pacific ENSO update

3rd Quarter, 2007 Vol. 13, No. 3 ISSUED: July 26, 2007

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

www.soest.hawaii.edu/MET/Enso

CURRENT CONDITIONS

The pattern of sea surface temperatures in the tropical Pacific, along with the recent values of the Southern Oscillation Index (SOI) indicate ENSO-neutral conditions. Weather conditions in the tropical western North Pacific over the past three months can be best described as tranquil: fewer than normal tropical cyclones, a weak monsoon, and a general suppression of large-scale convective activity. July continued the general trend of tranquil weather, with the exception early in the month of one large tropical depression that became a tropical storm when it passed to the southwest of Guam. This tropical depression (which later became Typhoon Man-Yi), brought minimal tropical storm conditions to the Mariana Islands and to Yap State. Yap and Palau received enhanced rainfall from the associated monsoon flow, but rainfall in the Marianas was not plentiful. The South Pacific Convergence Zone has been fairly active over the Samoa region, keeping conditions wetter than expected for the first half of the year.

Most of the island groups of Micronesia were drier than normal during the first half of 2007. Six-month rainfall totals were less than 75% of normal at some locations in the Republic of Palau, Yap State, Guam, the northern RMI (**see Figures 1a and 1b**). Driest of all were some locations on Guam and in the northern RMI, where six-month totals of less than 20 inches occurred. Only a few islands were wetter than normal in the first half of 2007. Six-month rainfall totals in excess of 125% of normal were seen at Aasufou, American Samoa, and (surprisingly) in Saipan where the relatively meager 25-inch island totals were about 5 inches greater than the normal of approximately 20 inches. The 127.38 inches of rain at Aasufou, American Samoa during the first half of 2007 was the highest recorded value in the USAPI, followed by the 94.10 inches of rainfall at the WSO Kolonia, Pohnpei Island and the 94.04 inches recorded at nearby Palikir. Six-month rainfall totals exceeded 90 inches at Nukuoro and at Kosrae SAWRS. Two typhoons (Kong-Rey and Yutu) occurred in the western North Pacific basin during the first half of 2007. Both of these typhoons evolved through their tropical depression stage in portions of Micronesia, contributing rainfall to some locations from Pohnpei westward to Yap. The Hawaiian islands have been quite dry for the first half of 2007, and dry conditions have continued to worsen through the summer, with most locations receiving below average rainfall in the 2nd quarter.

The underlying weather pattern in the Samoa region is expected to bring near normal rainfall to the islands of American Samoa as they enter the heart of their dry season. Easterly trade winds should continue to dominate the flow in eastern Micronesia (Pohnpei and eastward), and keep rainfall average to slightly below average. Monsoon and storm activity will have more influence in western Micronesia (Chuuk and westward), and these areas will likely see average to slightly above average rainfall. The Marianas will have near average rainfall, while Hawaii is expected to continue receiving below-average rainfall through the 3rd quarter. The trade winds and sub-surface ocean warmth in the western North Pacific will keep sea levels above normal.

Sea-level variation in the USAPI is sensitive to ENSO-cycle, with low sea-level observed during El Niño and high sea-level during La Niña years. All locations across the USAPI have continued to record a rise in sea level during the 2nd quarter of 2007, which is consistent with the transition from ENSO-neutral to La Niña conditions.

The following comments from the EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION were posted on the U.S. Climate Prediction Center web site on July 12, 2007:

<u>Synopsis:</u> ENSO-neutral conditions are expected to continue for the next 2 months, with ENSO-neutral or La Niña conditions equally likely thereafter.

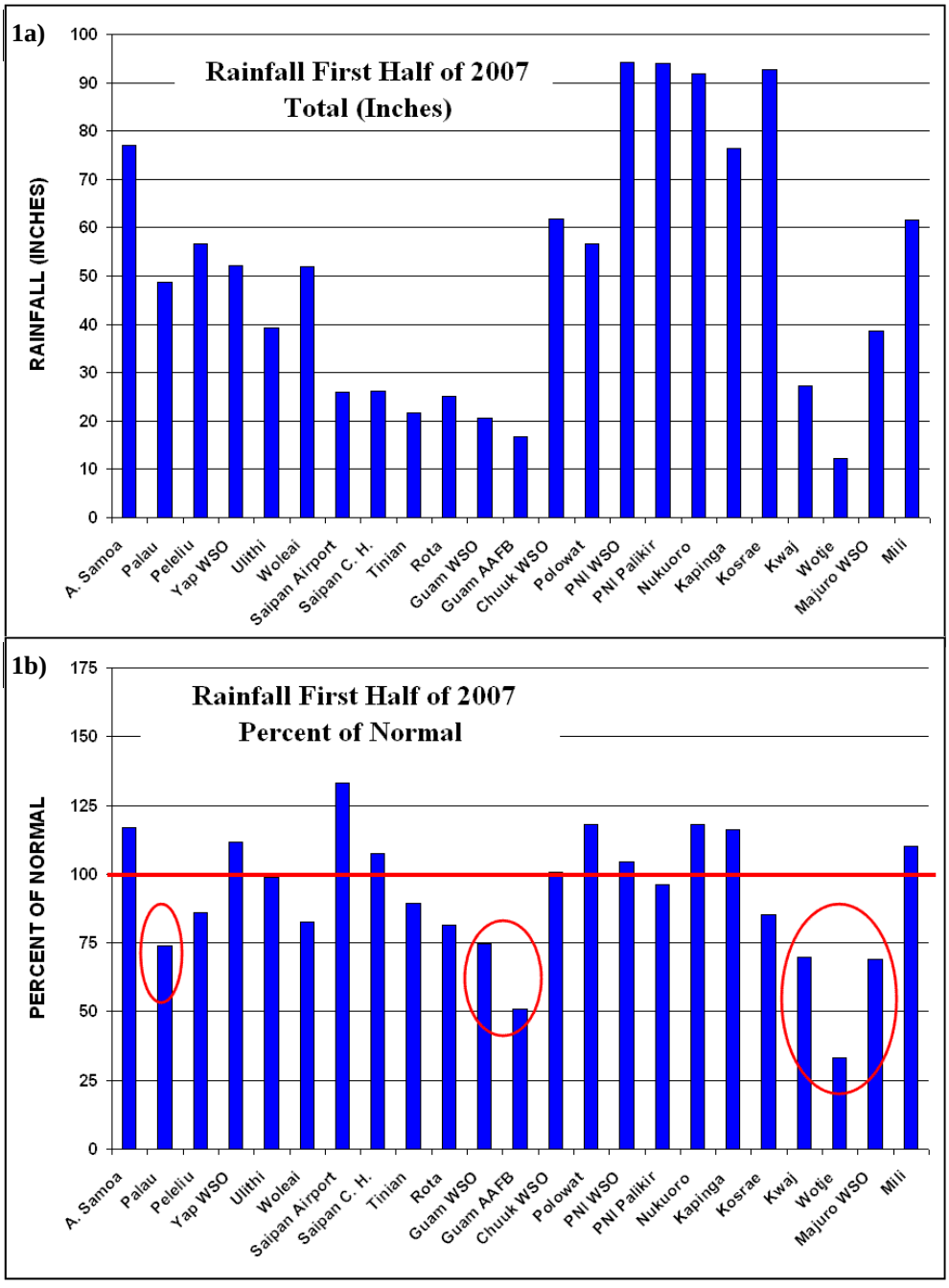
"ENSO-neutral conditions continued in the tropical Pacific during June 2007, with average to below-average sea surface temperatures (SSTs) extending from the date line to the west coast of South America."

