NWS Climate Services

August PEAC Audio Conference Call Summary

8 August, 1430 HST (9 August 2019, 0030 GMT)

July rainfall totals reported (Sony)

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

	Rainfall	% Norm	Median	Departure	3 Month Total
	Inches	July	Inches	inches	MJJ
Koror	15.04	81	18.53	-3.49	38.12
Yap	12.25	81	15.08	-2.83	32.54
Chuuk	11.65	97	11.98	-0.33	31.01
Pohnpei	15.64	101	15.43	0.21	48.14
Kosrae	9.19	62	14.91	-5.72	51.18
Kwajalein	4.77	48	9.87	-5.10	20.24
Majuro	7.12	64	11.17	-4.05	34.57
Guam NAS	4.63	46	10.14	-5.51	10.09
Saipan	6.73	76	8.91	-2.18	14.62
Pago Pago	17.54	316	5.55	11.99	38.66
Lihue	1.72	102	1.69	0.03	9.37
Honolulu	0.12	33	0.36	-0.24	6.10
Kahului	0.15	39	0.38	-0.23	1.07
Hilo	9.56	100	9.53	0.03	17.31

Sea Level Discussion Remarks (Rashed) All values are in inches (1 inch=25.4 mm); Seasonal cycle removed.

PEAC Teleconference: Sea-Level Outlook—August 08, 2019

All values are in inches (1 inch=25.4 mm); Seasonal cycle removed.

Tide Gauge stations	Seasonal Forecasts ASO (mean[1]) (ano)	SD of MJJ (mean)	Monthly mean[1] anomaly			Current State/ Trend MJJ 2019	Seasonal Forecasts ASO (max[2]) (ano.)	SD of MJJ (max)	Monthly max[2] anomaly		
			Observed rise/fall						Observed rise/fall		
			May/ 2019	Jun/ 2019	Jul/ 2019				May/ 2019	Jun/ 2019	Jul/ 2019
Marianas, Guam	+3	3.5	+5	+4.5	+4.5	Above	+19	4.0	+18	+18	+18
Malakal, Palau	0	4.4	-3	+2	-2	Normal	+36	4.2	+34	+33	+36
Yap, FSM	+3	3.7	0	+1	+4	Above	+28	3.6	+27	+25	+27
Chuuk, FSM***	+3	*	+4	+3.5	+4.5	Above	+29				
Pohnpei, FSM	+4	3.0	+5	+6	+8	Above	+36	3.3	+32	+33	+39
Kapingamarangi	+4	**	**	**	**	**	**	**	+34	**	**
Majuro, RMI	+4	2.3	+6.5	+6	**	Above	+40	3.0	+43	+41	**
Kwajalein, RMI	+4	2.8	+4	+6.5	+4.5	Above	+40	3.0	+38	+41	+43
Pago Pago*	+7 [+10]	3.7	+9 [+14]	+9 [+14]	+9 [+14]	Above	(+35) [+40]	4.2	+35	+35	+36
Honolulu	+3	1.8	+3	+1	+4	Above	+23	2.4	+22	+20	+26
Hilo	+4	2.1	+4	+4	+6	Above	+27	2.7	+30	+25	+29

+/- indicate positive anomaly (rise) and negative anomaly (fall) respectively. Note that any changes between (0~ ±1) inch is considered to be negligible. Also note that changes within the range of (+/-) 2 inches are unlikely to cause any adverse climatic impact. *** (Experimental) Satellite Aviso Altimetry data, ** Data currently unavailable; *Figures in parenthesis ( ) for monthly-max anomaly indicates difference between the maximum anomaly for the given month and the long-term monthly average anomaly.*

1: *Difference between the mean sea level for the given month and the 1983 through 2001 monthly mean sea level value at each station (seasonal cycle removed);* 2: *Same as 1 except for maxima; SD stands for standard deviations.*

* *In Pago Pago,* There was a level shift (approximately 5 inches) in American Samoa at the time of September 2009 earthquake. So, -5 inches has been adjusted (shown in parenthesis [ ] to the current tide-gauge values of Pago Pago.

