NWS Climate Services

May PEAC Audio Conference Call Summary

14 May, 1430 HST (15 May 2020, 0030 GMT)

April rainfall totals reported (Sony)

% Normal: blue above normal & red below normal. Departure from normal: blue-above & red-below

	Rainfall	% Normal	Normal	Departure	3 mon
	Inches	April	Inches	inches	FMA
Palau	10.70	101	10.56	0.14	25.86
Yap	4.50	80	5.63	-1.13	8.92
Chuuk	8.13	65	12.47	-4.34	16.11
Pohnpei	23.03	125	18.41	4.62	40.24
Kosrae	29.87	171	17.51	12.36	61.65
Kwajalein	7.64	145	5.26	2.38	13.30
Majuro	13.95	148	9.42	4.53	30.46
Guam NAS	2.47	98	2.53	-0.06	7.59
Saipan	0.50	19	2.63	-2.13	4.60
Pago Pago	15.56	166	9.39	6.17	56.48
Lihue	1.96	101	1.94	0.02	19.97
Honolulu	2.56	492	0.52	2.04	7.20
Kahului	2.79	313	0.89	1.90	6.52
Hilo	7.75	87	8.95	-1.20	41.32

Reports from around the Region

Hawaii: Following the wettest March in over a decade, the weather pattern over the main Hawaiian Islands was much drier in April, especially during the second half of the month. Upper tropospheric disturbances during the first half of the month provided enough instability to support periods of heavy rainfall, though none produced significant flooding.

The most notable heavy rain event occurred on April 13 and 14 as an upper tropospheric low pressure system tapped into the remnant moisture from a dissipated cold front cloud band. Heavy rainfall affected the windward slopes of Oahu's Koolau Range during the late morning hours of April 13. Gages in the area recorded between 3 and 5 inches of rainfall from this episode. Waikane Stream overflowed a bit onto Kamehameha Highway but did not close the road. Another round of heavy rainfall with isolated thunderstorms occurred later that night and into the early morning hours of April 14. This second episode deposited 1 to 2 inches of rainfall along the more urbanized southern slopes of Oahu, causing some minor flooding problems. The area of heavy rainfall also affected the eastern slopes of the island of Maui, with some minor flooding occurring on the Hana Highway. A small rockslide also briefly closed a lane on the Hana Highway near Keanae.

From April 15 through the rest of the month, weather conditions across the state stabilized with a surface ridge of high pressure over or near the island chain for several days. Significant trade winds returned on April 24, but conditions remained relatively dry. A weak upper tropospheric disturbance passed over the state on April 26 and 27 but was not strong enough to trigger enhanced rainfall activity.

Island of Kauai: After having the wettest March since 2006, rainfall totals on Kauai were considerably lower for the month of April. The U.S. Geological Survey's (USGS) rain gage on Mount Waialeale had the highest monthly total of 14.37 inches, but this was only 38 percent of the April average and was the lowest April total since 1992. This gage also posted the highest daily total of 2.18 inches on April 13. The Hanalei and Wainiha rain gages recorded their lowest April rainfall totals since 1991.

Despite the recent dry conditions, rainfall totals for 2020 through the end of April remained above average at nearly all of the gages across Kauai. Mount Waialeale had the highest year-to-date total of 174.21 inches (140 percent of average).

Island of Oahu: Gages along the windward slopes of the Koolau Range had mostly near to above average rainfall totals for the month of April. Most of the remaining sites across Oahu had near to below average monthly totals, with the notable exceptions being coastal sites from downtown Honolulu to Ewa Beach. These locations had April totals skewed into the above average range due to the heavy rain event on April 14. The USGS' Kahana rain gage had the highest monthly total of 8.78 inches (118 percent of average). The Ahuimanu gage recorded the highest daily total of 4.98 inches during the heavy rain event on April 13. On the low end of the spectrum, the Manoa Lyon Arboretum and Nuuanu gages had their lowest April totals since 1992 and 1995, respectively.

Rainfall totals for 2020 through the end of April were near to above average at nearly all of the gages across Oahu. The USGS' Poamoho Rain Gage No. 1 had the highest year-to-date total of 71.69 inches (93 percent of average).

