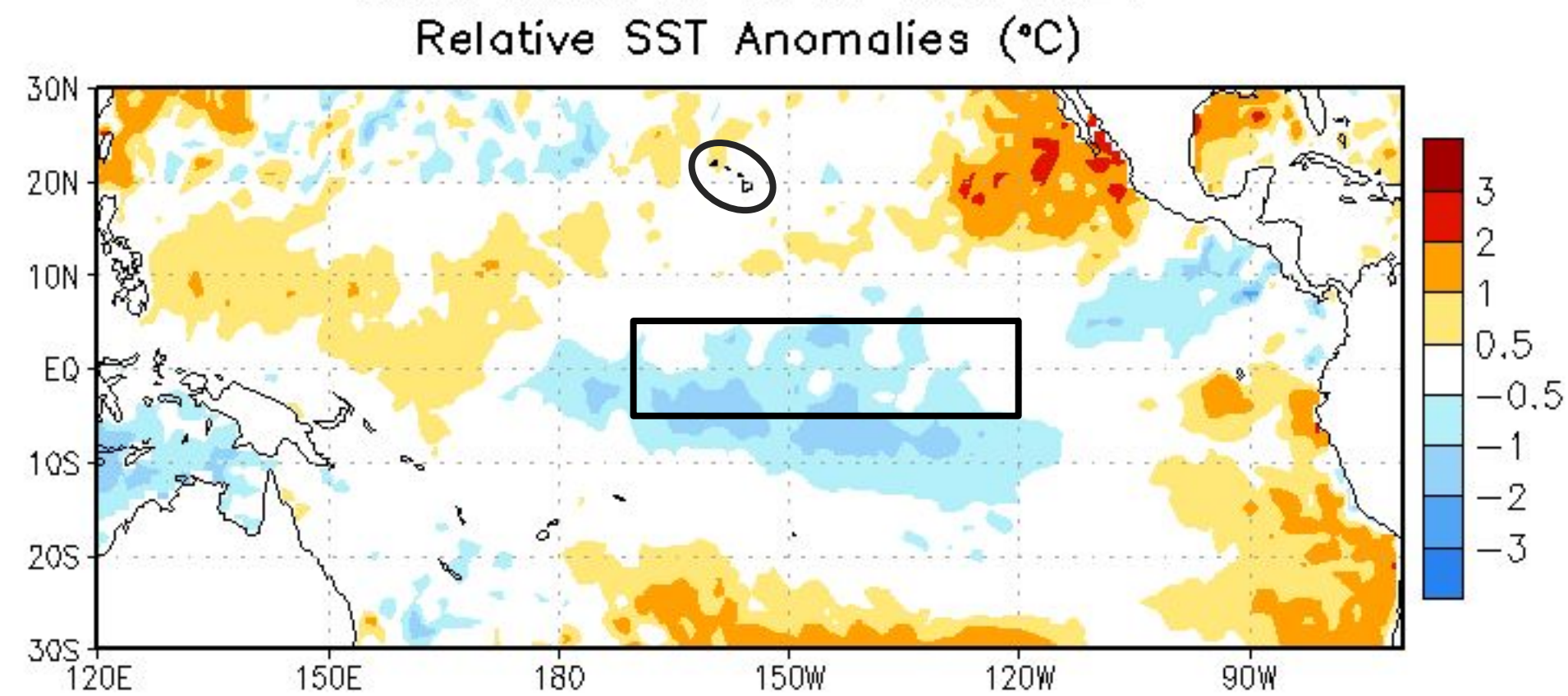
Recent Ocean Temperatures

Weekly Sea Surface Temperatures and SST Anomalies

Week centered on 04 MAR 2026
SST (°C)



Week centered on 04 MAR 2026
Relative SST Anomalies (°C)

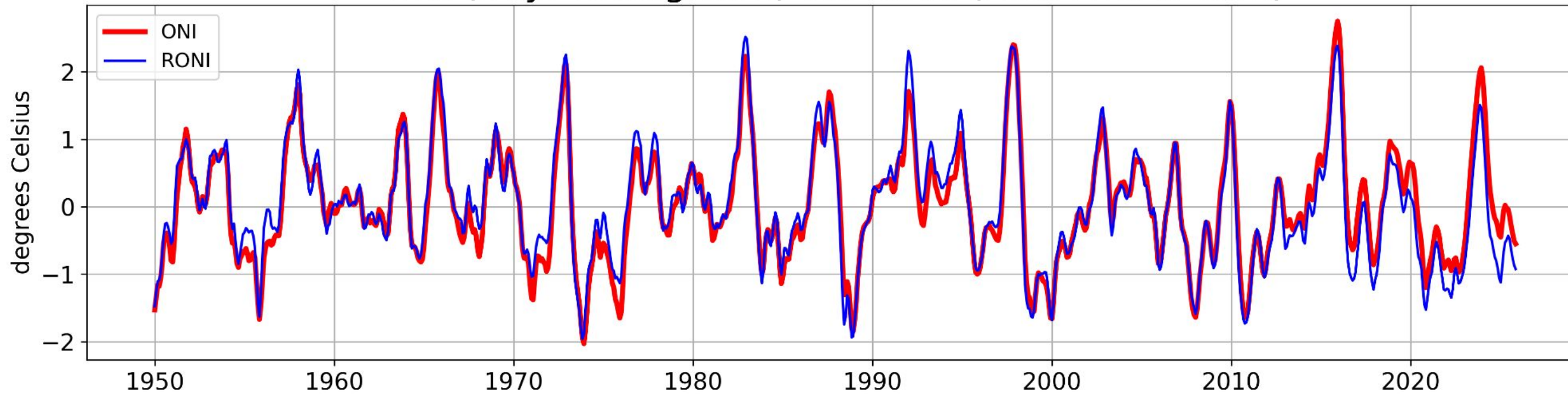




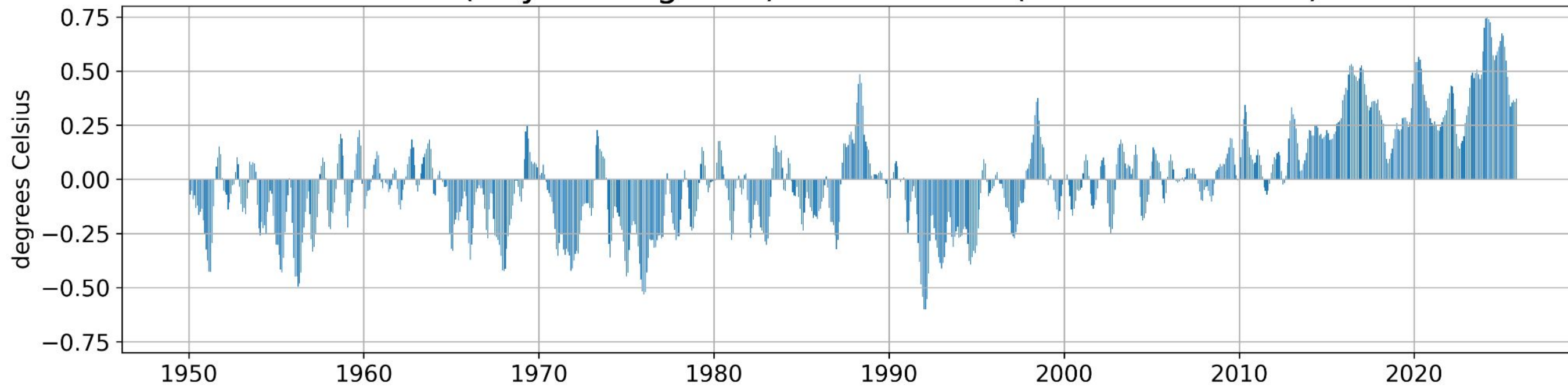
Relative Oceanic Niño Index (RONI)

A clearer, more reliable way to track El Niño and La Niña

ONI (30yr rolling clim) vs. RONI (1991-2020 clim)



ONI (30yr rolling clim) minus RONI (1991-2020 clim)



- The "Relative" ONI uses the same calculation as the traditional ONI but subtracts the sea surface temperature anomaly of the entire tropical mean (20° N-20°S)
- ONI: only includes the 30-year climatology
- RONI: includes the 30-year climatology and the tropical mean average

More information: <https://www.weather.gov/media/climateservices/RONI.pdf>

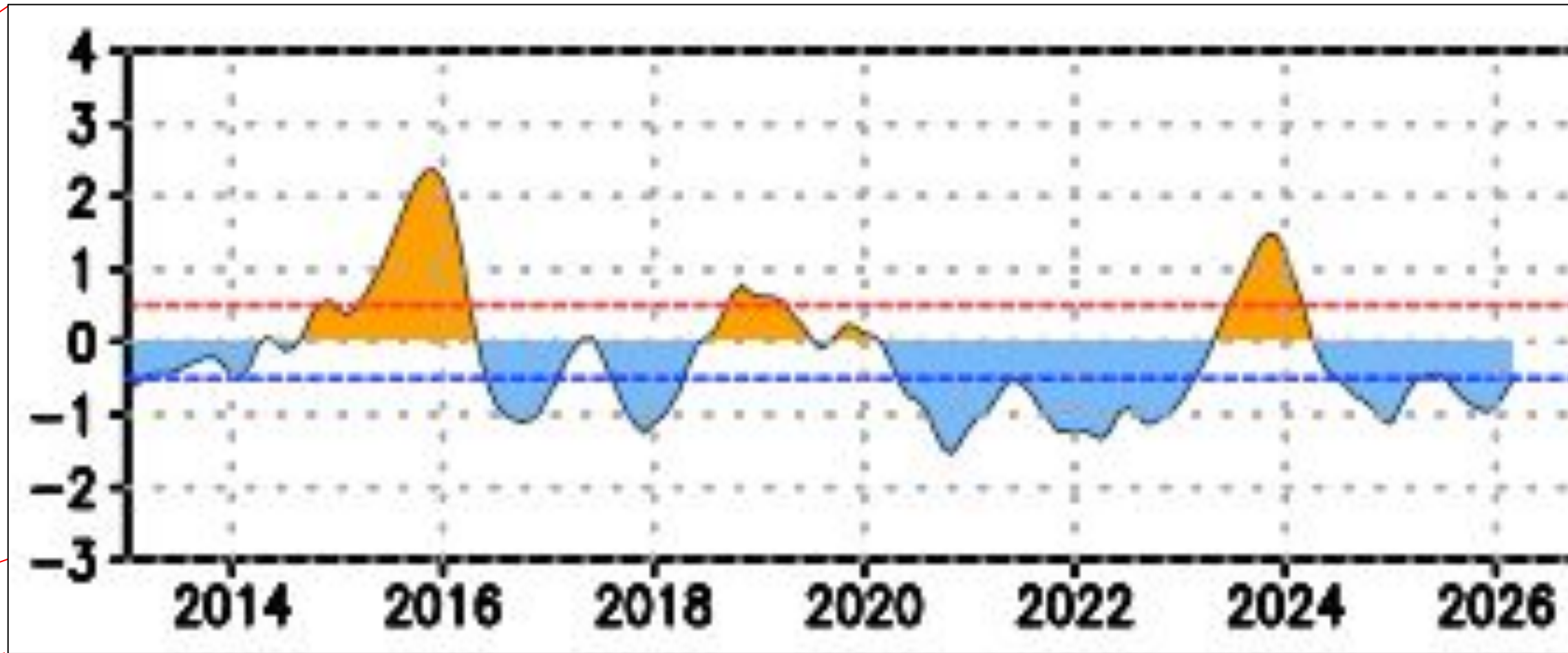
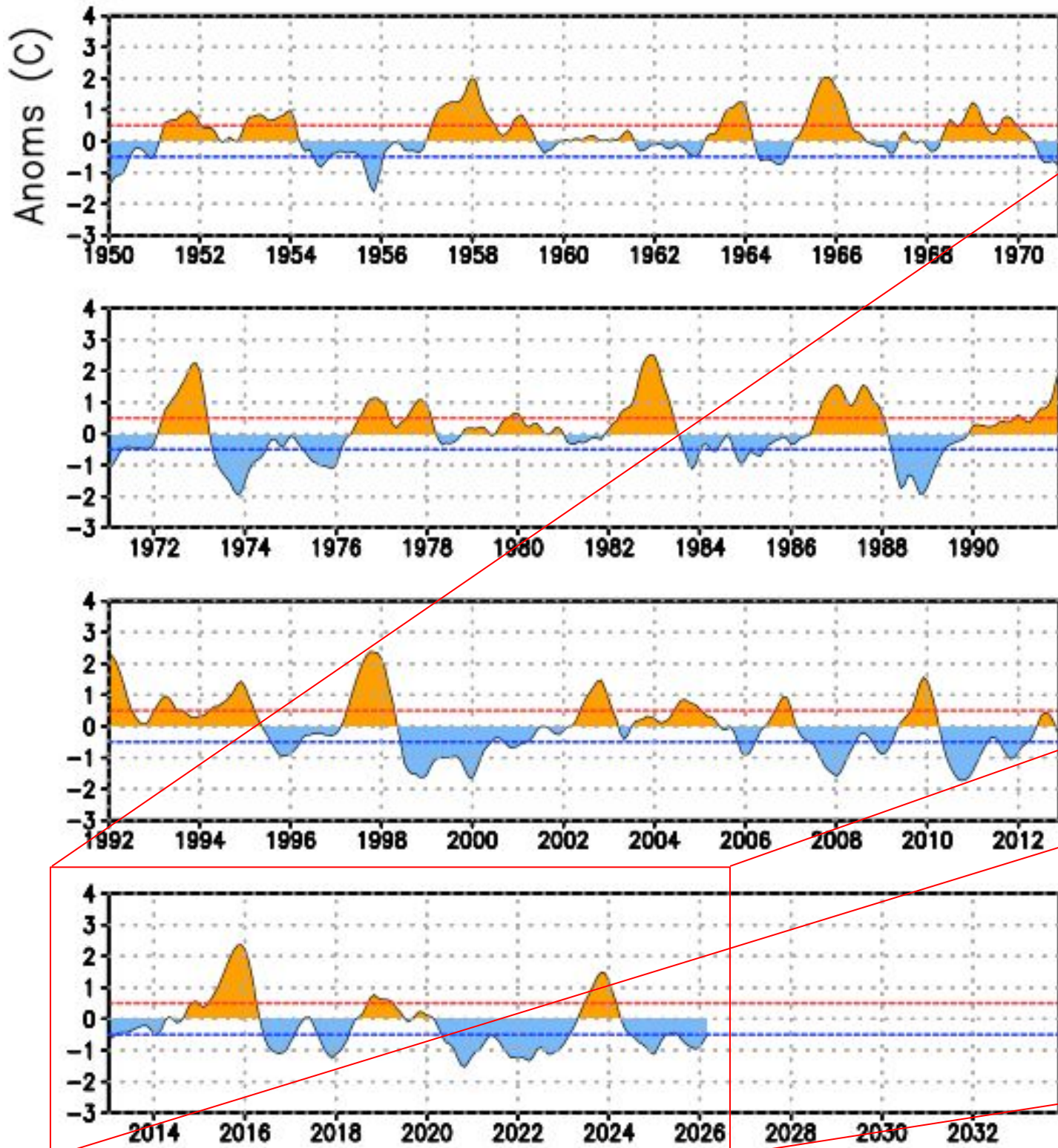


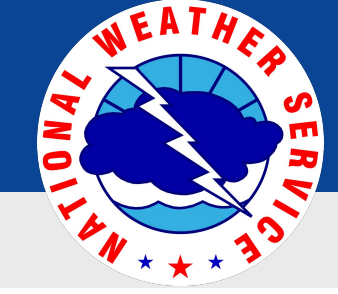


Historical El Niño/La Niña

Relative Oceanic Niño Index – three month running mean

Relative Oceanic Niño Index (ERSST.v5 RONI)
3mrm Relative Niño 3.4 SST Anomalies (1991–2020 base period)



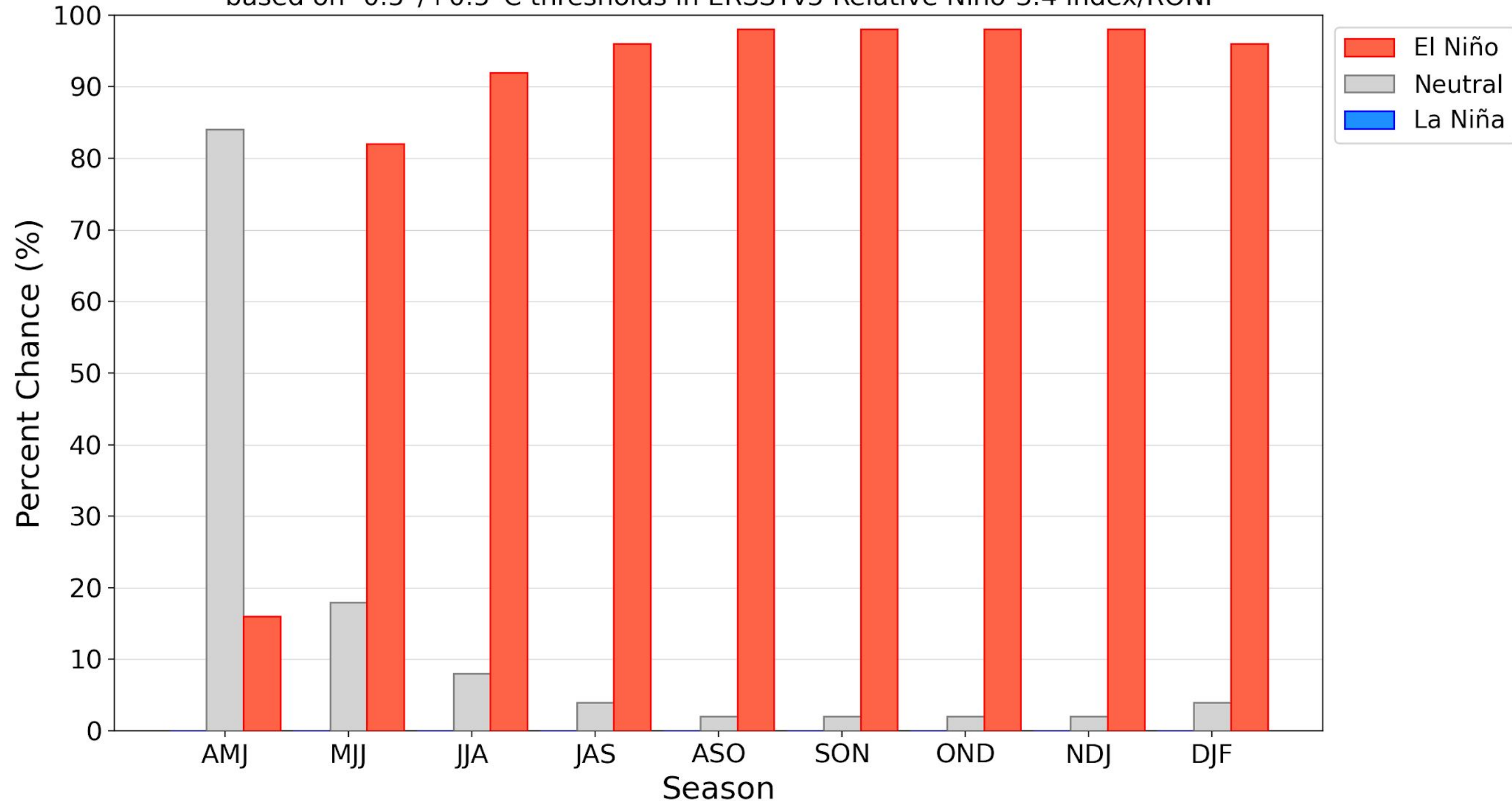


ENSO Outlook – from May 2026

El Niño to begin soon and continue through winter 2026-2027

Official NOAA CPC ENSO Probabilities (issued May 2026)

based on $-0.5^{\circ}/+0.5^{\circ}\text{C}$ thresholds in ERSSTv5 Relative Niño-3.4 index/RONI



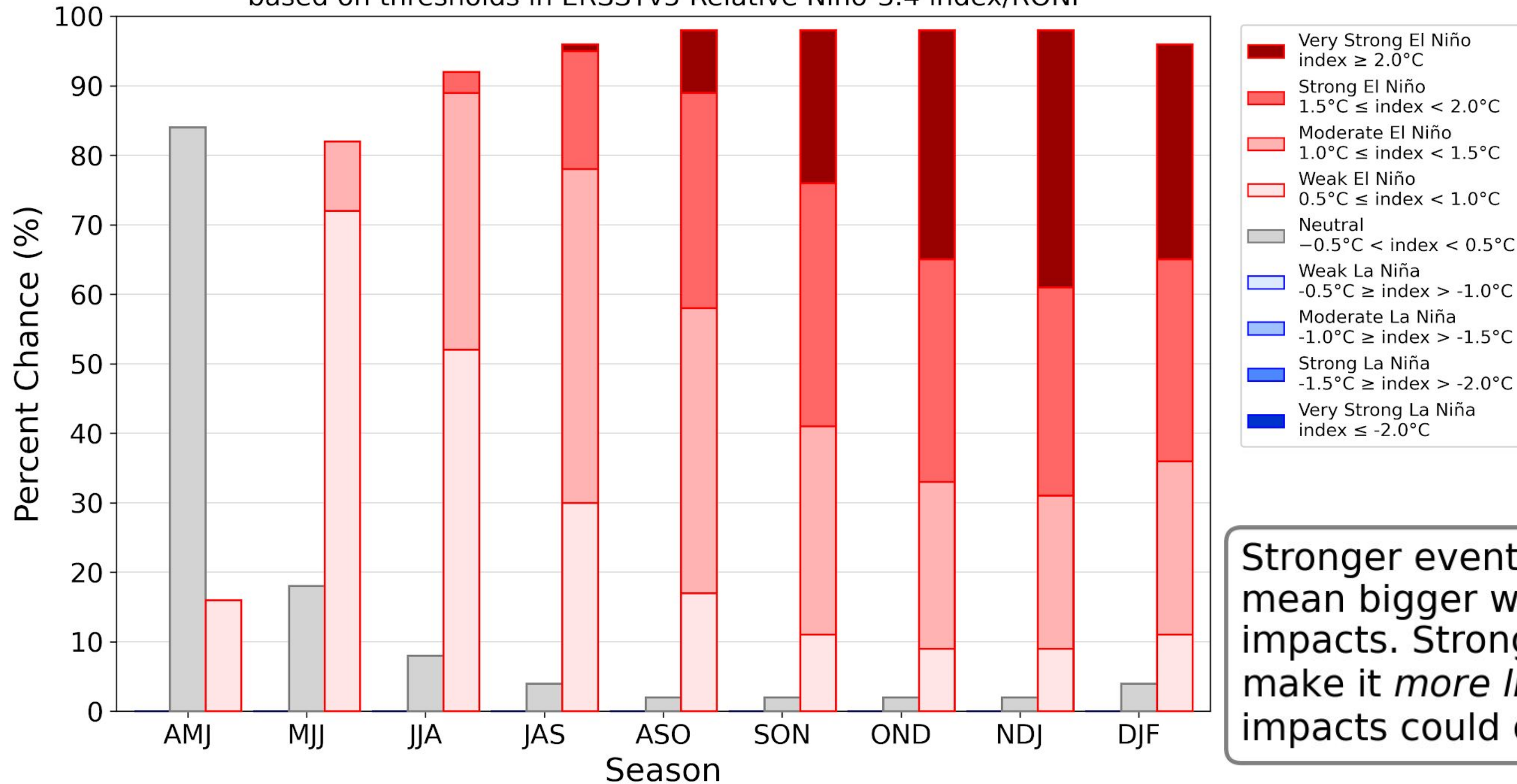


ENSO Outlook – from May 2026

El Niño to begin soon and continue through winter 2026-2027

NOAA CPC ENSO Strength Probabilities (issued May 2026)

