



2016 CPHC SEASON: SUMMARY & OPERATIONAL CHALLENGES

TC Operations and Research Forum

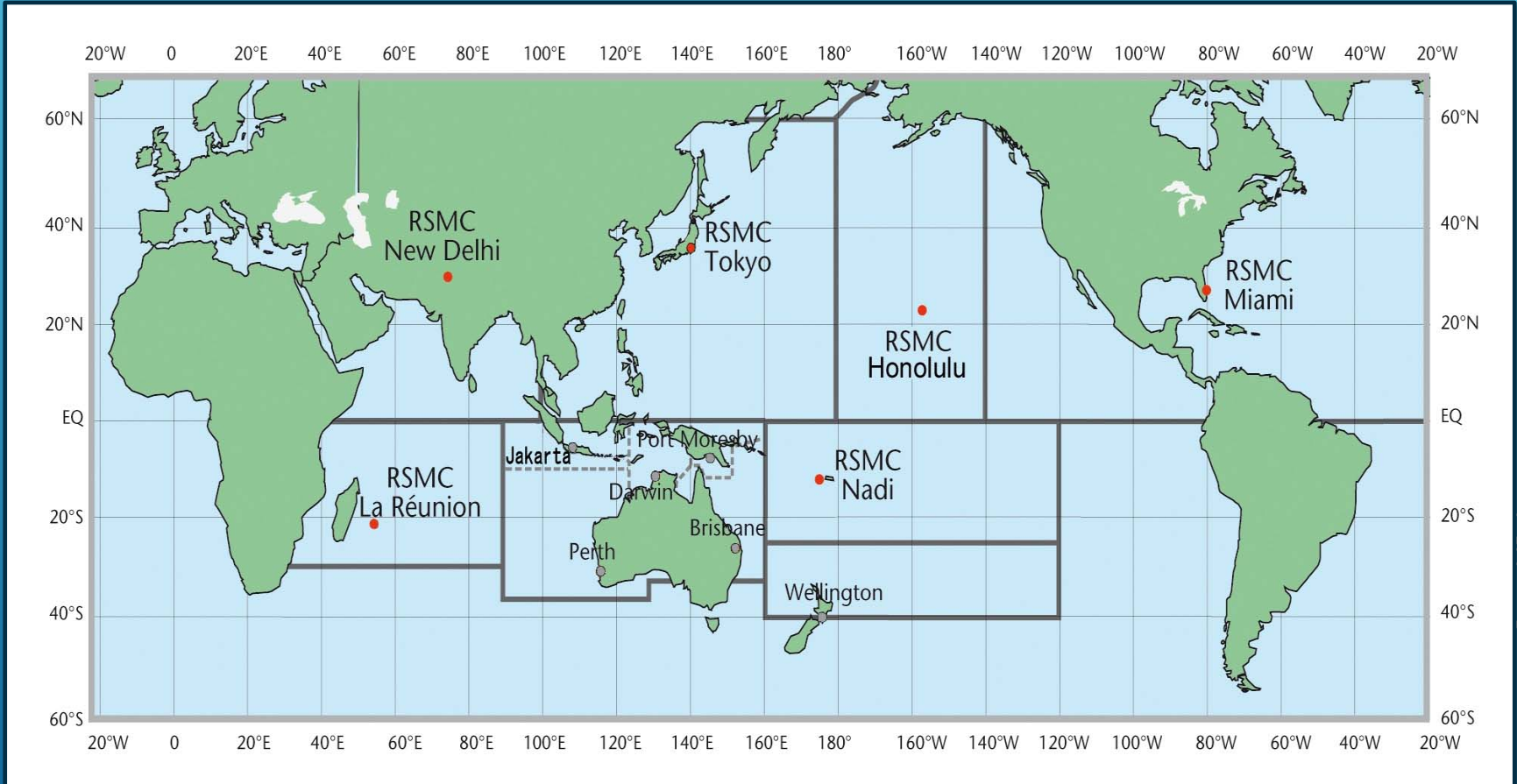
14 March 2017

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National Weather Service Central Pacific Hurricane
Center



CPHC AOR



RSMC – Regional Specialized Meteorological Center



LOOK BACK AT THE 2016 SEASON OUTLOOK

4-7 Tropical Cyclones

40% Above Normal Season

40% Normal Season (4-5 TCs)

