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A Quarterly Bulletin of the Pacific El Niño/Southern Oscillation Applications Climate (PEAC) Center
Providing Information on Climate Variability for the U.S.-Affiliated Pacific Islands

http://www.prh.noaa.gov/peac

CURRENT CONDITIONS

The tropical Pacific climate system fell just short of El Niño status during July, August and September of 2012. During these three months the SST in the Niño 3.4 region of the tropical central Pacific warmed to the threshold of El Niño (an SST anomaly at or above +0.5°C). During October 2012, however, the SST in the crucial Niño 3.4 region fell below this threshold. By December 2012, the SST there was below normal, and has remained slightly below normal ever since. By definition, the climate state of the Pacific thus entered ENSO-neutral, but weather conditions more in-line with La Niña (e.g., a weakening of the monsoon, reduced tropical cyclone activity and elevated sea level) became established across Micronesia. In the South Pacific there was an early start to tropical cyclone activity with a major cyclone affecting Samoa and Fiji during December 2012. Enhanced tropical cyclone activity in the South Pacific near Samoa sometimes occurs during ENSO-neutral, but is most pronounced during a weak or moderate El Niño. A strong El Niño can move the cyclone activity so far to the east that American Samoa is spared, while La Niña tends to move the cyclone activity so far to the west that Samoa is spared in that condition as well. This same east-west shift of tropical cyclone activity is seen in the western North Pacific as well in response to the neutral status of ENSO.

During the first part of the calendar year, most islands of Micronesia enter their typical dry season. At islands north of 10°N (e.g., Guam and the islands of the CNMI) the dry season is prolonged (~6 months), while at islands further to the south, the dry season is shorter. For example, at Pohnpei Island there are typically only two or three relatively dry months (January, February or March). In island groups that span across a wide range of latitudes, the rainfall can vary substantially, with islands further to the north more prone to very dry conditions. The first three months of 2013 provided a good example of this large north-south rainfall disparity as the northern-most islands of Chuuk State, the Republic of the Marshall Islands (RMI) and some islands of Yap state became very dry, with islands further to the south relatively unaffected. In the RMI, dry conditions in the northernmost islands (e.g., Kwajalein, Wotje and Utirik) became severe with impacts to water quality and quantity. The WFO Guam in conjunction with the RMI regional weather service office began to issue drought statements in February 2013. These statements continue to be issued at the time of this writing. By April 2013, the situation became so dire that the RMI Cabinet and the Chief Secretary declared a state of emergency for the northern RMI. Although normally very dry during the first part of the calendar year, Guam and some of the islands of the CNMI have recently become abnormally dry, with enhanced frequency and extent of brush fires being the most notable effects so far.

While dryness has been the dominant condition seen recently across most of the USAPI, it has not been dry everywhere. Notable surpluses of rainfall have been seen in American Samoa and continue still at Kapingamarangi and Nukuoro in Pohnpei State.

After a record setting dry fall and early winter seasons for the Hawaiian Islands, the January-February-March (JFM) season saw above average precipitation totals over large portions of the islands providing a much needed relief from drought conditions. January provided rainfall over all the islands improving drought conditions over the whole state while February and March rainfall was mostly concentrated over the western Islands of the state making for drought conditions still pervasive in some areas of The big Island and Maui. The JFM season also saw a few record braking events for precipitation maximums and low temperatures associated with frontal passages.

See the Local Variability Summaries for more details on the climate and weather of each island group.

The following comments from the **EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION** were posted on the U.S. Climate Prediction Center/NCEP and the International Research Institute for Climate and Society web site on April 4, 2013:

"**ENSO Alert System Status: Not Active**

Synopsis: ENSO-neutral is favored into the Northern Hemisphere summer 2013.

During March 2013, ENSO-neutral continued, with slightly above average SSTs in the eastern portion of the basin. Weekly values of all the Nino indices were between -0.5°C and +0.5°C during the month. The oceanic heat content (average temperature in the upper 300m of the ocean) increased to near-average during the month as an area of above-average temperatures at depth moved eastward into portions of the eastern basin."

SEA SURFACE TEMPERATURES

In January and February of this year, the ENSO-neutral status persisted, although below-average sea surface temperatures (SST) prevailed across the eastern half of the equatorial Pacific. In March 2013, ENSO-neutral continued, but with slightly above average SSTs in the eastern portion of the basin. Weekly values of all the Nino indices were between -0.5°C and +0.5°C during the month. The oceanic heat content increased to near-average during March as an area of above-average temperatures at depth moved eastward into portions of the eastern basin. Convection was enhanced over the western equatorial Pacific and suppressed in the central basin. Collectively, features indicate the continuation of ENSO-neutral.

SOUTHERN OSCILLATION INDEX

The 3-month average of the Southern Oscillation Index for the 1st Quarter of 2013 was 0.4, with monthly values of –0.1, -0.2 and 1.5 for the months of January, February, and March 2013 respectively. The Madden-Julian Oscillation (MJO) contributed to increased atmospheric variability over the tropical Pacific during January, February, and March of this year.

Normally, positive SOI values in excess of +1.0 are associated with La Niña conditions, and negative SOI values below -1.0 are associated with El Niño conditions. Low SOI values suggest a weak coupling between the ocean and the atmosphere. The SOI is an index representing the normalized sea-level pressure difference between Darwin, Australia and Tahiti.

