

Agenda 3i: Climate Monitoring Section: review & evaluation of November 2020 to April 2021

Northern hemisphere rain, air temperature, sea surface temperature and sea level

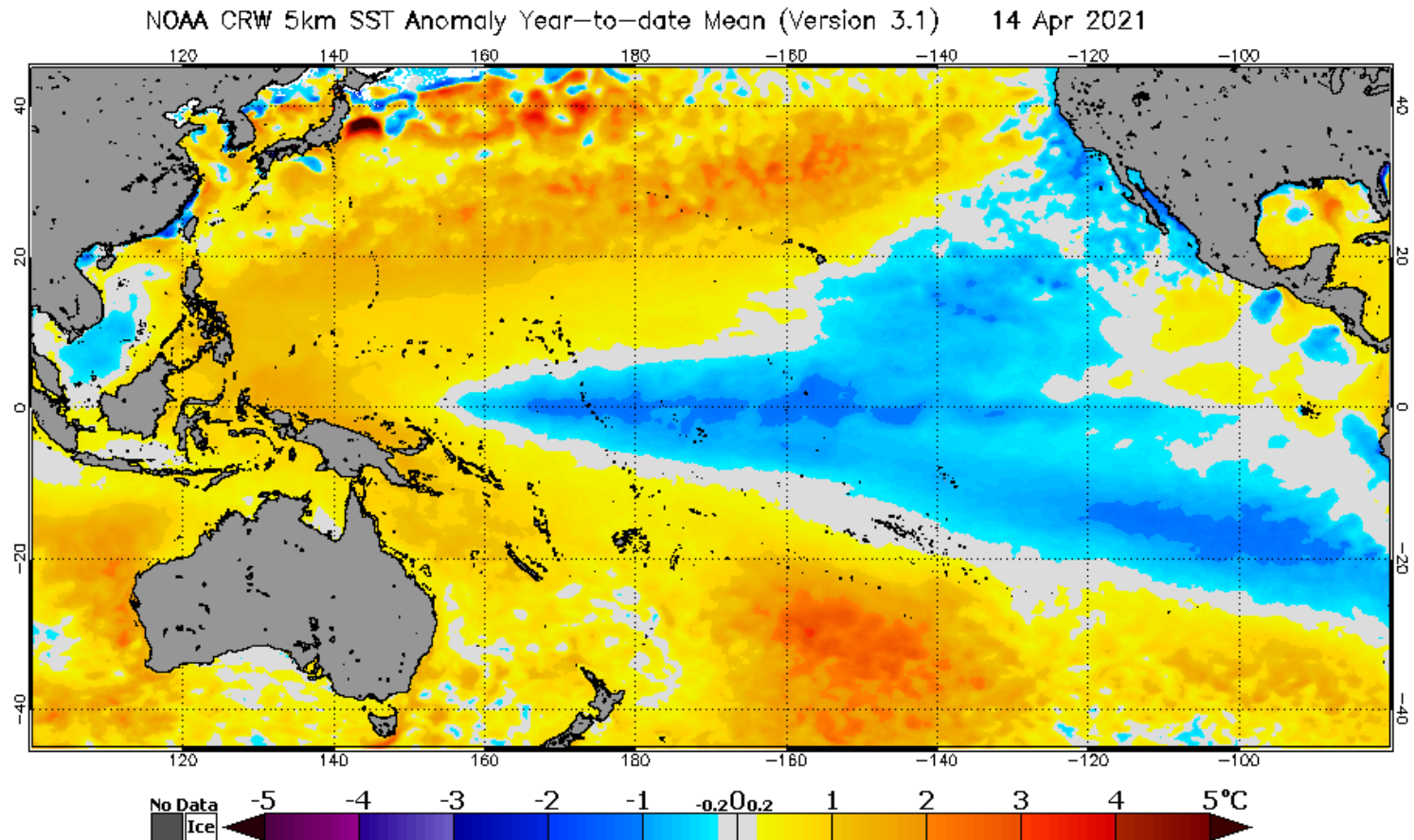
John J. Marra, Ph.D

NOAA

Pacific Islands Climate Outlook Forum (PICOF 8)