20% Below Normal Season



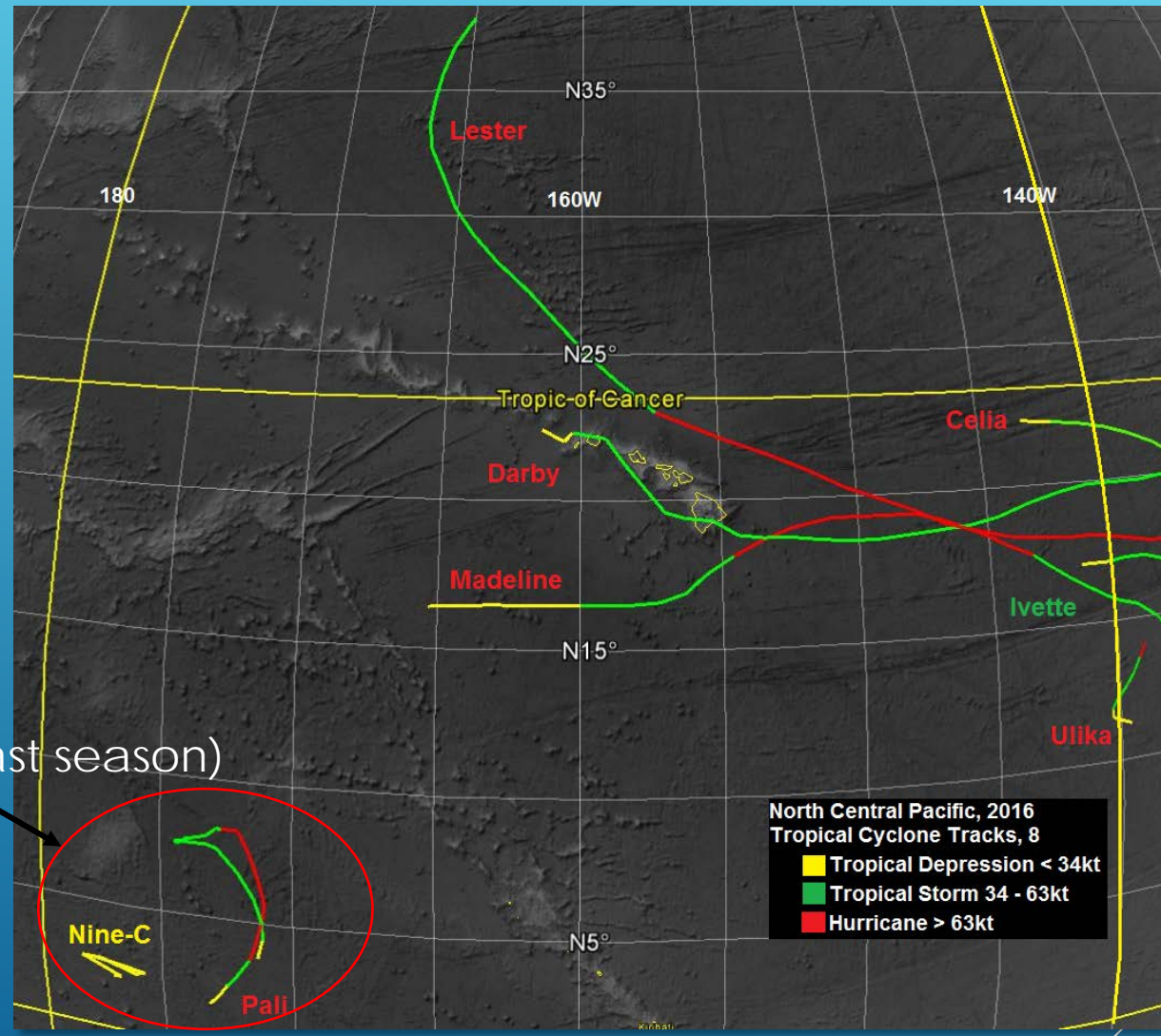
2016 SEASON STATISTICS

6 Tropical Cyclones
(1 addl. out of season)

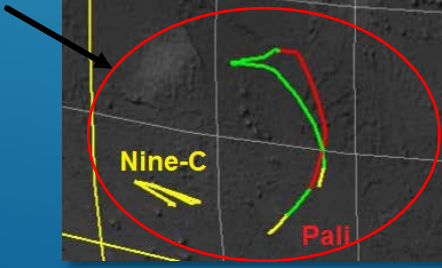
<u>Name</u>	<u>Dates (UTC)</u>	<u>Max Wind /mph/</u>
Hurricane Pali	January 7-15	100
Tropical Storm Celia	July 15-16	45
Tropical Storm Darby	July 20-26	65
Tropical Depression Ivette	August 8	35
Hurricane Madeline	August 28-Sept 3	135
Hurricane Lester	September 1-7	135
Tropical Storm Ulika	September 27-30	50



2016 TRACKS



Jan 2016
(End of last season)