Maui County: Many of the gages in the central and southeastern portions of the Big Island had above average rainfall totals. In fact, the highest April total of 17.51 inches (381 percent of average) came from the Kealakomo rain gage along the southeastern coast of the Puna District. This was easily the highest April total ever for this site, but its data record is rather short, going back to just 2010. Kealakomo also had the highest daily total of 5.98 inches on April 14. In the Kau District, the gage at Kapapala Ranch had its highest April total since 2002. Many of the remaining sites on the Big Island had below average totals.

Big Island rainfall totals for 2020 through the end of April were near to above average at most of the gages. The USGS' Saddle Road Quarry gage had the highest year-to-date total of 91.68 inches (179 percent of average).

Island of Hawaii: February totals from rain gages in the North and South Kohala Districts, the North and South Kona Districts, and the Hamakua District were mostly near to above average. Most of the February totals across the rest of the Big Island were near to below average. The USGS' rain gage at Kawainui Stream had the highest monthly total of 13.94 inches (146 percent of average). The Kamuela Upper gage, which recorded 4.76 inches on February 10, had the Big Island's highest daily total for the month. This is a rare distinction for this site. Its monthly total of 8.89 inches (182 percent of average) was also its highest February total since 2002.

Most of the Big Island's rain gages had above average rainfall totals for 2020 through the end of February. The USGS' Saddle Road Quarry gage had the highest year-to-date total of 65.62 inches (315 percent of average).

Reports around the Region Cont.

American Samoa: (not present)

Kwajalein: (Jason)

Past 30 days has yielded 8" of rainfall. Vegetation is starting to show green coloration. No severe weather to report.

Majuro: (Not present)

Pohnpei: (Not present)

Kosrae: (Not present)

Chuuk: (Sanchez)

A shift in the weather patterns spreading farther north has brought steady showers to Chuuk Lagoon during the last week of April. Although this has helped to lighten some of the impacts, drought conditions continue for those near and north of 8N. In response, jerry cans, water tanks, and drinking water were mobilized shortly after conducting extensive assessments on islands in need of relief. Meanwhile, in the Mortlock Islands, drought conditions have subsided. The bulk of the convection mostly situated in the south has produced enough rain placing Lukunoch in the category of No Drought or Dryness.

Yap: (Javez)

April has been relatively dry.

Palau: (Kikuko)

April 2020 Timeline:

- Last week of March through first week of April: Manmade fires reported in several States (Melekeok, Ngaraard, Ngardmau, and Ngatpang). Palau Public Utilities Corporation (PPUC) announces ***voluntary*** conservation of water for Palau. PPUC issued Water Shortage Alerts for three States of the Republic (Ngerchelong, Aimeliik and Airai).
- By April 7, PPUC announces ***mandatory*** conservation (limited water usage for essential use only; no car or pavement washing).
- On April 9, Staff Meteorologist Kikuko Mochimaru, provided a Weather and Climate Briefing at the Leadership meeting with the President of the Republic of Palau, Senators, Delegates, and representatives from PPUC, the media and other agencies.
- By April 13, water levels declined substantially for Ngerikiil Water Source and slightly for Ngerimel Dam. Daily water rationing was implemented for the hours from 11pm to 5am.
- On April 16, PPUC lifted the Nation-wide water rationing except for a few hamlets in Aimeliik and Ngerchelong. ***Mandatory*** conservation continued through the month of April
- No fires to report during voluntary and mandatory conservation until April 29, where slash and burn agricultural practices went out of control affecting Melekeok and Ngaraad States, again.

Figure 1 Estimated 5 mile charred ridge from Aimeliik to Ngatpang States March 29 thru April 1, 2020 photo by Ebiil Society Ann Singeo

Figure 3 Slash and burn agricultural practices gone bad for Melekeok and Ngaraard States on April 29, 2020. Photo by Ebiil Society Ann Singeo.

