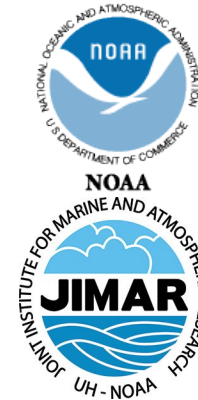




NWS Climate Services December PEAC Audio Conference Call Summary

**14 December, 1430 HST (15
December 2017, 0030 GMT)**



University of
Hawai'i
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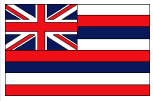


November rainfall totals reported (Joe)

% Normal: **blue** above normal & **red** below normal. Departure from normal: **blue**-above & **red**-below (same for 3 mon %)

	Rainfall	% Norm	Normal	Departure	3 mon %
	Inches	November	Inches	inches	SON
Koror	9.55	84	11.39	-1.84	42.48
Yap	9.40	106	8.83	0.57	40.98
Chuuk	11.15	105	10.61	0.54	38.71
Pohnpei	14.13	95	14.83	-0.70	41.71
Kosrae	23.21	168	13.83	9.38	60.88
Kwajalein	9.40	83	11.28	-1.88	41.29
Majuro	10.27	76	13.44	-3.17	49.41
Guam NAS	4.23	57	7.38	-3.15	37.62
Saipan	3.48	62	5.61	-2.13	18.96
Pago Pago	12.89	127	10.14	2.75	39.26
Lihue	1.13	32	3.53	-2.40	4.47
Honolulu	0.45	33	1.36	-0.91	3.33
Kahului	0.94	51	1.84	-0.90	2.93
Hilo	20.53	180	11.38	9.15	41.63

Reports from around the Region



Hawaii (Kevin)

In Hawaii, DJF represents the climatological core of the rainy season, and with CPC outlooks favoring above-normal precipitation this winter, it's reasonable to expect drought improvement and/or removal across the Islands. For January 2017 through the end of October 2017, rainfall total accumulations were as follows: Lihue Airport: 21.31 inches (78% of normal), Honolulu Airport: 18.77 inches (164% of normal), Kahului Airport: 17.09 inches (139% of normal), and Hilo Airport: (75% of normal). Island-wide climate summary is given below:

Kauai

Bookend heavy rain events at the start and end of November produced above average monthly rainfall totals at several of the windward Kauai rain gages. The USGS' Mount Waialeale gage had the highest monthly total of 56.06 inches (149 percent of average) and the highest daily total of 13.57 inches during the November 30 flash flood event. This daily total overshadowed the 9.15 inches recorded by the same gage on November 1 which on most months would likely be the highest value. Due to the higher than average frequency of trade winds, gages along the south and west sides of the island had mostly below average totals.

Rainfall totals for 2017 through the end of November were in the near average range at most of the gages on Kauai. Mount Waialeale had the highest year-to-date total of 300.52 inches (83 percent of average).

Oahu

Along the slopes of the Koolau Range of Oahu, most of the rain gages reported near to above average totals for the month of November. Due to the persistent trade winds, most of the leeward gages posted below average totals. The Manoa Lyon Arboretum gage had the highest monthly total of 22.33 inches (147 percent of average). The highest daily total of 4.90 inches came from the USGS' Poamoho Rain Gage No. 1 on November 11. The Kamehame gage above Hawaii Kai recorded its highest November total since 2007.

Most of the gages on Oahu had rainfall totals for 2017 through the end of November in the near average range. The USGS' Poamoho Rain Gage No. 1 had the highest year-to-date total of 138.73 inches (67 percent of average).

Maui

Monthly totals were in the near to above average range from most of the windward gages across Maui County. The USGS' Puu Kukui gage had the highest monthly total of 55.36 inches (185 percent of average), which made it the wettest November since 1998. This gage also had the highest daily total of 9.25 inches on November 27. Many of the leeward monthly totals were in the below average range. The Kahakuloa gage along the windward slopes of the West Maui Mountains had its highest November total since 2006.

Rainfall totals across Maui County for 2017 through the end of November were in the near to above average range at most of the gages. The USGS' rain gage at West Wailuaiki Stream had the highest year-to-date total of 185.37 inches (89 percent of average).

Big Island

Above average rainfall totals were recorded at most of the gages on the Big Island for the month of November. Several of the leeward gages in the North Kona, South Kona, and Kau Districts posted below average totals. The USGS' Saddle Road Quarry rain gage had the highest monthly total of 66.95 inches (514 percent of average). Close to two-thirds of this total occurred within the above mentioned 72-hour period from November 27 through November 30. Records for the wettest November were broken at the Kahua Ranch, Kamuela, and Kamuela Upper rain gages. Laupahoehoe and Mountain View had their wettest November since 2000.