Current Conditions: Models and expert opinion suggest that El Niño has already transitioned to ENSO neutral—

- *Since January 2019, the pattern of sea level variability corresponded very well with WP El Niño, where the positive sea level anomaly is located over/or near the central Pacific and maximum near 160°E-180 (i.e., Pohnpei, Kwajalein, and Majuro) and the negative SLA is located near 130°E-150°E (i.e., Koror) (also see Kug, J.-S., et al. (2009).*
- *The MJO displays eastward propagating signal across eight phases from the Indian Ocean to the Pacific and later the western hemisphere.*

Impacts: *There are reports of minor-to-moderate inundations in the low-lying atolls with some minor damages.*

Forecasts for MJJ: PEAC-CCA[1] Statistical model is predicting **above-normal** sea level to the north Pacific islands (***Koror, Yap, and Chuuk)***. Other FSM stations **(Chuuk, Pohnpei**) and RMI's stations are likely to remain in higher than normal state. In Hawaii, both Honolulu and Hilo are likely to be slightly elevated.

El Niño has already transitioned to ENSO neutral—this is most likely to continue through Northern Hemisphere winter 2019-20 (50-55% chance). So, the sea level is also likely to come back to normal by the end of 2019.

Kug, J.-S., et al. (2009). Two types of El Niño events: Cold tongue El Niño and warm pool El Niño. J. Climate, 22, 1499–1515 (available @ https://journals.ametsoc.org/doi/pdf/10.1175/2008JCLI2624.1).

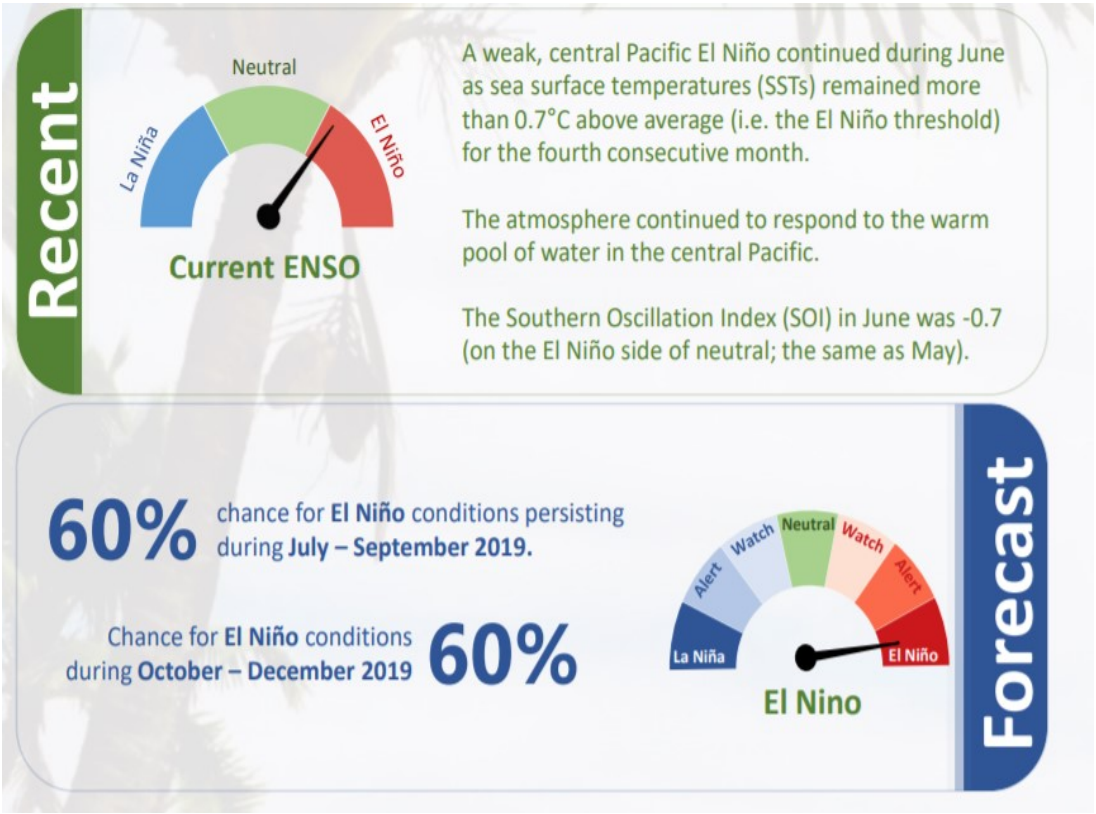
Chowdhury M. R., Chu P-S, and Guard C. (2014): An Improved Sea Level Forecasting Scheme for Hazards Management in the U.S.-Affiliated Pacific Islands. *Int. J. Climatology* 6, 2320-2329.