"Nearly all of the model forecasts predict below-average SSTs in the Niño 3.4 region during the remainder of the year. A majority of the statistical models indicate a continuation of ENSO-neutral conditions through the summer months, with several statistical models forecasting weak La Niña conditions during the fall or winter. In contrast, most dynamical models, including the NCEP Climate Forecast System (CFS), continue to predict a transition to La Niña within the next three months. However, several of the dynamical models have recently been predicting a stronger and more rapid cooling than has actually occurred. Given the large spread in ENSO forecasts, along with the slower than expected decrease in observed SSTs over the past few months, it is reasonable to expect either a slower evolution toward La Niña conditions or the continuation of ENSO-neutral conditions."

CURRENT CONDITIONS

SST (Sea Surface Temperatures)

Sea surface temperatures (SST) in the equatorial eastern Pacific have been cooler than average since January 2007. SST anomalies through mid-July were more than 1ºC below average in areas between 110ºW and the South American coast, and more than 0.5ºC above average in portions of the western Pacific. Equatorial sub-surface temperatures have remained mostly below average in the region east of the date line since May, while weak positive sub-surface temperature departures have extended from the western to the central Pacific. Recently, the magnitude of the negative subsurface temperature anomalies have increased slightly in the eastern and central Pacific, with a majority of the statistical and coupled model forecasts indicating that SSTs will continue to cool during the next several months. Therefore, ENSO-neutral conditions are likely to continue through the next 1-3 months, with a 50% possibility of La Nina conditions developing during the boreal autumn months.



SOI (Southern Oscillation Index)

The 6-month average of the Southern Oscillation Index was -0.4 for the first half of 2007, with monthly values of -1.1, -0.5, -0.4, -0.4, -0.4 and +0.2 for the months of January – June 2007, respectively. This shift in sign from a negative to positive SOI value in June came after 6 consecutive months with negative indices (December 2006 - May 2007). Monthly SOI values will likely remain near neutral or slightly positive over the next several months, as La Niña conditions may begin to develop during July-September 2007.

Normally, positive values of the SOI in excess of +1.0 are associated with La Niña conditions, and negative values of the SOI below –1.0 are associated with El Niño conditions. The SOI is an index representing the normalized sea level pressure difference between Darwin, Australia and Tahiti, respectively.

Figure 1, left. First Half 2007 Rainfall (a) totals in inches and (b) anomalies (expressed as percent of normal) at indicated stations. Solid line indicates normal rainfall. Circles indicate locations with rainfall anomalies less than 75% of normal.

TROPICAL CYCLONE

The PEAC 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 Meteorology 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 the Tropical Cyclone Warning Centers at Brisbane, Nadi, and Wellington. The numbering scheme and the 1-minute average maximum sustained wind estimates are taken from warnings issued by the JTWC. There are sometimes differences in the statistics (e.g., storm maximum intensity) for a given tropical cyclone among the agencies that are noted in this summary.

TROPICAL CYCLONE

Tropical Activity Summary

The 2007 typhoon season cyclone season is off to a slow start with a total of 4 cyclones (three typhoons and one tropical storm) numbered by the JTWC through late July. All four of the JTWC cyclones were given names by the JMA: Kong-Rey, Yutu, Toraji, and Man-Yi. Typhoon Man-Yi affected Guam and Yap when it was a tropical storm (see island summaries), and later blasted Okinawa with high winds and torrential rains as a very intense typhoon. Normally, the JTWC numbers 5 or 6 cyclones in the western North Pacific basin during the first half of the year. By July, this basin is typically on a rapid upswing in activity, and 4 or 5 numbered cyclones usually occur in this month. By the end of July, the JTWC typically numbers 10 or 11 cyclones. Thus, with only 4 numbered cyclones through late July, the season is indeed off to a slow start. The number of early season tropical cyclones in the western North Pacific is strongly related to El Niño, with more occurring during the onset of El Niño and fewer of them occurring during the year that follows El Niño. Forecasts[1] for typhoon activity in the western North Pacific for all of 2007 are for below normal activity. With a normal of 30 numbered cyclones, however, a below-normal season in this basin is not to be taken lightly.