Figure 4 Babeldaob Fires from Jan-Mar 2020, 62 incidents recorded. Largest and recent Fires March 29-April 1 crossed borders of Aimeliik and Ngatpang ~180 acres. Posted by Ebiil Society Ann Singeo

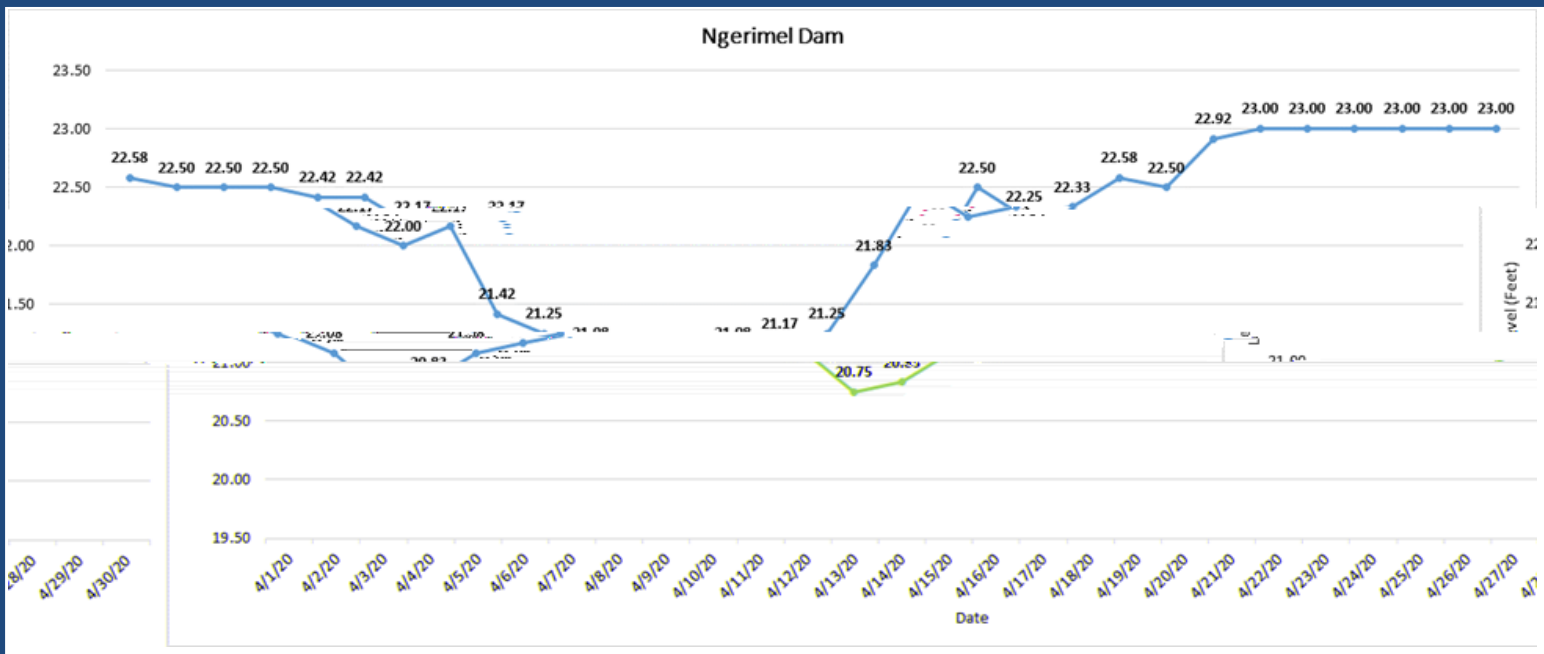


Figure 5 Ngerimel Dam April 2020 Water Levels

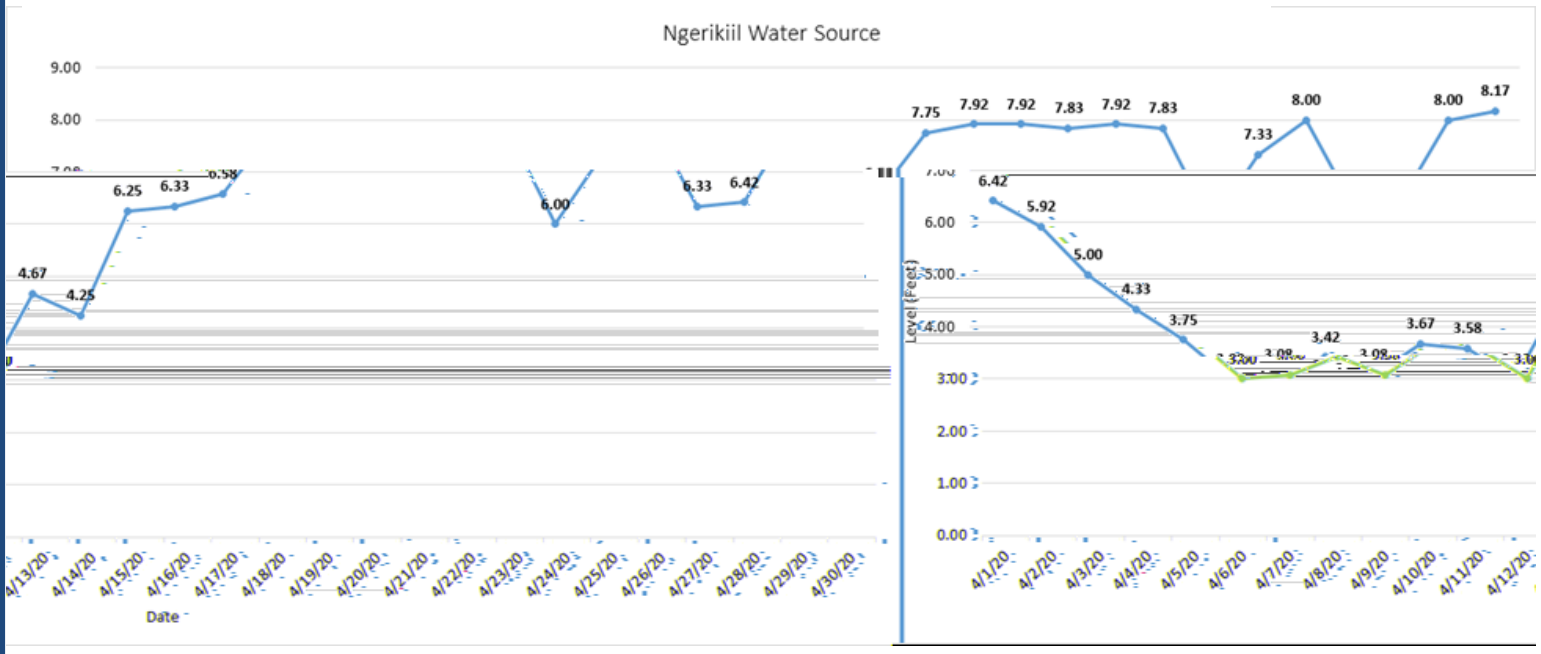


Figure 6 Ngerikiil Water Source April 2020 Water Levels

For the first 23 days of April, generally dry trade-winds were observed over the Republic of Palau. At that time, WSO Palau (Airai Airport) recorded rainfall amounts of 4.90 inches (52% of Normal), Koror at 4.85 inches (66% of Normal) while other stations recorded lesser amounts with Peleliu recording the lowest at 0.45 inches. WSO Palau inquired about Peleliu's water levels due to past and very low monthly rainfall totals. On April 24, 2020, PPUC reported that water levels in Peleliu were at 3.8 feet with maximum capacity at 5.4 feet. In the last week of April, mainly trade-wind convergence north of the equatorial troughs and embedded circulations located south of the main islands of Palau, increased rainfall totals across Palau with four out of five stations recording more than the "8-inch monthly average needed for most water needs".

Reports around the Region Cont.