based on thresholds in ERSSTv5 Relative Niño-3.4 index/RONI

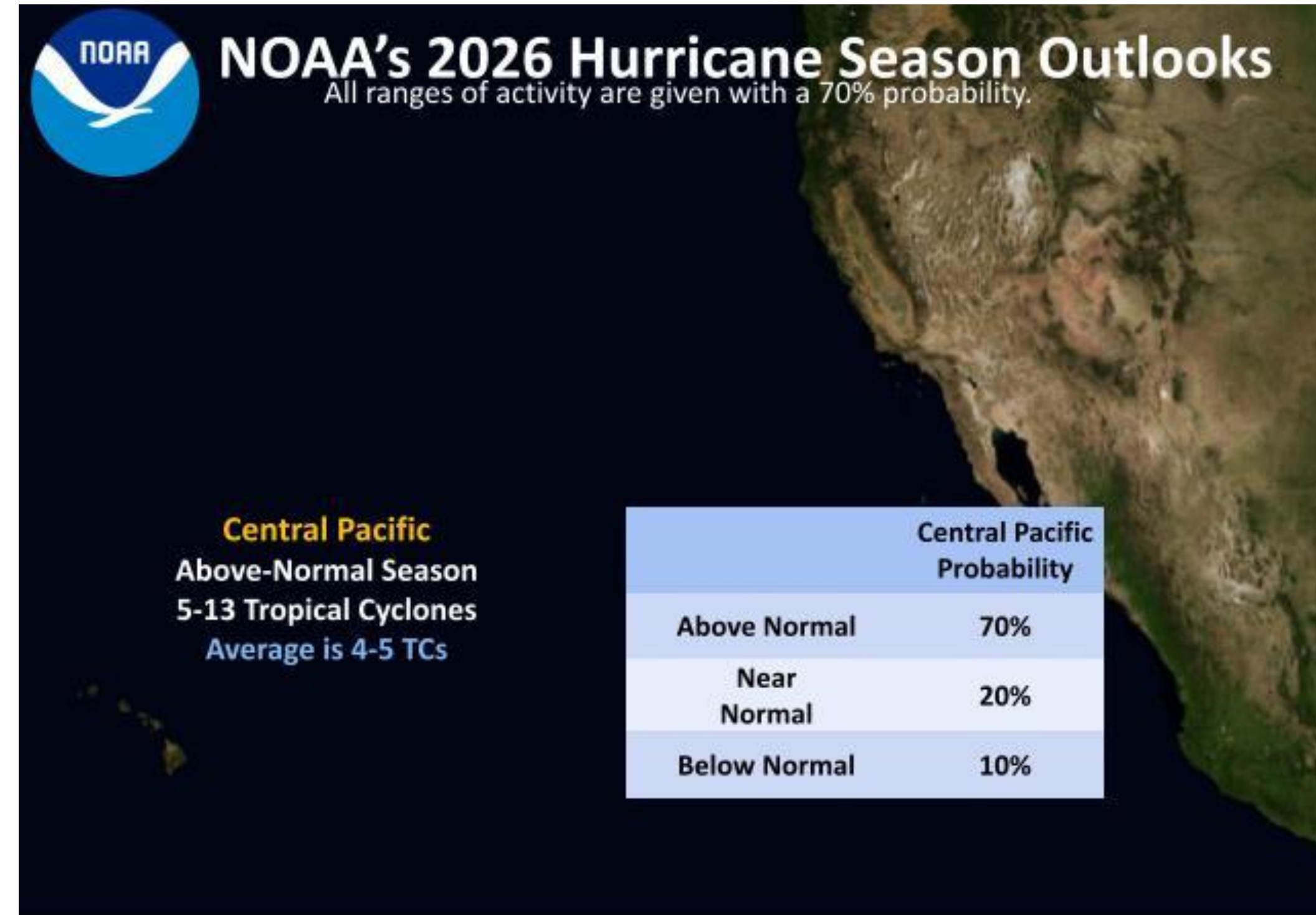


Stronger events do not always mean bigger weather and climate impacts. Stronger events can make it *more likely* that certain impacts could occur.



2026 Hurricane Season – Outlook

Central Pacific: above-normal (5 to 13 tropical cyclones)



- 2026 Central Pacific outlook:
 - 5-13 Tropical Cyclones (TC)
 - 70% chances of above normal, 20% near normal, 10% below
 - Average year: 4-5 TCs
- Developing El Niño very supportive of more activity in the Central Pacific
- Uncertainty as to how fast it will develop (very large range)

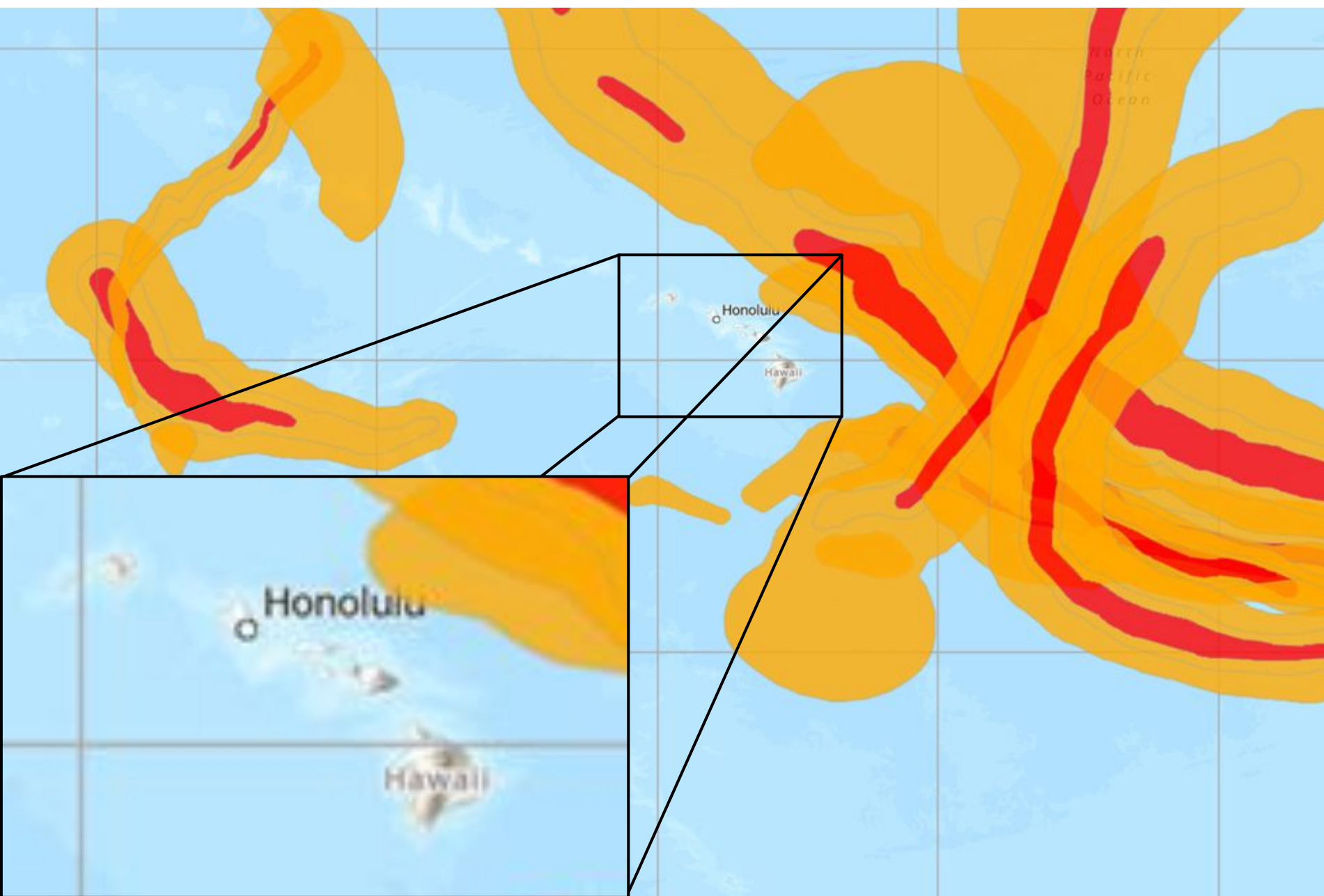
- Does not address potential impacts to Hawaii

More information: <https://www.weather.gov/hfo/hurricaneOutlook2026>

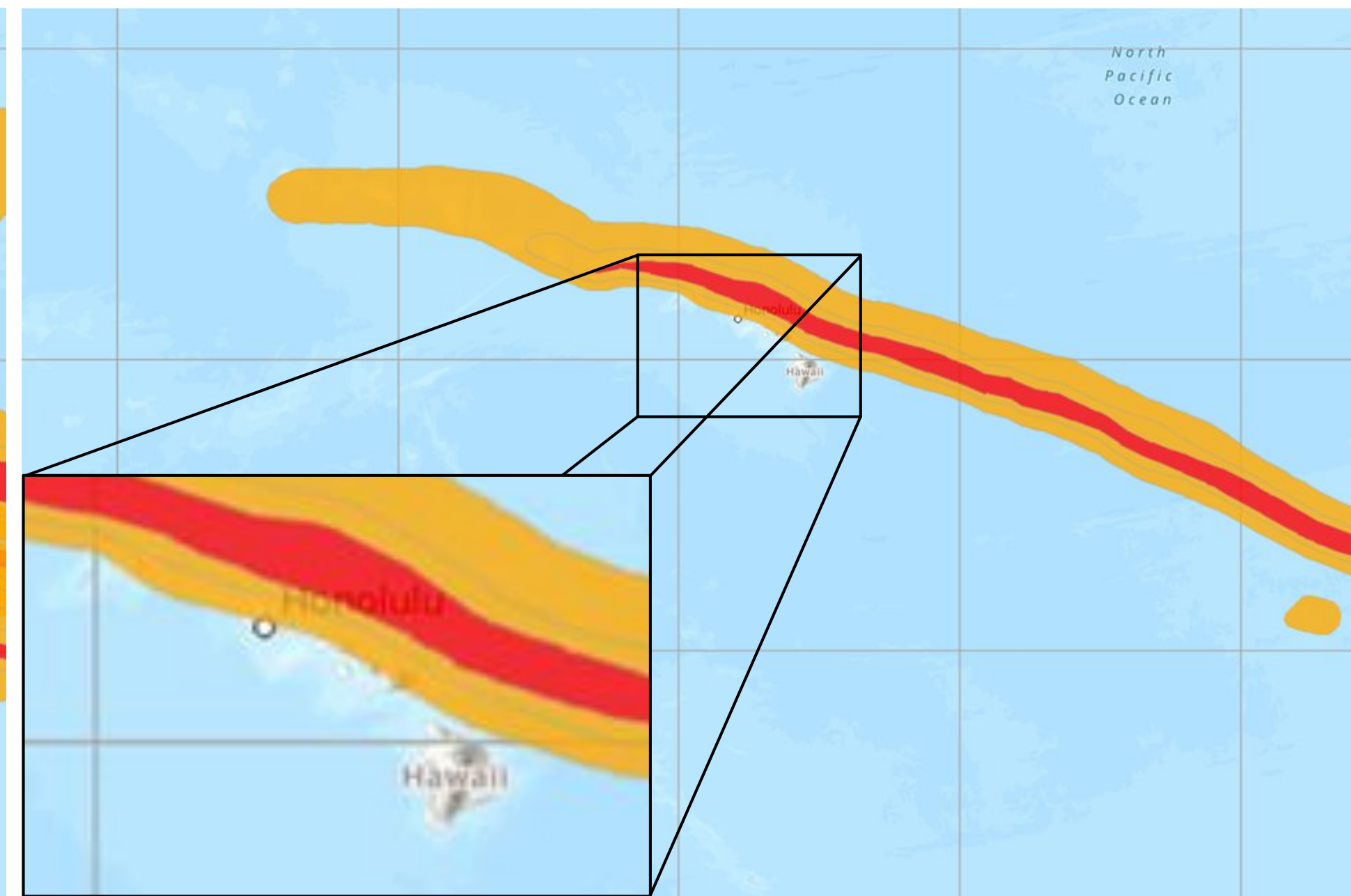


Composite Wind Field – 2015 vs 2020

Cliché but still true: “It only takes one”



2015: 16 tropical cyclones



2020: 2 tropical cyclones

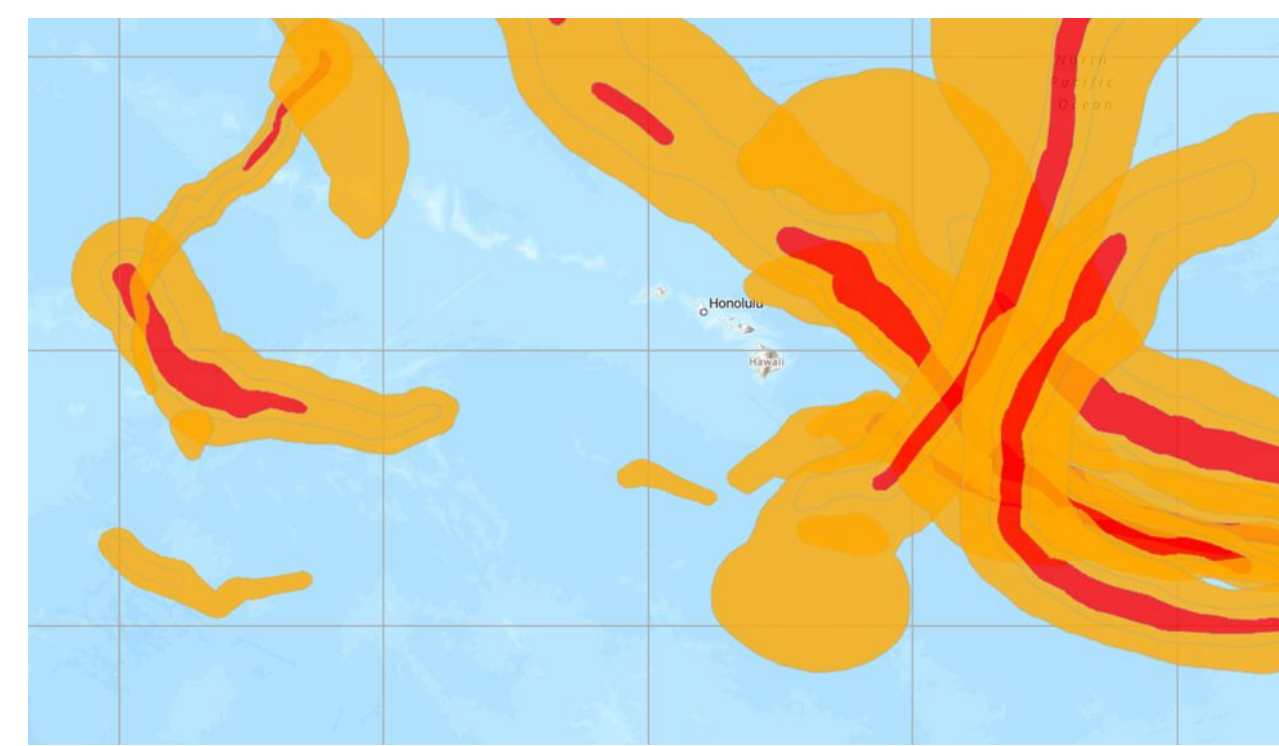
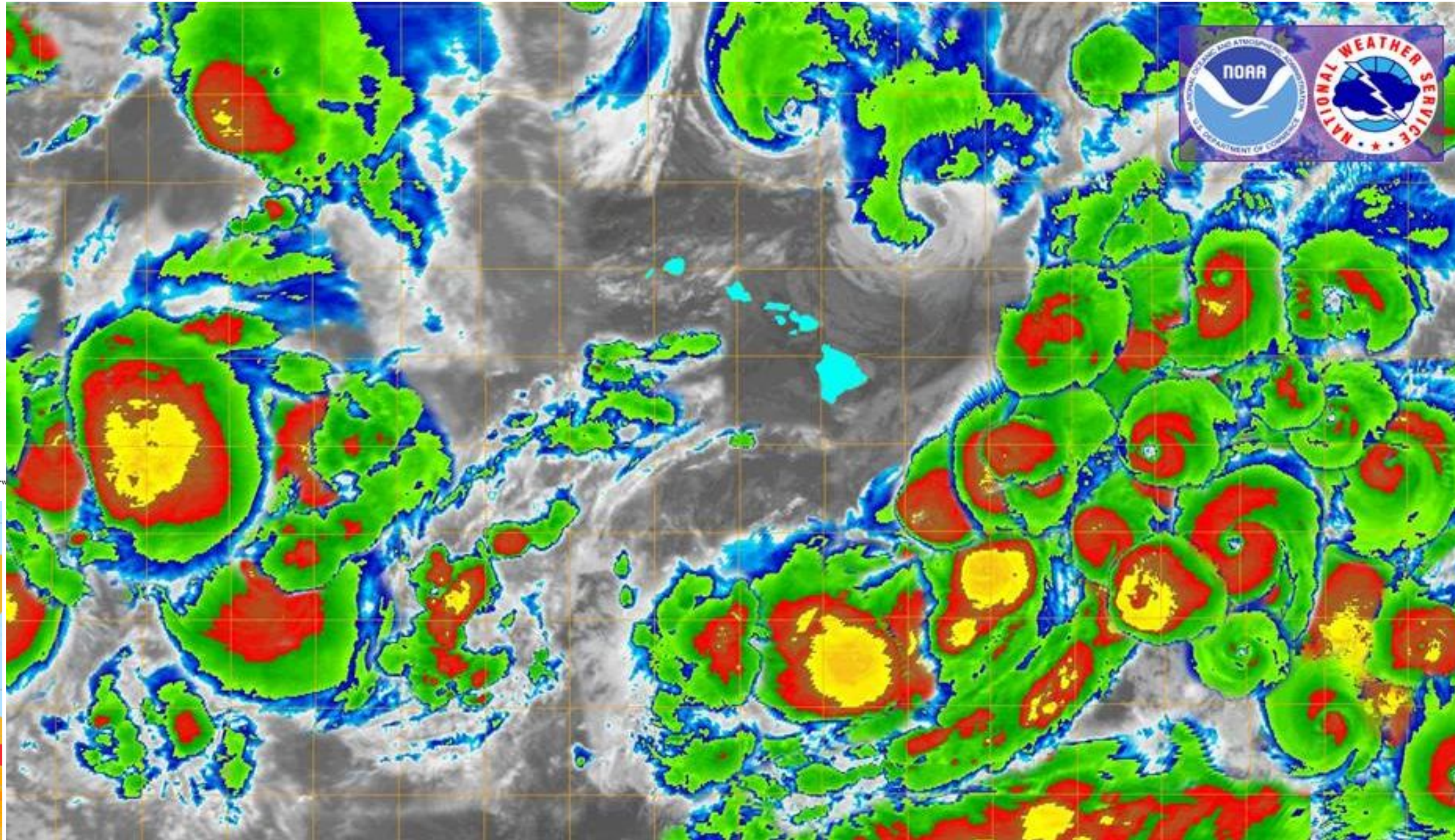
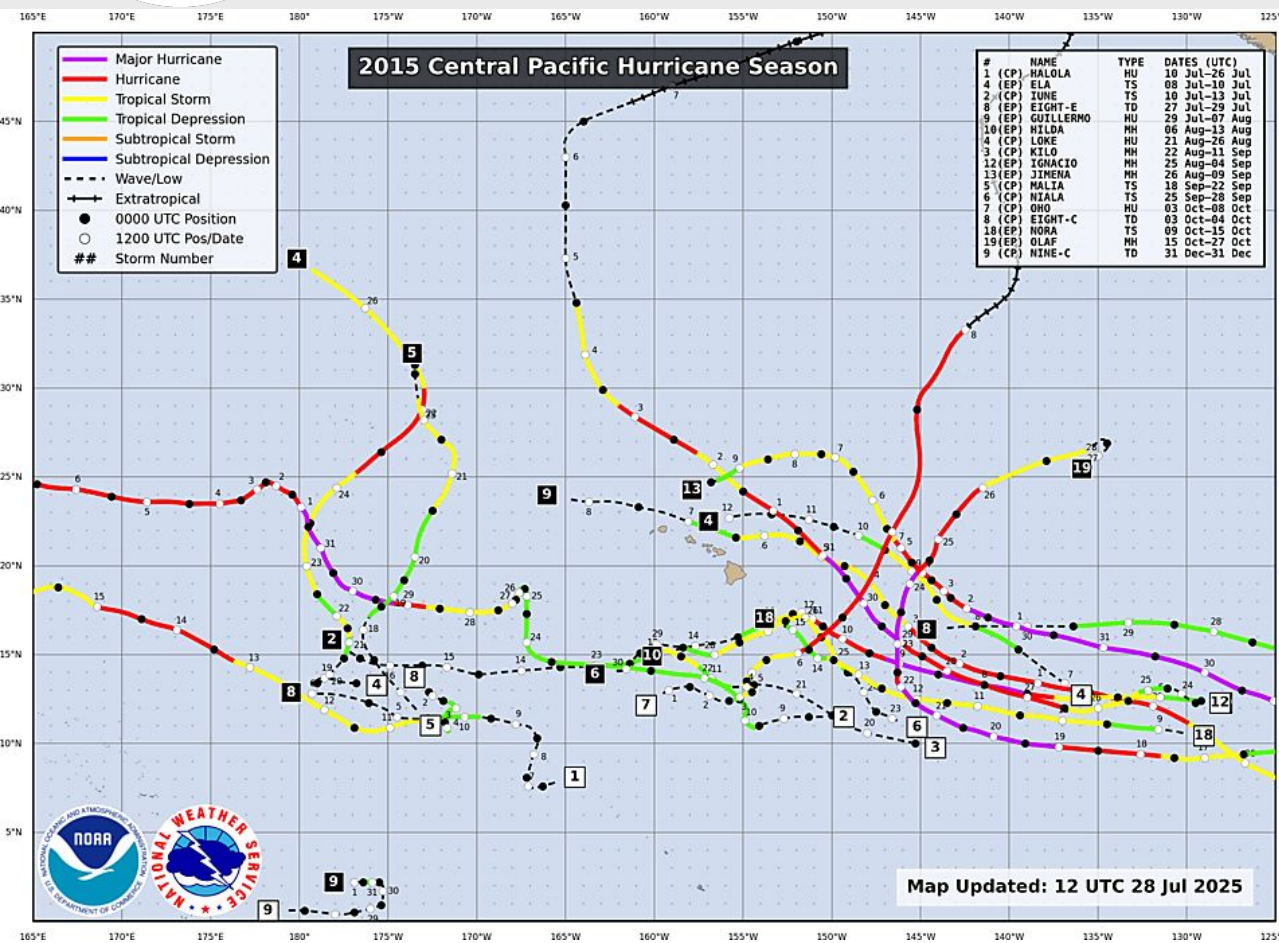
- **Orange: tropical storm (≥ 39 mph); Red: hurricane (≥ 74 mph)**