The hurricane season in the eastern north Pacific is near normal in numbers of cyclones (six through late July), but only three of these cyclones passed beyond the depression stage and were named by the National Hurricane Center in Miami: Alvin, Barbara, and Cosme. Hurricane Cosme (weakened to a depression) passed south of the Big Island in late July bringing some gusty winds to the Hawaiian Island chain. In contrast to the 2007 North Atlantic seasonal hurricane outlook, experts at the NOAA Climate Prediction Center are projecting a 70 percent chance the East Pacific hurricane season will be below normal, a 25 percent chance that the season will be near normal, and only a five percent chance the season will be above normal. Tropical storm activity in the Central Pacific basin is also expected to be below average, with only two to three tropical cyclones expected to form or cross into the area during the 2007 season.

TROPICAL CYCLONE

PEAC Tropical Cyclone Outlook

The PEAC tropical cyclone outlook[1] for the upcoming typhoon season of 2007 is for overall activity in the basin (e.g., numbers of tropical storms, numbers of typhoons, and numbers of intense typhoons) to be below normal. The track distribution should be near normal. Islands from Pohnpei eastward into the RMI experience tropical storms and typhoons primarily during El Niño, so the risk of a damaging tropical cyclone in these locations is considered to be low during 2007. **From Guam and the CNMI westward through Yap State and the Republic of Palau, the late summer and fall will likely bring 3 or 4 typhoon threats that will necessitate gale warnings and high-seas advisories for some or all of the islands. The risk of a direct hit by a damaging typhoon for Guam and the CNMI will be 10 to 15%; the risk of a direct hit by a damaging typhoon in Yap and its northern atolls will be on the order of 5 to 10%; and in the Republic of Palau the risk will be around 5% (1 in 20 odds). This level of threat for these locations is normal.**

[1]The PEAC forecast considered input from two seasonal outlooks for tropical cyclone activity in the western North Pacific basin: (1) *The City University of Hong Kong Laboratory for Atmospheric Research*, under the direction of J. C-L. Chan, and (2) *The Benfield Hazard Research Centre, University College London, Tropical Storm Risk (TSR) research group, UK*, led by Dr Adam Lea and Professor Mark Saunders.

Both the Hong Kong Center and the TSR consortium anticipate that the 2007 Northwest Pacific typhoon season will see slightly below average activity. They are expecting a small (15%) reduction in all categories: annual number of tropical cyclones, annual number of typhoons, annual number of intense typhoons, and the accumulated cyclone energy (ACE). ACE is a measure of the total energy expended by a tropical cyclone during its life. These forecasts span the full Northwest Pacific season from January to December. The activity so far in 2007 has been below normal.

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LOCAL SUMMARY AND FORECAST

American Samoa: Rainfall for the 2nd quarter of 2007 alternated from very dry conditions in April, to above-normal rainfall in May, and back to drier conditions in June. In April, Pago Pago recorded 42% of normal rainfall while Aasufou received 62% of normal rainfall. May was considerably wetter for both locations, with 166% of normal rainfall at Pago Pago International Airport and 148% of normal at Aasufou. June marked a return to dry conditions for Pago Pago with 58% of normal rainfall, while Aasufou received near normal rainfall for the month. Although American Samoa received an abundant amount of rainfall in May, there were no recorded flood advisories, warnings or any damages reported. The six month total of 127.38 inches at Aasufou was the highest value received by the PEAC for any U.S. Affiliated Pacific Island Station. — WSO Pago Pago

American Samoa Rainfall Summary 2nd Qtr 2007

Station		Apr.	May	Jun.	2nd Qtr	Predicted [1]
Pago Pago WSO	Rain (Inches)	4.66	17.34	3.44	**25.44**	**24.78**
	% of Normal	42%	166%	58%	**92%**	**90%**
Aasufou	Rain (Inches)	11.22	22.67	11.59	**45.48**	**39.36**
	% of Normal	62%	148%	102%	**104%**	**90%**

[1] Predictions made in the 1[2t] Quarter 2007 PEAC Newsletter

Climate Outlook: American Samoa is now entering the heart of its next dry season (July to September 2007). With forecast models favoring ENSO-neutral conditions for the next 1-3 months, **American Samoa should experience near normal rainfall conditions for the 3rd quarter.**

Given the time of year and current status of ENSO, there is no threat of a damaging tropical cyclone affecting any of the Samoan Islands at least until after the onset of the next rainy season (November 2007 - January 2008).

Forecast rainfall for American Samoa from August 2007 through July 2008 is as follows:

Inclusive Period	% of long-term average / Forecast rainfall (inches) [2]
Aug – Oct 2007 (Heart of Next Dry Season)	**95% (23.00 inches - Pago Pago)**
Nov 2007 – Jan 2008 (Onset of Next Rainy Season)	**95%**
Feb – Apr 2008 (Heart of Next Rainy Season)	**100%**
May – July 2008 (Onset of Next Dry Season)	**100%**

[2] Forecast rainfall quantities represent BEST ESTIMATES given the probabilistic forecast for each particular season and station.

For more information on American Samoa's weather and climate go to
http://www.prh.noaa.gov/samoa/

LOCAL SUMMARY AND FORECAST

Guam/CNMI: The weather on Guam during the first half of 2007 was overall quite dry. The total rainfall for the first half of 2007 was approximately 20 inches at all recording locations (ranging from 16.77 inches at Andersen AFB to 28.55 inches at Ypapao in the north). These amounts, and those elsewhere on the island, were roughly 50 to 70% of the normal rainfall expected during this typically dry half of the year. Wildfires were frequent in March and early April. Fires abated in May after some heavy rainfall, but then recurred in June as hot, dry conditions once again prevailed. On the 8th - 10th of July, the developing Typhoon Man-Yi passed to the southwest of Guam, bringing some heavy showers and southeasterly gales. Wind-driven sea salt scorched and browned the vegetation all along the eastern shoreline, with some small branches and loose coconut fronds blown down.