Current State of ENSO and predictions: (Rashed) **ENSO Alert System Status: Final El Niño Advisory**

Synopsis: El Niño has transitioned to ENSO-neutral, which is most likely to continue through Northern Hemisphere winter 2019-20 (50-55% chance).

During July, ENSO-neutral conditions were reflected by the combination of below-average sea surface temperatures (SSTs) in the eastern equatorial Pacific Ocean and above-average SSTs in the central Pacific . The latest weekly ENSO indices were +1.0° C, +0.5°C, -0.2°C and -0.5°C in the Niño-4, Niño-3.4, Niño-3 and Niño-1+2 regions, respectively. Upper-ocean subsurface temperatures (averaged across 180°-100°W) were near average throughout the month (Fig. 3), as anomalously cool waters prevailed in the eastern Pacific and anomalously warm waters continued in the central Pacific. Suppressed tropical convection continued over Indonesia, while near-average convection was observed near the Date Line. Low-level wind anomalies were near average over the tropical Pacific Ocean, and upper-level winds were easterly over the east-central Pacific. The traditional and equatorial Southern Oscillation Indices remained slightly negative. Overall, oceanic and atmospheric conditions were consistent with a transition to ENSO-neutral.

The latest IRI/CPC plume of forecasts of the Niño-3.4 index (Fig. 6) favors ENSO-neutral (Niño-3.4 index between -0.5°C and +0.5°C), with index values greater than zero from late Northern Hemisphere summer into fall, warming closer to the El Niño threshold (+0.5°C) by winter. Atypically, dynamical models forecast weaker positive SST anomalies than statistical models throughout most of the forecast period. As a result, while forecasters favor ENSO-neutral conditions, the odds of El Niño (~30%) are roughly twice that of La Niña for next winter. In summary, El Niño has transitioned to ENSO-neutral, which is most likely to continue through Northern Hemisphere winter 2019-20 (50-55% chance; click CPC/IRI consensus forecast for the chance of each outcome for each 3-month period).



Source: NIWA Island Climate Update: July 2019

Rainfall Verification and Outlooks for MJJ (Sony)

The verification result of **MJJ** rainfall forecasts was8 hits and 5 misses (Heidke score: 0.4150). The 5 stations we missed were: Chuuk, Majuro, Saipan, Lihue, and Honolulu.