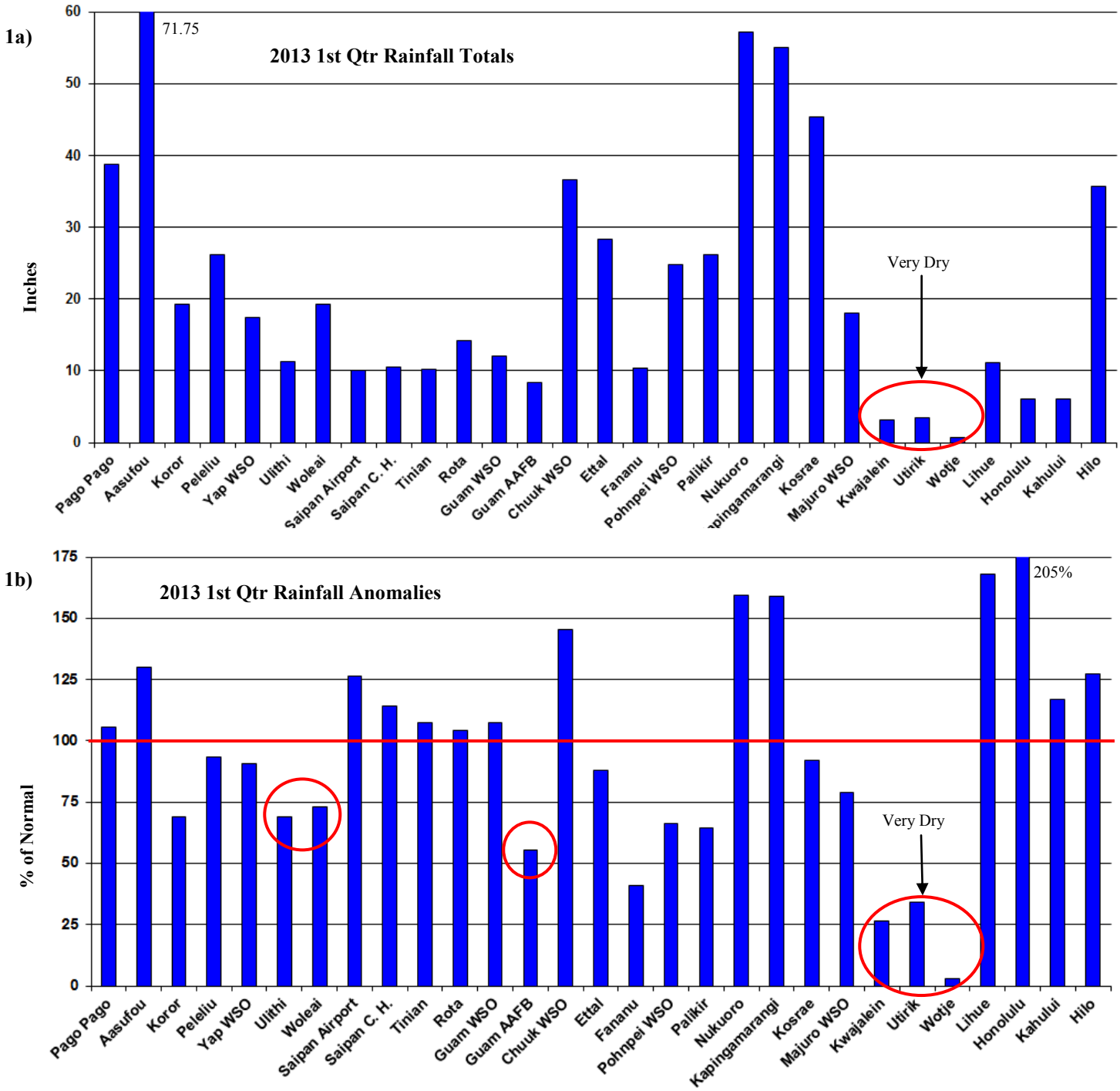

Figure 1, above. 2013 1st Quarter rainfall totals (a) in inches and (b) anomalies (expressed as % of normal). In 1b, solid line indicates normal rainfall (100%) and circles indicate rainfall less than 75% of normal.

TROPICAL CYCLONE

The PEAC Center archives western North Pacific tropical cyclone numbers, track coordinates, and 1-minute average maximum sustained wind taken from operational warnings issued by the Joint Typhoon Warning Center (JTWC) of the U. S. Air Force and Navy, located at Pearl Harbor, Hawaii. Western North Pacific tropical cyclone names are obtained from warnings issued by the Japan Meteorological Agency (JMA), which is the World Meteorological Organization's Regional Specialized Meteorological Center (RSMC) for the western North Pacific basin. The PEAC archives South Pacific tropical cyclone names, track coordinates, central pressure, and 10-minute average maximum sustained wind estimates from advisories issued by TCWCs at Brisbane, Wellington and Port Moresby and RSMC-Nadi. The numbering scheme for Southern Hemisphere tropical cyclones and the 1-minute average maximum sustained wind estimates are taken from warnings issued by the JTWC, which has a warning responsibility to its constituency across the South Pacific and South Indian oceans that overlaps the local centers. Tropical cyclone advisories for eastern North Pacific tropical cyclones are provided by RSMC Miami, and tropical cyclone advisories for the central North Pacific (140° W to the 180° meridian) are provided by RSMC Honolulu. There are sometime differences in the statistics (e.g., storm maximum intensity) for a given tropical cyclone between the JTWC and the local centers that are noted in this summary.

Tropical Cyclone Summary

In the first three months of 2013, the JTWC numbered two significant tropical cyclones that were both named by the JMA: One in January -- Sonamu (01W), and one in Feburary -- Shanshan (02W). Sonamu reached a peak intensity of 45 knots according to the JTWC, while Shanshan reached only 25 knots in JTWC advisories. Both of these cyclones passed across the Philippine archipelago and entered the South China Sea where strong wind shear caused their demise. Since then, and to-date, the tropics of the western North Pacific has been quiet, with no further activity noted.

Three organizations produce seasonal outlooks for tropical cyclone activity in the western North Pacific that are routinely used by the PEAC Center for guidance on the upcoming typhoon season: (1) The Guam Weather Forecast Office (WFO), (2) The City University of Hong Kong Laboratory for Atmospheric Research, and (3) The Benfield Hazard Research Centre Tropical Storm Risk (TSR) research group[1]. Only the WFO Guam has released a forecast at the time of this writing. This forecast calls for cyclone activity to be slightly below normal during 2013 for most aggregate statistics (e.g. annual number of all categories of cyclones, annual number of tropical storms and annual number of typhoons).

The Southern Hemisphere cyclone season of 2012-2013 began early with an intense cyclone (Anais) in the South Indian Ocean during October 2012, and an intense and destructive cyclone (Evan) in December that affected Samoa and Fiji (See Pacific ENSO Update Newsletter, 1st Quarter, 2013). Despite an early start and a spate of cyclones in the early part of the season, the activity in the Southern Hemisphere is now overall below normal. With the season count now at 22 numbered by the JTWC and 21 named by their respective TCWCs, and noting a normal additional occurrence of only one numbered cyclone in May and June, it would appear that the 2012-2013 Southern Hemisphere tropical cyclone season will end with a below normal annual count. Though there have been some notable destructive storms, both the western North Pacific and the Southern Hemisphere have seen relatively quiet seasons for the past several years. *No further tropical cyclone activity is anticipated for American Samoa through June 2013 to finish out the current cyclone season.

PEAC Center Tropical Cyclone Outlook

Based on available guidance[1] and the forecast behavior of ENSO, the PEAC tropical cyclone outlook for the upcoming western North Pacific typhoon season of 2013 is for slightly below normal activity, considering: (1) the relative quiescence of the season to-date; (2) the recent widespread trend toward reduced numbers of tropical cyclones; and, (3) the available guidance noted above. There may be a notable westward shift of tropical cyclone activity in the first half of 2013 based on the behavior of the season to-date and the decadal trend. If the current ENSO-neutral conditions were to evolve toward El Niño in the latter half of 2013 , then there may be near normal to slightly above normal activity within Micronesia in September through December. Otherwise, another quiet typhoon season appears to be in store for Micronesia. Please see the local variability summaries for the anticipated typhoon risk for each island group. (Note: a quiet season does not mean zero risk! Super Typhoon Bopha at the end of 2012 illustrates such danger).

[1] The PEAC tropical cyclone forecasts for 2013 are based on forecasts of the status of ENSO and input from three seasonal outlooks for tropical cyclone activity in the western North Pacific basin: (1) The Guam Weather Forecast Office (WFO), (2) The City University of Hong Kong Laboratory for Atmospheric Research, under the direction of Dr. J. C-L. Chan, and (3) The Benfield Hazard Research Centre, University College London, Tropical Storm Risk (TSR) research group, UK, led by Dr Adam Lea and Professor Mark Saunders.