Guam and CNMI Rainfall Summary 2nd Qtr 2007

Station		Apr.	May	Jun.	2nd Qtr	Predicted [1]
Guam						
GIA	Rain (Inches)	1.92	8.77	1.93	**12.62**	**14.30**
	% of Normal	49%	145%	30%	**75%**	**85%**
AAFB	Rain (Inches)	1.69	4.10	1.27	**7.06**	**15.00**
	% of Normal	35%	62%	20%	**40%**	**85%**
Dededo (Ypapao)	Rain (Inches)	2.23	6.99	1.46	**10.68**	**15.65**
	% of WSO	N/A	N/A	N/A	**58%***	**85%**
Ugum Watershed	Rain (Inches)	1.49	6.26	2.67	**10.42**	**13.84**
	% of WSO	N/A	N/A	N/A	**70%****	**85%**
CNMI						
Saipan Intl. Airport	Rain (Inches)	5.43	4.81	4.86	**15.10**	**7.73**
	% of Normal	194%	109%	105%	**127%**	**90%**
Capitol Hill	Rain (Inches)	4.71	5.54	3.12	**13.37**	**13.37**
	% of Normal	135%	101%	54%	**90%**	**90%**
Tinian Airport	Rain (Inches)	5.88	4.85	2.32	**10.73**	**10.97**
	% of Normal	168%	88%	40%	**88%**	**90%**
Rota Airport	Rain (Inches)	4.21	4.96	1.59	**10.76**	**14.52**
	% of Normal	93%	90%	27%	**63%**	**85%**

[1] Predictions made in the 1st Quarter 2007 PEAC Newsletter
* % of normal for Dededo is with respect to WSMO Finigayan
** % of normal are with respect to the WSO Tiyan (GIA)

LOCAL SUMMARY AND FORECAST

The rainfall totals in the CNMI for the first half of 2007 were generally a few inches higher than those on experienced on Guam. The 3 to 4 inches of rainfall experienced in the CNMI during the passage of Typhoon Kong-Rey in early April (with Guam only getting 0.5 inches) made-up most of this difference. The highest amount of rain recorded in the CNMI during the first half of 2007 was the 26.11 inches at the observing site at Capitol Hill, followed closely by the 25.88 inches recorded at the Saipan International Airport. Though the amounts of rainfall in the CNMI were quite dry when compared with other locations (see **Fig. 1a**), many locations were actually above normal for the season (see **Fig. 1b**) because it is normally so very dry at this time of year.

Climate Outlook: The rainy season on Guam and in the CNMI is off to a slow start. Near normal rains, however, should prevail in the region from August through the late fall as the monsoon circulation of the western North Pacific and tropical cyclone activity should finally begin to affect the western half of Micronesia. Easterly trade winds should continue to dominate the flow in eastern Micronesia (Pohnpei and eastward), and keep rainfall average to slightly below average. Monsoon and storm activity will have more influence in western Micronesia (Chuuk and westward), and these areas will likely see average to slightly above average rainfall. **The Marianas will have near average rainfall.** The trade winds and sub-surface heating in the western North Pacific will keep sea levels above normal. Tropical cyclone activity is expected to be below normal throughout the entire western North Pacific basin during 2007. **From August through the remainder of the year, however, Guam and the CNMI may expect to be threatened by 2 or 3 tropical cyclones that will produces gales and hazardous seas in the island waters. The odds of damaging winds from a typhoon on Guam and for each island of the CNMI will be approximately 10 to 15% for the remainder of the year, which is normal for a non-El Niño year.**

Forecast rainfall for Guam and the CNMI from August 2007 through July 2008 is as follows:

Inclusive Period	% of long-term average / Forecast rainfall (inches) [2]	
	Guam/Rota	Saipan/Tinian
Aug – Oct 2007 (Heart of Rainy Season)	**95% * (37.30 inches)**	**90% * (29.18 inches)**
Nov 2007 – Jan 2008 (Onset of Next Dry Season)	**100% ***	**100% ***
Feb – Apr 2008 (Heart of Dry Season)	**95%**	**90%**
May – July 2008 (End of Next Dry Season)	**95%**	**90%**

[2] Forecast rainfall quantities represent BEST ESTIMATES given the probabilistic forecast for each particular season and station.
* Forecasts are subject to large error if a typhoon should pass directly over any island!

For more information on Guam's weather and climate go to
www.weather.gov/guam

LOCAL SUMMARY AND FORECAST

Federated States of Micronesia

Yap State: Rainfall throughout Yap State during the first half of 2007 was generally abundant, thanks to a very wet month of May. Six-month totals at all Yap Island locations were in the range of 50 to 55 inches, which is approximately 5 inches above the typical value for the period. Nearly 30% of the Yap Island rainfall during the first half of 2007 occurred in the month of May. A substantial portion of the May 2007 rainfall was associated with Typhoon Yutu, which passed close by to the north of Yap Island in mid-May. Because of the wet May at Yap Island, the 2nd Quarter and first-half-of-2007 rainfall there surpassed the amount experienced at the normally wetter Woleai. In a more typical pattern, Ulithi received less rainfall than the Yap WSO. The total of 56.18 inches at North Fanif on Yap Island was the highest recorded value for all of Yap State during the first six months of 2007.