Most of the rain gages on the Big Island had rainfall totals for 2017 through the end of November in the near average range with several sites finally overcoming the severe dryness over the summer. The USGS' rain gage at Kawainui Stream had the highest available year-to-date total of 157.59 inches (129 percent of average).



American Samoa (Mark, Rashed):

This is the rainy season in American Samoa, so there has been plenty of rainfall. November recorded 127% of normal (**% of normal and % are synonymously used throughout this call-note**). Other than several flash-flood warnings, there has not been any major activity in American Samoa for the past couple of months. American Samoa was particularly dry during July-August and started to get back to normal in September with normal rainfall in Pago Pago. Model-based PEAC's seasonal climate outlook is now indicating above-average rainfall and elevated sea level over the next three months (DJF) with high confidence, and there is no active TC warning now.

Reports from around the Region (CON'T)



Kwajalein (Jason):

During the month of November, Kwajalein received only 83% of normal rainfall and is currently a little drier than normal. There have been rain showers everyday but no significant rainfall recorded so far. Overall, rainfall has been nearly 90% of normal during the last couple of months, including December. The easterly wind burst has been very active. Strong winds caused several trees to fall down and stronger wave action. Tides have also been very high as well but no severe inundations have been reported. PEAC-model forecasts have trended to show average rainfall and elevated sea level over the next 3 months, and there is no active TC warning now.



Majuro (Lee/Mark/Chip/Rashed):

Majuro has had good rainfall in September (187%) and October (143%) that is sufficient for helping keep their water reservoirs around 31 million gallons. This rain helped solve their prolonged drought in northern islands. However, the rainfall in November was low (76% of normal), which made November to be a drier month. Majuro has had elevated sea level and high tides since October 2017, which has inundated some low-lying areas, but didn't cause any major damage. PEAC-model forecasts have trended average rainfall and elevated sea level over the next 3 months, and there is no active TC warning now. Complementary to PEAC's statistical model forecasts, the dynamic model forecasts show that the sea level in Majuro will continue to rise until the end of this year. *The rise may even go up to 8-10 inches above normal. In addition to La Niña, the wind-forced equatorial Rossby wave is partly responsible for this rise. Pohnpei and Chuuk will also be affected similarly.*



Pohnpei (Wallace/ Rashed):

Despite lower-than-average rainfall in October (81%) and November (95%), Pohnpei remained sustainable without any major problem as the Island and most of the atolls of Pohnpei have lately been, "Plenty wet". Between the elevated sea level and larger waves, several places in Pohnpei reported inundations. Particularly, there were some high-tides that inundated roads and low-lying atolls on December 5th (Pic 1).

High-tides:



Picture-1: High-Tides and Inundation pictures in Pohnpei on December 5 (**Photo Courtesy: Wallace Jacob, WSO-Pohnpei**).

PEAC forecasts have trended normal rainfall and further rise of sea level for the next three months. *The rise may even go up to 8-10 inches above normal in Pohnpei*

Reports from around the Region (CON'T)



Kosrae (Wallace/Mark):

After prolonged dry periods, the situation has improved in Kosrae. Kosrae received 168% of rainfall in November. This rain helped solve their prolonged drought condition. There were some high tides that inundate low-lying areas (Pic. 2, top) and caused some damages on roads (Pic. 2, bottom). Currently, the island is wet. PEAC forecasts have trended to show above normal rainfall for the next three months.

High-tides in Kosrae



Picture-2: High-Tides and Inundation pictures in Kosrae on December 4 (**Photo Courtesy: Wallace Jacob, WSO-Pohnpei**).

High-tides and damaged roads in Kosrae



Chuuk (Sanchez/ Chip/Rashed):

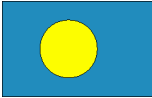
Chuuk has had good rainfall in October (127%) and November (105%). There were larger high-tides with waves, which inundated some low-lying atolls. PEAC forecasts are favoring above average rainfall and high sea level in DJF season. According to the dynamic model forecasts, sea level in Chuuk will continue to rise until the end of this year. *The rise may even go up to 8-10 inches above of normal. In addition to La Niña, the wind-forced equatorial Rossby wave is partly responsible for this rise.*

Reports from around the Region (CON'T)



Yap (Chip/Mark/Rashed):

Yap received 156% and 106% of rainfall in October and November. It is wet now and everything looks normal—reservoirs are full and streams are flowing well. Sea level has been relatively high (7.4 inches above normal), which is partly an impact of the Rossby wave. PEAC forecasts are favoring above average rainfall and high sea level in DJF season.