Location	UKMO	ECMWF	CA	NASA	NCEP	IRI	APCC	PEAC CCA	Rainfall Outlook	Final Probs	3 mo Verification		
											% norm	Total (in)	Tercile
Palau													
Koror 7° 22' N, 134° 32' E	Below	Below	Avg-below	Avg-above	Below	Below	Below	Below	Avg-below	35:35:30	80	38.12	Below
FSM													
Yap 9° 29' N, 138° 05' E	Below	Below	Avg-below	Avg-above	Avg-below	Below	Below	Below	Avg-below	35:35:30	93	32.54	Avg.
Chuuk 7° 28'N, 151° 51'E	Above	Below	Avg.	Avg-above	Avg-below	Below	Below	Below	Avg.	30:40:30	89	31.01	Below
Pohnpei 6° 59'N, 158° 12'E	Above	Below	Avg-below	Above	Avg.	Clim.	Below	Avg.	Avg.	30:35:35	96	48.14	Avg.
Kosrae 5° 21'N, 162° 57'E	Above	Above	Avg.	Avg-above	Avg-above	Below	Above	Above	Avg-above	30:35:35	108	51.18	Above
RMI													
Kwajalein 8° 43'N, 167° 44'E	Below	Below	Below	Avg-below	Below	Below	Below	Below	Below	45:30:25	86	20.24	Below
Majuro 7° 04' N, 171° 17'E	Below	Below	Below	Avg-above	Avg-below	Clim.	Avg.	Below	Avg-below	35:35:30	107	34.57	Above
Guam and CNMI													
Guam 13° 29'N, 144° 48' E	Below	Below	Below	Avg-below	Below	Below	Below	Below	Below	45:30:25	51	10.09	Below
Saipan 15° 06'N, 145° 48' E	Below	Below	Below	Avg-below	Below	Below	Below	Below	Below	45:30:25	98	14.62	Avg.
American Samoa													
Pago Pago 14° 20'S, 170° 43'W	Above	Avg.	Avg-above	Avg-above	Above	Above	Avg.	Avg-above	Avg-above	30:35:35	188	38.66	Above
State of Hawaii													
19.7° - 21.0' N, 155.0° - 159.5' W													
Lihue	Avg-above	Avg.	Avg.	Avg-below	Avg.	Below	Below	Avg.	Avg-below	35:35:30	210	9.37	Above
Honolulu	Avg-above	Avg.	Avg.	Avg-below	Avg.	Below	Below	Avg.	Avg-below	35:35:30	649	6.10	Above
Kahului	Above	Avg.	Avg.	Avg-below	Avg.	Below	Below	Avg.	Avg-below	35:35:30	111	1.07	Avg.
Hilo	Above	Above	Avg.	Avg-below	Avg.	Below	Below	Avg-below	Avg-below	35:35:30	75	17.31	Below

Hit	
Miss	
Heidke:	0.4150
RPSS:	-0.0156

Tercile Cut-offs for MJJ 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%	48.6795	31.95	34.01	45.79	18.47	13.58	30.51	20.99	4.87	0.84	0.7	20.19	18.47	45.01
near														
66.66%	63.963	39.5	37.92	54.28	25.81	18.53	33.4	26.52	5.93	1.62	1.83	29.13	26.83	50.14
above (>)														
Rainfall in inches														

Rainfall Verification and Outlooks for ASO (Con't)

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

Note:

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

Drought monitoring updates.

A. End-of-July Monthly Drought Assessment:

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

ii. July was wet (more than the 4- or 8-inch monthly minimum needed to meet most water needs) in the Marianas, Palau, American Samoa, and most FSM stations, and dry (less than 8 inches) in the RMI. Based on how often (number of days) rain fell, conditions were improving in the RMI. Even though it was wet in western Micronesia, normals are high during this time of year, so the July percent of normal values were below normal. The end-of-July monthly analysis (July 31) is consistent with the weekly analyses for July 30 and August 6 (and, in fact, is identical to the July 30 analysis since it is only one day later). Compared to the end-of-June analysis:

a. Drought improved everywhere that there was drought in June (except in parts of the RMI):

1. D3 improved to D-Nothing at Guam, Rota, & Saipan
2. D0 improved to D-Nothing at Palau & Yap
3. D1 improved to D0 at Fananu
4. D4 improved to D3 or D2 at Utirik & Wotje

b. Conditions worsened a bit in part of RMI

1. D1 worsened to D2 at Jaluit & Kwajalein
2. D0 worsened to D1 at Majuro
3. D-Nothing worsened to D0 at Ailinglapalap

c. Others: The rest of the stations were D-Nothing (no drought or abnormal dryness)

d. Ulithi was missing for the last several months, so could not be analyzed for the month.