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LOCAL SUMMARY AND FORECAST

NOTE: *All Predictions[1] listed in the rainfall summaries were made in the 4th Quarter 2012 Pacific ENSO Update Newsletter. Also note that all Forecast rainfall quantities[2] represent BEST ESTIMATES given the probabilistic forecast for each particular season and station.*

American Samoa: American Samoa began its rainy season of 2012-2013 with a very active weather pattern that included the nearby passage of a dangerous tropical cyclone (Evan – discussed in the previous newsletter), and copious rainfall from the South Pacific Convergence Zone (SPCZ). From December 2012 through February 2013, the SPCZ became the focus of episodic extensions of the Australian Northwest Monsoon bringing heavy convection, four named cyclones (Evan, Freda, Garry, and Haley) and several tropical depressions into the area of responsibility of the Regional Specialized Meteorological Center (RSMC) – Nadi in Fiji. American Samoa is within this area, and the rainfall there was enhanced by this active weather pattern. The January monthly rainfall of 36.89 inches at A'asofou was the fourth highest total in 30 years of data available for that station. By March 2013, the weather pattern in the region of American Samoa became quiet as the SPCZ shifted more to the west taking its heavy rains and tropical cyclone activity into the Coral Sea (e.g., cyclones Sandra and Tim). Largely because of the very high rainfall during January, the totals for the first three months of 2013 were wetter than normal at both the Weather Forecast Office (WFO) Pago Pago and at the inland higher-elevation station, A'asofou.

American Samoa Rainfall Summary 1st Qtr 2013						
Station		**Jan.**	**Feb.**	**Mar.**	**1st Qtr**	**Predicted[1]**
Pago Pago WSO	**Inches**	18.27	10.48	9.97	**38.72**	**36.61**
	% Norm	145%	82%	89%	**106%**	**100%**
A'asufou	**Inches**	36.89	19.86	15.00*	**71.75**	**55.11**
	% Norm	199%	105%	85%	**130%**	**100%**

* Estimated value

Climate Outlook: American Samoa is about to enter its dry season. Normal monthly rainfall at Paga Pago is typically below 10 inches per month for the period May through September at Pago Pago. Computer forecasts and a consensus of outlooks from several regional meteorological centers indicate that rainfall in American Samoa is likely to be slightly above normal for the next few months as the dry season becomes established. Thereafter for the remainder of 2013 and early 2014, the rainfall and tropical cyclone activity in American Samoa will depend on the evolution of ENSO. If the climate system is ENSO-neutral or moving toward El Niño in the latter half of 2013, the rainfall and tropical cyclone activity in American Samoa should be normal to above normal as the next rainy season gets underway in October. If the climate system moves toward La Niña at the end of 2013, rainfall should be near normal, but tropical cyclone activity would shift westward into the Coral Sea. Computer model predictions of the evolution of ENSO are most uncertain at this time of year due to the "predictability barrier" during the boreal spring.

Predicted rainfall for American Samoa from April 2013 through March 2014 is:

LOCAL SUMMARY AND FORECAST

Inclusive Period	% of long-term average / Forecast rainfall (inches) [2]
April - June 2013 (Onset of Dry Season)	**110% (30.29 inches - Pago Pago)**
July - September 2013 (Heart of Dry Season)	**100%**
October - December 2013 (Onset of next Rainy Season)	**110%**
January - March 2014 (Heart of next Rainy Season)	**110%**

Guam/CNMI: Continuing a decade-long trend, the weather during the first quarter of 2013 was quiet across Guam and the CNMI. Episodic shear line passages and the passage far to the south of Guam in mid-March of a tropical disturbance produced enough rainfall to keep the islands somewhat green, at least through mid-March. Thereafter, into late April, a more direct sun angle, fewer clouds than normal, and lower rainfall amounts (including many days with very few clouds and little or no rain) caused the islands to dry, with un-watered lawns turning brown, roadside weeds withering, mountain streams running low and small bush fires becoming an almost daily occurrence. Thanks to a relatively wet January and the tropical disturbance of mid-March, the rainfall across Guam and most of the locations of the CNMI had above normal rainfall for the 1st Quarter of 2013. After the mid-March tropical disturbance dropped up to 2 inches of rainfall on the 18th, and a trade wind disturbance dropped about half-an-inch on the 24th, the highest daily rainfall on Guam since then has been only about 0.25 inches. In fact, for April, 18 days had 0.01 inch or less at the Guam Weather Forecast Office (WFO), and 20 days had 0.01 inch or less at the Saipan International Airport. In April, several grass fires also affected Saipan.

Strong trade winds dominated the weather of the 1sr Quarter of 2013 throughout Guam and the CNMI, with many days of high surf. Trade winds routinely gusted to 35 mph or more during January and February at the Guam WFO, then became lighter during March and April. With lighter trade winds and mostly clear skies, it was very hot on Guam during March and April with highs of 90°F or above on 11 days in March and 21 days in April. With strong trade winds in the region and across the larger expanse of the equatorial Pacific, the sea level remained elevated.

Guam and CNMI Rainfall Summary 1st Qtr 2013						
CNMI						
Station		**Jan.**	**Feb.**	**Mar.**	**1st Qtr**	**Predicted[1]**
Saipan Intl. Airport	**Inches**	4.83	2.78	2.40	**10.01**	**6.72**
	% Norm	151%	116%	120%	**132%**	**85%**
Capitol Hill	**Inches**	4.28	3.56	2.74	**10.58**	**7.86**
	% Norm	107%	119%	110%	**121%**	**85%**
Tinian Airport	**Inches**	3.91	2.78	3.53	**10.22**	**8.08**
	% Norm	98%	93%	141%	**108%**	**85%**
Rota Airport	**Inches**	6.80	2.10	5.30	**14.20**	**12.28**
	% Norm	129%	45%	144%	**104%**	**90%**

LOCAL SUMMARY AND FORECAST

Guam and CNMI Rainfall Summary 1st Qtr 2013						
Station		**Jan.**	**Feb.**	**Mar.**	**1st Qtr**	**Predicted[1]**
Guam						
GIA* (WFO)	**Inches**	5.12	2.95	3.95	**12.02**	**10.05**
	% Norm	115%	79%	133%	**108%**	**90%**
AAFB**	**Inches**	4.86	1.02	2.41	**8.29**	**13.51**
	% Norm	85%	20%	59%	**55%**	**90%**
University of Guam	**Inches**	3.79	2.35	4.65	**10.79**	**10.06**
	% Norm	85%	63%	156%	**97%**	**90%**
Ugum Water-shed	**Inches**	4.24	2.91	5.29	**12.44**	**13.51**
	% Norm	74%	56%	129%	**83%**	**90%**
Northwest Guam	**Inches**	5.31	2.49	3.93	**11.73**	**13.54**
	% Norm	93%	48%	96%	**78%**	**90%**
Sinajaña	**Inches**	4.36	1.95	4.02	**10.33**	**10.06**
	% Norm	98%	52%	135%	**92%**	**90%**

* GIA-Guam International Airport
** AAFB-Anderson Air Force base

Climate Outlook: Since the start of the year, the status of ENSO has been ENSO-neutral, although the weather patterns have been somewhat more La Niña-like than the indexes would suggest (e.g., strong trade winds, elevated sea level, and no early season tropical cyclone activity). The very quiet beginning to 2013 would suggest yet another tranquil year is in store for the region. This would be most certain if the status of ENSO remains neutral for the better part of the remainder of the year. If the Pacific climate system evolves toward El Niño later in the year (or even if the ENSO indexes progress from the cold side of the neutral range to the warm side), the weather patterns could become active by mid-summer through the fall of 2013, with some moderate or strong episodes of the southwest monsoon and some heavy rains from the monsoon or the near passage of one or two tropical storms. We are now at the timing of a "predictability barrier" for ENSO. Thus, we can not at this time choose with confidence a preferred scenario for the evolution of ENSO over the course of the remainder of 2013, except to say that ENSO-neutral conditions should prevail through June.