Central Pacific activity in a strong El Niño year

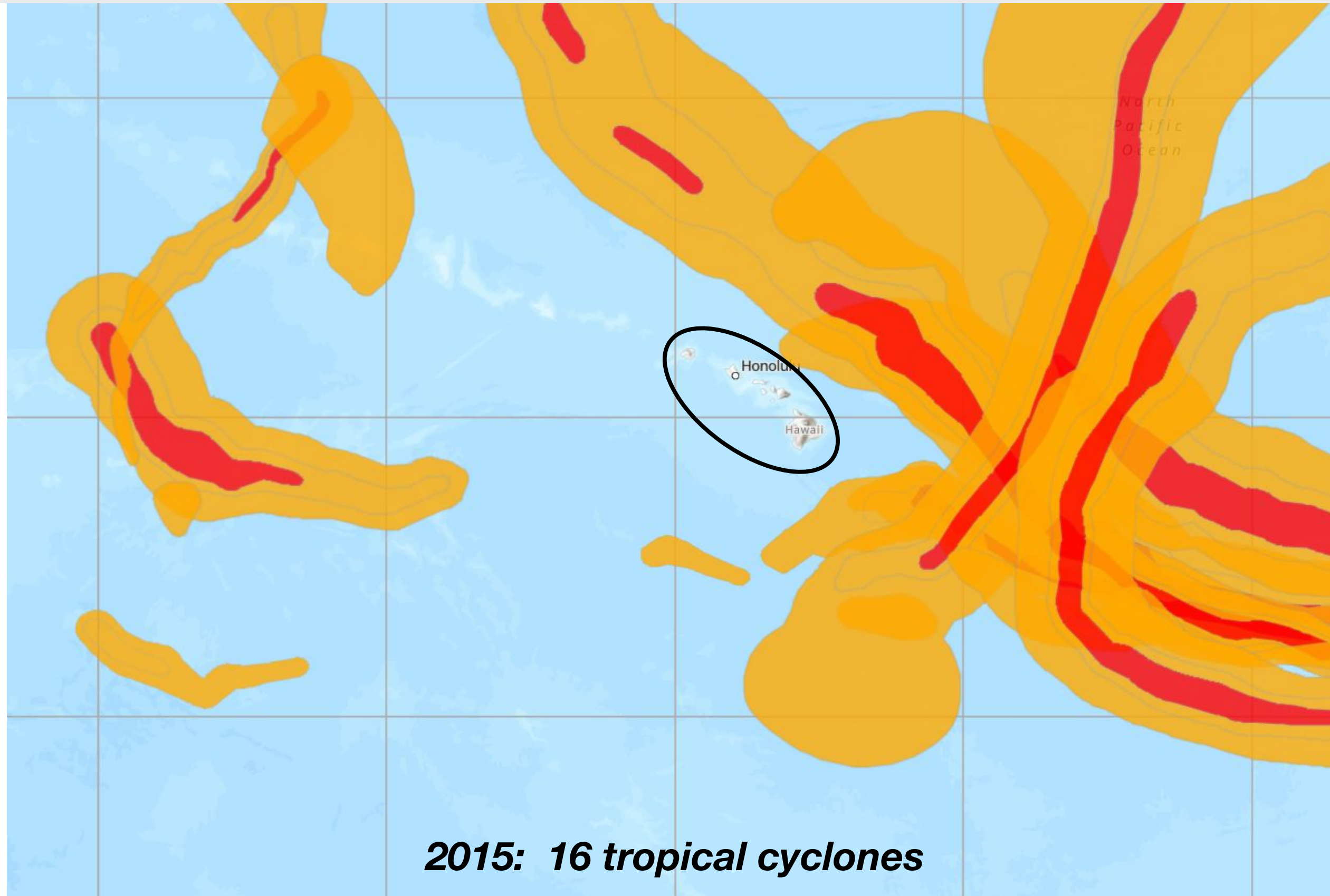
Example from 2015





Composite Wind Field – 2015 “What If”?

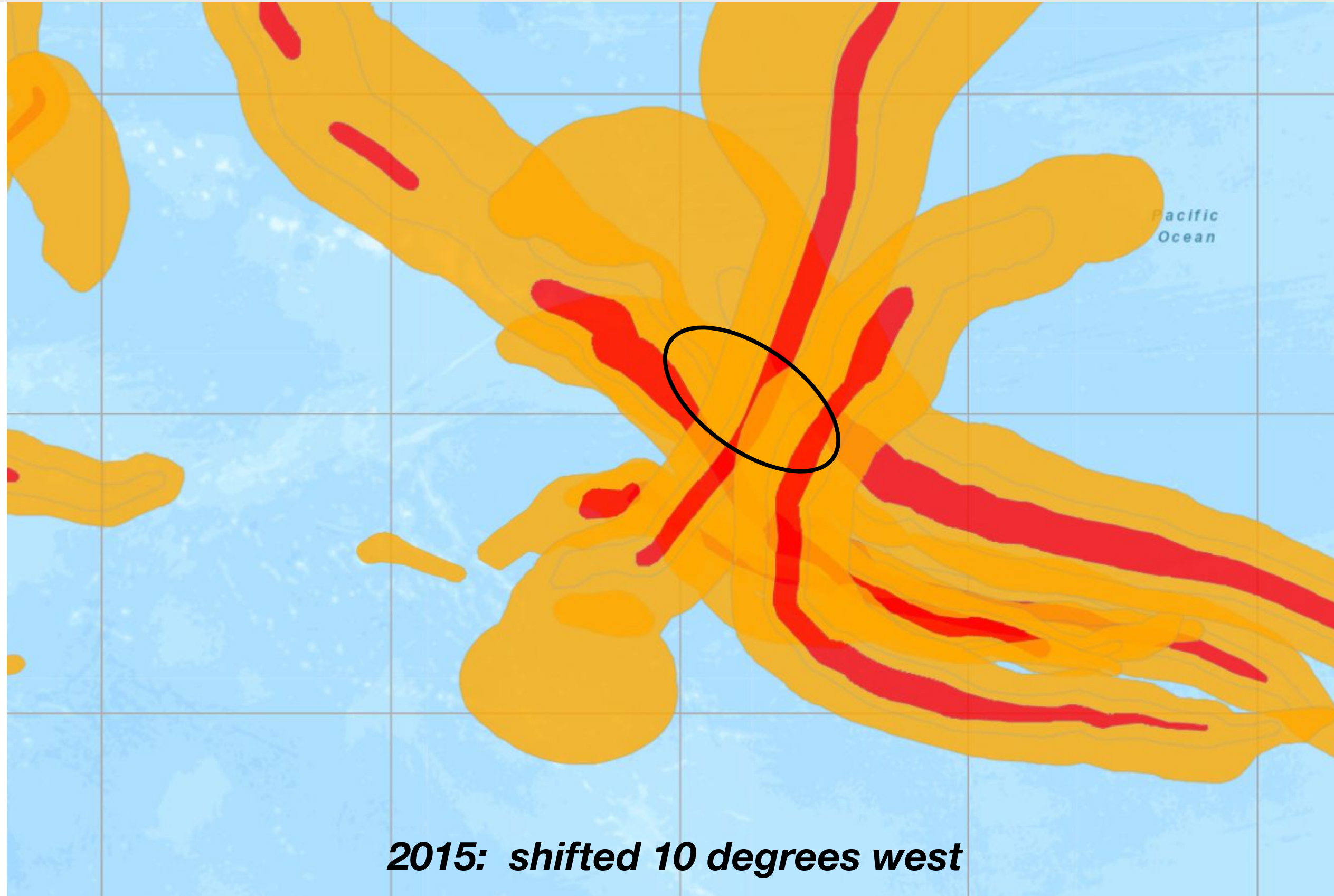
What if the weather pattern was slightly different?





Composite Wind Field – 2015 “What If”?

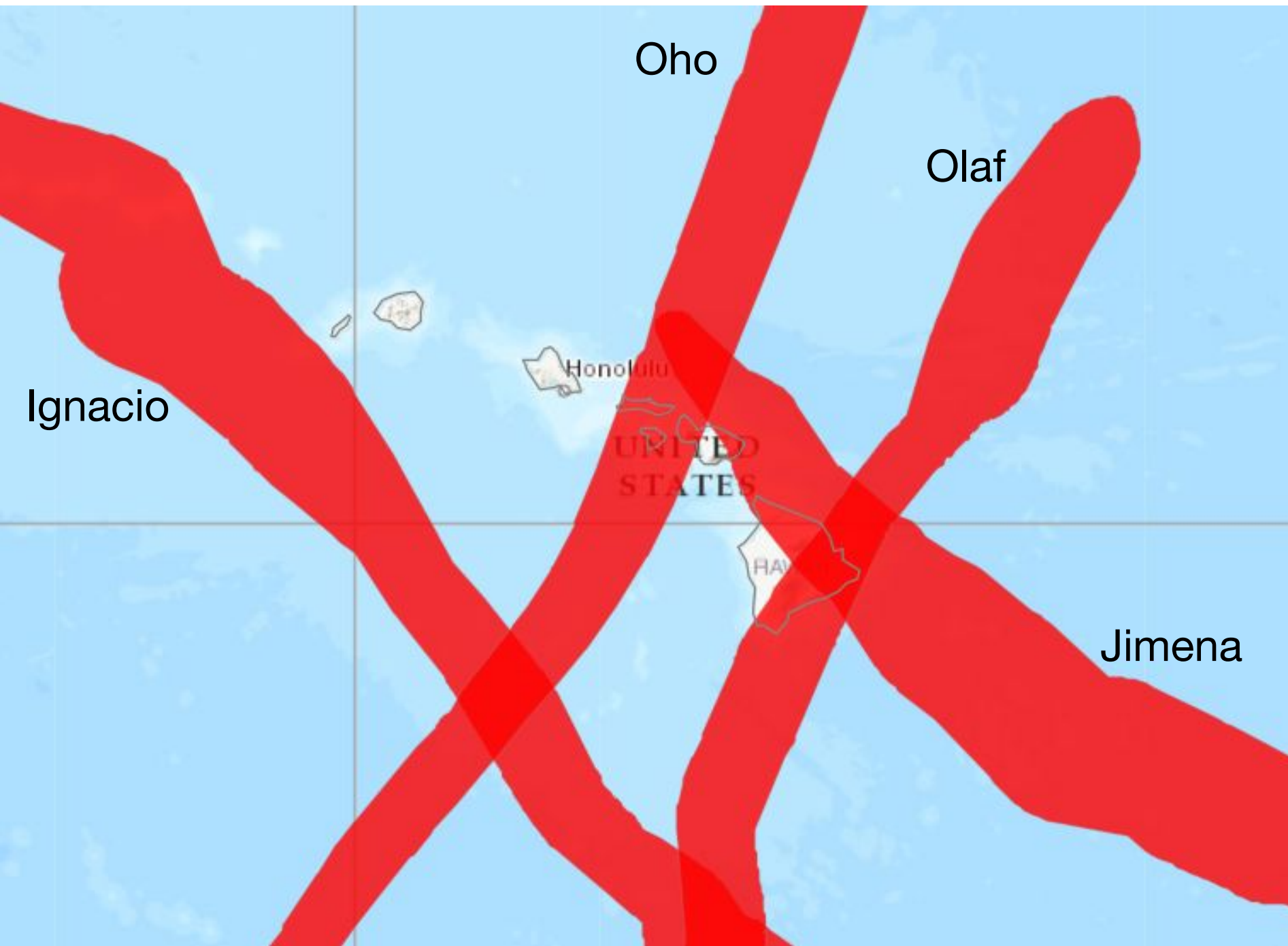
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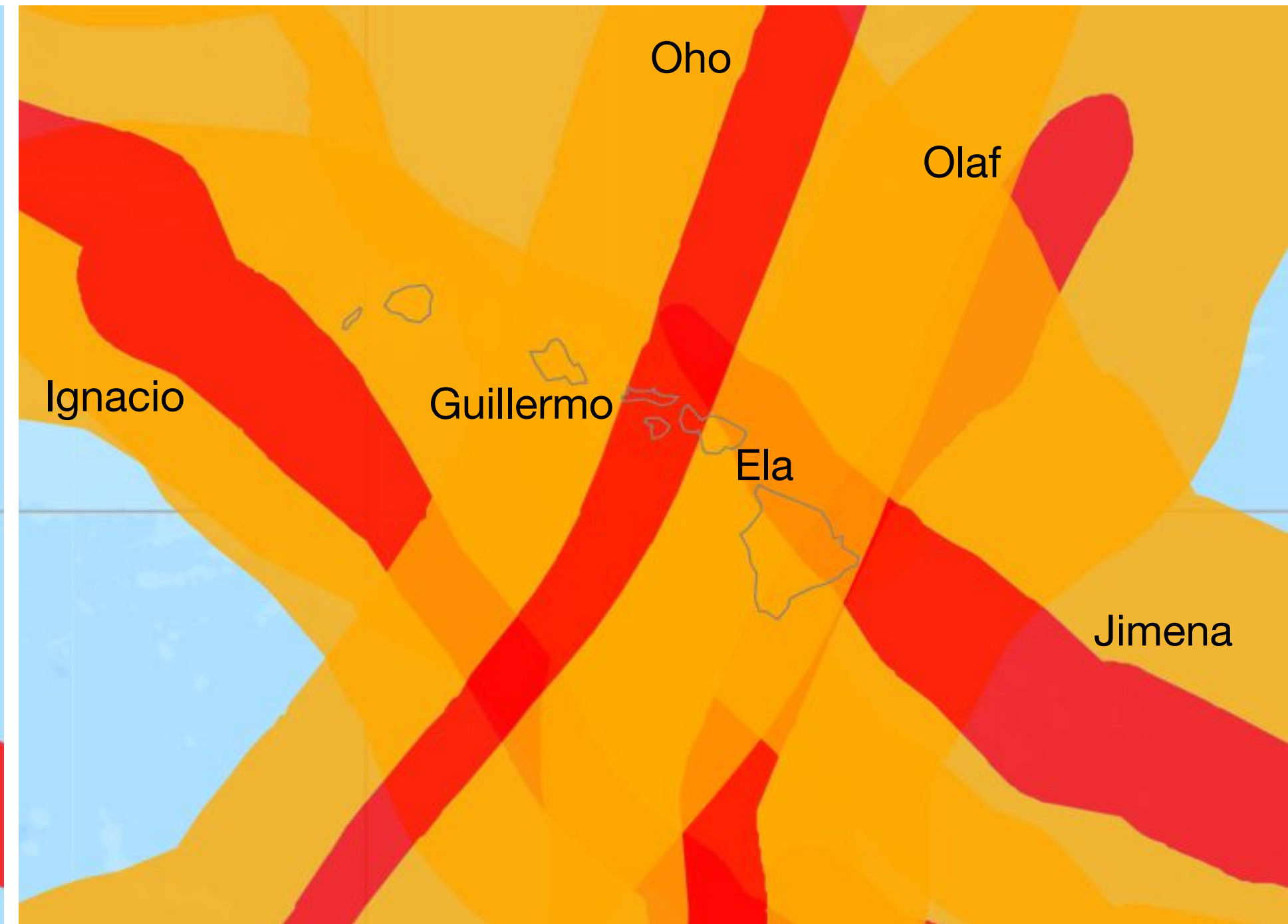


Composite Wind Field – 2015 “What If”?

What if the weather pattern was slightly different?



2015: shifted 10 degrees west (hurricane only)



2015: shifted 10 degrees west (hurricane and T.S.)



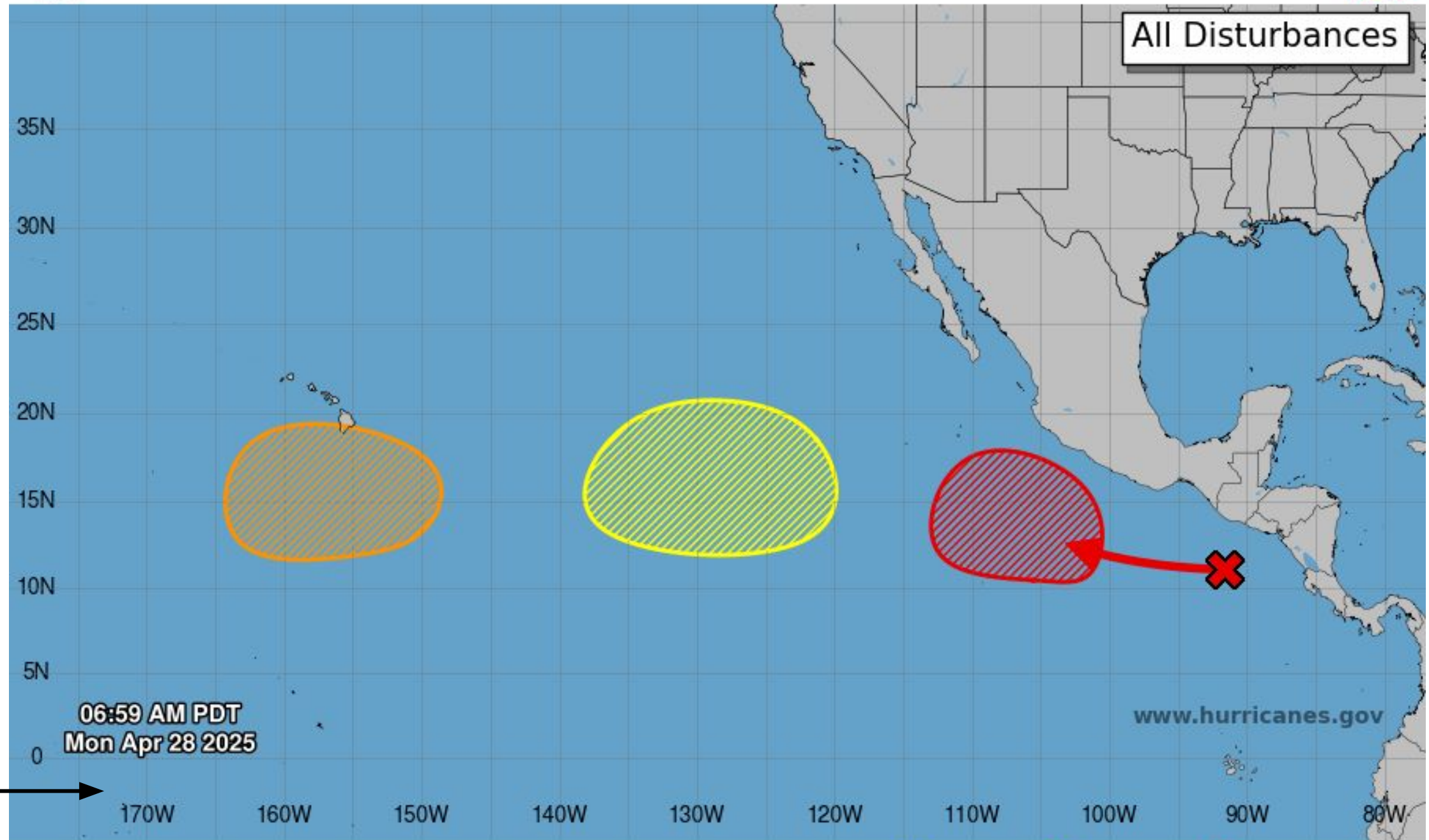
Tropical Weather Outlook – East Pacific Expansion

Central Pacific information included in East Pacific TWO since 2025



Seven-Day Graphical Tropical Weather Outlook

National Hurricane Center Miami, Florida

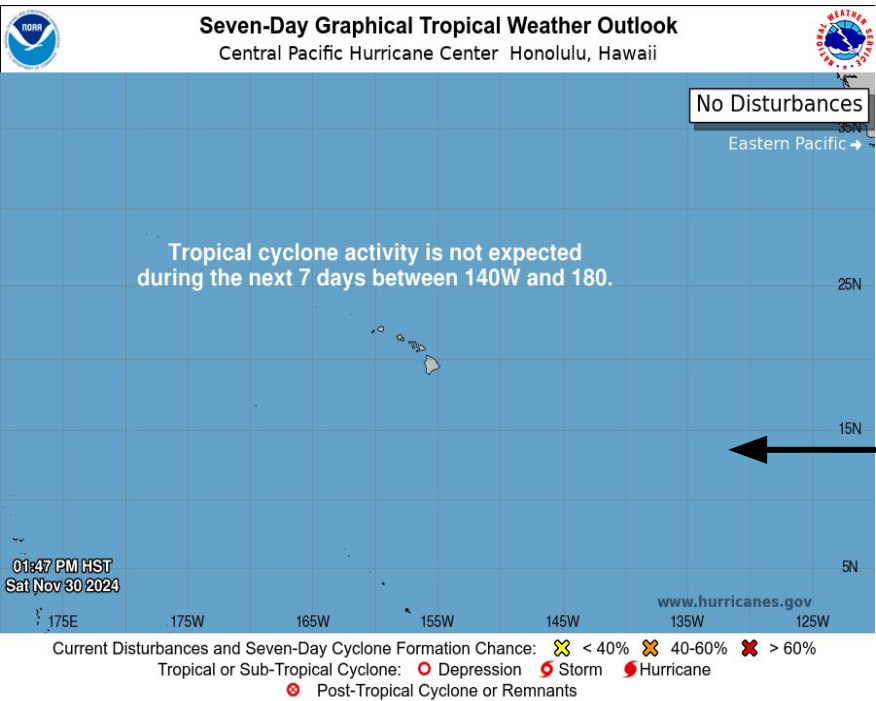


7-Day Cyclone Formation Chance and Area: < 40% 40-60% > 60%

Development not expected

Tropical or Subtropical Cyclone: Depression Storm Hurricane

Post-Tropical Cyclone or Remnants



No changes to the Central Pacific map: 120°W to 170°E



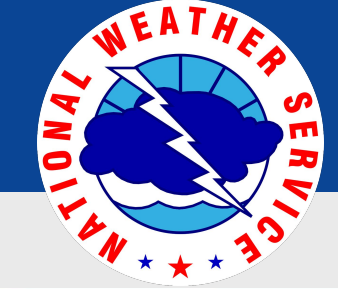
East Pacific map changed from 75°W to 145°W to 75°W to 180°W