Palau (Mark, Chip, Rashed):

Palau has also been wet these past two months with the monsoon trough providing good rainfall. It received 84% of normal rainfall in November. The Freshwater Jelly fish is also coming back. The rainfall at Palau tracks ENSO so well that it makes a good ENSO index in its own right! During El Niño, the ONI is warm and Palau's rainfall is low; during La Niña, the ONI is cold and Palau's rainfall is high. Currently, the state of ENSO is leaning towards La Niña, so slightly above normal rainfall is expected in the forthcoming months. PEAC forecast favoring above average rainfall at Palau for the remainder of 2017 and current PEAC forecast also favoring elevated sea level in DJF.



Guam and CNMI (Mark, Chip, Rashed):

Guam has been dry for the last two weeks with some spotty showers here and there. A delay in the onset of the western North Pacific monsoon has been responsible for a prolonged period of unremarkable weather extending into August 2017 on Guam and in the CNMI. The rainfall recorded, so far, are close to normal in the previous months; however, November rainfall in Guam is significantly lower than average (57%). Saipan also received only 62% of normal rainfall. Surprisingly, both Guam and Saipan are dry now! Reasons for this persistent dryness include a weak and largely absent monsoon and a lack of tropical cyclone activity. A delay in the onset of the western North Pacific monsoon offer no extremes of rainfall, very hot days, cool nights, and persistent light trade winds. PEAC forecasts are now indicating average rainfall for both Guam and Saipan over the next three months. The climate is now in a state of La Niña, which correlates well with average-to-above average rainfall in Guam.

Tropical Cyclones (TC) (Mark, Chip, Rashed)

Throughout 2017, there was a westward and northward displacement of the TC activity. This was similar to the TC distribution during 2016, but starkly different than the TC distribution during the 2015 El Niño year. A particular characteristic of the 2017 typhoon season was a clustering of activity across the South China Sea. The westward and northward displacement of the 2017 TCs is consistent with the development of La Niña. There are many weak unnamed tropical depressions in the Pacific. TC activities in any La Niña year in the tropical Pacific is relatively less active. For the remainder of 2017, PEAC anticipates that one or two TCs of tropical storm intensity or higher may pass within 180 nautical miles of Guam, the CNMI, Yap, or Palau. These should move away to the west before acquiring major typhoon intensity. Eastward of Chuuk State, the risk of a tropical storm or typhoon is lower than at locations farther to the west.

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

Tide Gauge stations	Seasonal Forecasts DJF (mean ¹) (ano)	SD of SON (mean)	Monthly mean ¹ anomaly			Current State/Trend	Seasonal Forecasts DJF (max ²) (ano.)	SD of SON (max)	Monthly max ² anomaly		
			Observed rise/fall						Observed rise/fall		
			Sep/2017	Oct/2017	Nov/2017				ASO/2017	Sep/2017	Oct/2017
Marianas, Guam	+4	3.5	+7	+6.3	+6.6	Above/Stable	+22	3.3	+22(0)	+22(0)	+22(0)
Malakal, Palau	+4	4.4	+5	**	**	Above/Stable	+41	4.2	+39(3)	+41(5)	+42(6)
Yap, FSM	+5	4.7	+7	+7.3	+7.4	Above/Stable	+34	4.9	+33(6)	+35(8)	+34(7)
Chuuk, FSM***	+5	**	+4	+6	+8	Above/Stable	+34		**	**	**
Pohnpei, FSM	+5	4.3	+6	+9.2	**	Above/Stable	+36	4.5	+30(0)	+33(3)	**
Kapingamarangi			+4	+4.2	+5.1	Above/Stable			+26(-1)	+26(-1)	+31(4)
Majuro, RMI	+5	3.3	+6	+8.2	**	Above/Stable	+45	3.7	+44(4)	+45(5)	**
Kwajalein, RMI	+4	3.5	+5	+5.8	+7	Above/Stable	+44	3.8	+38(1)	+41(4)	+43(6)
Pago Pago*	+5 (0)	3.1	+9 [4]	+10.2 [+5]	+11.2 [+6]	Above/Stable	+32 (+27)	3.2	+32(-1) [27]	+30(-3) [25]	+34(1) [29]
Honolulu	+3	1.8	+5	+4.8	+4	Above/Falling	+23	2.5	+21(1)	+21(1)	+24(4)
Hilo	+3	1.8	+5	+6	+5.5	Above/Stable	+26	2.4	+23(0)	+23(0)	+26(3)

+/- 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: Atmospheric and oceanic signals are leaning towards La Niña. La Niña means higher-than-average sea level—currently all stations are 4-7 inches above normal. This could potentially impact islands with minor coastal flooding or salt water intrusions and increase vulnerability to flooding from storms or large waves.