Predicted rainfall for the Mariana Islands from April 2013 through March 2014 is:

Inclusive Period	**% of long-term average / Forecast rainfall (inches)[2]**	
	Guam/Rota	**Saipan/Tinian**
April - June 2013 (2nd Half of Dry Season)	**90% (14.78 inches)**	**90% (7.73 inches)**
July - September 2013 (Heart of Next Rainy Season)	**95%**	**90%**
October - December 2013 (End of Next Rainy Season)	**95%**	**95%**
January - March 2014 (1sr Half of Next Dry Season)	**100%**	**100%**

LOCAL SUMMARY AND FORECAST

Federated States of Micronesia

Yap State: It was relatively dry throughout Yap State during the first quarter of 2013. Of eight recording sites on Yap Island, all but one (North Fanif) had below normal rainfall for the quarter. Both outer-island rain-gauge sites (Ulithi and Woleai) were below normal. As at Guam, the weather was dominated by steady trade winds. Also, as seen at Guam, recent temperatures at the Yap WSO have routinely reached 90°F or higher under conditions of light to moderate trade winds and clear skies. No problems with water supplies have yet been reported within Yap State, but the continuation of dry hot weather has prompted a mention of the abnormally dry weather on the Drought Information Statements issued by the Guam WFO, with the rainfall throughout Yap State (and other areas of Micronesia) being closely monitored.

Yap State Rainfall Summary 1st Qtr 2013						
Station		**Jan.**	**Feb.**	**Mar.**	**1st Qtr**	**Predicted[1]**
Yap Island						
Yap WSO	**Inches**	5.62	5.86	5.95	**17.43**	**15.42**
	% Norm	77%	98%	100%	**90%**	**80%**
Dugor	**Inches**	5.74	4.66	6.35	**16.75**	**15.42**
	% WSO	78%	78%	107%	**87%**	**80%**
Gilman	**Inches**	5.42	3.81	3.74	**12.97**	**15.42**
	% WSO	74%	64%	63%	**67%**	**80%**
Luweech	**Inches**	4.05	2.09	4.92	**11.06**	**15.42**
	% WSO	55%	35%	83%	**57%**	**80%**
Maap	**Inches**	6.69	3.08	3.06	**12.83**	**15.42**
	% WSO	91%	52%	51%	**67%**	**80%**
North Fanif	**Inches**	7.26	4.59	7.95	**19.80**	**15.42**
	% WSO	99%	77%	133%	**103%**	**80%**
Rumung	**Inches**	5.42	2.86	7.73	**16.01**	**15.42**
	% WSO	74%	48%	130%	**83%**	**80%**
Tamil	**Inches**	5.18	2.51	5.92	**13.61**	**15.42**
	% WSO	71%	42%	99%	**71%**	**80%**
Outer Islands						
Ulithi	**Inches**	3.24	4.81	3.23	**11.28**	**13.10**
	% Norm	52%	95%	64%	**69%**	**80%**
Woleai	**Inches**	6.89	9.39	3.05	**19.33**	**23.83**
	% Norm	65%	125%	37%	**73%**	**90%**

Climate Outlook: Similar to this time for the past two years, computer forecasts and a consensus of outlooks from several regional meteorological centers indicate that rainfall throughout Yap State is likely to be near average to above average for at least the next few months as the rainy season becomes established. While dry weather continues across Yap State at the time of this writing, abundant rainfall (average to above-average monthly totals) should return to Yap State by June and continue for the rainy season. Even with an anticipated westward bias to

LOCAL SUMMARY AND FORECAST

the western North Pacific tropical cyclone activity, Yap Island and the atolls to its northeast (e.g., Ulithi and Fais) should have a normal risk (roughly a 10-15% chance or once in 7 to 10 years) of a damaging tropical cyclone during 2013.

Predicted rainfall for Yap State from April 2013 through March 2014 is:

Inclusive Period	% of long-term average / Forecast rainfall (inches) [2]	
	Yap and Ulithi	Woleai
April – June 2013 (Onset of Rainy Season)	**95% * (25.83 inches)**	**90%* (32.63 inches)**
July – September 2013 (Heart of Rainy Season)	**110%**	**95%**
October – December 2013 (End of Rainy Season)	**100%**	**100%**
January – March 2014 (Onset of next Dry Season)	**95%**	**95%**

* These percentages strike a balance among a dry April, an average May, and a wet June.

Chuuk State: During the first three months of 2013, there was a sharp north-south rainfall gradient across Chuuk State. The measured rainfall on some atolls to the north of 8° N (e.g., Fananu and Onoun) was very low (3-month totals near or below 15 inches), prompting a mention of these abnormally dry conditions on the Drought Information Statement issued by the Guam WFO. Elsewhere, rainfall was abundant on most of the atolls in the central and southern portions of Chuuk State. By virtue of a very wet March (16.00 inches!), the Chuuk WSO received the highest 1st Quarter rainfall total in the State, with a three-month total of 36.60 inches (145%). Some of the sites in the southern Mortlocks (e.g., Lukunoch, Ettal and Namoluk) had 1st Quarter rainfall totals that were slightly below average, but with 3-month totals above 25 inches. Rainfall at Polowat in the western part of Chuuk State was near average.

Chuuk State Rainfall Summary 1st Qtr 2013						
Station		Jan.	Feb.	Mar.	1st Qtr	Predicted[1]
Southern Mortlocks						
Lukunor	Inches	5.05	11.93	11.34	**28.32**	**28.93**
	% Norm	48%	125%	94%	**88%**	**90%**
Ettal	Inches	4.75	9.83	13.72	**28.30**	**28.93**
	% Luk*	45%	103%	114%	**88%**	**90%**
Ta	Inches	4.72	14.64	15.40	**34.76**	**28.93**
	% Luk*	45%	154%	128%	**108%**	**90%**
Na-moluk*	Inches	6.09	11.05	9.44	**26.58**	**28.93**
	% Luk	58%	116%	78%	**83%**	**90%**
Western Atolls						
Polowat	Inches	7.71	4.82	7.74	**20.27**	**17.41**
	% Norm	96%	77%	124%	**99%**	**85%**

* % based on Lukunoch normal.