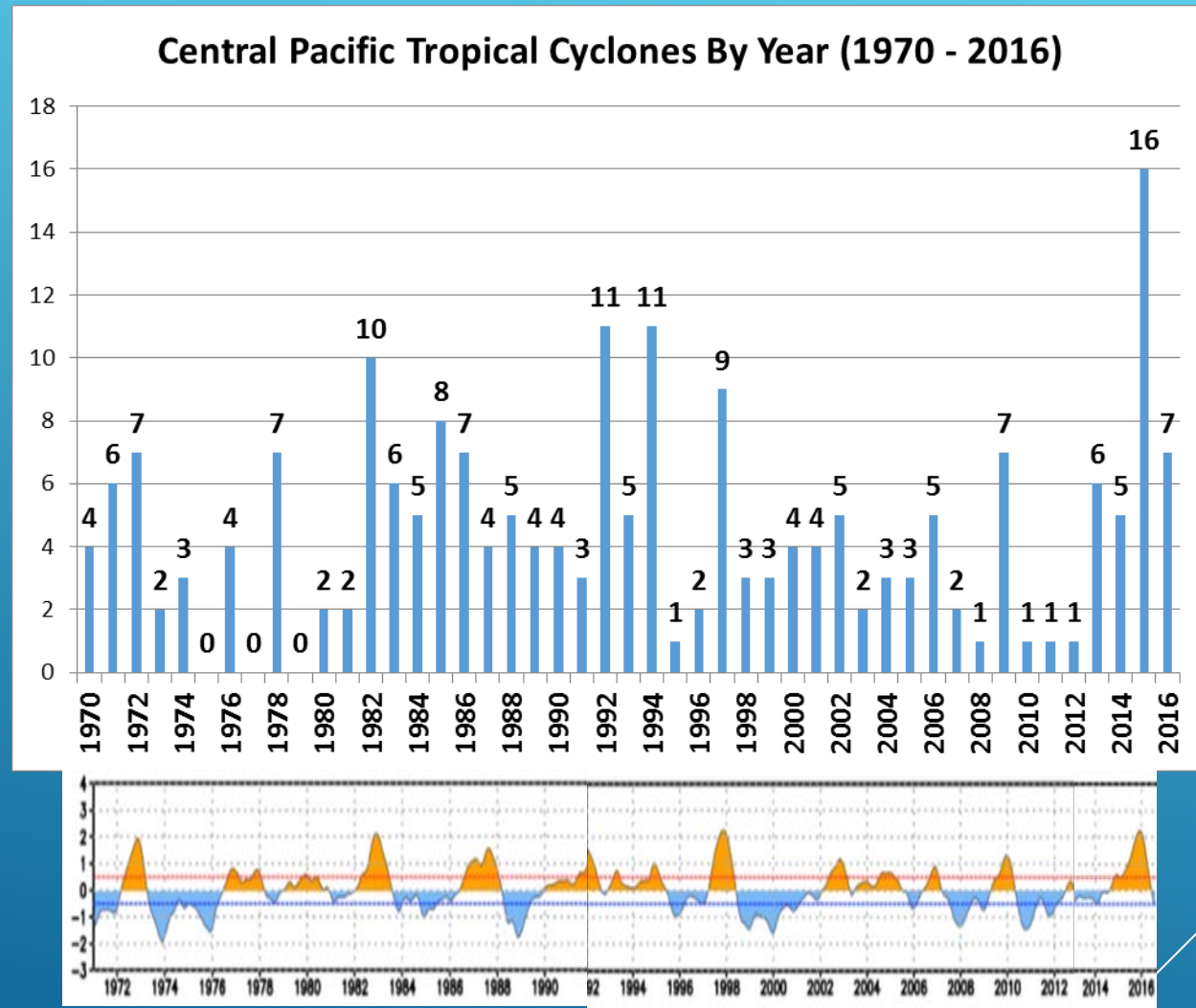
2016 AIR RECONNAISSANCE



- **USAF Reserve's 53rd Weather Reconnaissance Squadron:**
 - 15 total missions
 - 104 hours of operational flying time
 - Tropical Storm Darby
 - Hurricane Madeline
 - Hurricane Lester
- **NOAA Aircraft Operations Center Hurricane Hunters:**
 - G-IV surveillance missions
 - NSF/NCAR G-V High-performance Instrumented Airborne Platform for Environmental Research (GV HIAPER);
3 high level weather surveillance missions in Hurricane Lester