Climate Outlook: Easterly trade winds should continue to dominate the flow in eastern Micronesia (Pohnpei and eastward), and keep rainfall average to slightly below average there. Monsoon and storm activity will have more influence in western Micronesia (Chuuk and westward, including all islands of Yap State), where the rainfall should be average to slightly above

Yap State Rainfall Summary 2nd Qtr 2007

Station		Apr.	May	Jun.	2nd Qtr	Predicted [1]
Yap Island						
Yap WSO	**Rain (Inches)**	6.99	16.32	10.90	**34.21**	**23.11**
	% of Normal	121%	180%	86%	**124%**	**85%**
Dugor*	**Rain (Inches)**	9.16	17.35	9.79	**36.30**	**23.11**
Gilman*	**Rain (Inches)**	4.96	15.67	11.38	**32.01**	**23.11**
Luweech*	**Rain (Inches)**	6.84	16.36	10.09	**33.29**	**23.11**
Maap*	**Rain (Inches)**	8.91	12.97	11.38	**33.26**	**23.11**
North Fanif*	**Rain (Inches)**	10.47	17.41	10.95	**38.83**	**23.11**
Rumung*	**Rain (Inches)**	9.77	12.79	9.06	**31.62**	**23.11**
Tamil*	**Rain (Inches)**	11.51	15.53	11.34	**38.38**	**23.11**
Outer Islands						
Ulithi	**Rain (Inches)**	7.47	9.52	8.31	**25.30**	**19.91**
	% of Normal	152 %	124%	76%	**108%**	**85%**
Woleai	**Rain (Inches)**	10.41	11.68	7.57	**29.84**	**31.97**
	% of Normal	95%	97%	62%	**82%**	**90%**

[1] Predictions made in the 1st Quarter 2007 PEAC Newsletter
* Long term normal is not established for these sites

LOCAL SUMMARY AND FORECAST

average. The trade winds and sub-surface heating in the western North Pacific will keep sea levels above normal. **Tropical cyclone activity is expected to be below normal throughout the entire western North Pacific basin during 2007. From August through the remainder of the year, however, 2 or 3 typhoons should pass to the north of Yap Island and Ulithi producing gusty westerly winds and hazardous seas in the island waters.** The odds of damaging winds from a tropical cyclone on Yap or any of its atolls will be approximately 5 to 10% for the remainder of the year, which represents a normal risk.

Forecast rainfall for Yap State from August 2007 through July 2008 is as follows:

Inclusive Period	% of long-term average / Forecast rainfall (inches) [2]	
	Yap and Ulithi	Woleai
Aug – Oct 2007 (Heart of Next Rainy Season)	**100% (40.19 inches)**	**110% (44.00 inches)**
Nov 2007 – Feb 2008 (Onset of Next Dry Season)	**110%**	**110%**
Feb – Apr 2008 (Heart of Next Dry Season)	**100%**	**100%**
May – July 2008 (Onset of Next Rainy Season)	**100%**	**100%**

[2] Forecast rainfall quantities represent BEST ESTIMATES given the probabilistic forecast for each particular season and station.

Chuuk State: Rainfall amounts during the first half of 2007 varied substantially across Chuuk State: dry in the north (e.g., Fananu, Onoun and Piis Panew) and wet in the south (e.g., Ettal, Lukunoch and Ta). It was very dry throughout much of Chuuk State early in the year (January through March), and wetter thereafter. Effects of drought and substantial sea inundation on some of the northern atolls earlier in the year is still causing some problems, particularly the salt-induced withering of taro patches and other staple food plants such as breadfruit trees. The 61.88 inches of rainfall during the first half of 2007 at the WSO on Weno Island was 101% of normal, and was one of the higher values of rainfall in Chuuk State for this period. Only Ta, with a six month total of 76.97 inches, received more rain than the amount recorded at the WSO.

Chuuk State Rainfall Summary 2nd Qtr 2007

Station		Apr.	May	Jun.	2nd Qtr	Predicted [1]
Chuuk Lagoon						
Chuuk WSO	**Rain (Inches)**	8.79	10.98	15.92	**35.69**	**34.60**
	% of Normal	71%	90%	136%	**98%**	**95%**
Piis Panew*	**Rain (Inches)**	7.39	8.85	4.98	**21.22**	**34.60**
Xavier H. School*	**Rain (Inches)**	12.47	7.26	14.53	**34.26**	**34.60**
Southern Mortlocks						
Lukunoch*	**Rain (Inches)**	9.98	5.40	12.42	**27.80**	**34.49**
Ettal*	**Rain (Inches)**	10.28	9.76	3.14	**23.18**	**34.49**
Ta*	**Rain (Inches)**	11.23	14.57	10.86	**36.66**	**34.49**

[1] Predictions made in the 1st Quarter 2007 PEAC Newsletter
* Long term normal is not established for these sites

LOCAL SUMMARY AND FORECAST

Chuuk State Rainfall Summary 2nd Qtr 2007

Station		Apr.	May	Jun.	2nd Qtr	Predicted [1]
Northern Atolls						
Fananu*	**Rain (Inches)**	9.04	12.04	9.56	**30.64**	**32.78**
Onoun*	**Rain (Inches)**	6.17	11.75	10.90	**28.82**	**32.78**
Northern Mortlocks						
Losap*	**Rain (Inches)**	8.71	10.55	9.82	**29.08**	**34.60**
Nama*	**Rain (Inches)**	10.87	11.86	11.31	**34.04**	**34.60**
Western Atolls						
Polowat	**Rain (Inches)**	8.89	10.39	7.01	**26.29**	**26.13**

[1] Predictions made in the 1st Quarter 2007 PEAC Newsletter
* Long term normal is not established for these sites