LOCAL SUMMARY AND FORECAST

Chuuk State Rainfall Summary 1st Qtr 2013						
Station		Jan.	Feb.	Mar.	1st Qtr	Predicted[1]
Northern Atolls						
Fananu	Inches	3.10	2.41	4.87	**10.38**	**21.43**
	% WSO	29%	39%	58%	**41%**	**85%**
Onoun	Inches	9.26	2.13	6.06	**17.45**	**21.43**
	% WSO	87%	34%	73%	**69%**	**85%**
Northern Mortlocks						
Losap	Inches	4.35	9.99	16.54	**30.88**	**21.43**
	% WSO	41%	162%	198%	**123%**	**85%**
Nama	Inches	4.16	11.98	19.00	**35.14**	**21.43**
	% WSO	39%	194%	228%	**139%**	**85%**
Chuuk Lagoon						
Chuuk WSO	Inches	10.00	10.60	16.00	**36.00**	**22.69**
	% Norm	94%	171%	192%	**145%**	**90%**
Piis Panew	Inches	4.78	12.81	9.40	**26.99**	**22.69**
	% WSO	45%	207%	113%	**107%**	**90%**

Climate Outlook: Conditions across central and southern regions of Chuuk State are anticipated to be slightly wetter than average over the next few months. This is supported by long-range computer forecasts and the anticipated persistence of the trade wind trough through the middle of the state. The seasonal northward march of the trade wind trough should bring an end to the dry spell on atolls to the north of 8°N by late May or early June.

For the next five months (April 2013 through August 2013), there is a low risk (1-in-15, or 7% chance) of a tropical cyclone forming within the boundaries of Chuuk State. Later in the year (September through December), the risk of a tropical storm or typhoon occurring within the boundaries of Chuuk State will be slightly higher (~10%), but still below normal. Episodes of westerly monsoonal winds are anticipated to be less frequent and less intense than average during August through October. Trade winds may return early to Chuuk State later in the year, as they did last year, unless the climate system shifts towards El Niño.

Predictions for Chuuk State from April 2013 through March 2014 is:

Inclusive Period	% of long-term average / Forecast rainfall (inches) [2]			
	Chuuk Lagoon, Losap, and Nama	Polowat	Northern Atolls	Southern Mortlocks
Apr – Jun 2013	**110% (39.10inches)**	**90% (32.00 in)**	**80% (28.44 in)**	**100% (35.55 in)**
Jul – Sep 2013	**110%**	**95%**	**100%**	**100%**
Oct – Dec 2013	**100%**	**95%**	**100%**	**100%**
Jan – Mar 2014	**100%**	**95%**	**95%**	**100%**

LOCAL SUMMARY AND FORECAST

Pohnpei State: There were large differences of rainfall totals across Pohnpei State during the 1st Quarter of 2013. Stations on Pohnpei Island were very dry while atolls located closer to the equator had very heavy rainfall as measured both by the 3-month totals and percent of average. The 1st Quarter total of 24.80 inches (66%) at the Pohnpei WSO was in the lowest 10% of all 1st Quarter rainfall totals in a nearly 70-year time series. The WSO's two lowest 1st Quarter rainfall readings of 5.13 inches and 5.57 inches occurred at the peak of the 1982/83 and 1997/98 El Niño events, respectively. The wettest 1st Quarter total at the Pohnpei WSO was 59.81 inches occurring in the year 2000. Atolls close to the equator (e.g. Nukuoro at 3.8°N and Kapingamarangi at 1.0°N) were very wet in the 1st Quarter of 2013, with each atoll exceeding 55 inches for the 1st Quarter total. In contrast to Pohnpei Island, where the 1st Quarter of the calendar year is the brief "dry" season, the 1st Quarter months of the year are within the rainy season at Kapingamarangi. Near the equator, the rainfall pattern more closely follows the Southern Hemisphere activity, such as the typical enhancement of convection on and just north of the equator when a tropical cyclone develops at corresponding longitudes in the Southern Hemisphere. While recent dryness on Pohnpei Island has been noticeable by residents, there have been no reports of serious impacts to the water supply or an unusual number of grass fires

Pohnpei State Rainfall Summary 1st Qtr 2013						
Station		**Jan.**	**Feb.**	**Mar.**	**1st Qtr**	**Predicted[1]**
Pohnpei Island						
Pohnpei WSO	**Inches**	10.88	5.14	8.78	**24.80**	**35.54**
	% Norm	83%	48%	65%	**66%**	**95%**
Palikir	**Inches**	14.81	1.85	11.33	**27.99**	**38.41**
	% Norm	105%	16%	77%	**69%**	**95%**
Kolonia Airport	**Inches**	10.72	5.39	9.42	**25.53**	**29.16**
	% Norm	100%	61%	85%	**83%**	**95%**
Nukuoro	**Inches**	13.10	25.90	18.20	**57.20**	**34.11**
	% Norm	111%	245%	134%	**159%**	**95%**
Pingelap	**Inches**	12.08	7.74	7.36	**27.18**	**36.97**
	% Norm	98%	63%	51%	**70%**	**95%**
Mwoakilloa	**Inches**	15.34	12.29	6.39	**34.02**	**29.11**
	% Norm	143%	139%	57%	**111%**	**95%**
Kapingamarangi	**Inches**	18.02	14.25	22.79	**55.06**	**34.6**
	% Norm	172%	139%	164%	**159%**	**100%**

Climate Outlook: Recent dryness on Pohnpei Island should be replaced by abundant rainfall by early May, and thereafter rainfall should remain abundant throughout Pohnpei State for the remainder of the year. Nearly all computer forecast guidance suggests that abundant rainfall should return to Pohnpei Island soon. Rainfall at other atolls of Pohnpei State should continue to be near average to above average.

A direct strike of any Pohnpei State location by a tropical storm or typhoon is not anticipated for the foreseeable future. Later in the year (during August through October) two or three tropical depressions or tropical storms may develop north and/or west of Pohnpei Island, and within range to contribute to heavy rainfall on Pohnpei Island and possibly on some of the atolls.

Predicted rainfall for Pohnpei State from April 2013 through March 2014 is:

Inclusive Period	**% of long-term average / Forecast rainfall (inches) [2]**		
	Pohnpei Island	**Atolls**	**Kapingamarangi**
Apr - Jun 2013	**95%* (50.74 inches)**	**95% (50.74 inches)**	**120% (37.54 inches)**
Jul - Sep 2013	**95%**	**100%**	**110%**
Oct - Dec 2013	**100%**	**100%**	**100%***
Jan - Mar 2014	**100%**	**100%**	**100%***

* This is an average across a trend from dry in April to wet in June.

Kosrae State: During the 1st Quarter of 2013, rainfall was unusually variable across the relatively small island of Kosrae, with the 3-month totals ranging from 36.50 inches at Tofol to over 50 inches at Utwa. Three of the four recording stations around the island had 1st Quarter totals that were drier than average, with only Utwa seeing above average rainfall. March 2013 was a dry month across Kosrae with all stations reporting approximately 10 inches, which is just over 50% of average for that month. Monthly rainfall totals below 10 inches are relatively rare on Kosrae, comprising about 20% of all 1st Quarter months, and 15% of all months. November, December and January are typically the driest months at Kosrae (with monthly rainfall averaging below 15 inches), while April, May and June are typically the wettest months of the year (with monthly rainfall averaging above 18 inches).