National Oceanic and Atmospheric Administration

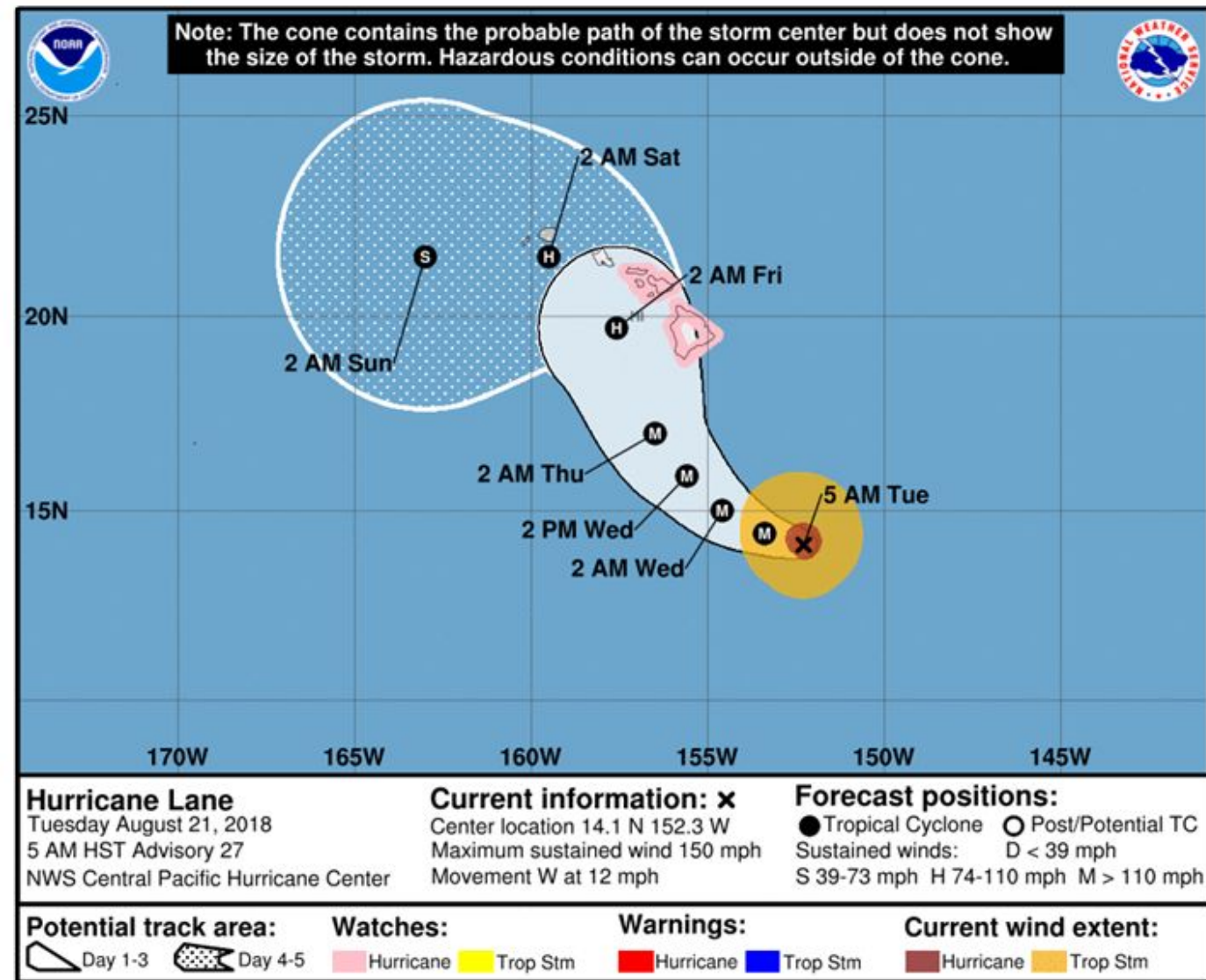
U.S. Department of Commerce

National Weather Service
Honolulu, HI



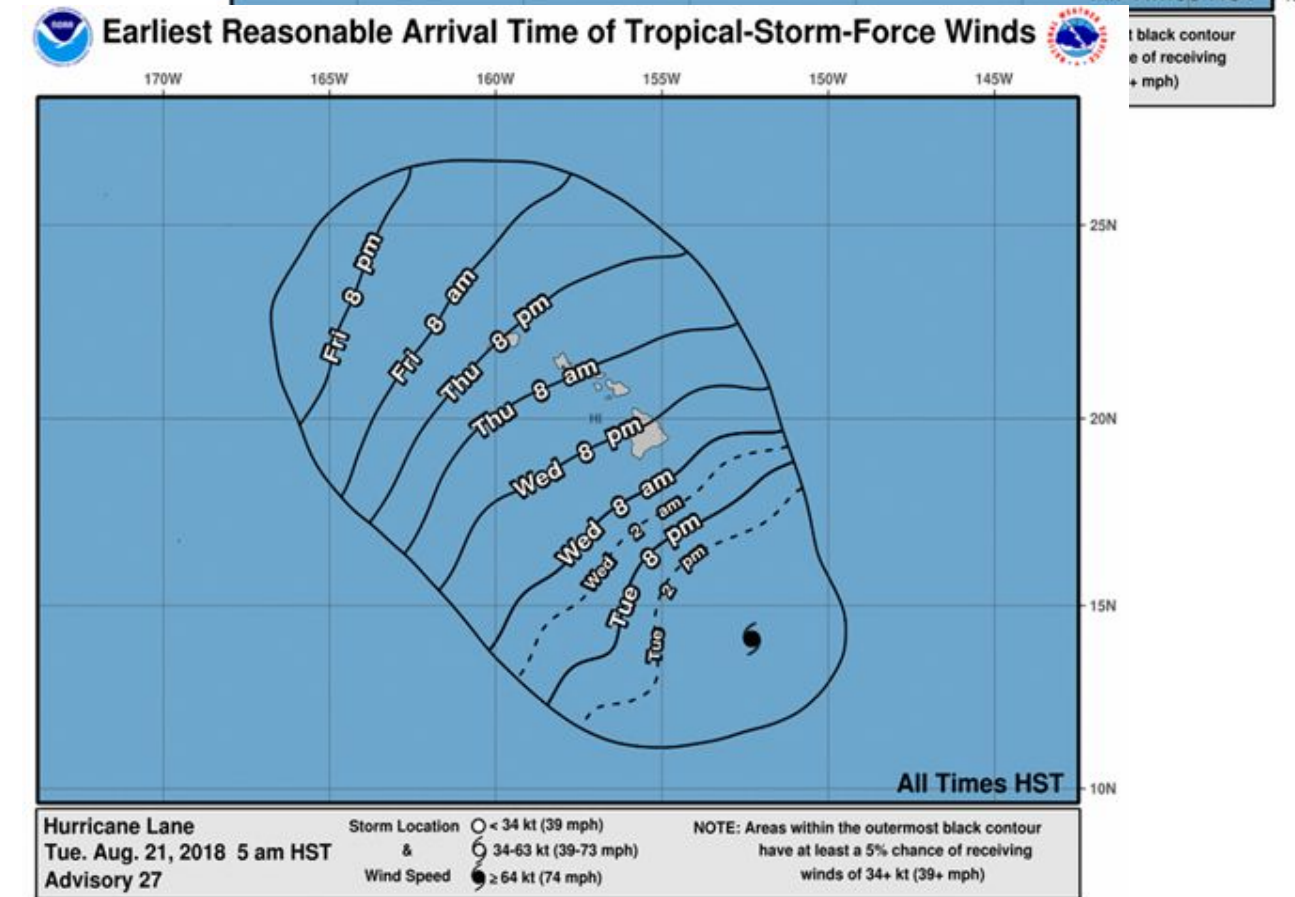
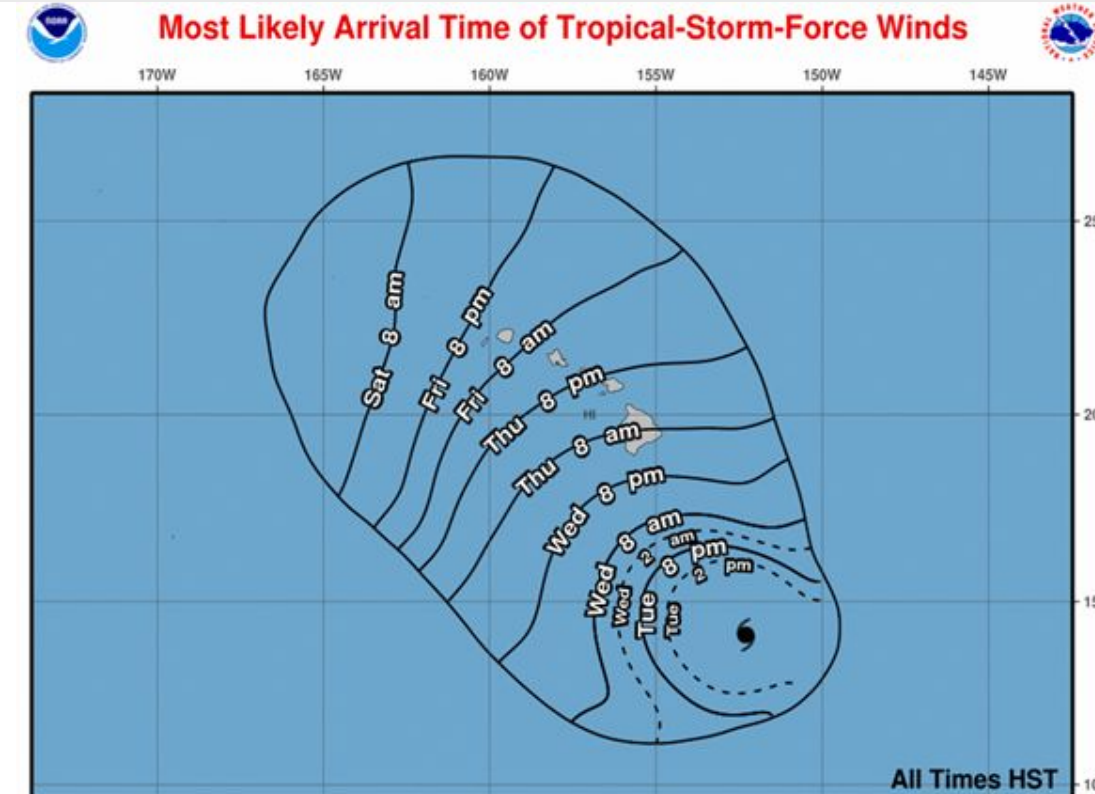
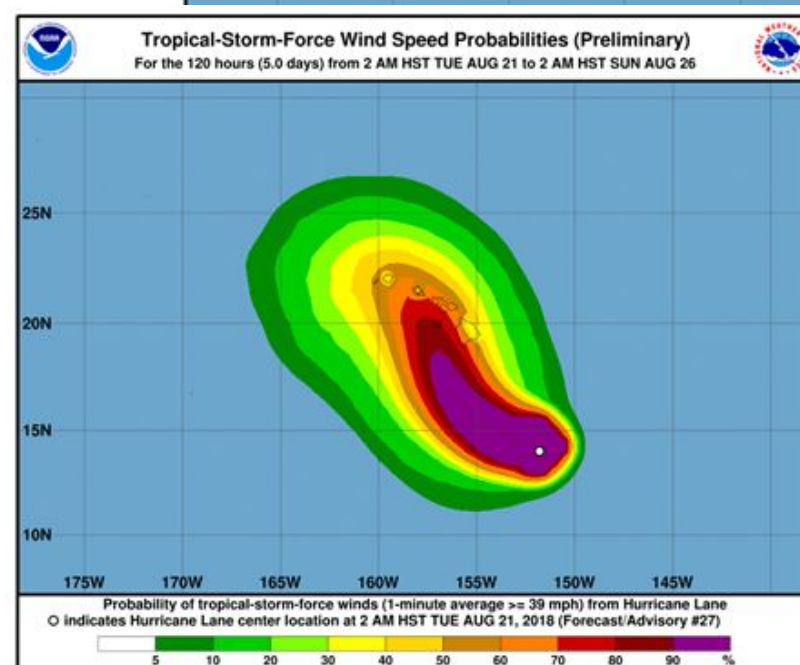
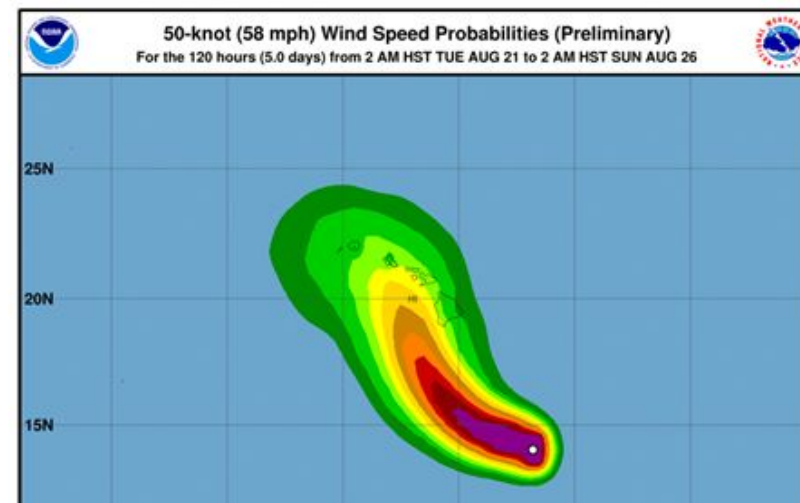
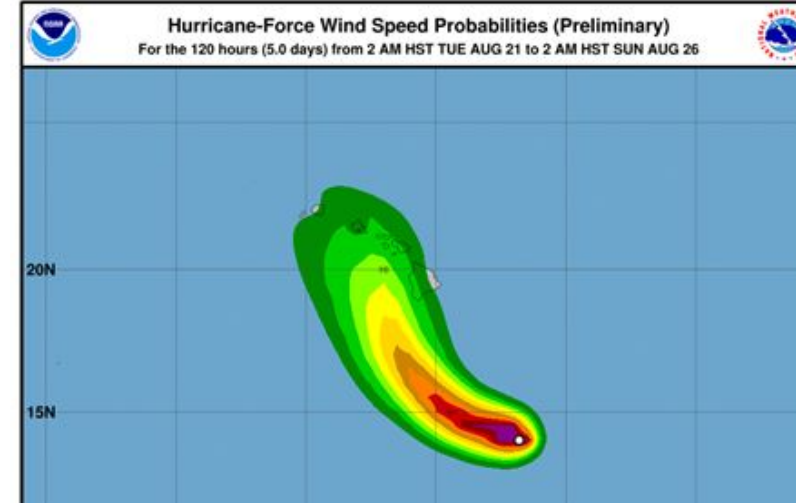
Tropical Cyclone Graphics

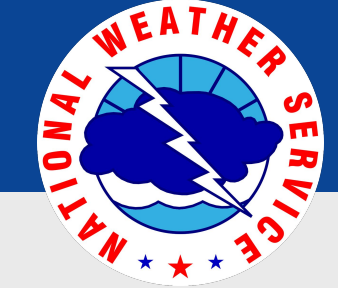
Hurricane Lane Example – Tuesday Aug 21, 2018, 5 am HST



- A more in-depth recorded webinar for media and the public is available here:

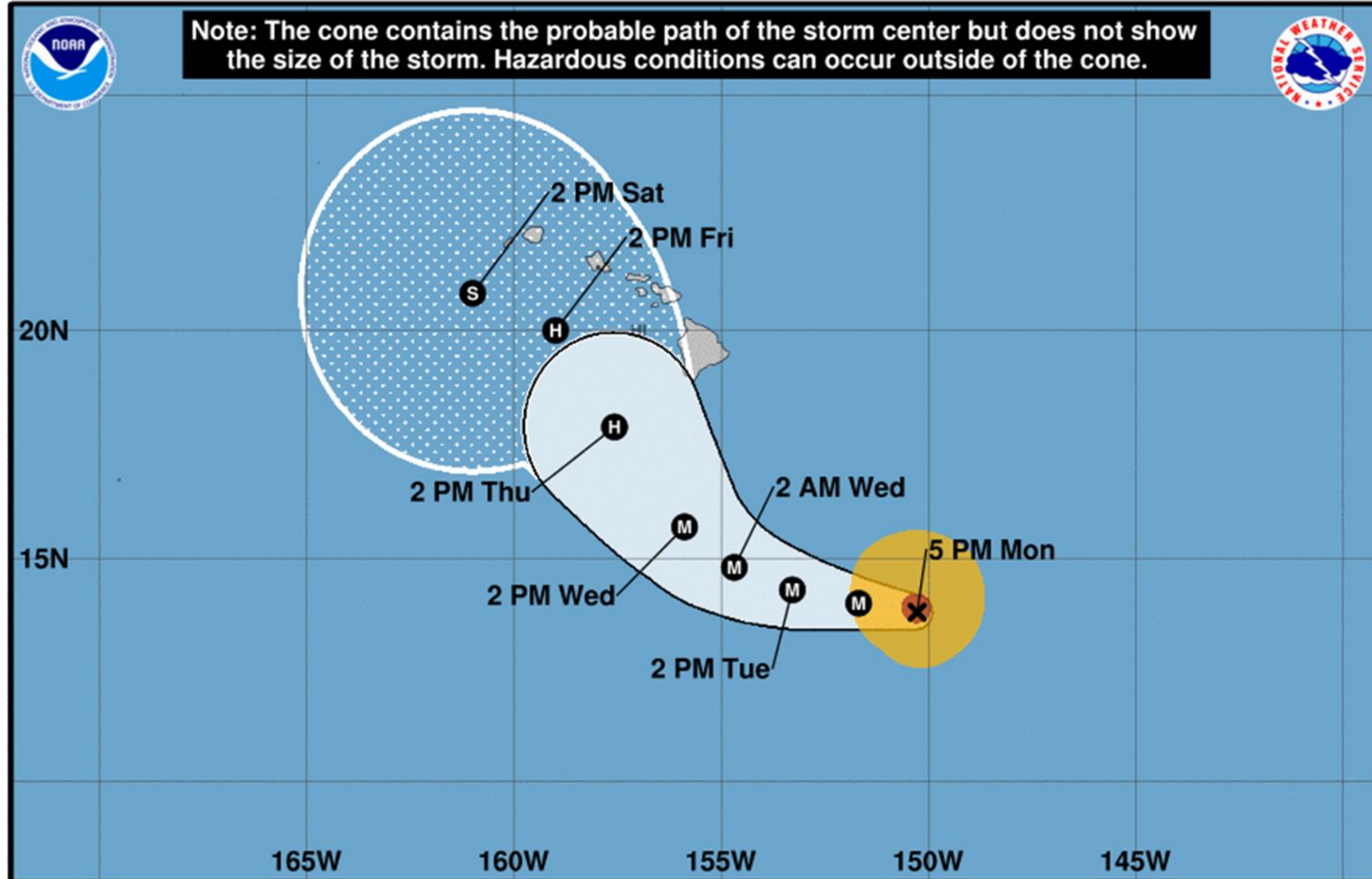
<https://youtu.be/FhTonbgYSXE>

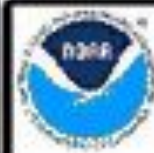
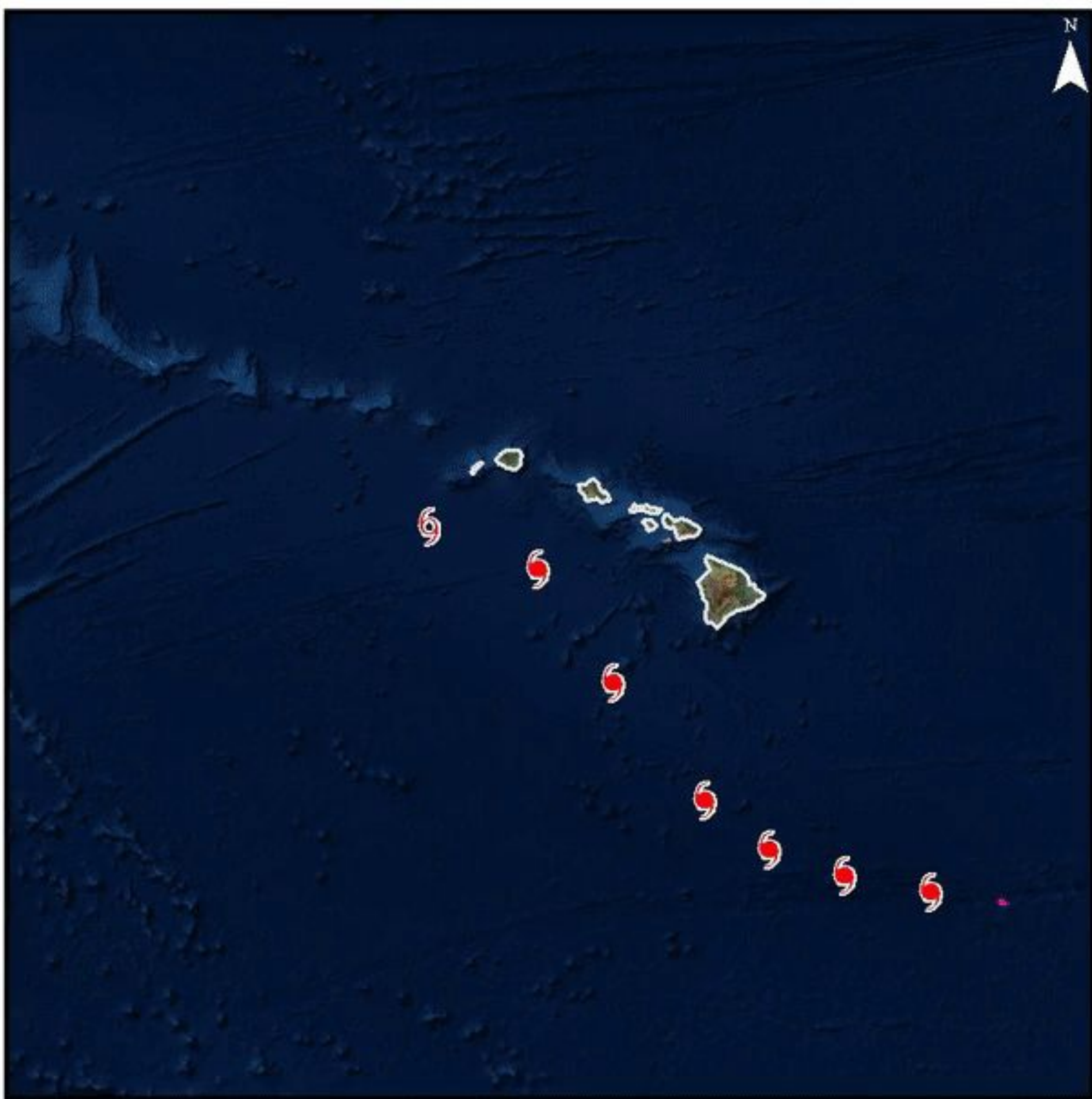




Error Cone – What about impacts?