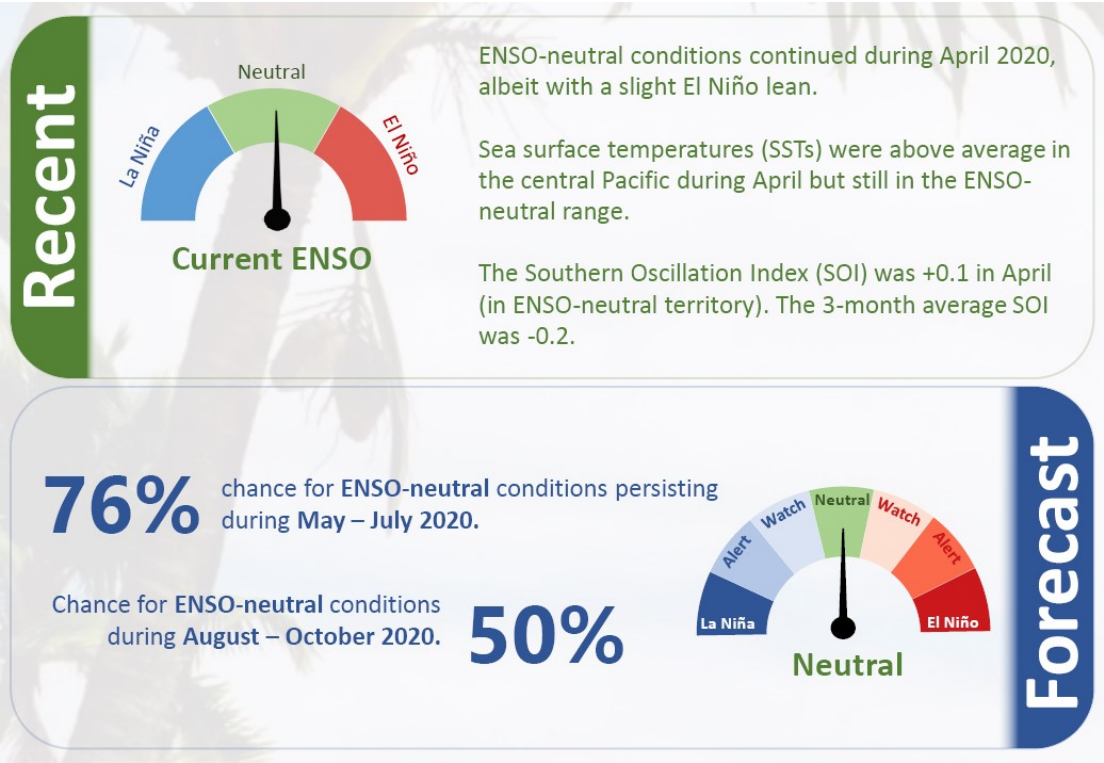
Guam/CMNI: (Chip, Brandon, Mark)

Good amount of rainfall took place in Guam but Saipan remains very dry. Green vegetation in Guam.

Tropical Cylone: (Mark)

Southern hemisphere season is pretty much over.

Current State of ENSO and predictions: **ENSO Alert System Status:** ***Not Active***



Source: NIWA Island Climate Update:

May 2020

ENSO situation summary

El Niño-Southern Oscillation (ENSO) neutral conditions continued during April 2020. The Southern Oscillation Index (SOI) was +0.1.

The NINO3.4 Index anomaly (in the central Pacific) for April was +0.54˚C (on the El Niño side of neutral). During April 2020, upper-oceanic heat content continued to decrease across the equatorial Pacific. This is the first time in at least a year that heat content was below average in the vicinity of the International Dateline. Heat content was slightly above average in the eastern part of the basin, closer to South America.

Trade winds during April were slightly stronger than normal along the equator. This pattern is expected to continue over the next 1-2 months, most likely leading to continued cooling in the west-central Pacific.

In the subsurface ocean, cooler than average temperatures extended across the Pacific below 50m depth and were buffered by a slightly warmer layer above. While there is no immediate indication that these cooler seas will surface, it lends credence to the idea that oceanic La Niña conditions might arrive later in 2020 as some models suggest.

According to the consensus from international models, ENSO-neutral conditions are very likely (76% chance) for the May – July period. For the August – October and November – January periods respectively, the probability for ENSO-neutral conditions is 50% and 40% with the probability for La Niña increasing to 30% by late 2020.

Rainfall Verification and Outlooks for FMA (Sony)

The verification result of **DJF** rainfall forecasts was 8 hits and 6 misses (Heidke score: 0.2655). The 6 stations we missed were: Palau, Yap, Kosrae, Guam, Saipan, and Pago Pago.