Virtual (via Zoom) Meeting on 21 April 2021

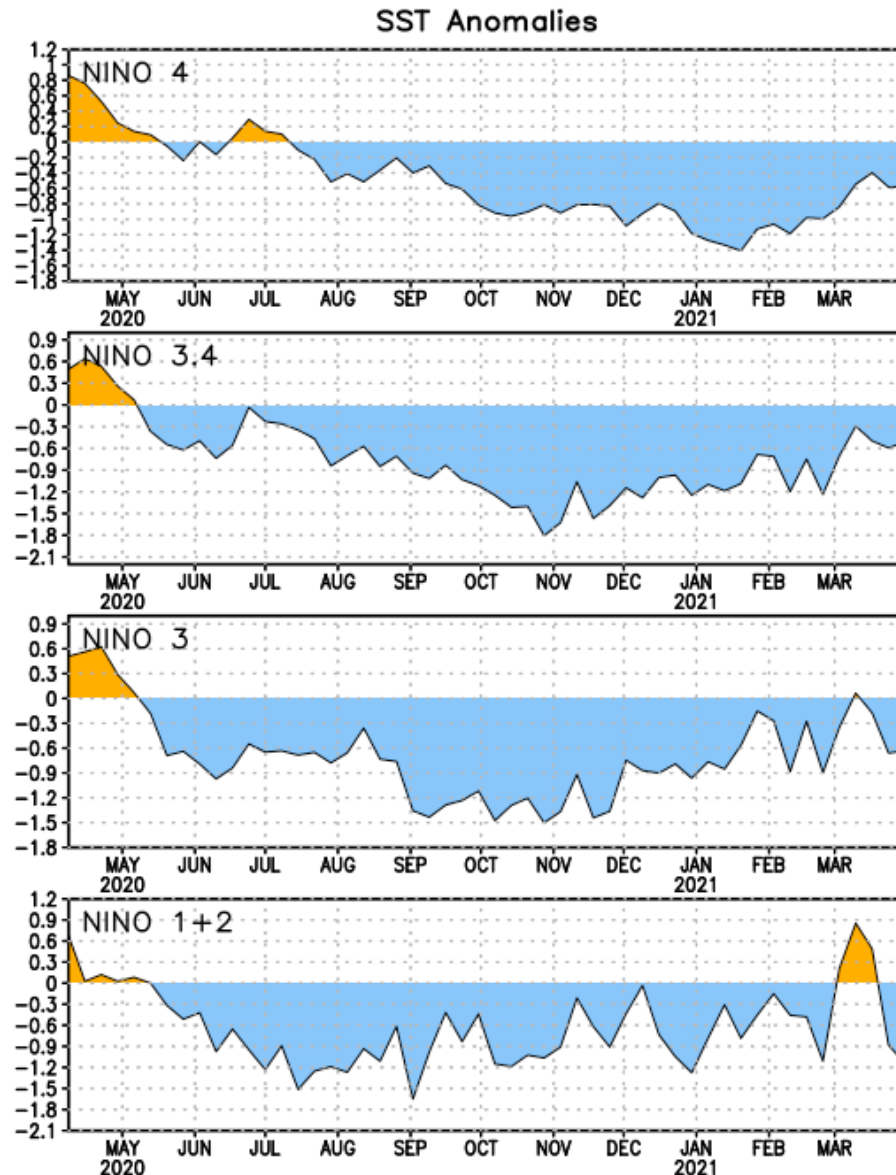
Sea Surface Temperature



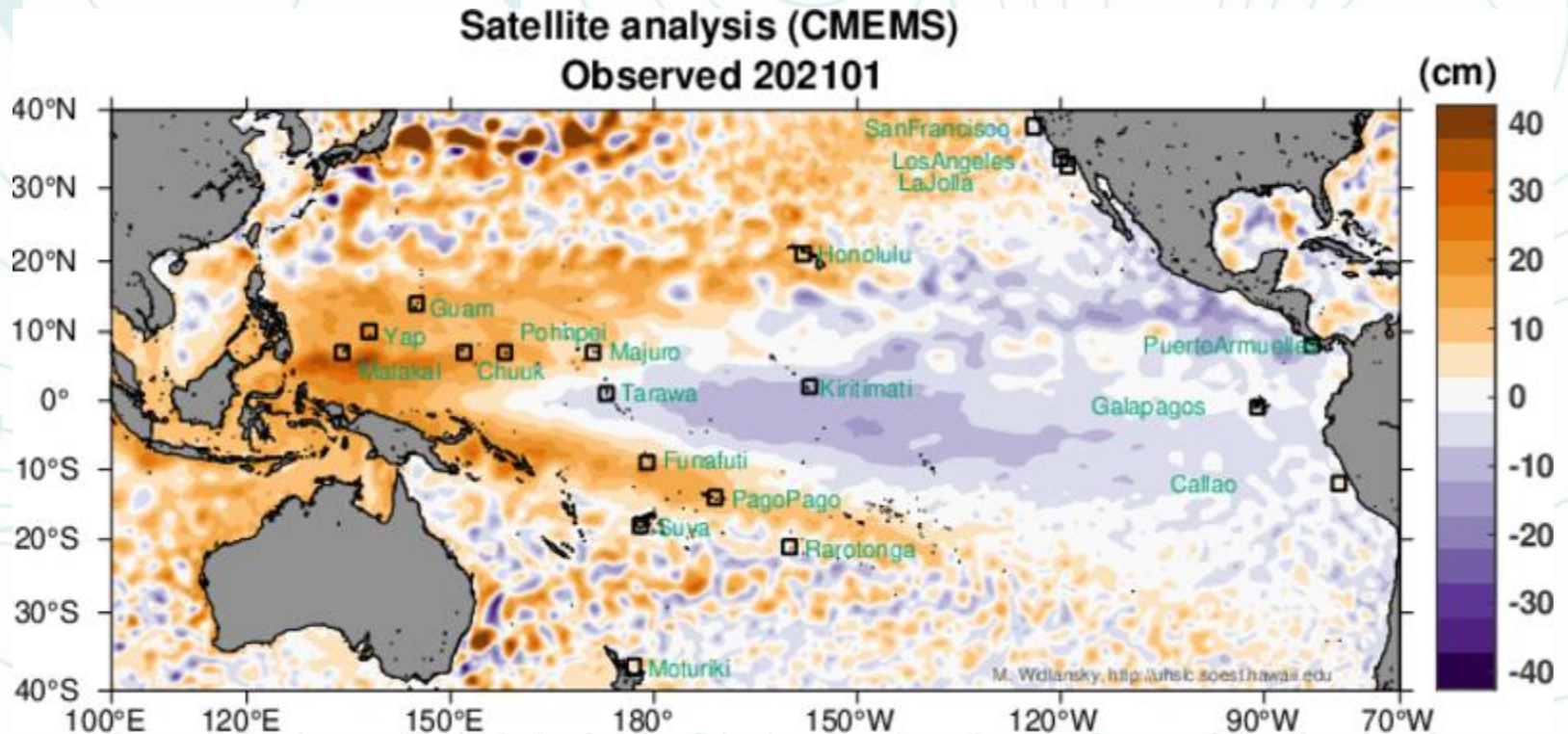
Year to Date Sea Surface Temperature Anomaly . Source: NOAA Coral Reef Watch

Sea Surface Temperature

Time series of area-averaged sea surface temperature (SST) anomalies ($^{\circ}\text{C}$) in the Niño regions [Niño-1+2 (0° - 10° S, 90° W - 80° W), Niño-3 (5° N - 5° S, 150° W - 90° W), Niño-3.4 (5° N - 5° S, 170° W - 120° W), Niño-4 (5° N - 5° S, 150° W - 160° E)]. SST anomalies are departures from the 1991-2020 base period weekly means. Source NOAA NWS CPC