Hurricane Lane – Monday Aug 20, 2018, 5 pm HST





Hurricane Lane



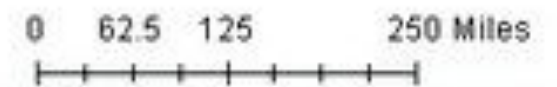
08-21-18 at 02Z

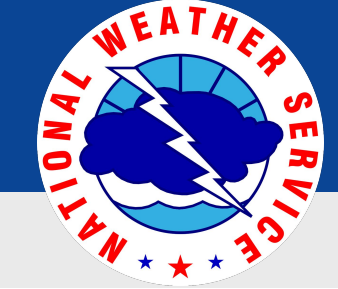
Wind Speed Intensity (kts)

- 5 - 33
- 34 - 64
- 65 - 83
- 84 - 95
- 96 - 113
- 114 - 134
- 135 - 200

Official Track

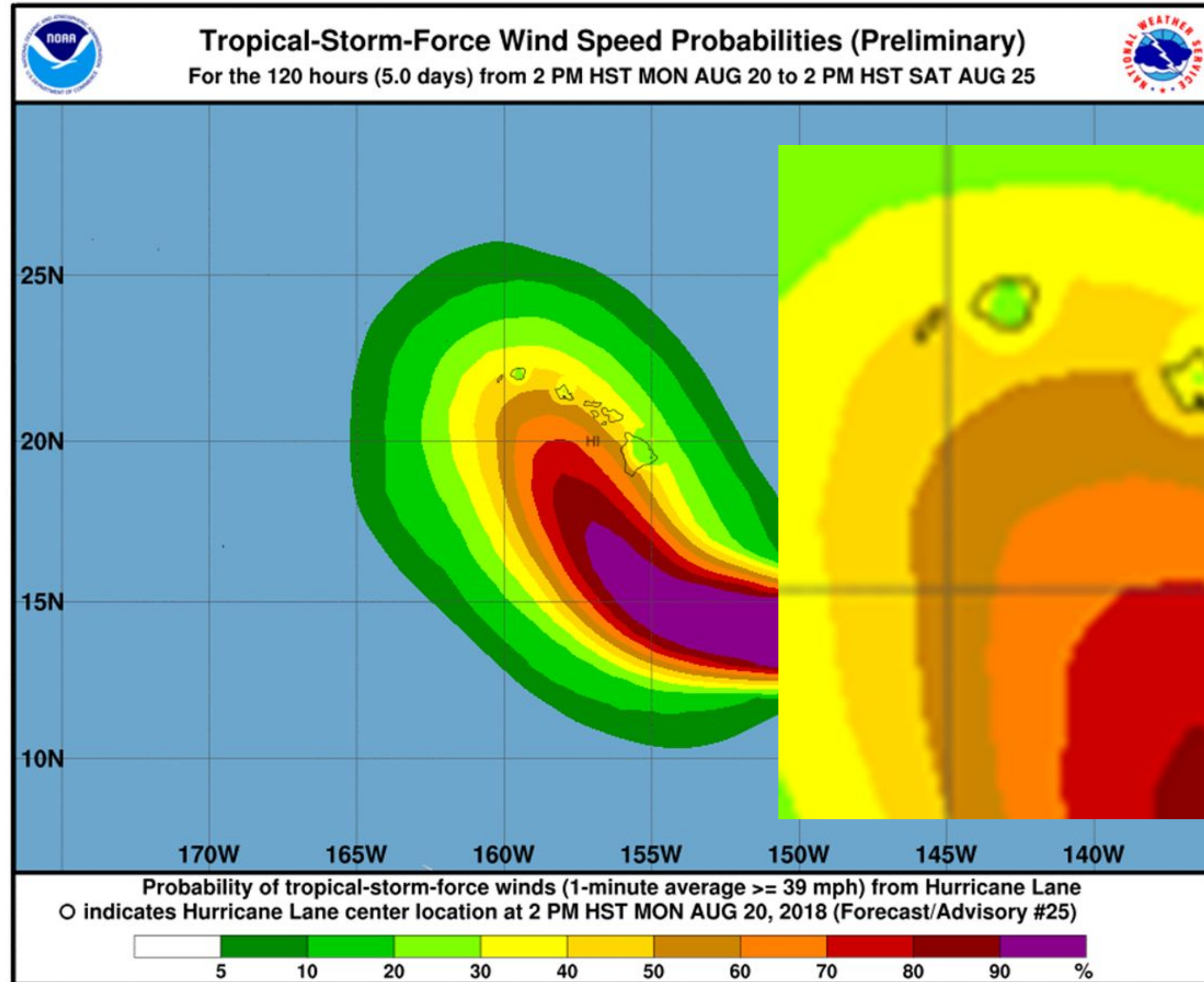
- knots
- L 15 - 33
 - 6 34 - 65
 - 6 65 - 200

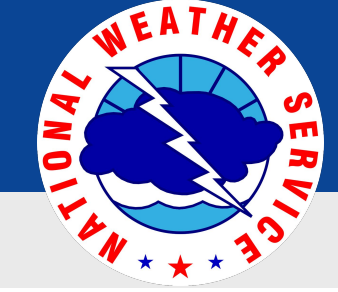




Graphics – Wind Speed Probabilities

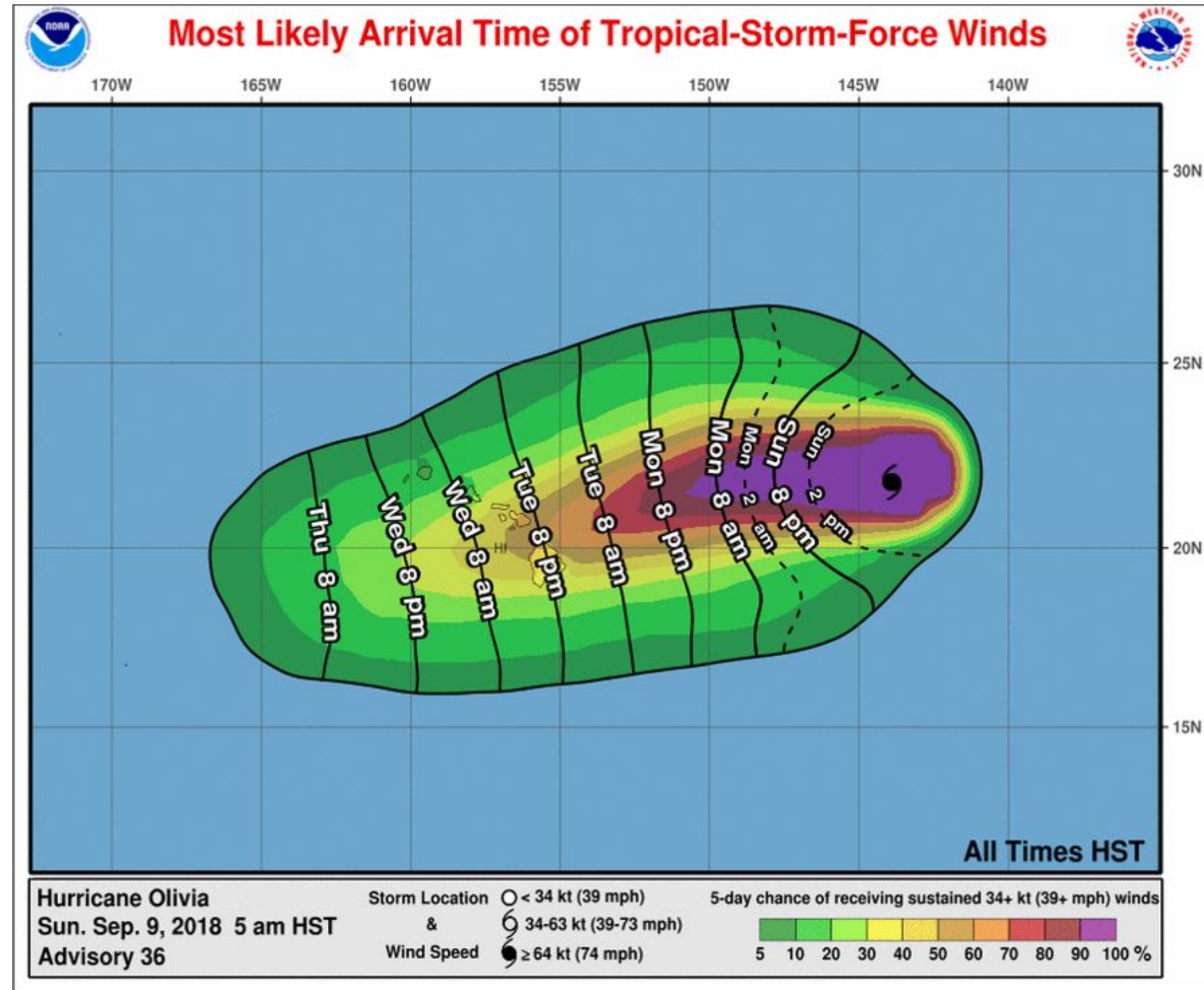
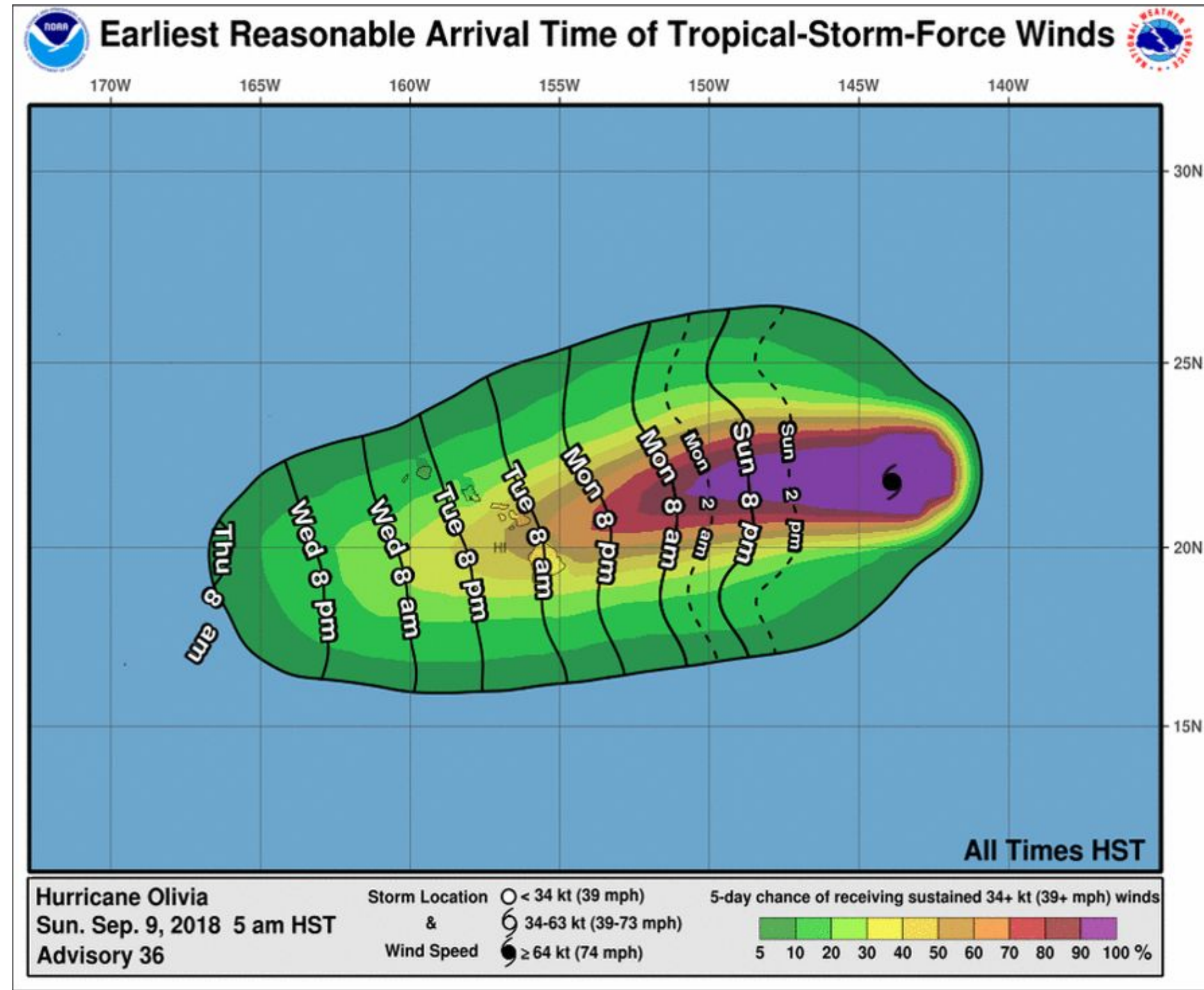
Hurricane Lane – Monday Aug 20, 2018, 5 pm HST

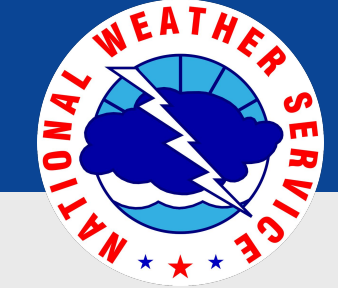




Time of Arrival

Earliest Reasonable vs Most Likely





Time of Arrival – Why Different Times?

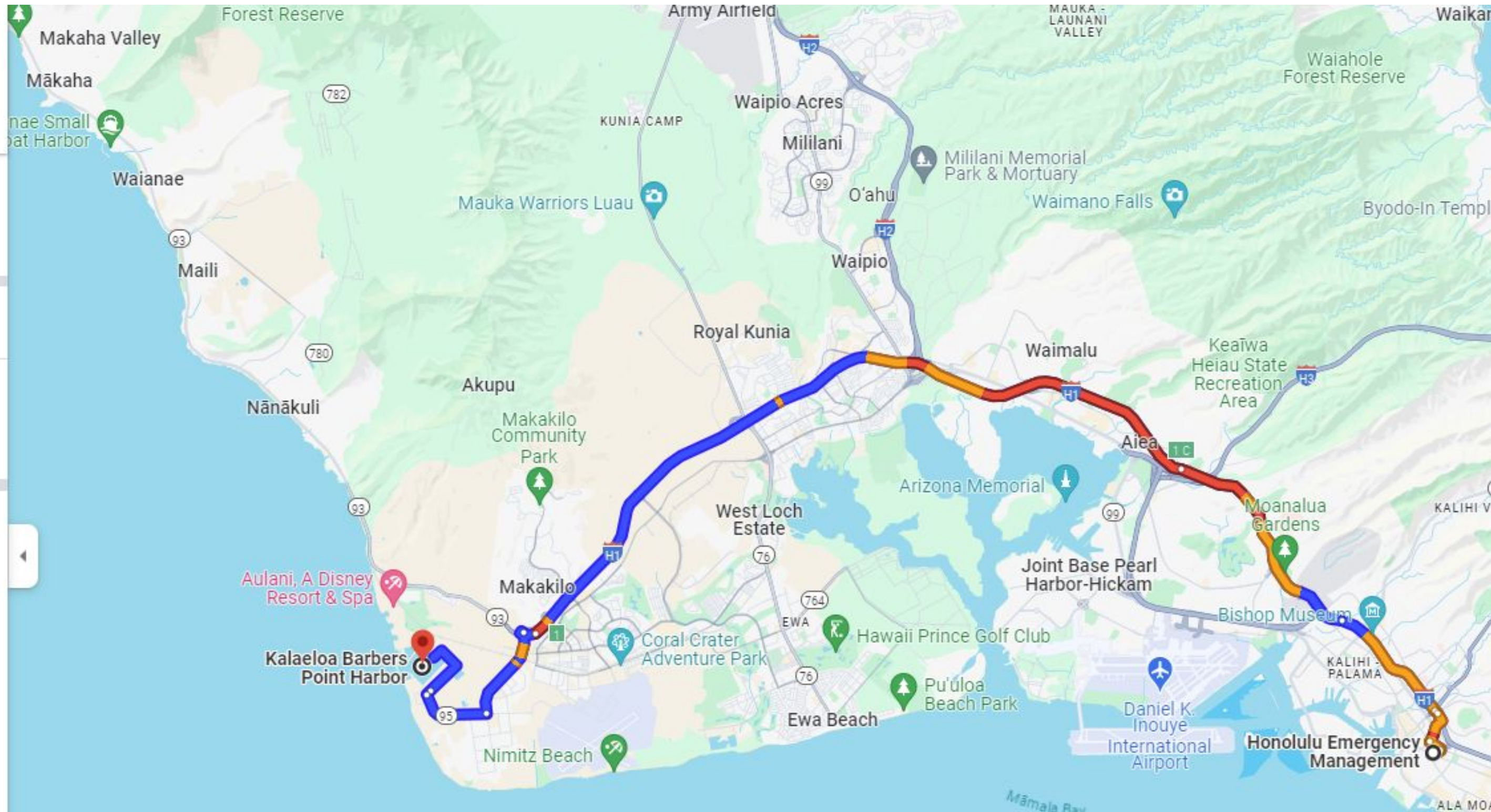
Based on risk sensitivity

○ Honolulu Emergency Management, 650 S
 ○ Kalaeloa Barbers Point Harbor, Barbers Po

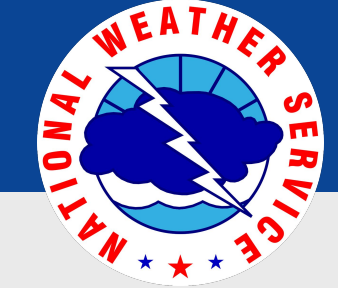
Arrive by 5:00 PM Fri, Jun 21

Send directions to your phone Copy link

via I-H-1W typically 40 min to 1 hr 15 min
 Leave around 3:45 PM
 25.1 miles



“typically 40 min to 1 hr 15 min”



Time of Arrival – Why Different Times?

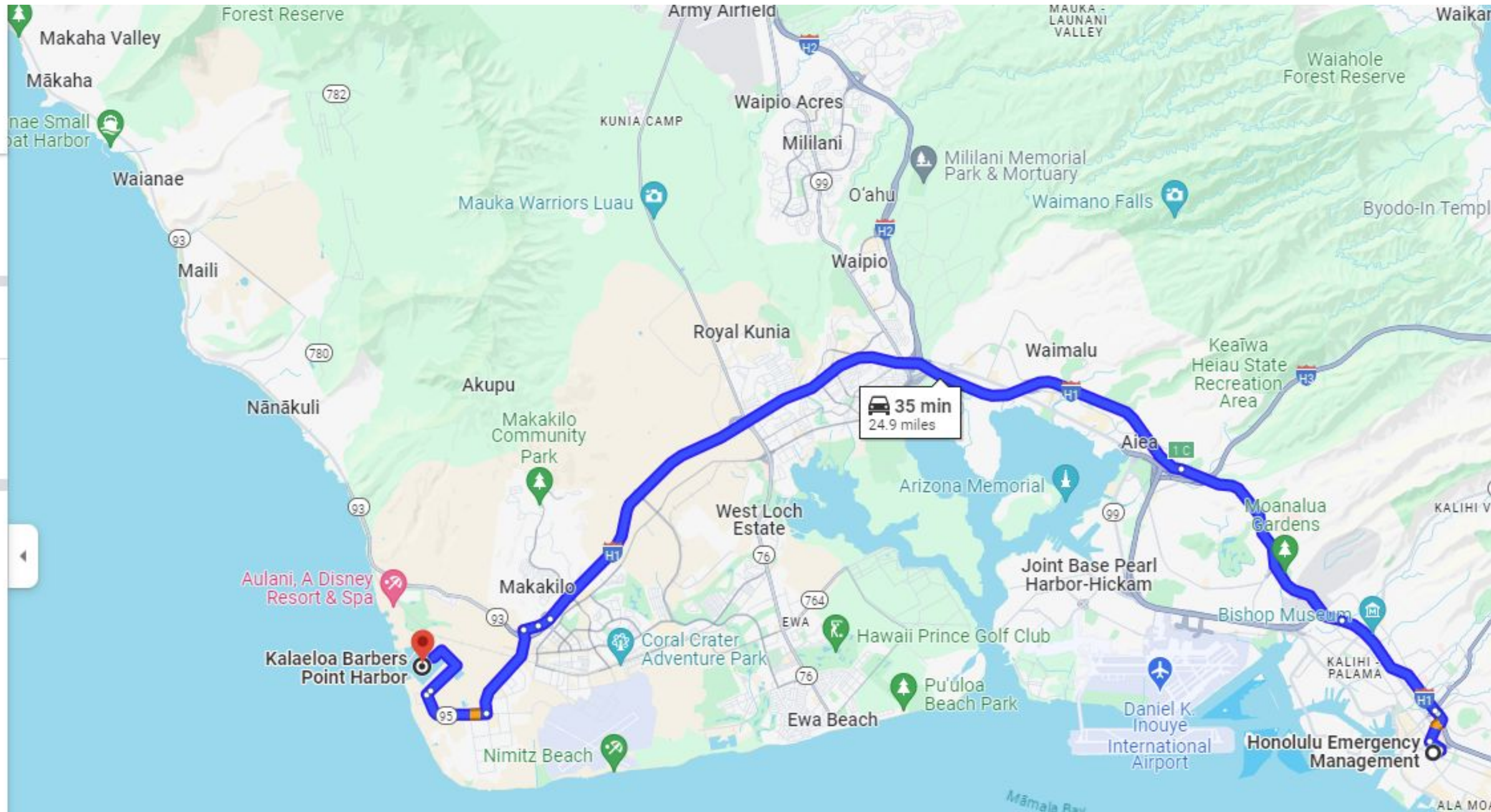
Based on risk sensitivity

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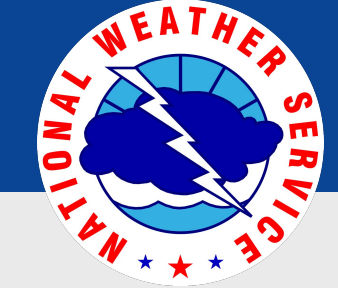
⊕ Arrive by ▾ Options
 ⌚ 3:00 AM ⏪ ⏩ 📅 Fri, Jun 21 ⏪ ⏩