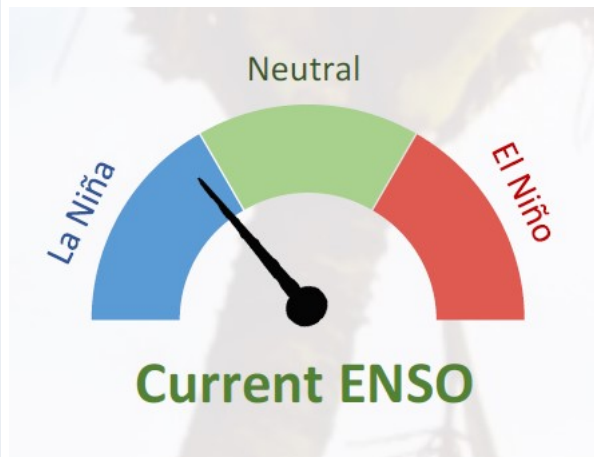
Forecasts for DJF: PEAC-CCA Statistical model is predicting 4-5 inches above normal sea levels with reasonably high skill for the whole USA-PI region. **Complementary to PEAC forecasts, some dynamical models are also predicted high sea levels.** At two and four months lead (November–January), sea levels are likely to be above-normal (4-8 inches) for Majuro, Pohnpei, and Chuuk. It is uncertain whether the high sea levels will propagate as far west as Yap and Malakal. At longer ranges (> 5 months), dynamical models suggest likelihood of rising sea levels in parts of the South Pacific (including American Samoa).

As a result of by “King Tides”, Hawaii was slightly affected by elevated sea levels. Current forecasts indicate that the highest tides of the year (“king tides”) will occur again in the early mornings over a few days either side of November 6, December 4, and January 2.

5. Current State of ENSO and predictions: (Rashed,)

ENSO Alert System Status: **La Niña Advisory**

Synopsis: La Niña is likely (exceeding ~80%) through the Northern Hemisphere winter 2017-18, with a transition to ENSO-neutral most likely during the mid-to-late spring.



La Niña strengthened during the past month, as indicated by an increasingly prominent pattern of below-average sea surface temperatures (SSTs) across the central and eastern equatorial Pacific Ocean. The latest weekly Niño-3.4 index value was -0.8°C, with the easternmost Niño-3 and Niño-1+2 indices at or below -1.0°C during much of the month. Sub-surface temperature anomalies weakened slightly during November, but remained significantly negative due to the anomalously shallow depth of the thermocline across the central and eastern Pacific. The atmospheric circulation over the tropical Pacific Ocean also reflected La Niña, with convection suppressed near the International Date Line and enhanced over Indonesia. The low-level trade winds were stronger than average over the western and central Pacific, with anomalous westerly winds at upper-levels. Overall, the ocean and atmosphere system reflects La Niña.

La Niña is predicted to persist through the Northern Hemisphere winter 2017-18 by nearly all models in the IRI/CPC plume and in the North American Multi-Model Ensemble. Based on the latest observations and forecast guidance, forecasters favor the peak of a weak-to-moderate La Niña during the winter (3-month Niño-3.4 values between 0.5°C and 1.5°C). **In summary, La Niña is likely (exceeding ~80%) through the Northern Hemisphere winter 2017-18, with a transition to ENSO-neutral most likely during the mid-to-late spring.**

6. Rainfall Outlooks for DJF (Joe)

Note

Interpretation of tercile probability: The **25:35:40** probability forecasts in DJF season means there is a 40% chance (probability) for occurrence of excess rainfall during the DJF season, 35% chance for occurrence of rainfall within a pattern considered normal during the DJF season, and 25% chance for occurrence of deficit rainfall during the DJF season. *Also note that excess and deficit limit for each of the stations are different*

Location	Rainfall Outlook	Final Probabilities
Palau		
Koror	Above	25:35:40
FSM		
Yap	Above	25:30:45
Chuuk	Above	25:35:40
Pohnpei	Avg-above	30:35:35
Kosrae	Above	25:35:40
RMI		
Kwajalein	Average	30:40:30
Majuro	Avg-above	30:35:35
Guam and CNMI		
Guam	Average	30:40:30
Saipan	Average	30:40:30
American Samoa		
Pago Pago	Above	25:30:45
State of Hawaii		
Lihue	Avg-above	30:35:35
Honolulu	Avg-above	30:35:35
Kahului	Avg-above	30:35:35
Hilo	Avg-above	30:35:35