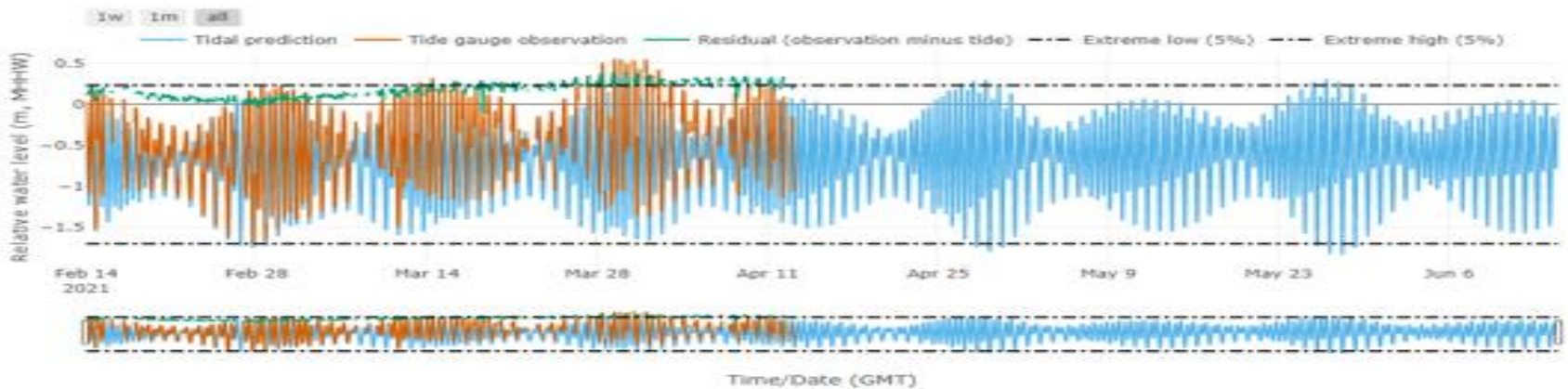
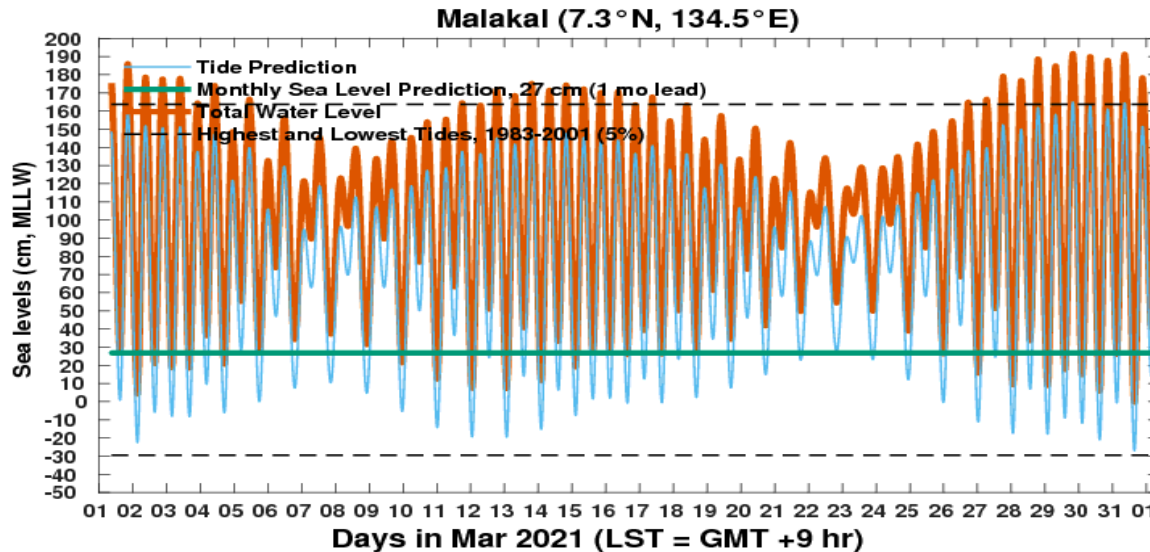
Sea Level



Consistent with the ongoing La Niña event, **sea levels in the tropical north-central and far western Pacific were above normal**. Conversely, **along the equator (east of ~160 deg E) and the eastern Pacific, sea levels were below normal**.

In the Hawaiian Islands, Honolulu setting record highs in June, July, September, October, November, December and January. Source UHSLC