📱 Send directions to your phone 🔗 Copy link

🚗 via I-H-1W typically 35 min
 Leave around 2:25 AM
 24.9 miles
 Details

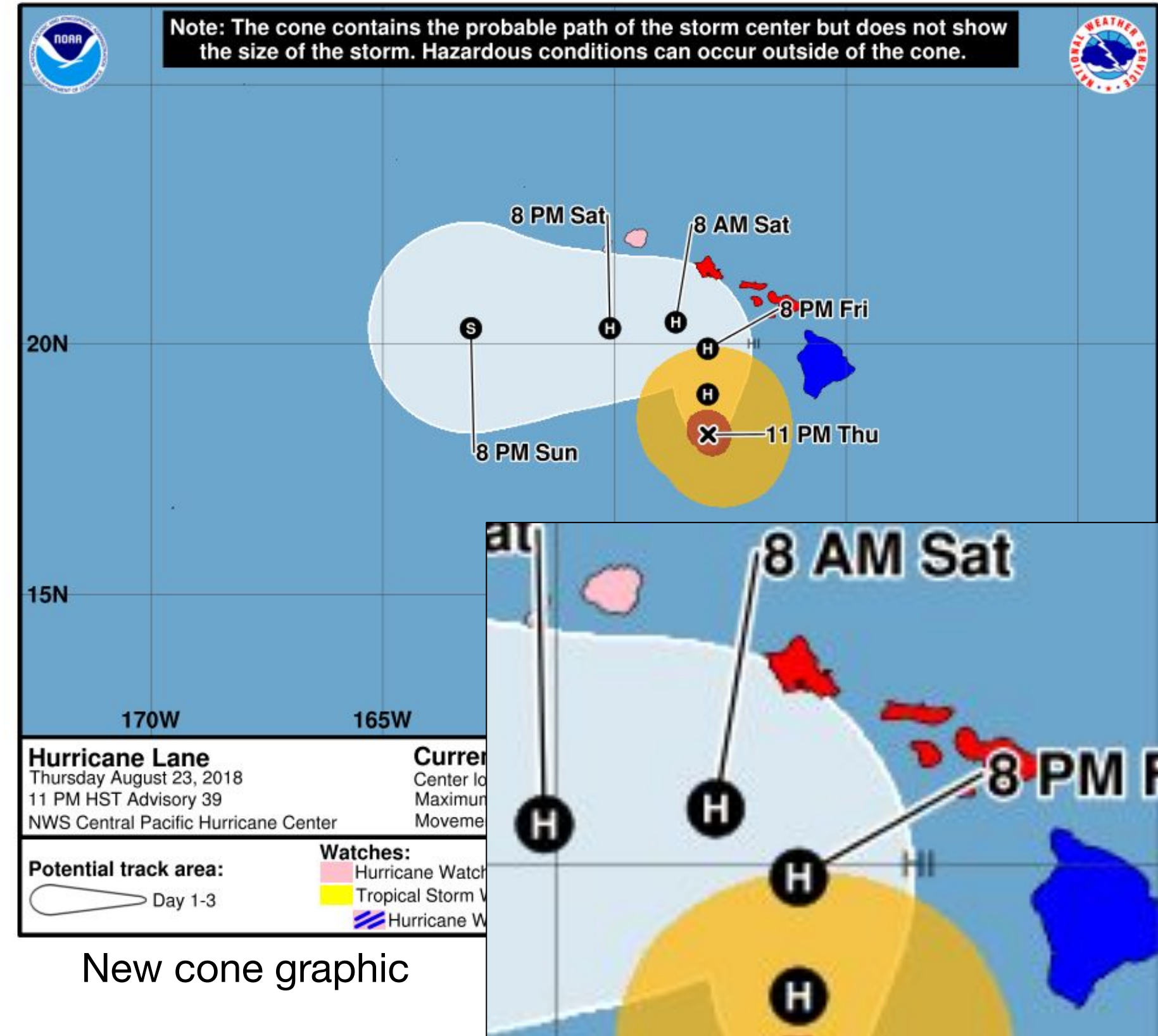
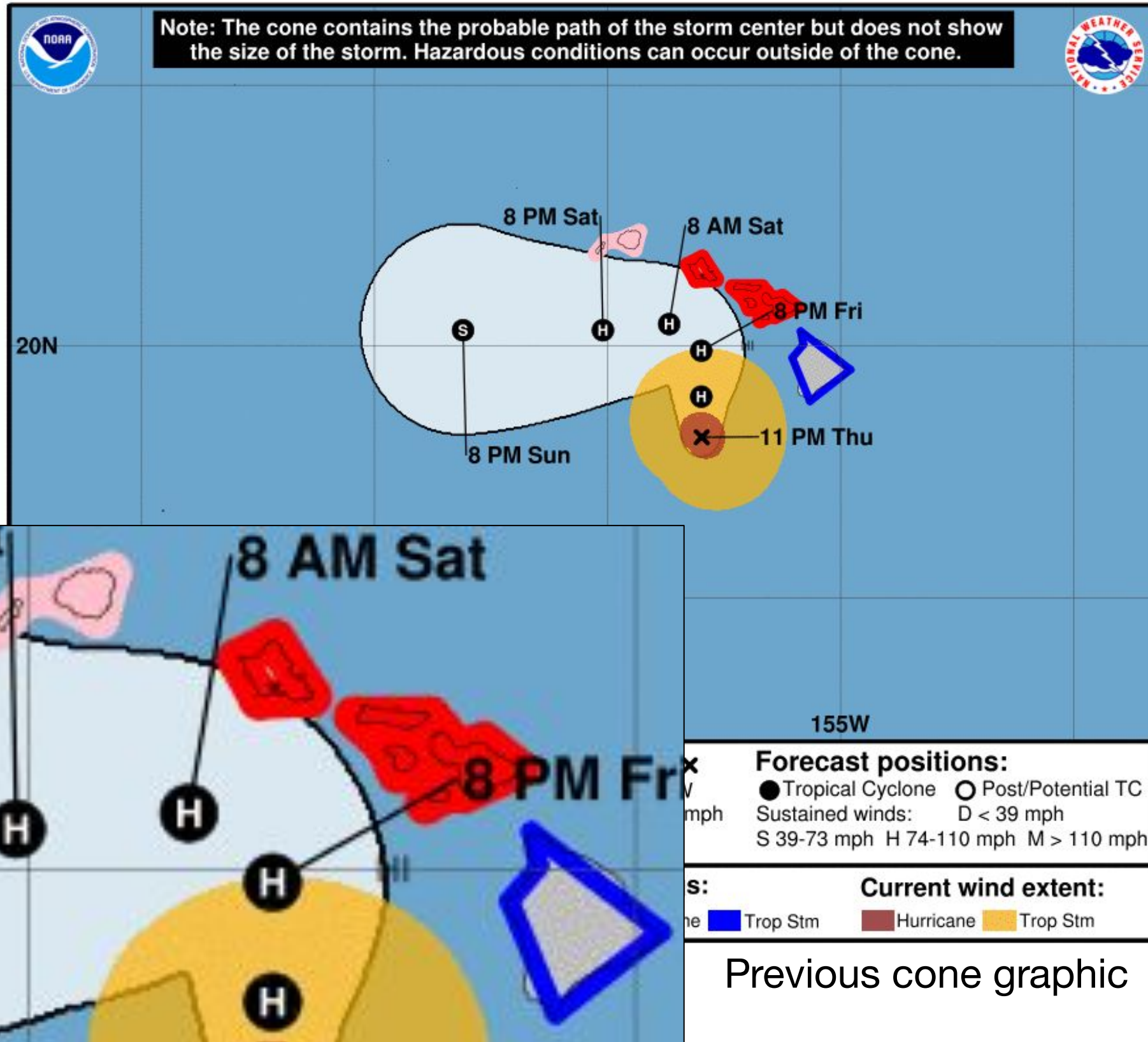


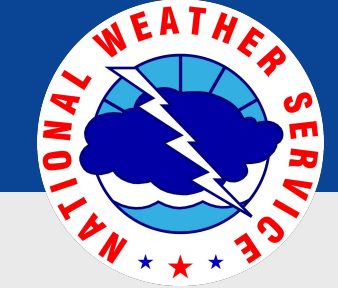
“typically 35 min”



New Cone Graphic

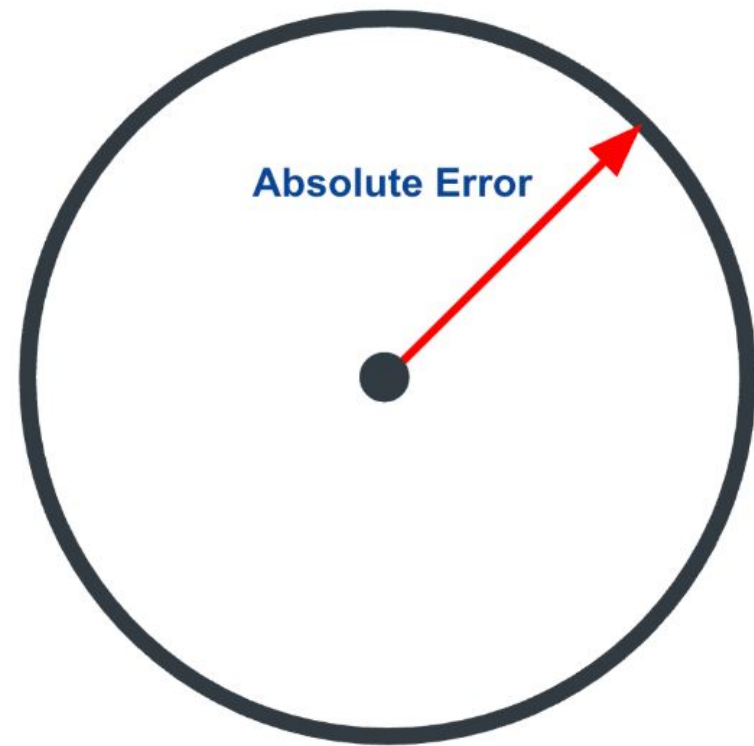
“Inland” Watch/Warning display - cleaner look for Hawaii





New Experimental Cone in 2026

Experimental cone based on speed and direction errors

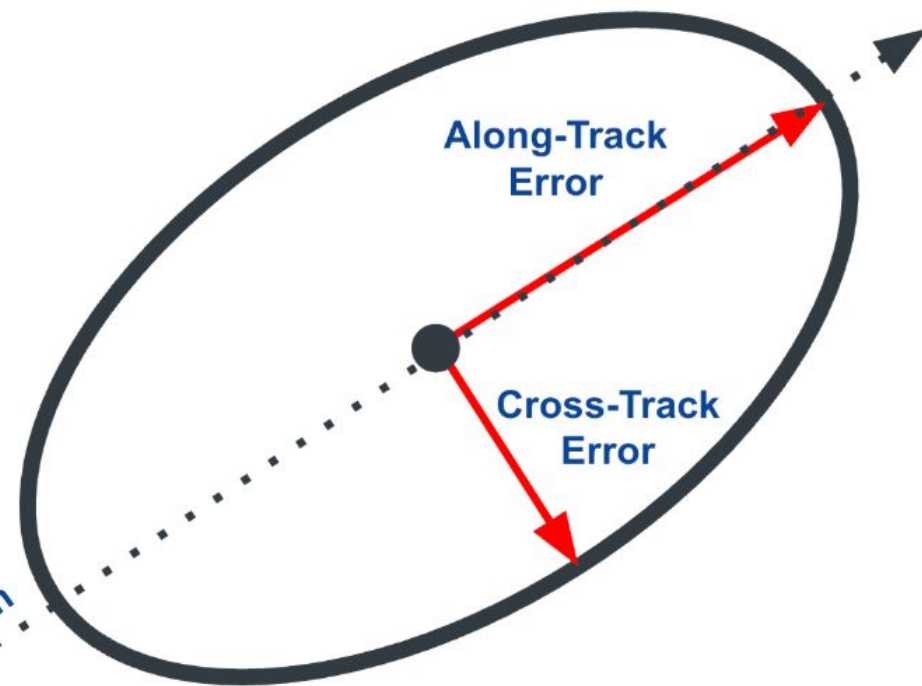


**Operational
Cone**

Traditionally, NHC's cone graphic is calculated based on 67% of absolute track error from the past five years, resulting in a cone formed based on circles at each forecast point.

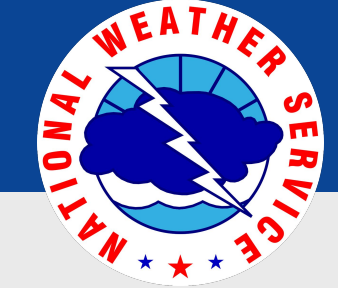
In 2026, the experimental cone graphic will:

- Utilize both **along-track (forward speed)** and **cross-track (direction)** errors, resulting in an ellipse-based cone.
- Use 90% along-track and cross-track errors over the past 5 years to define the size of the ellipse instead of 67%



**Experimental
Cone**

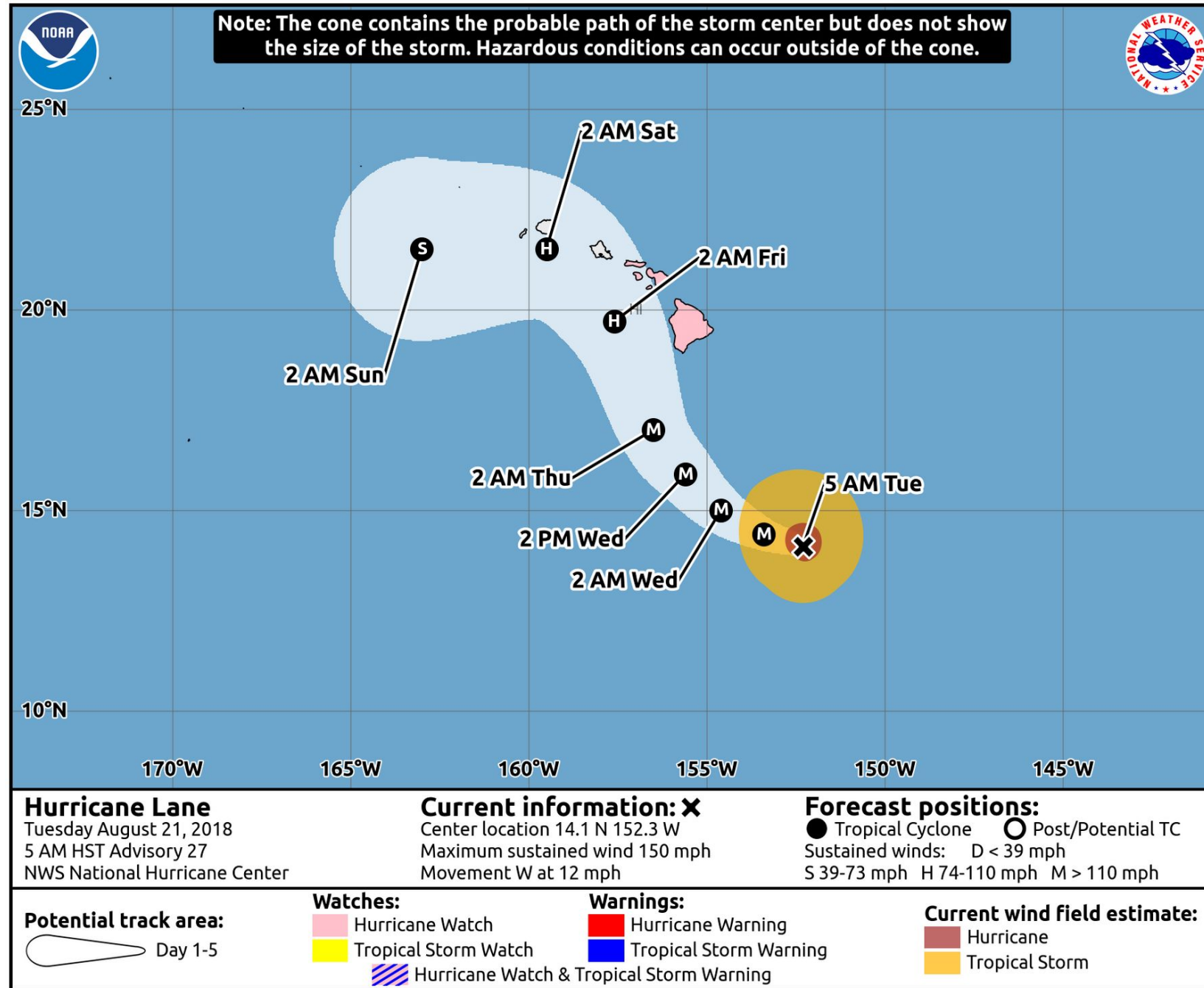




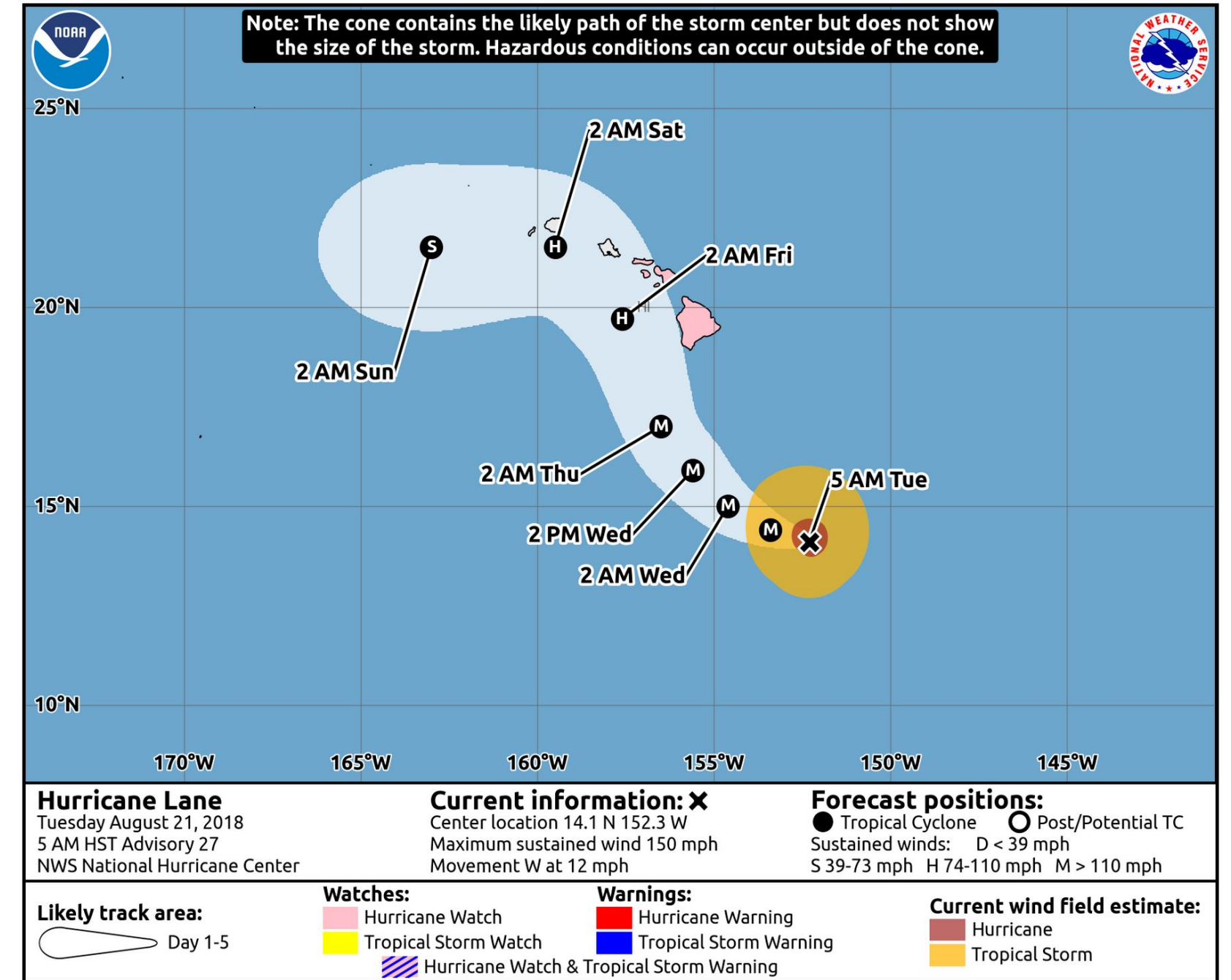
Experimental Cone of Uncertainty

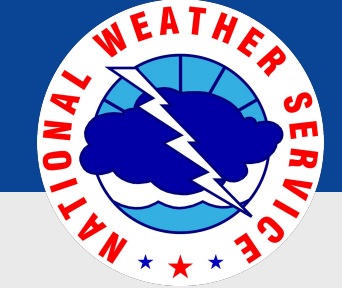
Example from Hurricane Lane (2018)

Operational Circle Cone (67th percentile of absolute errors)



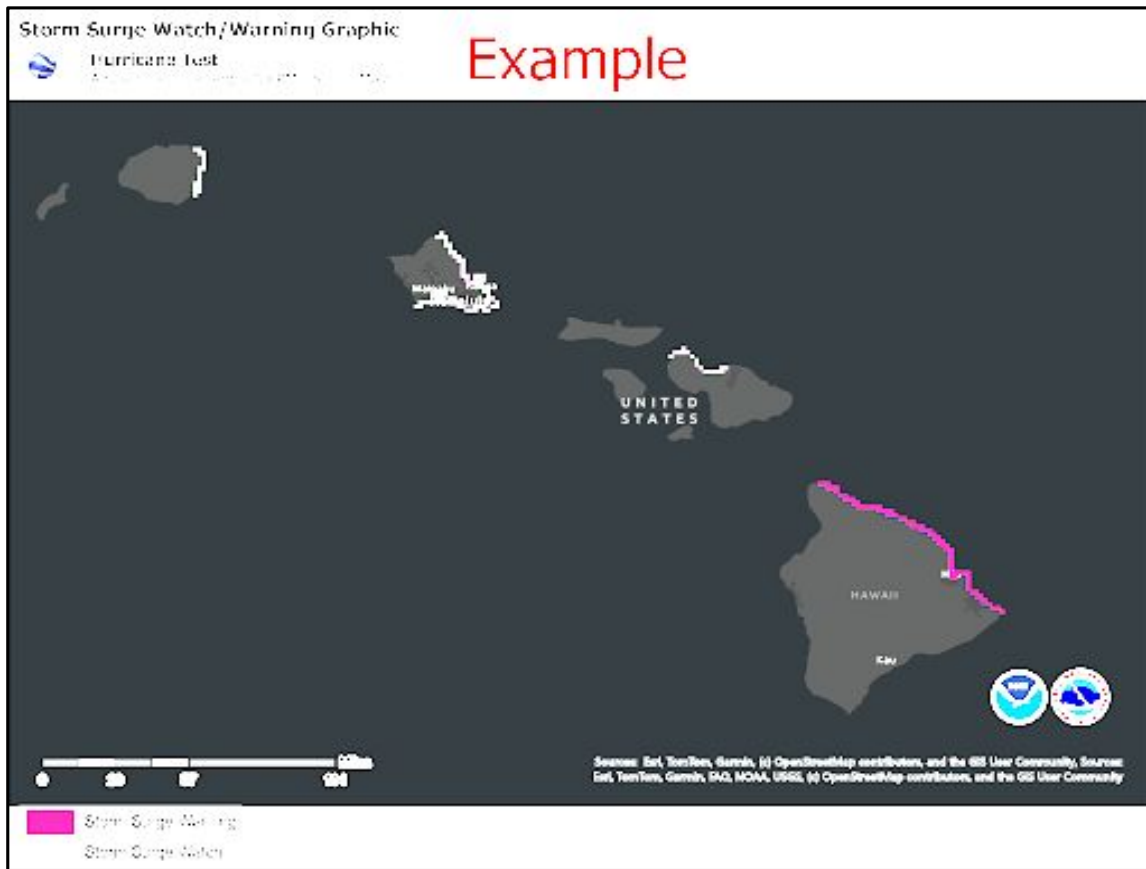
Experimental Ellipse Cone (90th percentile of along- and cross-track errors)