Location	UKMO	ECMWF	CA	NASA	NCEP	IRI	APCC	Rainfall Outlook	Final Probs	3 mo Verification		
										% norm	Total (in)	Tercile
Palau												
Airai 7° 22' N, 134° 32' E	Avg-below	Avg-below	Avg-below	Avg.	**Below**	**Below**	**Below**	**Below**	**45:35:20**	90	25.86	**Avg.**
FSM												
Yap 9° 29' N, 138° 05' E	Avg-below	**Below**	**Below**	Avg-below	**Below**	**Below**	**Below**	**Below**	**40:35:25**	**58**	8.92	**Below**
Chuuk 7° 28'N, 151° 51'E	Avg-above	Avg-above	Avg.	Avg-below	Avg-below	Avg-below	Avg.	Avg-below	**35:35:30**	**57**	16.11	**Below**
Pohnpei 6° 59'N, 158° 12'E	Avg-above	Avg-above	Avg.	Avg-below	Avg-below	Clim.	Avg.	Avg.	**30:40:30**	98	40.24	**Avg.**
Kosrae 5° 21'N, 162° 57'E	Avg-above	**Above**	Avg-above	Avg.	Avg.	**Above**	**Above**	Avg.	**30:40:30**	133	61.65	**Above**
RMI												
Kwajalein 8° 43'N, 167° 44'E	Avg-above	**Above**	Avg-above	Avg.	Avg.	Avg-above	**Above**	Avg.	**30:40:30**	130	13.30	**Avg.**
Majuro 7° 04' N, 171° 17'E	Avg-above	**Above**	Avg-above	Avg.	Avg-above	**Above**	**Above**	Avg-above	**30:35:35**	133	30.46	**Above**
Guam and CNMI												
Guam 13° 29'N, 144° 48' E	Avg-below	**Below**	Avg-below	Avg.	Avg.	**Below**	Avg-below	**Below**	**40:35:25**	99	7.59	**Avg.**
Saipan 15° 06'N, 145° 48' E	**Below**	**Below**	Avg-below	Avg.	Avg.	**Below**	**Below**	**Below**	**40:35:25**	65	4.60	**Below**
American Samoa												
Pago Pago 14° 20'S, 170° 43'W	Clim.	**Below**	Avg-below	**Below**	Avg.	Clim.	Avg-below	Avg.	**30:40:30**	**176**	56.48	**Above**
State of Hawaii												
19.7° - 21.0' N, 155.0° - 159.5' W												
Lihue	**Above**	Avg.	Avg-above	Avg-above	Avg.	Avg-above	Avg-above	Avg-above	**30:35:35**	**314**	19.97	**Above**
Honolulu	**Above**	Avg.	Avg-above	Avg-above	Avg.	Avg-above	Avg-above	Avg-above	**30:35:35**	**313**	7.20	**Above**
Kahului	**Above**	Avg.	Avg-above	Avg-above	Avg.	Avg-above	Avg-above	Avg-above	**30:35:35**	**174**	6.52	**Above**
Hilo	**Above**	Avg.	Avg.	Avg-above	Avg.	Avg-above	Avg.	Avg-above	**30:35:35**	**147**	41.32	**Avg.**

	Hit
	Miss
Heidke:	**0.4882**
RPSS:	**0.2322**

Tercile Cut-offs for Season based on 1981-2010 Pacific Rainfall Climatologies (Luke He)

	Koror	Yap	Chuuk	Pohnpei	Guam	Saipan	Majuro	Kwaj	Lihue	Honolulu	Kahului	Hilo	Pago Pago	Kosrae
below (<)														
33.33%	22.53	14.18	25.26	38.32	6.88	6.15	21.03	8.63	5.78	1.88	3.25	24.59	32.29	45.07
near														
66.66%	31.23	19.83	31.4	48.92	10.04	8.74	28.4	16.52	9.92	4.7	6.41	45.54	36.83	52.02
above (>)														
Rainfall in inches														

Rainfall Outlook for May, June, July (MJJ 2020)

Location	*Rainfall Outlook*	*Final Probabilities*
Palau		
Airai	Average-Above	**30:35:35**
FSM		
Yap	Average-Below	**35:35:30**
Chuuk	Average	**30:40:30**
Pohnpei	Average	**30:40:30**
Kosrae	Average-Above	**30:35:35**
RMI		
Kwajalein	Average	**30:40:30**
Majuro	Average	**30:40:30**
Guam and CNMI		
Guam	Average	**30:40:30**
Saipan	Average-Below	**35:35:30**
American Samoa		
Pago Pago	Average	**30:40:30**
State of Hawaii		
Lihue	Average-Below	**35:35:30**
Honolulu	Average-Below	**35:35:30**
Kahului	Average-Below	**35:35:30**
Hilo	Average-Below	**35:35:30**