ANNUAL COMPARISONS

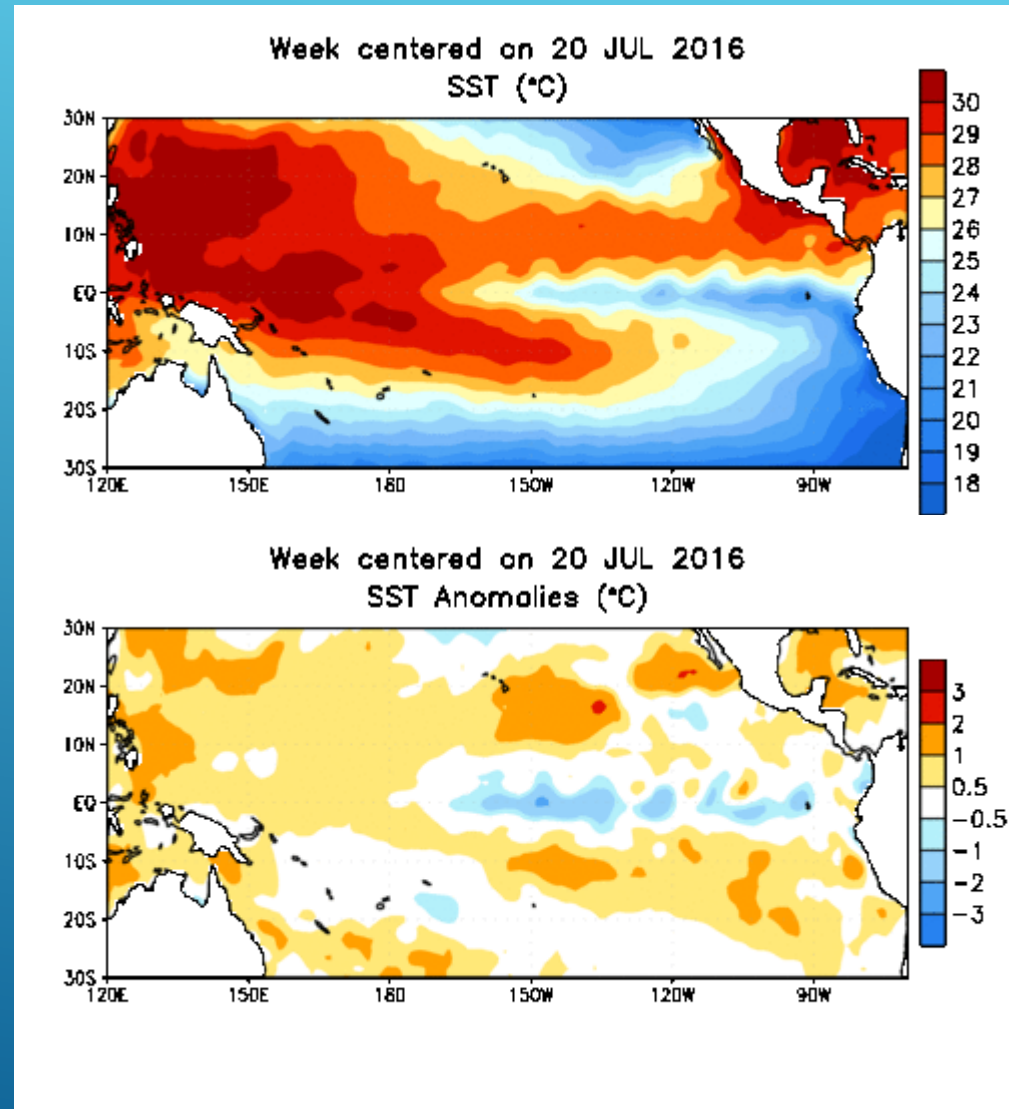


Strong statistical correlation with ONI (Oceanic Nino Index):
3 mo. running mean SST anomaly, 3.4 region



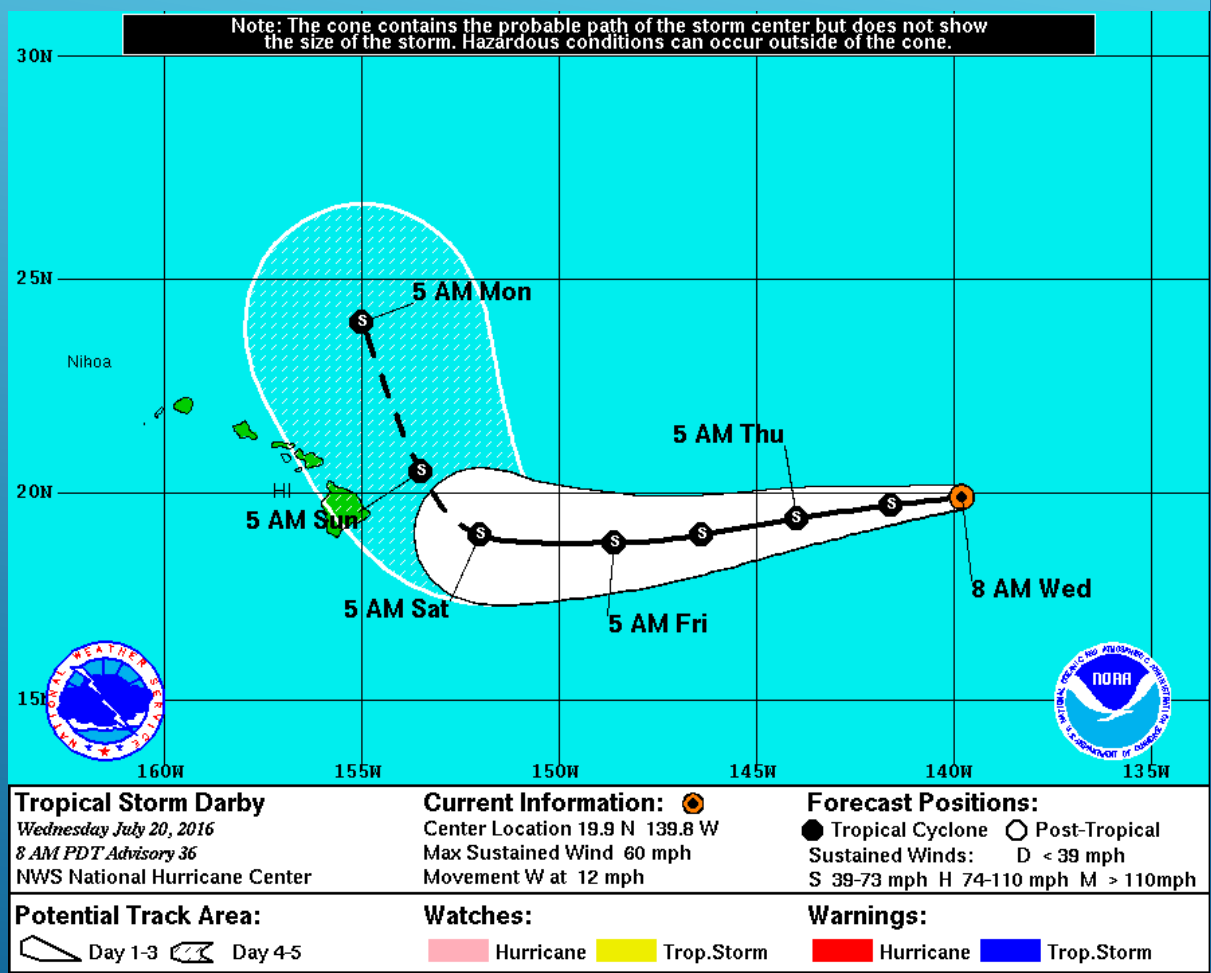
SST AND ANOMALIES -SUMMER 2016

- Transitioned to a weak La Nina during the season:
 - Cooler than normal waters across the Tropical East Pacific.
- Above normal SST's still existed near and east of Hawaii.