Kosrae State Rainfall Summary 1st Qtr 2013						
Station		**Jan.**	**Feb.**	**Mar.**	**1st Qtr**	**Predicted[1]**
Airport (SAWRS)	**Inches**	16.27	18.89	10.20	**45.36**	**49.41**
	% Norm	113%	116%	55%	**92%**	**100%**
Utwa	**Inches**	22.99	20.96	10.00*	**53.95**	**49.41**
	% Norm	160%	128%	54%	**109%**	**100%**
Nautilus Hotel	**Inches**	17.76	18.89	9.53	**46.18**	**49.41**
	% Norm	123%	116%	51%	**93%**	**100%**
Tofol	**Inches**	10.40	16.00	10.10	**36.50**	**49.41**
	% Norm	72%	98%	54%	**74%**	**100%**

* Estimated value

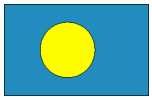
LOCAL SUMMARY AND FORECAST

Climate Outlook: While computer forecasts indicate wetter than average rainfall across Kosrae over the next three months, persistence of current conditions and a consideration of the long-term (50-year) trend toward slightly lower rainfall, leads us to temper the wet outlook to a forecast of "near-average to slightly above-average" rainfall for the near term (April through June), and continuing near average thereafter. A direct strike on Kosrae State by a tropical storm or typhoon is not anticipated for the foreseeable future. In the most recent decade, with weather patterns dominated by La Niña, there have been no tropical cyclones anywhere near Kosrae.

Predicted rainfall for Kosrae State from April 2013 through March 2014 is:

Inclusive Period	% of long-term average / Forecast rainfall (inches) [2]
April – June 2013	**105%* (62.43 inches)**
July - September 2013	**100%**
October - December 2013	**100%**
January - March 2014	**100%**

* A compromise between computer forecasts of wet conditions and other climatic factors indicating less rainfall.



Republic of Palau: During the first three months of 2013, locations throughout Palau were dry, more so at Koror and Nekken than at the International Airport and Peleliu. The rainfall at the airport typically is higher than at other Palau locations but during the 1st Quarter of 2013 the rainfall total at Peleliu surpassed that at the other locations. At Peleliu, it is typically a little bit drier than at Koror and other recording sites. Despite the relative dryness, there were no reports of any problems with water quantity in Palau during the 1st Quarter of 2013.

Republic of Palau Rainfall Summary 1st Qtr 2013						
Station		**Jan.**	**Feb.**	**Mar.**	**1st Qtr**	**Predicted[1]**
WSO Koror	**Inches**	7.29	7.91	4.13	**19.33**	**26.62**
	% Norm	68%	87%	50%	**69%**	**95%**
Nekken	**Inches**	7.63*	6.65*	5.49	**19.77**	**26.62**
	% WSO	71%	73%	67%	**71%**	**95%**
Intl. Airport	**Inches**	10.72	5.39	9.42	**25.53**	**26.62**
	% WSO	100%	59%	115%	**91%**	**95%**
Peleliu	**Inches**	8.63	6.60	10.86	**26.09**	**26.51**
	% Norm	81%	72%	132%	**93%**	**95%**

* Estimated (Koror + Airport)/2

LOCAL SUMMARY AND FORECAST

Climate Outlook: Computer rainfall guidance suggests that Palau (along with most of the rest of Micronesia) will have average to above average rainfall over the period April through June. There are no compelling reasons for conditions to be very dry in Palau over this time period, so combining the computer outlooks with consideration of recent anomalies and a continuation of the ENSO-neutral climate state; it is most likely that the next few months will have near average to above average rainfall across the Republic of Palau. Late October through December is the most likely time for one of the western North Pacific basin's final typhoons of 2013 to pass to the north or northeast of Palau at a close-enough distance to bring a few days of gusty westerly winds, high surf on the western shores, and some heavy showers. However, low latitude super typhoons like Bopha, while rare, can occur during that late fall time period.

Predicted rainfall for Palau from April 2013 through March 2014 is:

Inclusive Period	% of long-term average / Forecast rainfall (inches) [2]
April – June 2013 (Onset of Rainy Season)	**100% (38.25 inches)**
July – September 2013 (Heart of Rainy Season)	**110%**
October – December 2013 (End of Rainy Season)	**110%**
January – March 2014 (Next Dry Season)	**100%**

Republic of the Marshall Islands (RMI): At the time of this writing severe drought conditions were still occurring on the atolls of the RMI north of 10°N, including Bikini, Enewetak, Rongelap, Rongerik, Alinginae, and Utirik. Severe conditions were also affecting Wotje Atoll east of Kwajalein and Ebeye. On April 16, the RMI cabinet and the Chief Secretary declared a state of emergency for the northern Marshall Islands. Extremely dry conditions may have damaged agriculture on many of the atolls of the northern RMI. The atoll of Wotje was particularly dry through March, but some small relief came in late April, with the April total now at 1.27 inches. Atolls southward from Majuro have received enough rain to be spared dangerous water shortages. The large municipal reservoir at the Majuro Airport held 20 million gallons as of mid-April, which is a little over half of capacity. Very dry conditions were also experienced on Kwajalein Atoll, but an unusual extreme rainfall event occurred during which the Reagan Test Site measured 2.94 inches on the 16th of April and a further 5.56 inches on the 17th. The 5.56 inches on the 17th was a new 24-hr rainfall record for April, the previous one being 5.41 inches in 1971. This major rainfall event at Kwajalein was rather localized, and brought no relief to atolls just a short distance to the north, where severe drought continues unabated. Less than one inch of rain fell at Kwajalein during all the other days of April combined.

Climate Outlook: Computer rainfall guidance suggests that islands of the RMI from Kwajalein southward will have average to above average rainfall over the period April through June. The extreme mid-April rainfall at Kwajalein will help to guaran-

LOCAL SUMMARY AND FORECAST

RMI Rainfall Summary 1st Qtr 2013						
Station		**Jan.**	**Feb.**	**Mar.**	**1st Qtr**	**Predicted[1]**
RMI Central and Southern Atolls						
Majuro WSO	**Inches**	2.42	10.44	5.13	**17.99**	**20.57**
	% Norm	29%	170%	62%	**79%**	**90%**
Laura	**Inches**	3.51	13.18	8.18	**24.87**	**20.57**
	% Norm	42%	214%	99%	**109%**	**90%**
Aling-laplap	**Inches**	6.11	3.96	5.83	**15.90**	**15.54**
	% Norm	94%	84%	94%	**91%**	**90%**
Arno	**Inches**	1.53	5.79	6.08	**13.40**	**20.57**
	% Norm	18%	94%	73%	**59%**	**90%**
Jaluit	**Inches**	4.76	9.46	5.98	**20.20**	**20.57**
	% Norm	56%	154%	72%	**88%**	**90%**
Mili	**Inches**	5.97	17.28	12.49	**35.74**	**20.57**
	% Norm	71%	281%	151%	**156%**	**90%**
RMI Northern Atolls						
Kwajalein	**Inches**	1.22	0.46	1.73	**3.41**	**9.51**
	% Norm	27%	14%	42%	**29%**	**80%**
Wotje	**Inches**	0.42	0.12	0.12	**0.66**	**18.29**
	% Norm	10%	4%	3%	**6%**	**80%**
Utirik	**Inches**	1.91	1.19	0.37	**3.47**	**8.10**
	% Norm	49%	43%	11%	**34%**	**80%**

tee this there. Otherwise, notwithstanding a repeat of such daily extremes on Kwajalein (or elsewhere), the rainfall should slowly build back to normal across the RMI, starting with Majuro in May, Kwajalein by June, and into the drought-stricken northern islands by July.