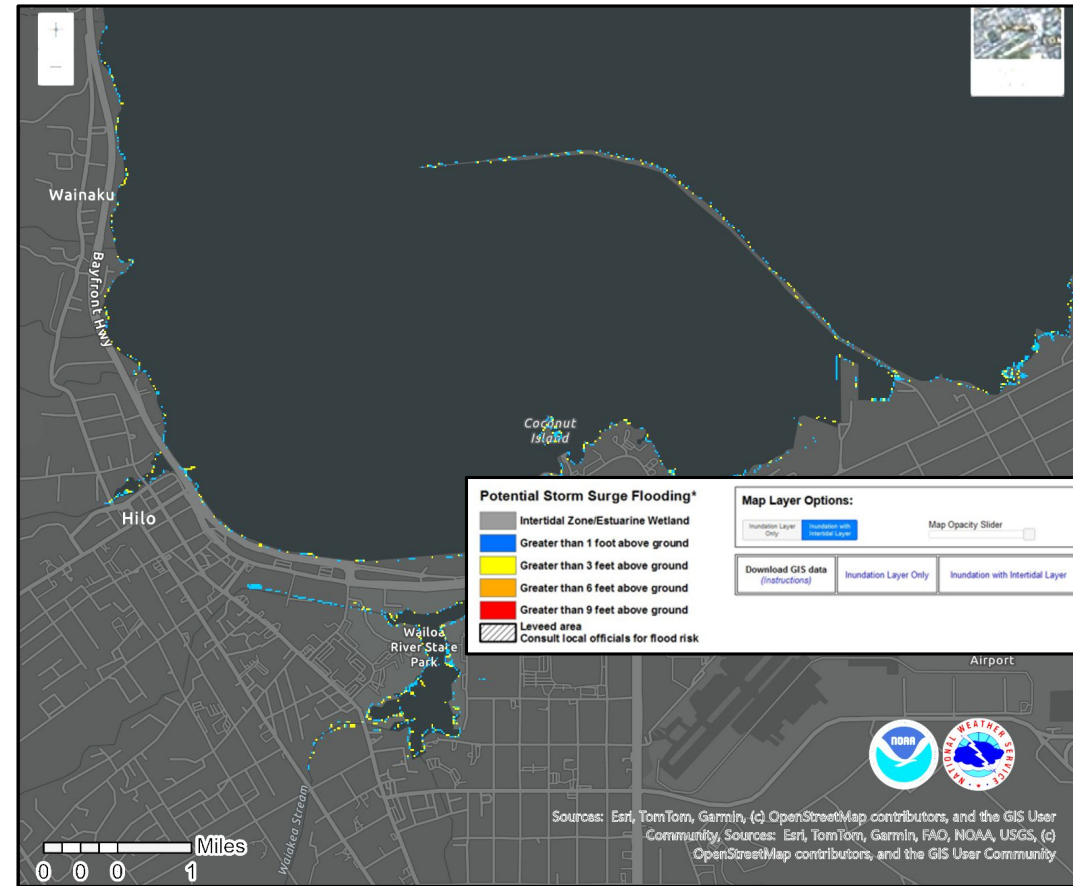


Expansion of Storm Surge Products to Hawaii

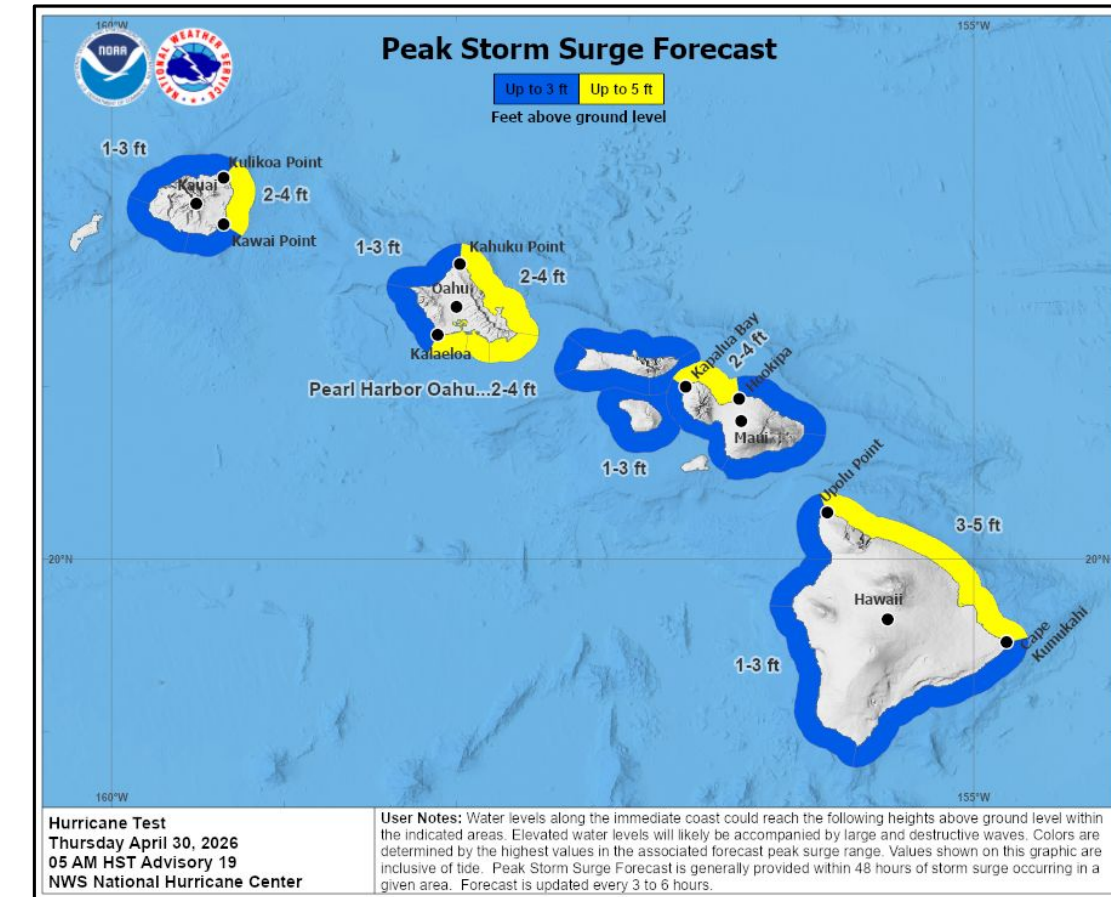
Storm Surge Watch/Warning, Potential Storm Surge Flooding Map, Peak Storm Surge Graphic



Storm Surge Watch/Warning



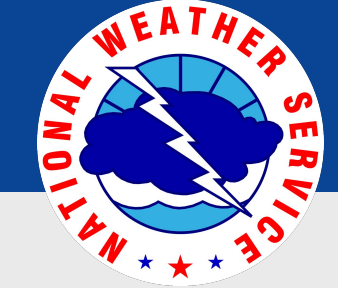
Potential Storm Surge Flooding Map



Peak Storm Surge Graphic

Beginning June 1, 2026. More information:

https://www.weather.gov/media/notification/pdf_2026/scn26-31_Expansion_Storm_Surge_Products_Hawaii.pdf



Which storm surge products should I use?

Top to bottom: generalized/uncertain to storm-specific/more certain

Pre-computed Products

Interactive map available here:

<https://www.nhc.noaa.gov/nationalsurge/>

MOMs

- Maximum Of the MEOWs

Main Audience: Emergency Management, General Public

MEOWs

- Maximum Envelopes Of Water

Main Audience: Emergency Management

Real Time Products

New for Hawaii in 2026

- Probabilistic Storm Surge (Psurge)

- Potential Storm Surge Flooding Graphic

Main Audience: Emergency Management

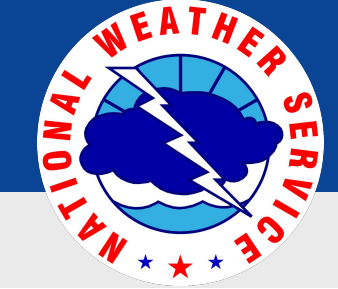
- Storm Surge Watch/Warning

- Peak Inundation Graphic

Main Audience: General Public, Emergency Management

- HTI Storm Surge Threat Graphic






Preparedness Information

Messages from Hurricane Preparedness Week

Hurricane Preparedness weather.gov/hurricane

Know Your Risk: Water & Wind

- Consider your threats: storm surge, flooding from heavy rain, strong winds, tornadoes, rip currents
- Determine if you live in a flood-prone area
- Find out if you live in an evacuation zone
- Identify your home's structural risks (mobile homes & basements can be especially vulnerable)




NOAA

Hurricane Preparedness weather.gov/hurricane

Get Moving When a Storm Threatens

- Protect your home: cover windows, secure doors & loose items
- Determine sheltering options and consider your pets
- Ready your go-bag, meds & supplies, charge phone, fill up/charge vehicle
- Help your neighbors, especially the elderly & other vulnerable people
- Follow evacuation orders if given



NOAA

Hurricane Preparedness weather.gov/hurricane

Take Action Today

- Determine your risk from water & wind
- Begin preparing now, before a storm
- Learn how to understand hurricane forecasts and alerts
- Learn what to do before, during, and after a storm



NOAA

Hurricane Preparedness weather.gov/hurricane

Prepare Before Hurricane Season

- Develop an evacuation plan
- Assemble disaster supplies: food, water, batteries, charger, radio, cash
- Get an insurance checkup and document your possessions
- Create a communication plan with a hand-written list of contacts
- Strengthen your home




NOAA

Hurricane Preparedness weather.gov/hurricane

Stay Protected During Storms

- Stay in your safe places from water & wind
- Have a way to get weather alerts and forecast updates
- Keep in mind that impacts can be felt far from the coast
- Listen to local officials & avoid travel unless ordered to evacuate



NOAA

Hurricane Preparedness weather.gov/hurricane

Understand Forecast Information

- Rely on forecasts from the Central Pacific Hurricane Center & your local NWS office
- Know your alerts & the difference between a Watch and Warning
- Focus on potential impacts, regardless of storm size or category
- Know that deadly hazards occur well outside of the Forecast Cone



NOAA

Hurricane Preparedness weather.gov/hurricane

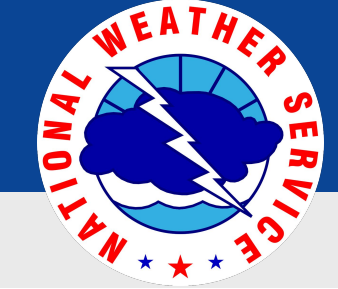
Use Caution After Storms

- If you evacuated, only return home when directed it's safe to do so
- Remain vigilant, as hazards remain: heat, downed powerlines, floodwaters, & more
- Clean up safely: don't push yourself, and check on neighbors
- Only use generators outdoors, 20+ feet from your home
- Prepare for the likelihood that help and communications may not be available



NOAA

More information available at:
[weather.gov/hfo/HPW2026](https://www.weather.gov/hfo/HPW2026)



Key Actions to Take Now

Family Preparedness Plan

Hurricane Preparedness

weather.gov/hurricane



Prepare Before Hurricane Season



Develop an evacuation plan

- Will your home be safe? If not, where will you go? *Decide ahead of time so you won't have to think about it in an emergency.*



Assemble disaster supplies: food, water, batteries, charger, radio, cash



Get an insurance checkup and document your possessions

- Have a point of contact off-island (*better: out of state*) to serve as a check-in hub
- Set a locally rally point for sudden emergencies



Create a communication plan with a hand-written list of contacts

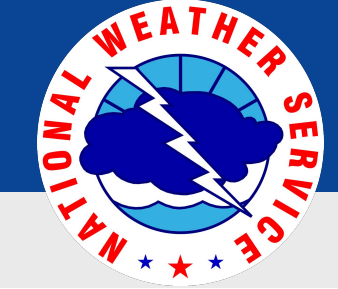


Strengthen your home



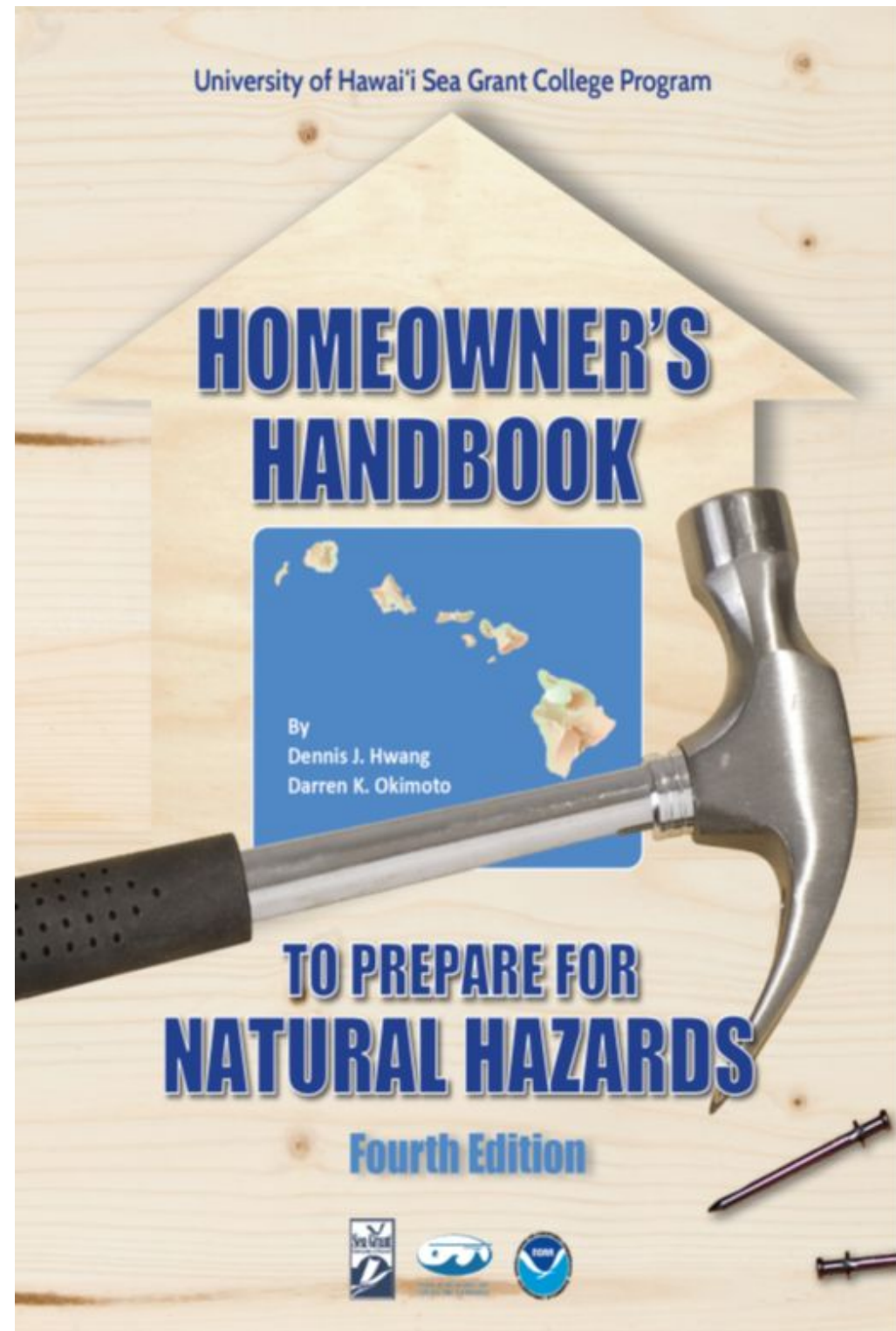
NOAA





Preparedness Information

Determine your risk



ABILITY TO SHELTER IN PLACE DURING A HURRICANE						
PLEASE READ INSTRUCTIONS BEFORE USING THIS TABLE						
Safe room						FEMA or Hawai'i Residential Safe Room
Concrete or CMU wall house	Concrete CMU wall house in poor condition	Concrete CMU wall house in good condition	Concrete CMU wall house with hurricane clips	Concrete CMU wall house with hurricane clips & window protection	Concrete CMU wall house with hurricane clips exceeding code & window protection	
Double wall house	Double wall house in poor condition	Double wall house in good condition	Double wall house with hurricane clips	Double wall house with hurricane clips & window protection	Double wall house with hurricane clips, window protection, garage & roof reinforced	
Single wall house	Single wall house in poor condition	Single wall house in good condition	Single wall house with hurricane clips	Single wall house with hurricane clips & window protection	Single wall house with clips, window protection and foundation upgrades	
Suggested Action	Unsafe Evacuate! Do Not Shelter in place	Marginal Shelter in place up to a Tropical Storm	Good Shelter in place up to Category 1 hurricane	Better Shelter in place up to Category 2 hurricane	Best Shelter in place up to Category 3 hurricane	

Shelter in place or evacuate?
Hazards to consider:

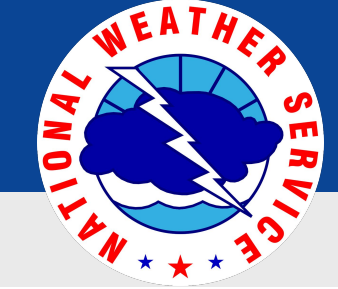
- Wind
- Heavy rain
- Storm surge

FEMA Flood Map search: <https://msc.fema.gov/portal/home>

NOAA storm surge: <https://www.nhc.noaa.gov/nationalsurge>

<https://seagrant.soest.hawaii.edu/homeowners-handbook-to-prepare-for-natural-hazards/>

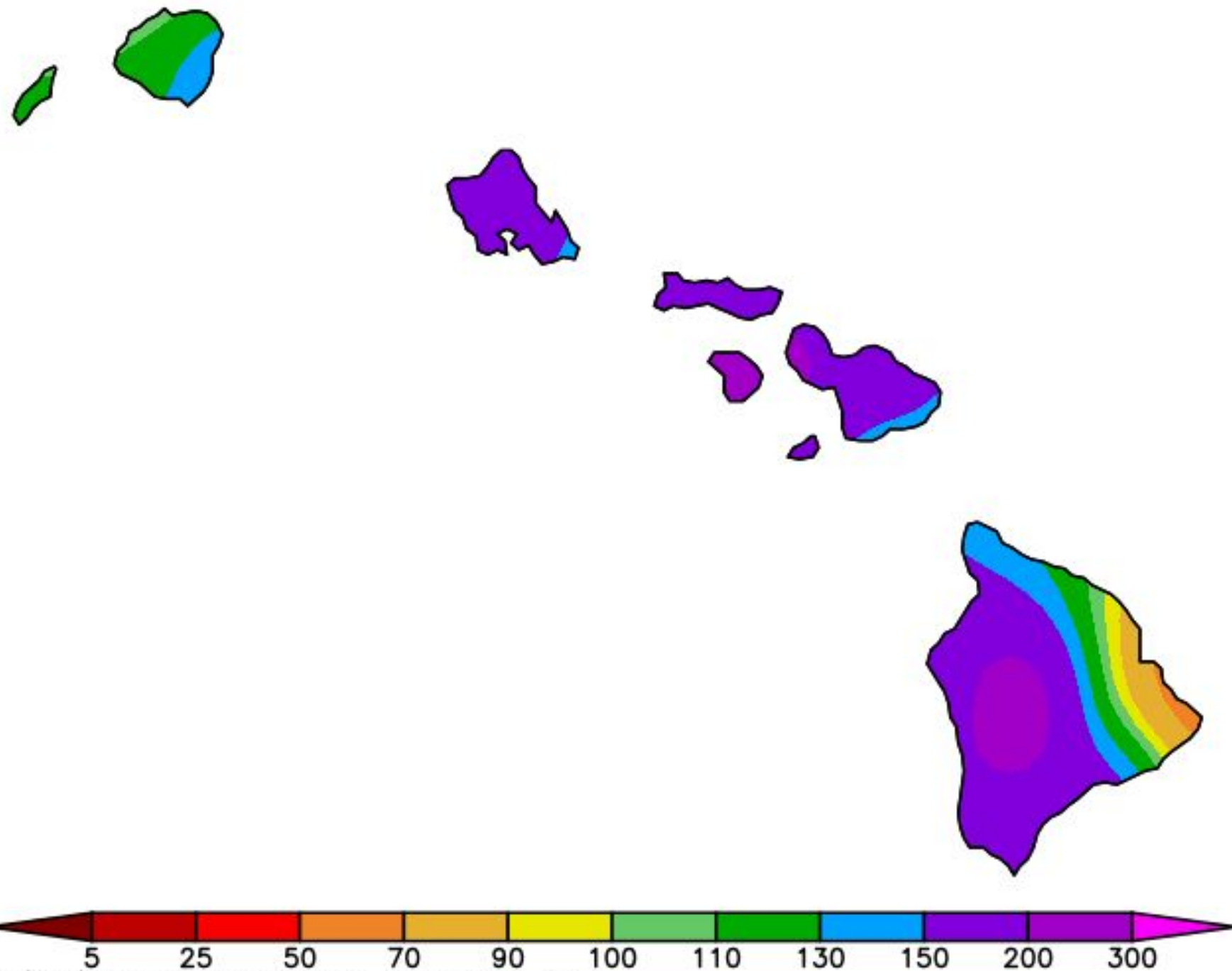




Hawaii Ho'oilō Wet Season 2025-2026

Rainfall near to above normal most areas, mainly due to a very wet late February through mid April

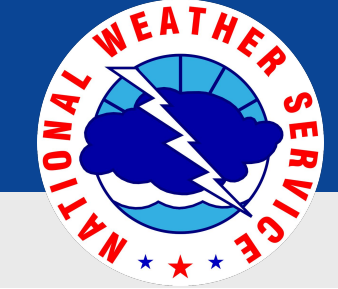
Percent of Average Precipitation (%)
10/1/2025 – 5/13/2026



- October: Very slow start to the wet season with mostly below-average totals statewide.
- November: Mostly below-average rainfall statewide, especially for leeward areas.
- December: Above-average rainfall for Kauai County and Oahu. Maui County and the Big Island continued below average.
- January and February: Near- to above-average rainfall for eastern/southern Big Island, otherwise well below average. Mainly near to below average rainfall elsewhere, but significant amounts in February for most windward areas.
- March and April: Well-above-average rainfall statewide with significant flooding in many areas.

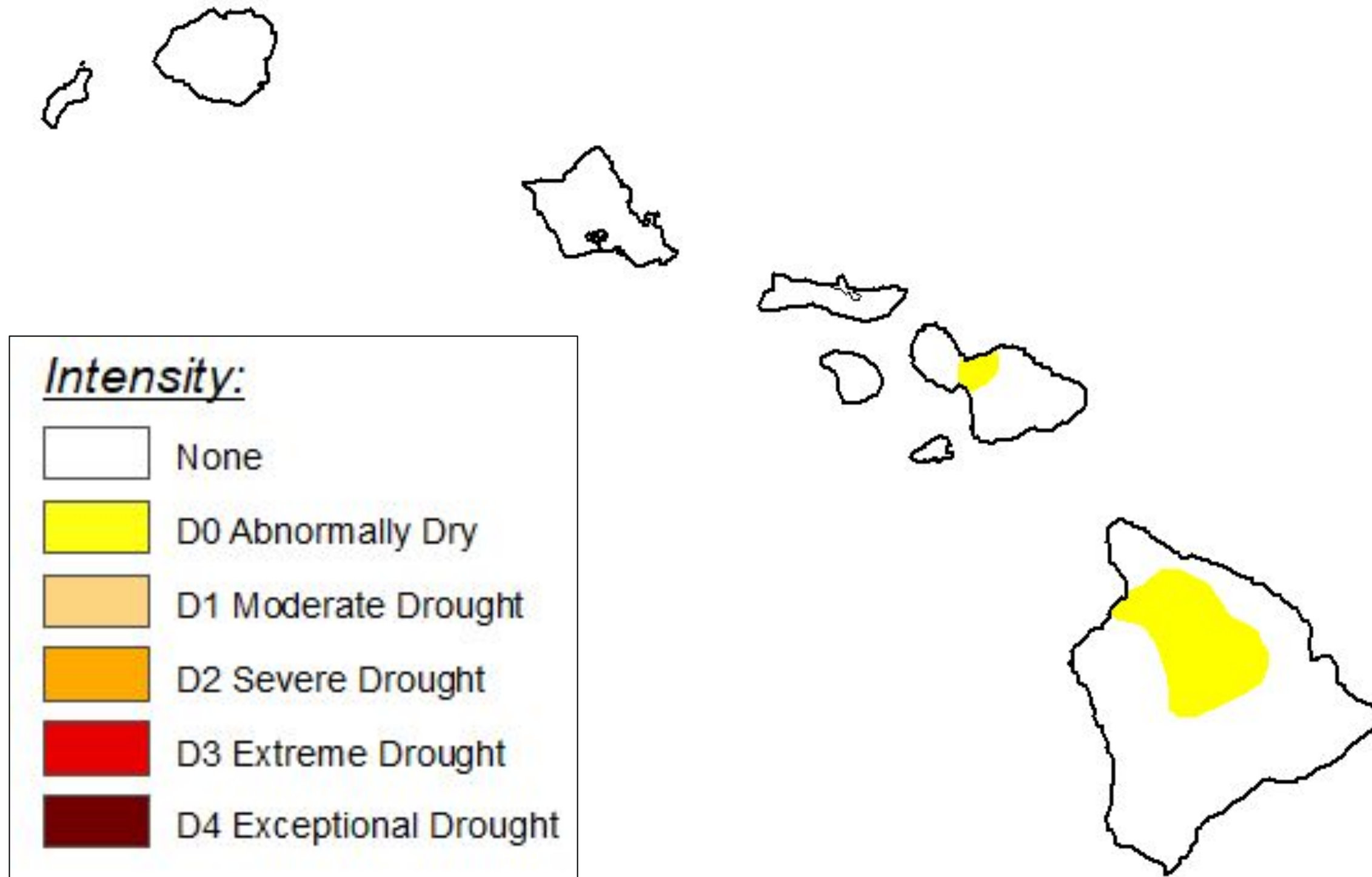
Generated 5/14/2026 at WRCC using provisional data.
NOAA Regional Climate Centers

Image source: https://wrcc.dri.edu/anom/haw_anom.html



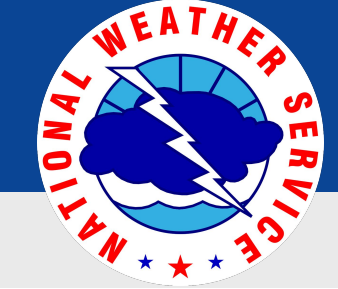
2026 Hawaii Dry Season Outlook

Hawaii Drought Map – May 26, 2026



- Dry season outlook: above-normal rainfall for the entire state
 - Significant wet season rainfall and the potential for above-normal summer rainfall may help delay (but not prevent) drought development and significant wildfire risk.
 - However, the resulting vegetation growth provides abundant fuel and will likely increase the potential for significant wildfire risk once it dries out.