7. Drought monitoring updates (Richard Heim).

End-of-November Monthly Drought Assessment:

- i. With WxCoder III data, we have 23 stations in the monthly analysis.
- ii. November was wet (more than the monthly minimum required to meet most water needs) in American Samoa and most of Micronesia. It was dry across most of the Marianas (Saipan & Rota), in northern Yap State (Ulithi), in northern Chuuk State (Fananu), & southern Pohnpei State (Kapingamarangi). This was the first wet month at Utirik, and second wet month at Wotje, since November 2016. The November monthly analysis (November 30) is consistent with the weekly analyses for November 28 and December 5 and, in fact, matches the November 28 analysis. Compared to the end-of-October analysis, drought conditions at the end of November improved in the Marshall Islands (Utirik) and stayed the same at the rest of the stations:

a. D2-L improved to D0-L at Utirik.

b. All other stations continued at a D-Nothing classification (no drought or abnormal dryness).

- B. Current (Weekly) Drought Conditions: The discussion above is the monthly (end of November) analysis. The latest weekly USAPI USDM assessment may show different USDM classifications. The latest weekly USAPI USDM assessment is for December 12 and has D0-S at Saipan.

- C. December 26, 2017 Weekly USAPI USDM Assessment: I will be out of town December 23-30 and won't be able to do the December 26 assessment that week. I could do it late when I get back, or we could go without an assessment that week.

- D. November NCEI State of the Climate Drought Report: I included a discussion of USAPI drought conditions in my November 2017 NCEI SotC Drought report (which went online Monday).

- i. The web page url is:

<https://www.ncdc.noaa.gov/sotc/drought/201711#det-reg-pacis-usapi>

- E. Automated Ingest of Daily Rainfall Data: We are working with NWS, WRCC, and HPRCC personnel to have the WxCoder III daily data transmitted near-real time every day so we can incorporate it into our GHCN-Daily data base here at NCEI. This will enable us to automate the processing, which is a required step before we can make the USAPI USDM weekly analyses official and release them publicly (they are considered experimental now). – **Status: The computer program, that automates the ingest and processing of the data, is running every morning at 10 a.m. EST; I'm in the process of doing routine checking of the output.**

- F. Weekly USAPI Drought Assessment:

- i. I assessed drought conditions for each week from December 9, 2014 through December 12, 2017.
- ii. Stations that don't have data (or enough data) for the week in question are designated as having No Data for that weekly assessment.
- iii. Source of the daily data for the weekly assessments: Guam and Pago Pago NWS web sites; Kwajalein PLCD web site; WRCC web sites for the automated stations; WxCoder III for most of the stations.
- iv. I will continue this on a weekly basis (Monday afternoons EST).

Preferred process: I can do the weekly rainfall analysis, send my drought classification recommendation to the USAPI folks (either just Guam or Guam and all WSOs) for confirmation and local impacts, then send it after any modification to the USDM author.

Discussion:

Mark Lander noted that he has been on Saipan for the past several days, and it is showing signs of being very dry. Grass is drying, and the tangantangan (Haole Koa, for you Hawaiian types) is defoliating in some places for lack of rain. Soil on hiking trails is dusty and dry and has large cracks appearing. There have been daily trade-wind showers, but not really enough to wet (Chip's poor quality rain). Can discuss in the next call. Rota and Tinian may also be getting a bit dry. Guam is also unusually dry, but so far vegetation is holding out. Streamflow is very low, though. Richard: I changed Saipan's status to D0-S for December 12, and plan to go to D1-S December 19. Also, noticing that Rota was dry in November (2.92"), but wet (> 1") last 2 weeks; Fananu has been dry last 3 months, but wet last week.

Participants:

NWS Climate Services Program Managers (CSPMs): Joe Brinkley

WSO Climate Service Focal Points (CSFPs):

(Majuro)

(Kosrae)

(Palau)

Sanchez (Chuuk)

(Yap)

Jason (Kwajalein)

Wallace (Pohnpei)

(Pago Pago)

Mark/Chip/Clint (Guam & CNMI)

PEAC Principal Research Scientist: Rashed Chowdhury

WERI Scientist: Mark Lander

CPC Forecaster:

WFO Guam : Chip Guard, Clint Simpson

PEAC GRA: Alejandro Ludert

NWS MIC, Honolulu: Christopher Brenchley

NCEI: Richard Heim

Pacific RISA: Krista Jaspers

NWS Hydrologist: Kevin Kodama

Additional Attendees: John Marra, Jim Potemra, Seema Balwani

***** Next Call– 11 January 2018, 1430 HST (12 January 2018, 0030 GMT)*****