Note:

Interpretation of tercile probability Example: The Avg-above probability, **30:35:35** forecasts in MJJ season means there is a **35%** chance (probability) for occurrence of excess rainfall during the MJJ season, **35%** chance for occurrence of rainfall within a pattern considered normal during the MJJseason, and **30%** chance for occurrence of deficit rainfall during the MJJ season. *Also note that excess and deficit limit for each of the stations are different*

Drought monitoring updates.

A. End-of-April Monthly Drought Assessment:

i. With WxCoder III data, we have 23 stations in the monthly analysis.

ii. April was dry (less than the 4- or 8-inch monthly minimum needed to meet most water needs) across the Marianas, northern RMI, & western FSM. It was wet across the rest of Micronesia and American Samoa. The end-of-April monthly analysis (April 30) is consistent with the weekly analyses for April 28 and May 5 and is the same as the April 28 analysis. Compared to the end-of-March monthly analysis:

a. The USDM status worsened in the Marianas, western Yap State, and the northern RMI:

1. Yap, Utirik, Rota, & Saipan wet to D3-S or D3-SL; Guam, Woleai, & Kwajalein went to D2-S; Chuuk & Ailinglapalap went to D1-S.

b. The USDM status improved in the southern & eastern FSM:

1. Lukonor, Nukuoro, & Pingelap went to D-Nothing.

c. The USDM status stayed the same at the other stations:

1. D2-S at Ulithi; D0-S at Palau & Majuro; D-Nothing at Pohnpei, Kosrae, Kapingamarangi, Jaluit, Mili, & Pago Pago.

d. Fananu was plotted as missing (could not be analyzed) due to missing data for the last 7 months.

iii. Some April 2020 precipitation ranks:

a. Saipan: driest April in their 40-year record, 3rd driest Dec-Apr (31 years), but second wettest May-Apr (31 yrs)

b. Ulithi: 2nd driest April (38 yrs)

c. Woleai: 2nd driest Jul-Apr (25 yrs), 5th driest Jan-Apr (33 yrs)

d. Yap: 8th driest Jan-Apr (69 yrs), 4th driest May-Apr (68 yrs)

e. Chuuk: 8th driest Feb-Apr (69 yrs)

f. Lukonor: 4th driest Dec-Apr (35 yrs), but driest May-Apr (23 yrs)

g. Kapingamarangi: 6th driest Dec-Apr (23 yrs)

h. At the other extreme: Pago Pago: wettest Jan-Apr, Dec-Apr, & Nov-Apr (54 yrs), 2nd wettest May-Apr (54 yrs) – and Mili: 2nd wettest Apr (36 yrs), wettest Oct-Apr (34 yrs) & Jun-Apr & May-Apr (32 yrs)

Drought monitoring updates (CON'T).

B. Current (Weekly) Drought Conditions: The discussion above is the monthly (end of April) analysis. The latest weekly USAPI USDM assessment may show different USDM classifications. The latest weekly USAPI USDM assessment is for May 12.

i. The May 12 analysis shows improving conditions in Palau, the FSM, southern Marianas, & southern RMI:

a. D2-S at Yap; D1-S at Ulithi, Woleai, Guam, Kwajalein; D0-S at Chuuk; D-Nothing at Palau

b. otherwise it is the same as the April 30 analysis.