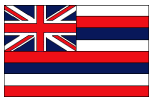
There is only a very small chance (~5%, or 1-in-20 odds) that a tropical cyclone in its depression stage or early tropical storm stage may pass through the RMI, most likely late in the year (i.e., November 2013 through January of 2014).

Predicted rainfall for the RMI from April 2013 through March 2014 is:

Inclusive Period	**% of long-term average / Forecast rainfall (inches) [2]**		
	Jaluit and Mili	**Majuro**	**Northern Atolls**
April – June 2013 (Onset of rainy Season)	**100% (33.92 inches)**	**90% (30.53 in)**	**60%* (15.07 in)**
July – Sept 2013 (Heart of Rainy Season)	**100%**	**100%**	**85%***
Oct – Dec 2013 (End of Rainy Season)	**100%**	**100%**	**90%***
Jan – Mar 2014 (Dry Season)	**100%**	**100%**	**90%***

* Kwajalein will probably come out ahead of these numbers, but atolls further north may struggle to reach these.

LOCAL SUMMARY AND FORECAST



Hawai'i: Several heavy rain events in January brought varying levels of drought relief to all four counties across the state. For some locations it was the wettest January in at least five years. Kauai even became drought free. In February, wet trade wind conditions brought above-average amounts of rainfall to windward areas of the state, but below average rainfall occurred over the leeward areas of Maui and Big Island, both of which have been hit hardest by the ongoing drought.

Several cold fronts affected the State of Hawaii during March but most rainfall occurred over the western parts of the state which have been less severely affected by drought conditions. The eastern islands saw drier than normal conditions while the western islands of the state experienced wetter than normal conditions. The greatest improvement in drought conditions has been in Molokai, where significant rainfall enabled continued improvement, especially in the western parts of the island. Oahu and Kauai continued to be drought-free.

Also March 2013 saw some record setting weather in the state of Hawai'i. On Sunday 3/10/13 a record rainfall of 1.67 inches was set in Honolulu, breaking the old record of 1.65 inches set in 1951. In Lihue, a second system on Wednesday 3/27/13 produced a record breaking 1.23 inches of rainfall, breaking the 1.12 inch record set in 2006. For temperature, on Sunday 3/17/13, a record low of 57 was set in Lihue, breaking the previous record of 59 set in 1955 and a record low of 55 was set in Kahului, which tied the previous record of 55 set in 1955.

State of Hawaii Rainfall Summary 1st Qtr 2013					
Station		**Jan.**	**Feb.**	**Mar.**	**1st Qtr**
Lihue Airport	**Inches**	5.88	1.00	4.29	**11.17**
	% Norm	265%	54%	166%	**168%**
Honolulu Airport	**Inches**	2.42	0.65	2.95	**6.02**
	% Norm	210%	66%	373%	**205%**
Kahului Airport	**Inches**	1.99	2.96	1.18	**6.13**
	% Norm	87%	277%	63%	**117%**
Hilo Airport	**Inches**	8.38	23.12	4.14	**35.64**
	% Norm	94%	276%	38%	**127%**

Climate Outlook: The following comments are from the U.S. Climate Prediction Center's Hawaiian Seasonal Outlook Discussion, posted April 18, 2013: "Below median precipitation amounts are favored for Hawaii from May-June-July to August-September-October 2013 according to a majority of climate models run as part of the NMME. The NMME model gives equal chances for above, near, and below normal temperatures for Hawaiian Islands."

For more information on weather and climate in Hawai'i go to:
www.cpc.noaa.gov/products/predictions/long_range/fxhw40.html

Seasonal Sea-Level Outlook for the US-Affiliated Pacific Islands

The following sections describe; (i) the *Canonical Correlation Analysis* (*CCA*)-based forecasts of sea-level deviations for forthcoming seasons AMJ, MJJ, and JJA of 2013, (ii) the observed monthly mean and maximum sea-level deviations for the season JFM 2013, and (iii) a Synopsis of ENSO and seasonal sea-level variability. (The forecast verifications (observed/ forecast values) for JFM 2013 can be found online at http://www.prh.noaa.gov/peac/sea-level.php) *Note that the deviations are defined as 'the difference between the mean sea level for the given month and the 1983 through 2001 mean sea-level value computed at each station' unless otherwise noted.*

(i) **Seasonal sea level forecast** *(deviations with respect to climatology)* for AMJ, MJJ, and JJA of 2013 (Table 1).
Forecasts of the sea-level deviations in the USAPI (see http://www.prh.noaa.gov/peac/map.php for location of stations) are presented using CCA statistical model. Based on the independent SST values in JFM 2013, the resulting CCA model has been used to forecast the sea-level of three consecutive months: AMJ, MJJ, and JJA (see Table 1: left panel shows values for seasonal mean while the right panel shows the seasonal maxima). All the tide gauge stations (at 0 to 2-months lead time) show skillful forecasts for these three consecutive seasons.

Table 1: **Forecasts of sea-level deviation (in inches) for April-May-June, May-June-July, and June-July-August 2013.**

	Seasonal Mean Deviations [1]				Seasonal Max Deviations [2]					
Tide Gauge Station	**AMJ**	**MJJ**	**JJA**	**Forecast Quality [3]**	**AMJ**	**MJJ**	**JJA**	**Forecast Quality [3]**	***Return Period [4] for AMJ Season***	
Lead Time [5]	0	1M	2M		0	1M	2M		*20 year*	*100 year*
Marianas, Guam	+5	+5	+6	Good	+20	+10	+21	Good	*5.6*	*6.7*
Malakal, Palau	+5	+5	+6	Good	+39	+40	+41	Good	*9.6*	*14.3*
Yap, FSM	+4	+5	+6	Good	+31	+32	+32	Good	*16.7*	*33.0*
Chuuk, FSM**	+4	+5	+6	N/A	+30	+31	+31	N/A	*N/A*	*N/A*
Pohnpei, FSM	+5	+4	+3	V. Good	+34	+34	+32	V. Good	*5.8*	*7.1*
Majuro, RMI	+2	+2	+3	Good	+41	+40	+40	Fair	*4.1*	*5.1*
Kwajalein, RMI	+5	+5	+4	Good	+42	+42	+42	Good	*4.5*	*5.9*
Pago Pago, AS	+3	+2	+2	V. Good	+26	+26	+26	Good	*3.9*	*5.4*
Honolulu, Hawai'i	0	+1	+1	Fair	+20	+20	+21	Fair	*4.1*	*5.9*
Hilo, Hawai'i	0	0	0	Good	+21	+23	+24	Fair	*7.9*	*11.4*

Note: (-) indicates negative deviations (fall of sea level from the mean), and (+) indicates positive deviations (rise of sea level from the mean); N/A: data not available. Deviations from -1 to +1 inch are considered negligible, and deviations from –2 to +2 inches are unlikely to cause any adverse climatic impact. Forecasts for Chuuk (**) are estimated subjectively based on information from WSO Chuuk and observations from neighboring stations of Pohnpei and Yap. See http://www.prh.noaa.gov/peac/peu/2012_2nd/sea_level.php#footnote for explanations of footnotes 1 through 5.