Climate Outlook: Monsoon and storm activity will influence the weather patterns in western Micronesia (Chuuk and westward, including all islands of Chuuk State), where the rainfall should be near normal with substantial month-to-month variations. From August through December, several of the tropical cyclones of the western North Pacific basin will begin their lives in Chuuk State as depressions. These depressions will bring episodes of heavy showers across Chuuk State before they move northwestward and become named cyclones somewhere beyond Guam. **No damaging wind from any tropical cyclone is anticipated anywhere in Chuuk State until late in the year (October through December), when any one of these depressions may become a tropical storm within the boundaries of Chuuk State.**

Forecast rainfall for Chuuk State from August 2007 through July 2008 is as follows:

Inclusive Period	% of long-term average / Forecast rainfall (inches) [2]			
	Chuuk Lagoon and Northern Mortlocks	Polowat	Northern Atolls	Southern Mortlocks
Aug - Oct 2007	**100% (38.08 inches)**	**100% (40.25 in)**	**100% (38.08 in)**	**100% (39.52 in)**
Nov 07 - Jan 08	**110%**	**110%**	**100%**	**100%**
Feb - Apr 08	**100%**	**100%**	**90%**	**100%**
May - July 08	**100%**	**100%**	**100%**	**100%**

[2] Forecast rainfall quantities represent BEST ESTIMATES given the probabilistic forecast for each particular season and station.

LOCAL SUMMARY AND FORECAST

Pohnpei State: Rainfall totals throughout most of Pohnpei State were near normal during the first half of 2007. The 94.04 inches of rainfall recorded at the WSO Kolonia, Pohnpei Island during the first six months of 2007 was the highest recorded total in Micronesia for this time period. Although substantial, this rainfall represented a near normal (104%) amount for this station. Elsewhere in Pohnpei State, Kapingamarangi was wet once again, as it has been for many months. Six-month rainfall totals in excess of 90 inches occurred at locations on Pohnpei Island (WSO and Palikir) and at Nukuoro, where the 91.79 inches for the first six months of 2007 was 118% of normal.

Pohnpei State Rainfall Summary 2nd Qtr 2007

Station		Apr.	May	Jun.	2nd Qtr	Predicted [1]
Pohnpei Island						
Pohnpei WSO	**Rain (Inches)**	18.73	23.03	14.79	**56.55**	**53.41**
	% of Normal	114%	120%	86%	**107%**	**100%**
Palikir	**Rain (Inches)**	18.37	21.56	18.96	**58.89**	**57.17**
	% of WSO	N/A	N/A	N/A	**103%**	**100%**
Kolonia Airport	**Rain (Inches)**	14.28	15.59	11.54	**41.41**	**45.50**
	% of WSO	N/A	N/A	N/A	**91%**	**100%**
Atolls of Pohnpei State						
Nukuoro	**Rain (Inches)**	14.04	15.48	1.95	**41.47**	**41.89**
	% of Normal	94%	105%	98%	**99%**	**100%**
Pingelap	**Rain (Inches)**	9.18	14.13	14.59	**37.90**	**50.53**
	% of Normal	54%	83%	90%	**75%**	**100%**
Mwoakil-loa*	**Rain (Inches)**	9.33	15.47	14.59	**39.39**	**56.27**
	% of WSO	N/A	N/A	N/A	**70%**	**100%**
Kapinga-marangi	**Rain (Inches)**	12.93	16.36	6.67	**35.96**	**31.27**
	% of Normal	95%	158%	92%	**115%**	**100%**

[1] Predictions made in the 1st Quarter 2007 PEAC Newsletter

* Long term normal is not established for these sites

Climate Outlook: Easterly trade winds should continue to dominate the flow in eastern Micronesia (Pohnpei and eastward), keeping rainfall average to slightly below average there for the foreseeable future. During the next few months (August through October), Kapingamarangi might actually see normal monthly rainfall values (between 5 - 10 inches). Beginning in August and continuing through December, a few of the tropical cyclones of the western North Pacific basin may begin their lives in Pohnpei State as loosely organized tropical disturbances. These weather systems should bring some periods of enhanced heavy shower activity

LOCAL SUMMARY AND FORECAST

across Pohnpei State (except at Kapingamarangi) before they move west and northwestward away from the region and become named cyclones somewhere beyond Guam on their journey to Philippine or East Asian waters. **No typhoons or tropical storms are anticipated to affect Pohnpei State for the remainder of this year.**

Forecast rainfall for Pohnpei State from August 2007 through July 2008 is as follows:

Inclusive Period	% of long-term average / Forecast rainfall (inches) [2]	
	Pohnpei Island and atolls	Kapingamarangi
Aug – Oct 2007	**100% (47.61 inches)**	**100% (16.87 inches)**
Nov 2007 – Jan 2008	**100%**	**95%**
Feb - Apr 2008	**100%**	**95%**
May - July 2008	**110%**	**95%**

[2] Forecast rainfall quantities represent BEST ESTIMATES given the probabilistic forecast for each particular season and station.

Kosrae State: Total rainfall during the first half of 2007 was slightly drier than normal at all Kosrae rain gage sites, ranging from 75% of normal at Utwa to 85% of normal at the airport. Although the 92.74 inches of rainfall at the airport during the first six months of 2007 was one of the highest readings for all of Micronesia, it was slightly below normal (85%) for this location, which has the wettest annual average rainfall of any official observing site in the region.