Image source: <https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?HI>



Wildfire Preparedness Resources

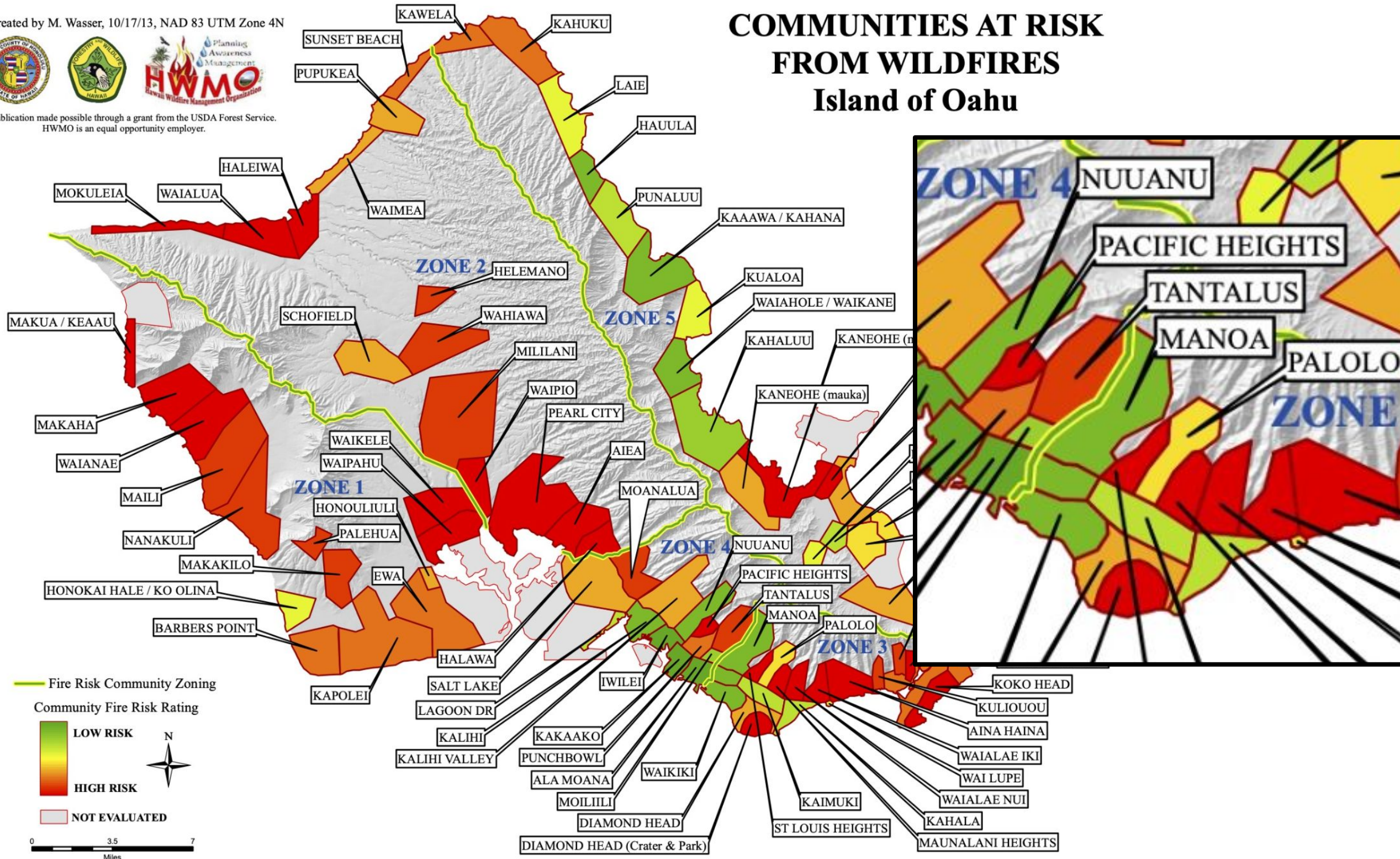
Hawaii Resource: Hawaii Wildfire Management Organization

Map created by M. Wasser, 10/17/13, NAD 83 UTM Zone 4N

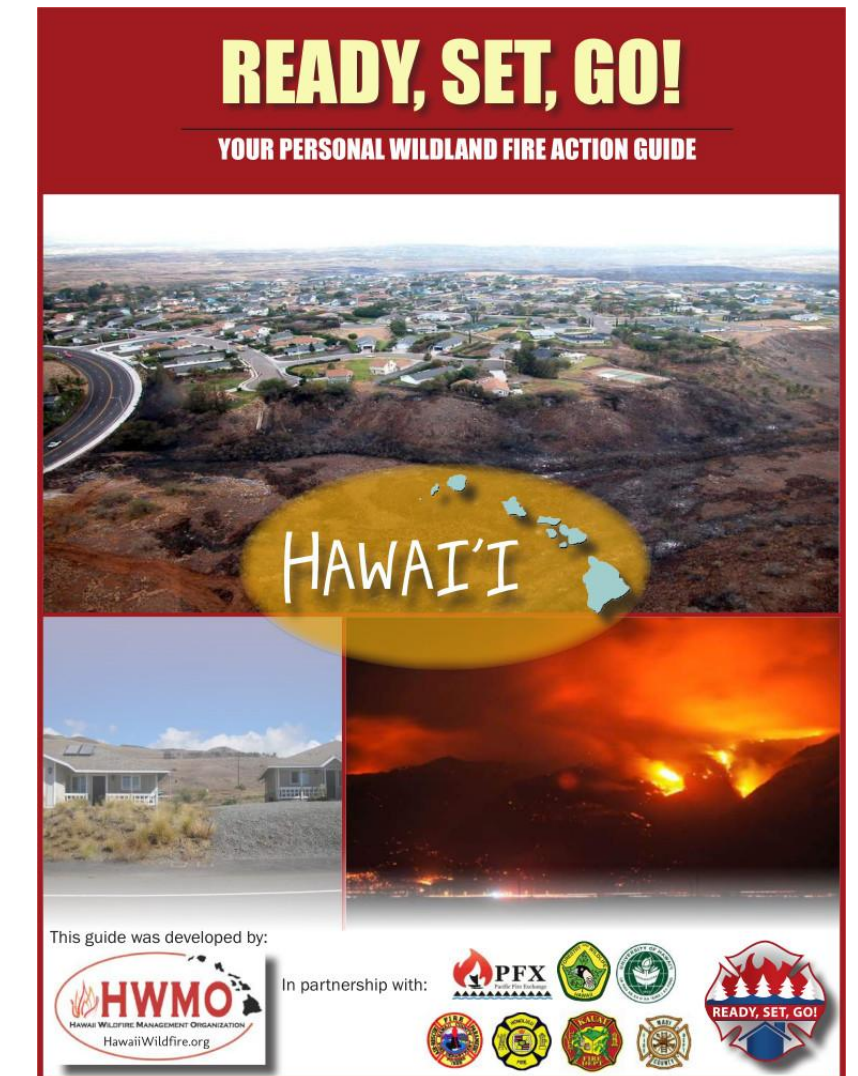


This publication made possible through a grant from the USDA Forest Service. HWMO is an equal opportunity employer.

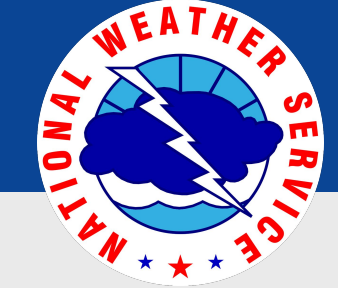
COMMUNITIES AT RISK FROM WILDFIRES Island of Oahu



[Ready, Set, Go! Hawaii: Your Personal Wildland Fire Action Guide](#)



Hawaii Wildfire Management Organization: <https://www.hawaiiwildfire.org/home>



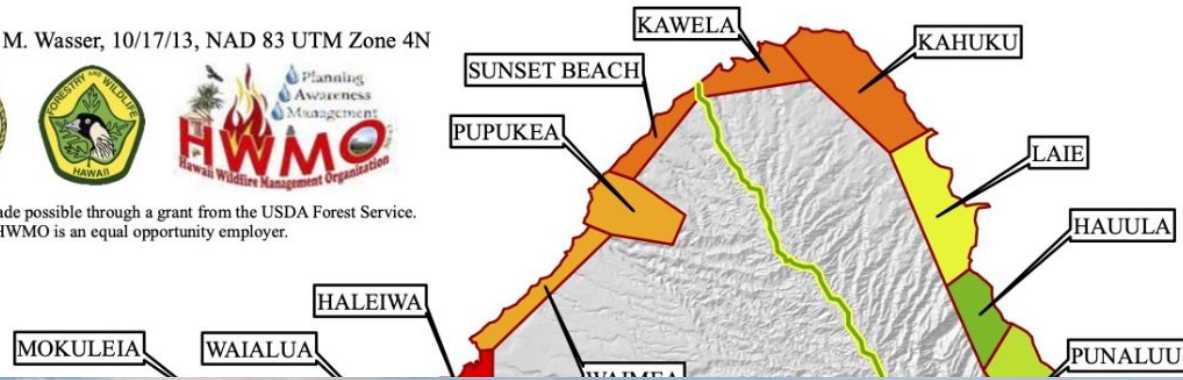
Wildfire Preparedness Resources

Hawaii Resource: Hawaii Wildfire Management Organization

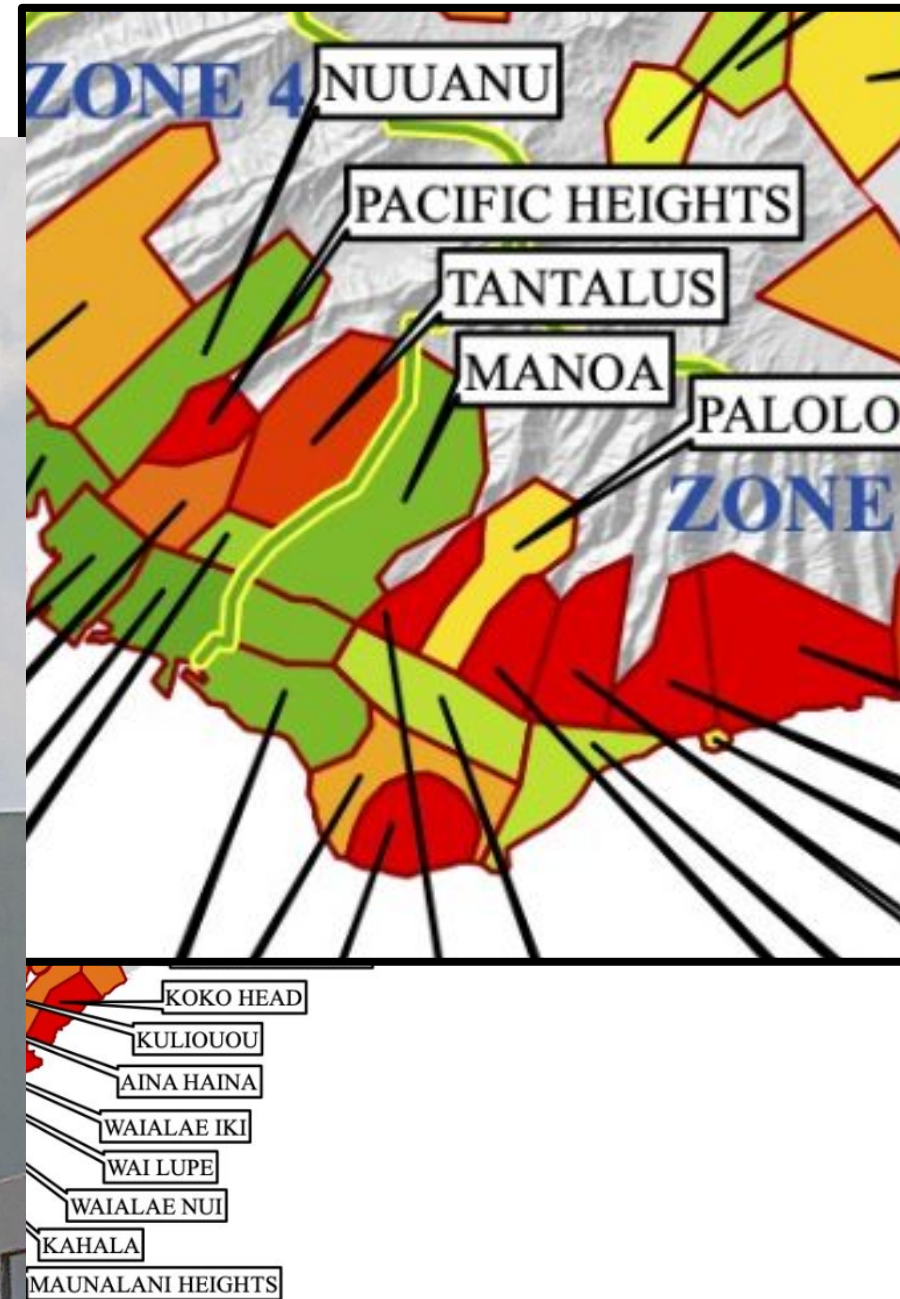
Map created by M. Wasser, 10/17/13, NAD 83 UTM Zone 4N



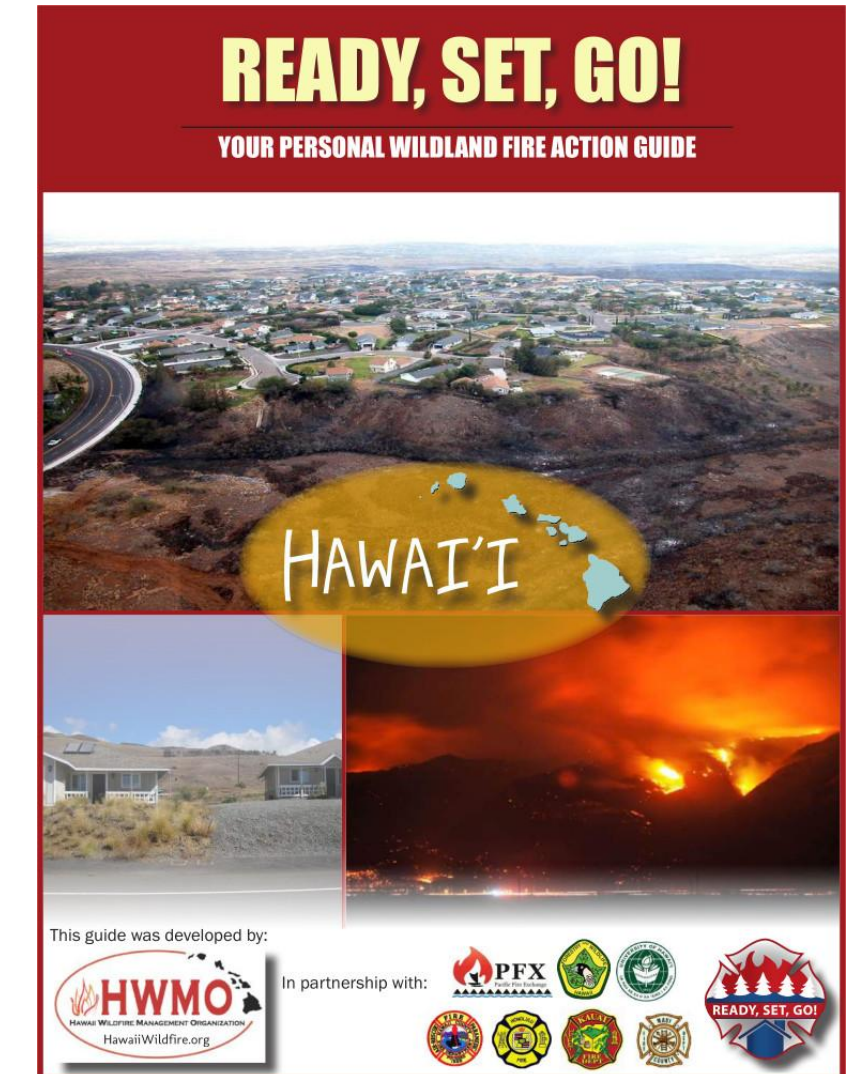
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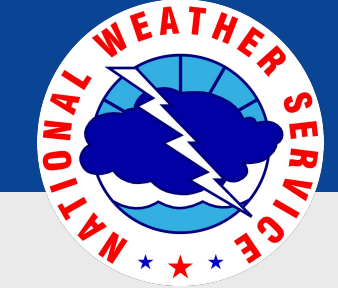
COMMUNITIES AT RISK FROM WILDFIRES Island of Oahu



[Ready, Set, Go! Hawaii: Your Personal Wildland Fire Action Guide](#)



Hawaii Wildfire Management Organization: <https://www.hawaiiwildfire.org/home>



Fire Weather

What's the difference between a watch and warning?

FIRE WEATHER WATCH

A Fire Weather Watch is issued when **critical fire weather conditions are possible.**

“Critical fire conditions” means warm temperatures, low humidity, and strong, gusty winds.

Be Prepared.

RED FLAG WARNING

A Red Flag Warning is issued when **critical fire weather conditions are happening or are about to happen.**

Avoid burning, be careful around open flames, safely dispose of cigarettes. Fires can spark and grow very quickly.

Take Action!

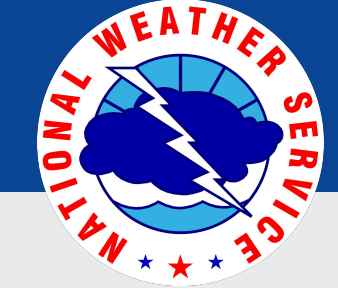
“Red Flag” conditions indicate potential for extreme fire behavior

- Rapid spread
- Difficult containment

Original/old NWS thresholds for Hawaii:

- Strong winds (sustained ≥ 20 mph)
- Low humidity (≤ 45 percent)
- Dry fuels
(Keetch-Byram Drought Index ≥ 600)





NOAA Weather Radio

Have multiple sources to receive information

How Can You Receive Emergency Notifications When Your Power is Out?

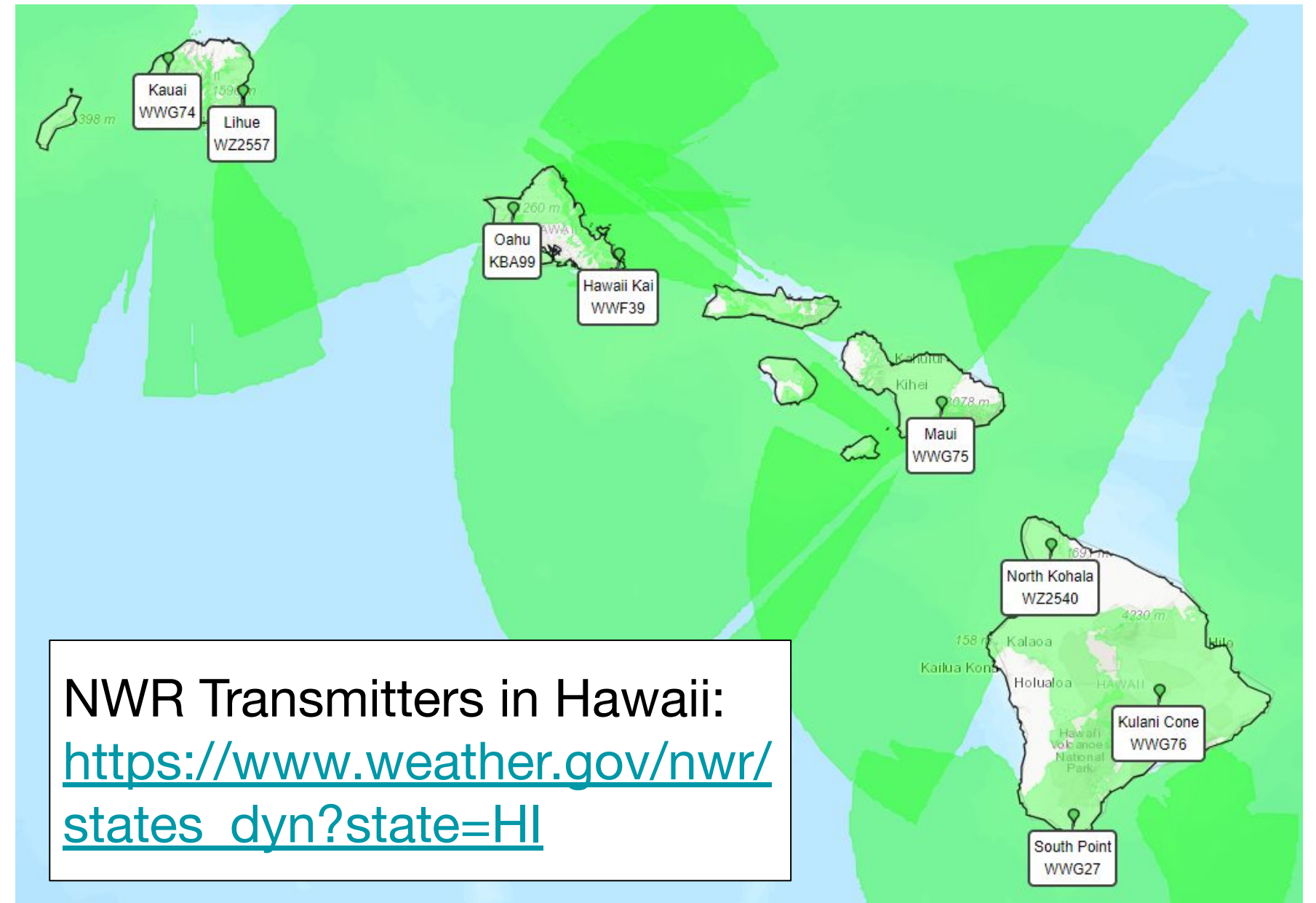
NOAA Weather Radio or another battery powered radio!

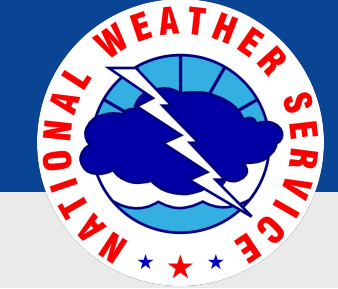
- ✓ Look for radios with solar power or hand cranks
- ✓ Make sure you have extra batteries!
- ✓ Some radios have USB ports to charge electronics



What if you lose internet and cell service?

- Broadcast radio (AM/FM)
- NOAA Weather Radio





Contact Information

Thank you for your time!

Any Questions?

John Bravender, Warning Coordination Meteorologist

NOAA/NWS Weather Forecast Office Honolulu

john.bravender@noaa.gov

808-973-5275 (office)

808-772-0641 (cell)