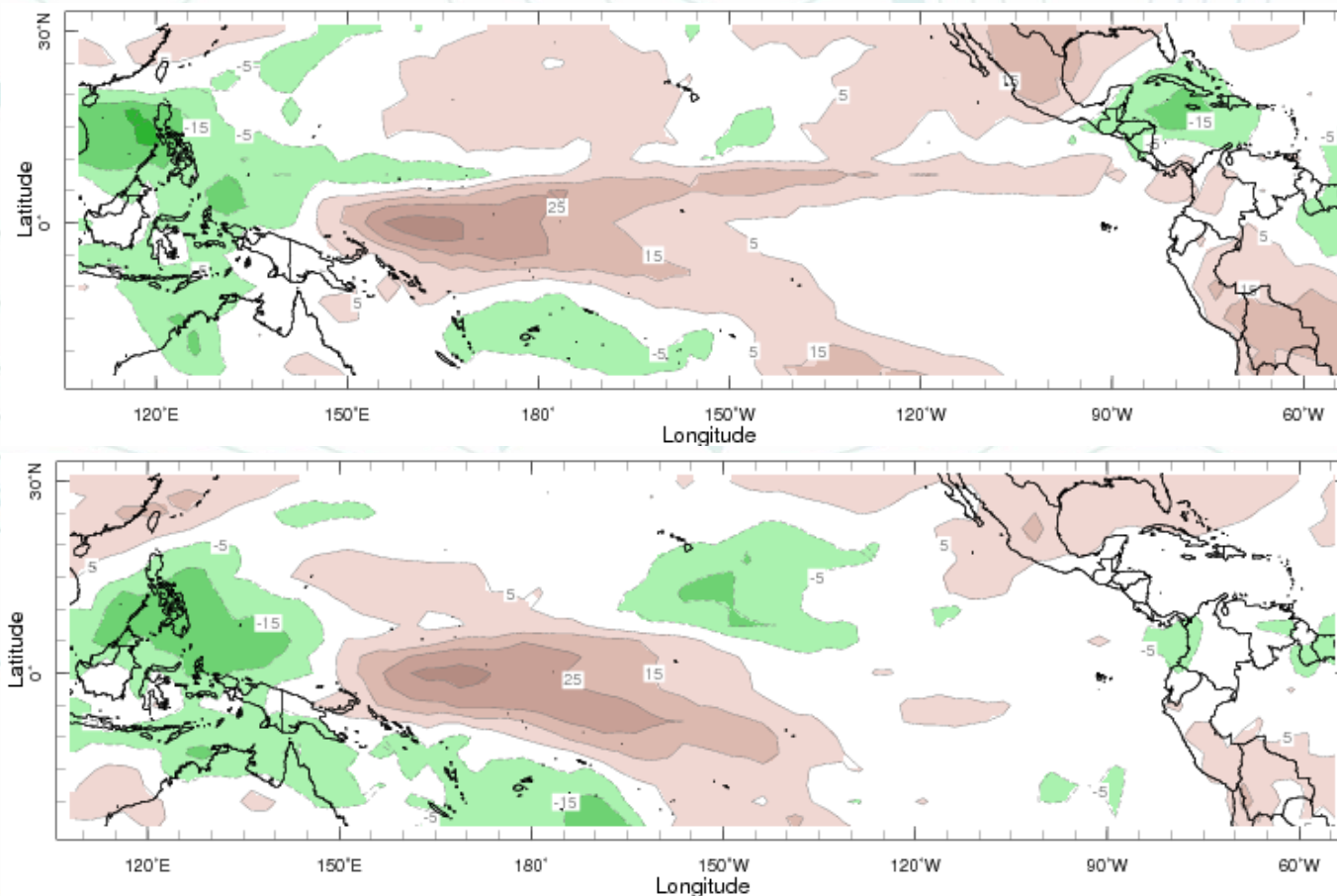
Sea Level



High Waves and Elevated Water Levels, Flooding Observed in Palau - Thanks Kikuko!!

...and FSM?? Image Source :UHSLC Station Explorer <https://uhslc.soest.hawaii.edu/stations/?stn=007#levels>

Rainfall



Seasonal outgoing long-wave radiation anomalies for OND 2020 (top) and JFM 2021(bottom). Areas with more rain/clouds than normal are depicted in green while areas with fewer clouds/less rain are depicted in brown.
Source: IRI.)

Rainfall and Drought

Highlights – September to November 2020


- On Kapingamarangi Atoll, Federated States of Micronesia (FSM),. **Exceptional drought.** It had the 4th driest September on record and its 5th driest October and November. Collectively, September-November 2020 ranked as the 2nd driest such 3-month period in the 25-year record.
- For the month of October, Majuro (RMI) logged its 3rd wettest month on record.
- In American Samoa, Pago Pago, American Samoa recorded its 5th wettest October on record.