Kosrae State Rainfall Summary 2nd Qtr 2007

Station		Apr.	May	Jun.	2nd Qtr	Predicted [1]
Airport (SAWRS)	**Rain (Inches)**	20.35	16.94	14.56	**51.85**	**56.62**
	% of Normal	94%	90%	77%	**87%**	**95%**
Utwa*	**Rain (Inches)**	14.14	20.40	11.81	**46.35**	**56.62**
	% of WSO	N/A	N/A	N/A	**78%**	**95%**
Nautilus*	**Rain (Inches)**	18.39	13.96	13.20	**45.55**	**56.62**
	% of WSO	N/A	N/A	N/A	**77%**	**95%**

[1] Predictions made in the 1st Quarter 2007 PEAC Newsletter

* Long term normal is not established for these sites

Climate Outlook: Easterly trade winds should continue to dominate the flow in eastern Micronesia (Pohnpei and eastward), resulting in average to slightly below average rainfall for Kosrae State. Within this anticipated weather pattern, **the rainfall at Kosrae for the rest of 2007 should be near normal (approximately 15-18 inches per month), or slightly below normal.** Islands from Pohnpei eastward into the RMI primarily experience tropical storms and typhoons during El Niño years; therefore, **no tropical cyclone activity is expected to affect Kosrae State during the remaining months of 2007 or during the first half of 2008.**

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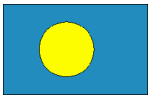
Forecast rainfall for Kosrae State from August 2007 through July 2008 is as follows:

Inclusive Period	% of long-term average / Forecast rainfall (inches) [2]
Aug – Oct 2007 (Heart of Next Rainy Season)	**95% (47.40 inches)**
Nov 2007 – Jan 2008 (Onset of Next Dry Season)	**100%**
Feb – Apr 2008 (Heart of Next Dry Season)	**100%**
May – July 2008 (Onset of Next Rainy Season)	**100%**

[2] Forecast rainfall quantities represent BEST ESTIMATES given the probabilistic forecast for each particular season and station.



Republic of Palau: During the first half of 2007, rainfall throughout Palau was slightly below normal. The 6-month total of 48.76 inches at the WSO Koror was 74% of normal, making this station one of only a few others (including stations on Guam and in the northern RMI) that received less than 75% of normal rainfall during the first 6 months of 2007. Other locations in Palau had more rainfall than at the WSO, and 6-month totals were roughly 85% of normal.

Republic of Palau Rainfall Summary 2nd Qtr 2007

Station		Apr.	May	Jun.	2nd Qtr	Predicted [1]
Koror WSO	**Rain (Inches)**	5.61	11.62	9.53	**26.76**	**34.43**
	% of Normal	65%	97%	55%	**71%**	**90%**
Nekken*	**Rain (Inches)**	6.51	16.83	12.30	**35.64**	**34.43**
	% of WSO	N/A	N/A	N/A	**94%**	**90%**
Intl. Airport*	**Rain (Inches)**	7.76	9.50	15.05	**32.31**	**34.43**
	% of WSO	N/A	N/A	N/A	**85%**	**90%**
Peleliu*	**Rain (Inches)**	6.36	13.94	11.95	**32.25**	**34.20**
	% of Normal	N/A	N/A	N/A	**85%**	**90%**

[1] Predictions made in the 1st Quarter 2007 PEAC Newsletter
* Long term normal is not established for these sites

Climate Outlook: Monsoon and storm activity will influence the weather patterns in western Micronesia (Chuuk and westward, including all islands of the Republic of Palau), where the rainfall should be average to slightly above average. The trade winds and sub-surface heating in the western North Pacific will keep sea levels above normal.

Tropical cyclone activity is expected to be below normal throughout the entire western North Pacific basin during 2007. **Tropical cyclone activity should be near normal, however, in the western portion of the basin, meaning that Palau should experience two or three episodes of near-gale (25 to 35 mph) westerly winds and hazardous seas in island waters associated with tropical cyclones passing to the north. This level of risk is normal.**

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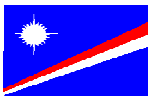
Surges in the southwest monsoon can also produce prolonged episodes of westerly wind on Palau, usually during the period from July through December. Rains associated with the monsoon trough and with tropical cyclones passing to north of Palau may yield a month or two with rainfall of 20 inches or more in any of the months during the period August through November. Because of this effect, some of the inclusive periods below have been given slightly above normal rainfall.

Forecast rainfall for Palau from August 2007 through July 2008 is as follows:

Inclusive Period	% of long-term average / Forecast rainfall (inches) [2]
Aug – Oct 2007 (Heart of Next Rainy Season)	**110% (44.75 inches)**
Nov 2007 – Jan 2008	**110%**
Feb – Apr 2008	**100%**
May – July 2008	**120%**

[2] Forecast rainfall quantities represent BEST ESTIMATES given the probabilistic forecast for each particular season and station.



Republic of the Marshall Islands (RMI):

A welcome return of abundant rainfall occurred in April for most of the RMI. Rainfall in April at some atolls was greater than in the previous 3 months combined! During the first half of 2007, there was a sharp north-south gradient of rainfall in the RMI with islands to the south (such as Mili) receiving abundant rainfall, and islands to the north (such as Kwajalein and Utirik) undergoing extremely dry conditions.

RMI Rainfall Summary 2nd Qtr 2007

Station		Apr.	May	Jun.	2nd Qtr	Predicted [1]
RMI Central Atolls (6º N - 8º N)						
Majuro WSO	**Rain (Inches)**	11.26	9.54	6.67	**27.47**	**32.22**
	% of Normal	110%	85%	58%	**83%**	**95%**
Laura*	**Rain (Inches)**	6.31	13.01	3.66	**22.98**	**32.22**
Arno*	**Rain (Inches)**	10.13	10.79	8.04	**28.96**	**32.22**
Aling-laplap*	**Rain (Inches)**	8.92	10.58	10.61	**30.11**	**32.22**
RMI Southern Atolls (South of 6º N)						
Mili*	**Rain (Inches)**	16.88	13.23	8.00*	**38.11**	**33.92**

[1] Predictions made in the 1st Quarter 2007 PEAC Newsletter
* Long term normal is not established for these sites