iii. With this being the wet season and normals are high, even though some stations had enough rain to get them out of drought, they still had low ranks:

a. Driest July at Guam (drought improved) & Jaluit (drought worsened)

b. 2nd driest July at Kwajalein (drought worsened) & Woleai (no drought)

c. 3rd driest July at Kosrae (no drought) & Ailinglapalap (conditions worsened)

d. 4th driest July at Mili (no drought), Majuro (drought worsened), & Utirik (drought improved)

Drought monitoring updates (CON'T).

B. Current (Weekly) Drought Conditions: The discussion above is the monthly (end of July) analysis. The latest weekly USAPI USDM assessment may show different USDM classifications. The latest weekly USAPI USDM assessment is for August 6.

i. For August 6, differences include:

a. Improvement at Fananu, Utirik, Wotje, & Majuro

C. July 2019 NCEI State of the Climate Drought Report: I'm including a discussion of USAPI drought and climate conditions in my July 2019 NCEI SotC Drought report (which will go online Monday).

i. The web page url will be:

a. https://www.ncdc.noaa.gov/sotc/drought/201907#det-reg-pacis-usapi

D. Next 2 Weeks: I will be having hand surgery Thursday next week. I still expect to be able to do the USAPI USDM when I author the following week (8/20 USDM). Claire Shield is author next week.

E. North America Commission for Environmental Cooperation Survey: As part of a project to improve drought indices, drought monitoring, and drought products in the US, Canada, & Mexico, a group of us are working with a contractor to run a survey on drought indices used in the 3 countries. We plan to have the contractor send the survey request to you for USAPI input, so please do participate in the survey!

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

i. The OCONUS (USAPI) USDM became an operational product at the beginning of March, with author-ship 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).

G. Automated Ingest of Daily Rainfall Data:

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.

Updates and Fixes

Drought monitoring updates (CON'T).

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

1. Thank you, Chip, for getting the metadata for Jaluit and Woleai changed so they are getting into the automated system!

2. Chip: 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)

3. Chip: C/would you send me the COOP station i.d. number and NWSLI code for Palau International Airport, so we can get that station into the automated data base.

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.

d.I had a good meeting with Bill Ward (when I was in Honolulu last month) about getting automated observations set up.

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).

Drought monitoring updates (CON'T).

H. USAPI Listserv: -- NO CHANGE IN STATUS

i. NDMC (National Drought Mitigation Center) set up a listserv for communication of the USAPI USDM analyses and discussion, similar to the listservs that were set up for the Mainland and for the U.S. Virgin Islands. **We have been using this for communications, both for sending out the USAPI USDM analyses and it is also for NWS offices to report drought impacts to the authors and rest of the group.**

ii. If others want to be added to the listserv, let me (Richard Heim) or Brian Fuchs know and Brian will get them added.

iii. There is also a DMUpdate Listserver for those who just want to know when the new USDM maps are released.

Participants:

NWS Climate Services Program Managers (CSPMs):

WSO Climate Service Focal Points (CSFPs):

Lee, Nover (Majuro) Sanchez (Chuuk) Wallace (Pohnpei)
(Kosrae) Matt, Justin (Yap) (Pago Pago)
(Palau) Kikuko (Kwajalein) Mark/Chip/Brandon/Clint (Guam & CNMI)

PEAC Principal Research Scientist: Rashed Chowdhury

WERI Scientist: Mark Lander

CPC Forecaster:

WFO Guam : Chip Guard, Clint Simpson

NWS MIC, Honolulu: Christopher Brenchley

NCEI: Richard Heim

Pacific RISA: Krista Jaspers

NWS Hydrologist: Kevin Kodama

Additional Attendees:

***** Next Call– 12 September 2019, 1430 HST (13 September 2019, 0030 GMT)*****