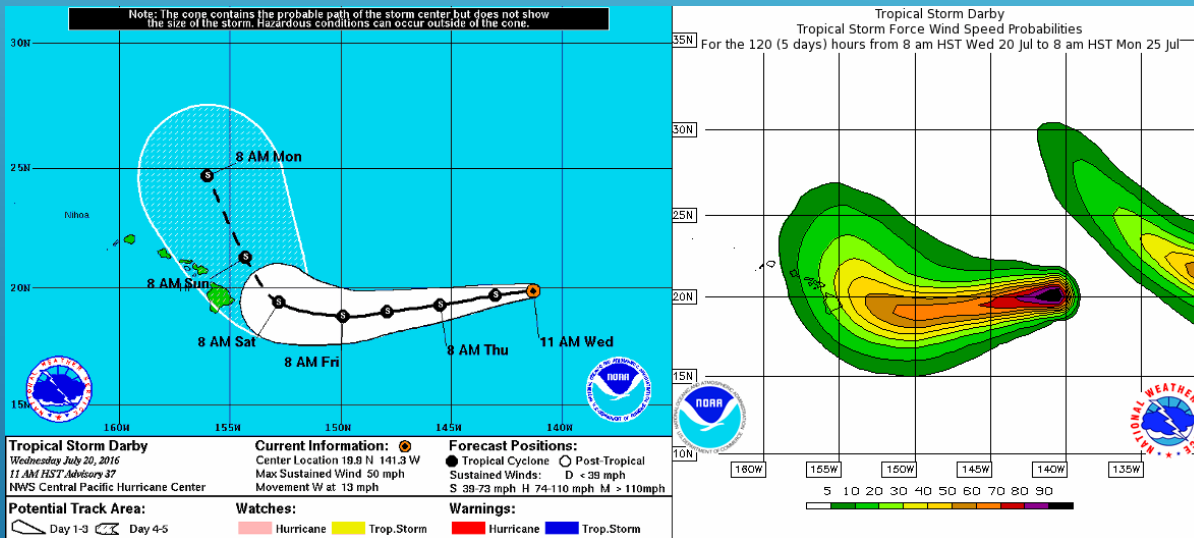
TROPICAL STORM DARBY REVIEW



- Importance of looking at wind speed probabilities, not just cone graphic.
- Initial forecasts curved Darby northward too soon.
- Main Impacts:
 - 40-60 mph wind gusts on Big Island.
 - Flash flooding Metro Honolulu (6-12" in 6 hours)
 - High surf E shores.