Remarks: The forecast values of sea level for AMJ, MJJ, and JJA seasons (Table 1, above) indicate that most of the stations in the north Pacific region are likely to be 2-6 inches higher than normal in the forthcoming seasons. Other south Pacific stations such as Pago Pago, are likely to be about 2-3 inches higher than normal during the same time period. In Hawaii, both Honolulu and Hilo are likely to be closer to normal during the same time period.

Features indicate the continuation of ENSO-neutral. The rising trend of sea levels in the forthcoming seasons are the result of recent Madden-Julian Oscillation (MJO) activity that has already contributed to increased atmospheric variability over the tropical Pacific. Low-level winds were near average, and upper-level winds are anomalously westerly across the equatorial Pacific. According to CPC-IRI's ENSO Alert System, ENSO-neutral is favored into the Northern Hemisphere summer of 2013.

Receive *Pacific ENSO Update* notifications by email:
Visit **http://www.prh.noaa.gov/peac/update.php**
To receive email notifications for the latest Pacific ENSO Update Newsletter

Seasonal Sea-Level Outlook for the US-Affiliated Pacific Islands

(ii) Observed Monthly Sea-Level Deviation in the January-February-March (JFM) 2013 Season

The monthly time series (January - March) for sea-level deviations has been taken from the UH Sea Level Center. The full time series (in mm) is available at ftp://ilikai.soest.Hawaii.edu/islp/slpp.deviations. (Locations of these stations can be found at http://www.prh.noaa.gov/peac/map.php.)

Table 2: Monthly observed max/mean sea-level deviations in inches (year to year standard deviation in parentheses)

Tide Gauge Station	Monthly Mean Deviations[1]				Monthly Max Deviations[2]			
	Jan.	Feb.	Mar.	Standard Deviations	Jan.	Feb.	Mar.	Standard Deviations
Marianas, Guam	+5.5	+6.0	+6.2	4.3	+21	+20	+20	4.0
Malakal, Palau	*	*	*	5.2	+41	+40	+39	5.3
Yap, FSM	+3.3	+5.0	+6.0	4.2	+32	+32	+33	4.5
Pohnpei, FSM	+4.1	+6.5	*	3.4	+36	+34	*	3.4
Majuro, RMI	+4.0	+1.9	*	2.4	+45	+40	*	2.7
Kwajalein, RMI	+3.5	+3.0	+4.0	3.0	+44	+42	+43	3.4
Pago Pago, American Samoa	+6.8	+6.0	+5.0	3.3	+32	+28	+27	3.8
Honolulu, Hawai'i	-0.1	-1.0	0.0	1.6	+22	+18	+15	2.5
Hilo, Hawai'i	*	*	*	2.0	*	*	*	3.0

* Data currently unavailable; [1] Difference between the mean sea level for the given month and the 1983 through 2001 mean sea level value at each station; [2] Same as [1] except for maxima; SD stands for standard deviations.

Remarks: As compared to February 2013, the monthly mean sea level in March 2013 shows slight rise in most of the USAPI stations. The rise could be the result of the recent Madden-Julian Oscillation (MJO) activity and upper-level winds. Currently, based on 1983-2001 mean value, all stations are 2-6 inches higher than normal: Based on 2001-10 mean value, all stations are 1-4 inches higher than normal.

(iii) ENSO and Seasonal Sea-Level Variability: A Synopsis

Table 3: Sea-Level Deviation in Current and Major ENSO Years

	Seasonal Mean Deviations: Observed rise/fall (inches)					
	JFM13(ENSO neutral)	OND12 (Moderate-to-weak La Nina)	JFM98 (Strong El Nino)	JFM99 (Strong La Nina)	OND97 (Strong El Nino)	OND98 (Strong La Nina)
Marianas, Guam	+7	+4	-6	+6	-7	+6
Malakal, Palau	+7	+7	-9	+6	-7	+8
Yap, FSM	+5	+4	-7	+5	-9	+8
Majuro, RMI	+4	+6	-3	+1	-10	+3
Kwajalein, RMI	+4	+6	-4	+2	-7	+2
Pago Pago	+7	+8	-7	+3	+1	-4

Note: All information in Table 3 is based on the d*ifference between the mean sea level for the given month and the 1975 through 1995 mean sea level value at each station.*

Remarks: As the sea level in the USAPI is very sensitive to the phase of the ENSO climate cycle, a perspective of sea level anomalies during the recent ENSO event (2011-13) and the historically strongest ENSO events of 1997-99 is presented in the above table (Table 3). The objective is to provide an insight to the readers about the strength of on-going ENSO and the trend of rising sea level.

Pacific ENSO Update

Excerpts from El NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION
Issued by NOAA NWS Climate Prediction Center - 4 April 2013
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.html

ENSO Alert System Status: Not Active

Synopsis: **ENSO-neutral is favored into the Northern Hemisphere summer 2013.**

During March 2013, ENSO-neutral continued, with slightly above average SSTs in the eastern portion of the basin. Weekly values of all the Nino indices were between -0.5°C and +0.5°C during the month. The oceanic heat content (average temperature in the upper 300m of the ocean) increased to near-average during the month as an area of above-average temperatures at depth moved eastward into portions of the eastern basin. The Madden-Julian Oscillation (MJO) again contributed to increased atmospheric variability over the tropical Pacific. Low-level winds were near average, and upper-level winds were anomalously westerly across the equatorial Pacific. Convection was enhanced over the western equatorial Pacific and suppressed in the central basin. Collectively, these features indicate the continuation of ENSO-neutral.

Most models forecast Niño-3.4 SSTs to remain ENSO-neutral through the Northern Hemisphere fall, with dynamical models tending to predict warmer conditions (0°C to 0.5°C) than the statistical models (-0.5°C to 0°C). There is less confidence in the forecasts for the last half of the year, partly because of the so-called "spring barrier," which historically leads to lower model skill beginning in late spring. Thus, ENSO-neutral is favored into the Northern Hemisphere summer 2013 (see CPC/IRI consensus forecast).

This discussion is a consolidated effort of the National Oceanic and Atmospheric Administration (NOAA), NOAA's National Weather Service, and their funded institutions. Oceanic and atmospheric conditions are updated weekly on the Climate Prediction Center web site (El Niño/La Niña Current Conditions and Expert Discussions). Forecasts for the evolution of El Niño/La Niña are updated monthly in the Forecast Forum section of CPC's Climate Diagnostics Bulletin. The next ENSO Diagnostics Discussion is scheduled for 9 May 2013. To receive an e-mail notification when the monthly ENSO Diagnostic Discussions are released, please send an e-mail message to: ncep.list.enso-update@noaa.gov.

The Pacific ENSO Update is a bulletin of the Pacific El Niño-Southern Oscillation (ENSO) Applications Climate (PEAC) Center. PEAC conducts research & produces information products on climate variability related to the ENSO climate cycle in the U.S.-Affiliated Pacific Islands (USAPI). This bulletin is intended to supply information for the benefit of those involved in such climate-sensitive sectors as civil defense, resource management, and developmental planning in the various jurisdictions of the USAPI.

The Pacific ENSO Update is produced quarterly both online and in hard copy, with additional special reports on important changes in ENSO conditions as needed. For more information about this issue please contact the editor, LTJG Charlene Felkley, at peac@noaa.gov or at the address listed below.

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