Highlights – December 2020 to February 2021

- On Kapingamarangi Atoll, FSM, **Extreme drought.** It had its 4th driest Dec-Feb (DJF) period on record, and **driest year (January-December 2020) on record.**
- For the DJF period, precipitation was well above normal in areas of FSM including Kosrae, Lukunor, and Yap.
- **Moderate drought** was observed in the Republic of the Marshall Islands (RMI) on Kwajalein and Wotje.
- In American Samoa, Pago Pago logged its **wettest year on record in 2020.**

Rainfall Verification





https://www.weather.gov/peac/PEAC_Monthly_Call



NWS Climate Services

March PEAC Audio Conference Call Summary

11 March, 1430 HST (12 March 2020, 0030 GMT)

Location	DJF Verification	Rainfall Outlook	Final Probs	3 month Verification		
				% norm	Total (in)	Tercile
Palau						
Airai 7° 22' N, 134° 32' E	Above		20:30:50	121	40.47	Above
FSM						
Yap 9° 29' N, 138° 05' E	Above		25:30:45	185	37.08	Above
Chuuk 7° 28' N, 151° 51' E	Above		25:30:45	151	43.32	Above
Pohnpei 6° 59' N, 158° 12' E	Above		25:35:40	135	52.57	Above
Kosrae 5° 21' N, 162° 57' E	Avg-above		30:35:35	171	79.51	Above
RMI						
Kwajalein 8° 43' N, 167° 44' E	Above		25:35:40	67	8.33	Below
Majuro 7° 04' N, 171° 17' E	Avg-above		30:35:35	124	32.18	Above
Guam and CNMI						
Guam 13° 29' N, 144° 48' E	Above		25:35:40	108	13.14	Avg.
Saipan 15° 06' N, 145° 48' E	Above		25:35:40	144	12.88	Above
American Samoa						
Pago Pago 14° 20' S, 170° 43' W	Avg-above		30:35:35	128	49.03	Above
State of Hawaii						
19.7° - 21.0° N, 155.0° - 159.5° W						
Lihue	Avg-above		30:35:35	108	7.83	Avg.
Honolulu	Avg-above		30:35:35	147	5.08	Avg.
Kahului	Avg-above		30:35:35	74	4.46	Below
Hilo	Avg-above		30:35:35	165	45.33	Above

Heidke: 0.5544
RPSS: 0.1101

- The verification result of MAM rainfall forecasts was 11 hits and 3 misses (Heidke score: 0.4159).
- The verification result of AMJ rainfall forecasts was 9 hits and 5 misses (Heidke score: 0.3417).
- The verification result of MJJ rainfall forecasts was 10 hits and 4 misses (Heidke score: 0.4476).
- The verification result of JJA rainfall forecasts was 9 hits and 5 misses (Heidke score: 0.3435).
- The verification result of ASO rainfall forecasts was 9 hits and 5 misses (Heidke score: 0.3417).
- The verification result of SON rainfall forecasts was 9 hits and 5 misses (Heidke score: 0.0136).
- The verification result of OND rainfall forecasts was 10 hits and 4 misses (Heidke score: 0.4515).
- The verification result of NDJ rainfall forecasts was 10 hits and 4 misses (Heidke score: 0.4104).
- The verification result of DJF rainfall forecasts was 9 hits and 5 misses (Heidke score: 0.5544).

NOAA NWS PEAC Services: <https://www.weather.gov/peac/>

NOAA NWS Weather Forecast Office Honolulu & Guam: <http://www.prh.noaa.gov/pr/hnl/>
<http://www.prh.noaa.gov/pr/guam/>

NOAA National Centers for Environmental Information:
<http://www.ncei.noaa.gov/>

NOAA NMFS Pacific Island Fisheries Science Center: <http://www.pifsc.noaa.gov/>

NOAA OceanWatch - Central Pacific:
<http://oceanwatch.pifsc.noaa.gov/>

NOAA Coral Reef Watch:
<http://coralreefwatch.noaa.gov/>

USGS Pacific Islands Water Science Center: <http://hi.water.usgs.gov/>

USGS Science Center – Pacific Coastal and Marine Science Center: <http://walrus.wr.usgs.gov/>

University of Hawaii - Joint Institute of Marine and Atmospheric Research:
<http://www.soest.hawaii.edu/jimar/>

University of Guam - Water and Environmental Research Institute: <http://www.weriguam.org/>

University of Hawaii Sea Level Center: <https://uhslc.soest.hawaii.edu/>

University of Hawaii Asia Pacific Data Research Center (APDRC) - <http://apdrc.soest.hawaii.edu/index.php>

Western Regional Climate Center <https://wrcc.dri.edu/>