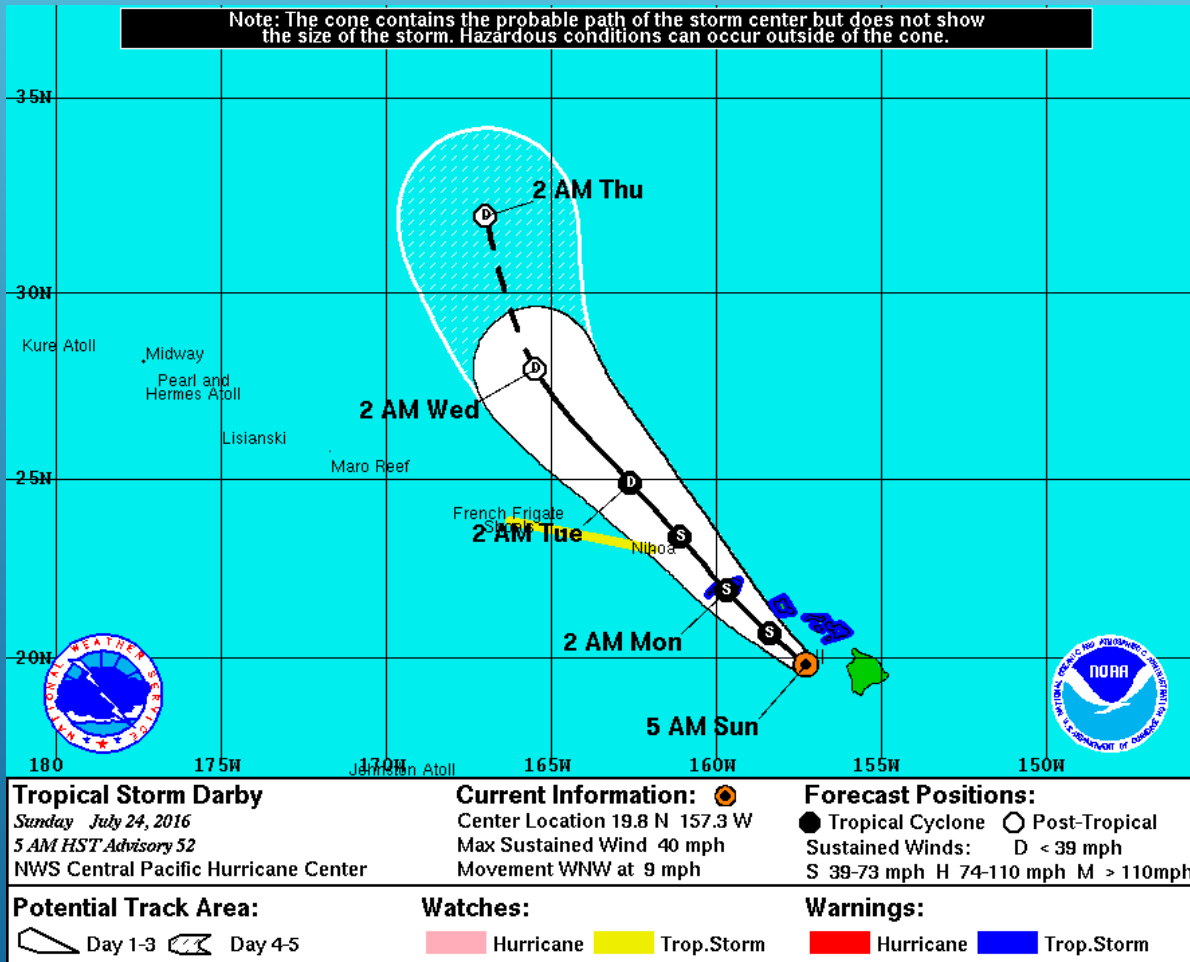
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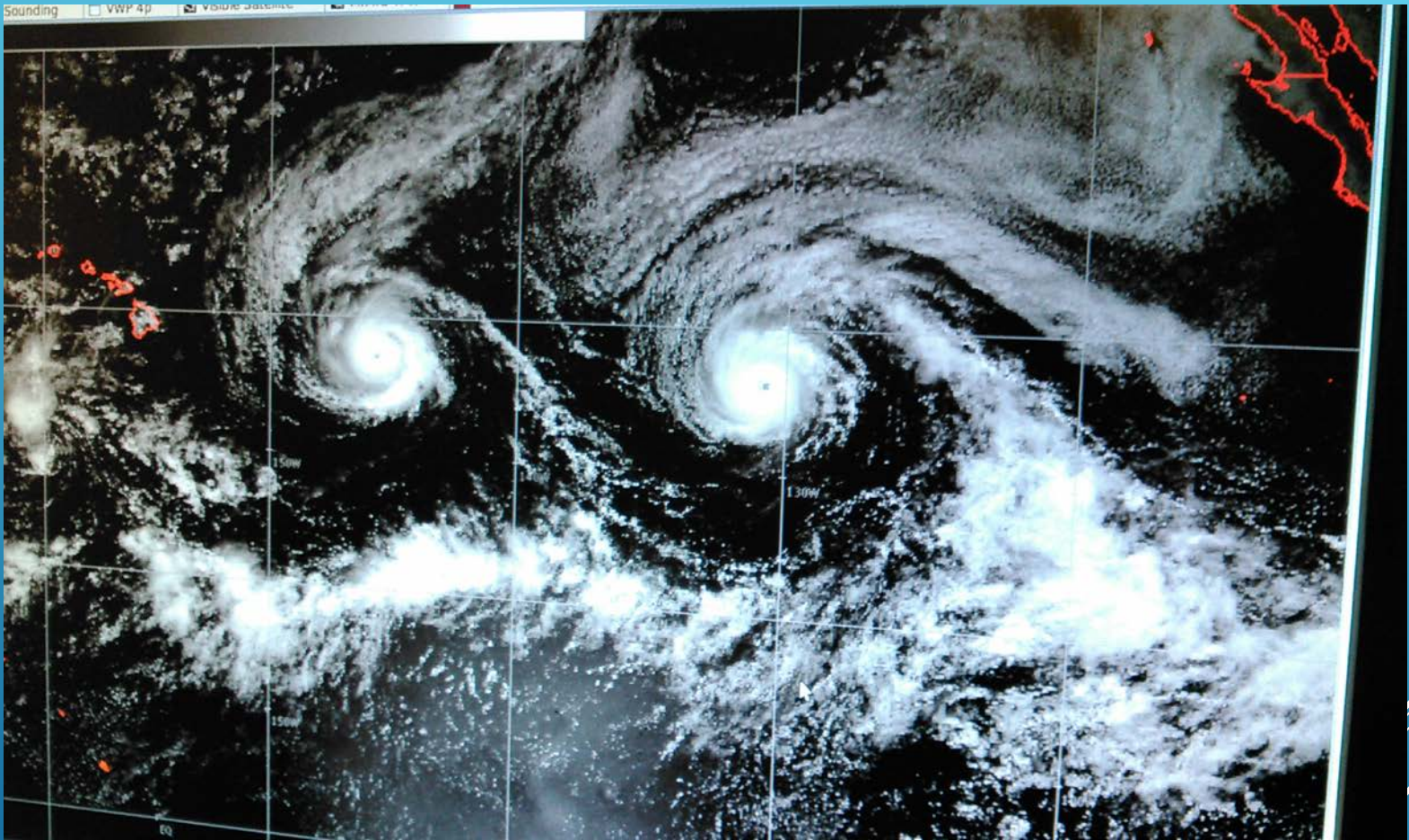


“The sheer amount of water that came down all at once may have exceeded the capacity for those drainage canals and those drains on the freeway,” said transportation spokesman Tim Sakahara.