C. April 2020 NCEI State of the Climate Drought Report: The April 2020 NCEI SotC Drought report went online Monday, May 11.

i. The web page url is:

a. https://www.ncdc.noaa.gov/sotc/drought/202004#det-reg-pacis-usapi

D. USAPI USDM journal article: *Atmosphere* has published our (my, Chip's, Mark's, Brandon's) article summarizing the development of the USAPI drought monitoring methodology for the USDM.

i. The article title: "USAPI USDM: Operational Drought Monitoring in the U.S.-Affiliated Pacific Islands"

ii. The url for the online article is:

a. https://www.mdpi.com/2073-4433/11/5/495

A

B North America Commission for Environmental Cooperation Survey: Thank you for participating in the survey! **If anyone hasn't yet but wants to, here is the url: https://survey.zohopublic.com/zs/InbASK**

C

F. USAPI USDM Authors: -- NO CHANGE IN STATUS

i. The OCONUS (USAPI) USDM became an operational product at the beginning of March, with authorship rotating amongst the NCEI, NDMC, USDA, & CPC authors.

ii. There are 7 USAPI USDM (OCONUS) authors: Ahira Sanchez-Lugo and myself (Richard Heim) from NCEI; Curtis Riganti, Claire Shield, and Deb Bathke from NDMC; Brad Rippey (from USDA); Anthony Artusa (from CPC).

a. Claire, Curtis, & Brad have authored besides Ahira & me.

With the June 4 map, the U.S. Virgin Islands have been added to the USDM product suite. The USDM web site (https://droughtmonitor.unl.edu/) has been revised so that two USDM products (sets of maps) are produced each week: a CONUS USDM and an OCONUS USDM. The OCONUS USDM includes the USAPI and the US Virgin Islands (dots), while the CONUS USDM is what has been done for years (50 States & Puerto Rico) (polygon shapefiles).

Drought monitoring updates (CON'T).

G. Automated Ingest of Daily Rainfall Data: -- NO CHANGE IN STATUS

i. Automated Program: -- NO CHANGE IN STATUS—I modified the automated program that ingests the USAPI station daily data to send out a master file of the current data to the authors, in case NCEI's web pages go down because of a future government shut down or for other reasons.

ii. **Updates and Fixes**

a. Follow up on why Kwajalein & Pago Pago are not getting into the automated process.

1. Kwajalein is in the Super Form in WxCoder III, but it is not in the regular station list. Question: Can Kwajalein's data be automatically transmitted daily from WxCoder III into the NOAAPort data feed? (need to find out station I.D. and other info to get it in to the NOAAPort feed)

b.Find out why Saipan's ASOS data are being transmitted and getting into our automated process instead of the manual gauge WxCoder III data.

c. Add new stations to the automated process (Capital Hill 1, Nimitz Hill, Palau International Airport, Mwoakilloa). I need to identify the WxCoder I.D. call sign and the COOP station numbers for these stations, then find them in our (NCEI) metadata base, then determine if they are being captured from the NOAAPort feed.

iii. Web interface: url is:

a. https://www.ncdc.noaa.gov/temp-and-precip/drought/usapi-pcp/

b. The "All Indicators" tab is the most used tab by USDM authors:

1. https://www.ncdc.noaa.gov/temp-and-precip/drought/usapi-pcp/all

c. The "Weekly", "Monthly", and "Seasonal" tabs have data tables as well as maps plotting the values.

d. The web page is updated automatically every day by a computer program that automates the ingest and processing of the data. The program runs every morning at 10 a.m. EST; it also sends out an email every day containing daily and weekly rainfall totals for several USAPI stations.

e. Some data on the web page are color coded to indicate wet or dry conditions (weekly and monthly precipitation totals), missing days (grey), and USDM categories (monthly and seasonal rank percentiles).

f. The web page is for internal use by NWS Pacific Island personnel and USDM author personnel. It is not for public release (NCEI does not have the staff to answer questions from the public and media and other users about why there is missing data).

Participants:

NWS Climate Services Program Managers (CSPMs):

WSO Climate Service Focal Points (CSFPs):

(Majuro) Sanchez (Chuuk) (Pohnpei)
(Kosrae) Javez (Yap) (Pago Pago)
(Palau) Kiku Jason (Kwajalein)
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PEAC Principal Research Scientist: Rashed Chowdhury

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CPC Forecaster: Luke He

WFO Guam : Brandon, Chip

NWS MIC, Honolulu: Christopher Brenchley

NCEI: Richard Heim

Pacific RISA:

NWS Hydrologist: Kevin Kodama

Additional Attendees:

John Marra

Anthony Artusa

Dave Simeral

**** Next Call– 11 June 2020, 1430 HST (12 June 2020, 0030 GMT)****