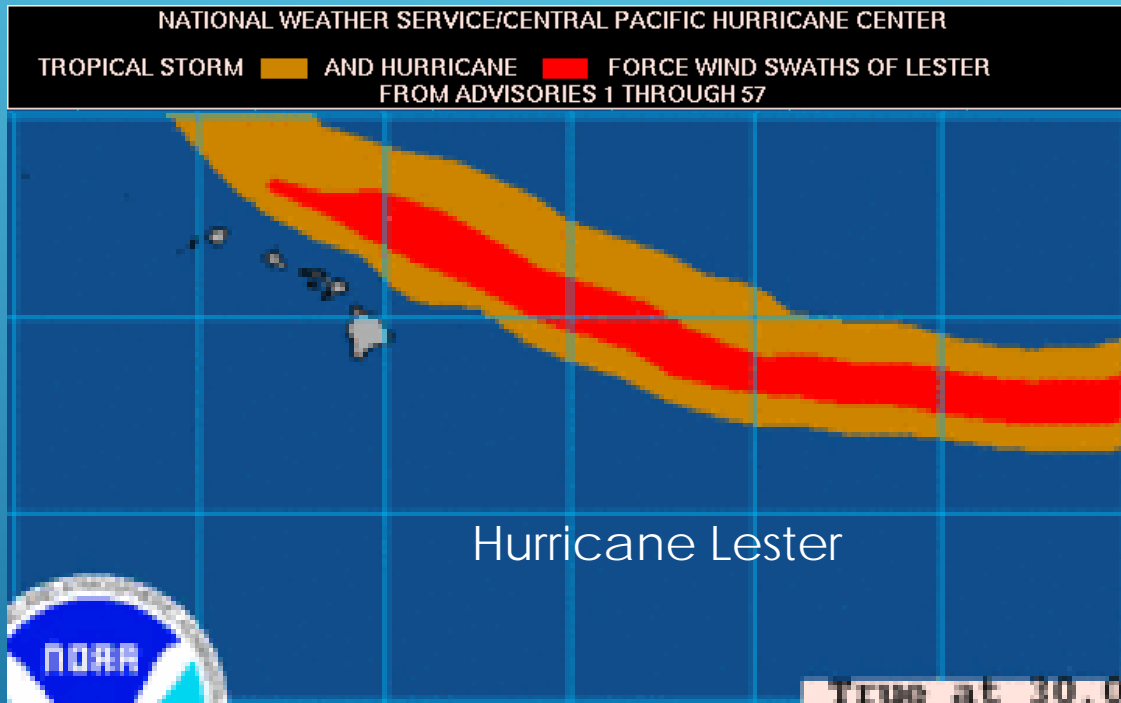




MADLINE/LESTER TWIN THREATS



MADELINE/LESTER TWIN THREATS

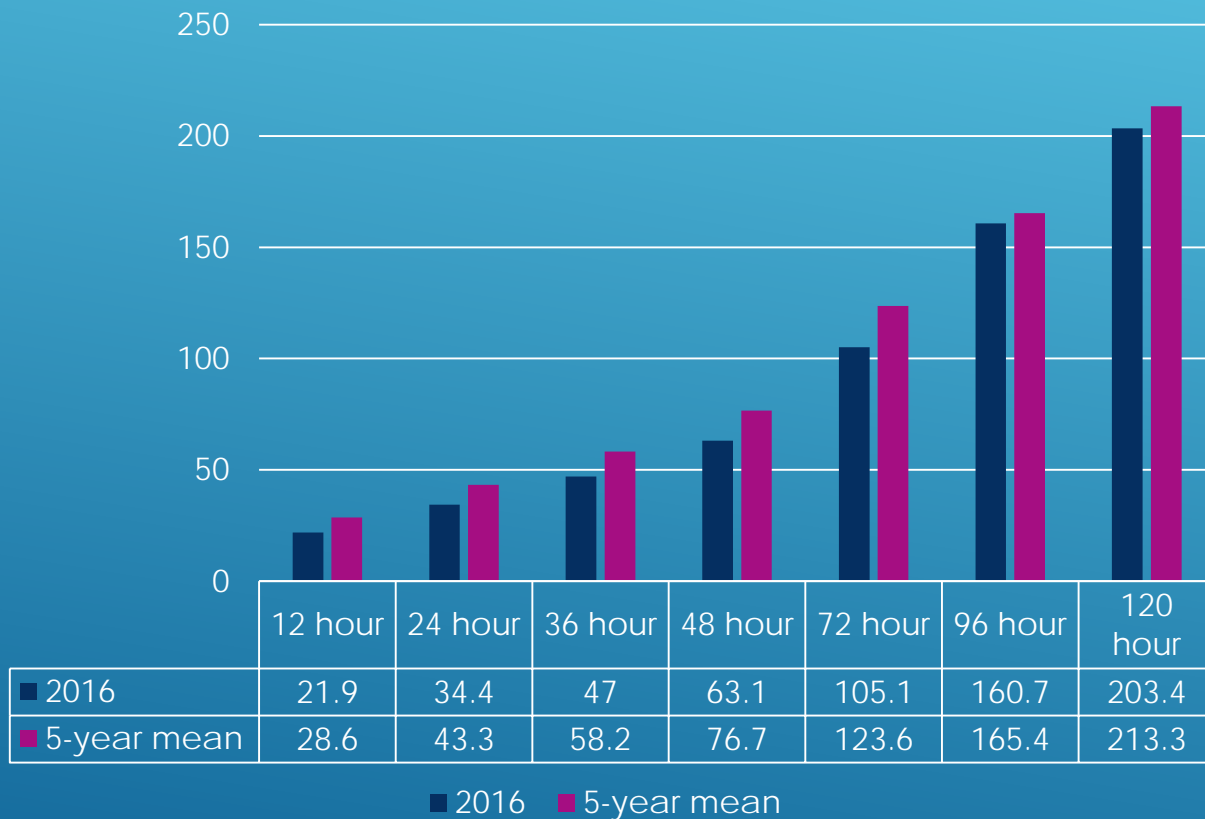


- Back to back Hurricane threats.
- Main Impacts:
- High surf on E facing shores.
- 2-3' Coastal Inundation - Kapoho area on Big Island.



2016 PRELIM VERIFICATION

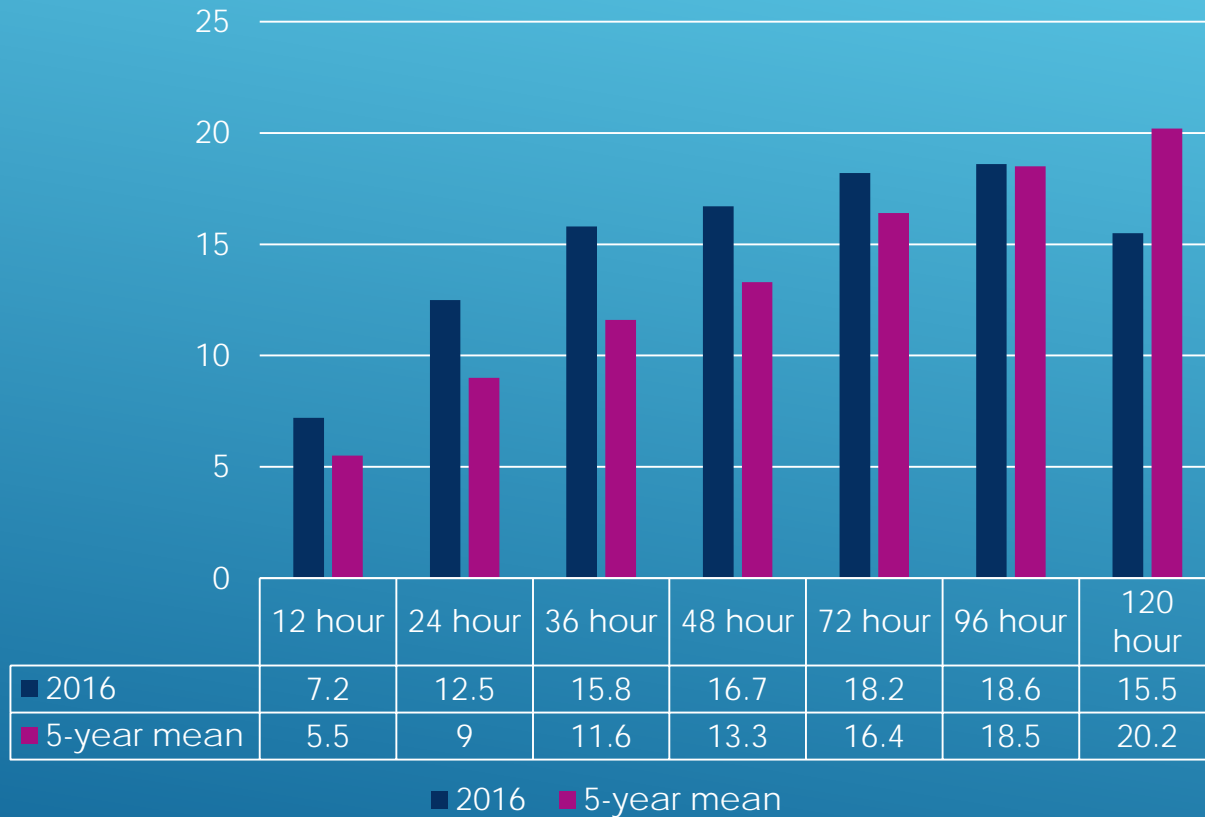
2016 vs 5-year Average Forecast Track Errors (NM)





2016 PRELIM VERIFICATION

2016 vs 5-year Average Forecast Intensity Errors (KT)





CHALLENGES & UPDATES

- Consecutive threats of Madeline and Lester: Nearly tested/broke(?) NWS Watch/Warning system
- Darby center tracked outside error cone: CPHC to use central Pacific track errors in TCM and error cone creation; similar to NHC Atlantic values (150 nm at 96h; 200 nm at 120h)
- Updates to CPHC web page to mimic NHC; includes GIS files; numerous graphics options without “skinny black line”
- 5 day Tropical Weather Outlook; 2 & 5 day graphic; potential-TC watches/warnings
- IT support, ATCF and network security



Questions??

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www.weather.gov/cphc