LOCAL SUMMARY AND FORECAST

RMI Rainfall Summary 2nd Qtr 2007

Station		Apr.	May	June	2nd Qtr	Predicted [1]
RMI Northern Atolls (North of 8º N)						
Kwajalein	**Rain (Inches)**	11.06	5.57	5.00	**21.63**	**22.59**
	% of Normal	146%	56%	52%	**80%**	**90%**
Wotje*	**Rain (Inches)**	5.40	2.06	2.77	**10.23**	**22.59**
Utirik*	**Rain (Inches)**	5.68	0.46	3.42	**9.56**	**22.59**

[1] Predictions made in the 1st Quarter 2007 PEAC Newsletter
* Long term normal is not established for these sites

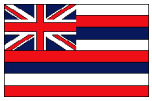
Climate Outlook: Welcome rains came to the northern RMI in April, after a tense 3-month period of very dry conditions that became a water emergency in the northern islands. Near normal rainfall is now anticipated for most of the atolls of the RMI for the rest of 2007. **Residents of the northern RMI, though not in any immediate threat of extreme dry conditions, are urged to take every measure possible to ensure adequate water supplies should dry conditions return in the next dry season (January through April 2008). Near normal summer rains should be experienced on all islands.**

Tropical cyclone activity is expected to be below normal throughout the entire western North Pacific basin during 2007, and especially in the eastern portion of the basin. No tropical cyclones are anticipated in the RMI through the rest of 2007. It is possible that during the period August through October, a remnant of 2 or 3 eastern or central Pacific tropical cyclones may enter the western North Pacific somewhere between Kwajalein and Wake Island. **The chance for a tropical storm to threaten Wake Island is a plausible scenario, but the chance for a tropical storm at any other island of the RMI is remote for the foreseeable future. This level of risk is below normal.**

Forecast rainfall for the RMI from August 2007 through July 2008 is as follows:

Inclusive Period	% of long-term average / Forecast rainfall (inches) [2]		
	South of 6ºN	6ºN to 8ºN	North of 8ºN
Aug – Oct 2007	**100% (37.78 inches)**	**95% (35.89 in)**	**90% (30.47 in)**
Nov 2007 – Jan 2008	**100%**	**100%**	**100%**
Feb – Apr 2008	**100%**	**95%**	**85%**
May – July 2008	**100%**	**100%**	**90%**

[2] Forecast rainfall quantities represent BEST ESTIMATES given the probabilistic forecast for each particular season and station.



Hawaii: Dry conditions continued through the 2nd quarter of 2007 for the majority of the Aloha State. Standardized Precipitation Index (SPI) values from the National Weather Service Forecast Office in Honolulu indicate "moderately dry" to "very dry" conditions across many areas of Hawaii for the last 3 - 6 months. This ongoing dryness combined with the seasonal increase in temperatures began producing some agricultural drought impacts on several islands in early May, including voluntary irrigation water conservation in the Waimanalo area of Oahu and portions of the Kau District on the Big Island. Livestock farmers also reported degraded pasture conditions in the leeward areas of Maui and the Big Island. By June, the continued lack of significant rainfall resulted in a worsening of drought conditions in several leeward areas. Water conservation notices shifted from voluntary reductions to mandatory restrictions in Waimanalo (Oahu), Upcountry Maui and portions of the South Kohala and Hamakua Districts on the Big Island. Brush fires have also increased statewide during the past month with large outbreaks occurring in leeward west Maui and near Waikoloa on the Big Island. In early July, a brush fire on Wa'ahilo Ridge prompted the evacuation of faculty housing and several buildings at the University of Hawaii Manoa Campus until it could be extinguished.

LOCAL SUMMARY AND FORECAST

For updated values or more information on SPI, please visit http://www.prh.noaa.gov/hnl/hydro/pages/spi_web_page.php. Additional individual rainfall station information and specific information for the Hawaiian islands can be found online at http://www.prh.noaa.gov/hnl/pages/hydrology.php.

State of Hawaii Rainfall Summary 2nd Qtr 2007

Station		Apr.	May	Jun.	2nd Qtr
Lihue Airport	**Rain (Inches)**	0.72	0.60	0.32	**1.64**
	% of Normal	24%	21%	18%	**21%**
Honolulu Airport	**Rain (Inches)**	0.20	0.12	0.16	**0.48**
	% of Normal	18%	15%	37%	**21%**
Kahului Airport	**Rain (Inches)**	0.25	0.07	0.04	**0.36**
	% of Normal	14%	11%	17%	**14%**
Hilo Airport	**Rain (Inches)**	7.39	2.32	6.38	**16.09**
	% of Normal	59%	29%	87%	**58%**

Climate Outlook: The following is in excerpt from the Climate Prediction Center's official Seasonal Outlook Discussion for Hawaii:

"The tropical Pacific is still in an ENSO-Neutral state. ENSO- neutral conditions are expected to continue during the next 2 months, with ENSO-neutral or La Nina conditions equally likely thereafter…"

"[CPC Models] predict a tendency for below-normal temperature for Hilo from Aug-Sep-Oct to Sep-Oct-Nov 2007, and above-normal temperature for Lihue from Sep-Oct-Nov to Dec-Jan-Feb 2008. ***Below-normal precipitation is predicted for all locations across Hawaii for Aug-Sep-Oct 2007, while above-normal precipitation is predicted for Hawaii from Dec-Jan-Feb to Jan-Feb-Mar 2008."***

The Climate Prediction Center's (CPC's) Prognostic Discussion and official 90-day Seasonal Outlook Discussion for Hawaii can be viewed at www.cpc.noaa.gov/products/predictions/90day/fxhw40.html.

Seasonal Sea Level Outlook for the US-Affiliated Pacific Islands

The following sections describe: (i) the CCA-based forecasts for sea level deviations for the forthcoming seasons; (ii) tide predictions for JAS (July 1 - September 30); (iii) the observed/forecast monthly sea-level deviations for the previous season AMJ 2007; and (iv) the Generalized Extreme Value (GEV)-based seasonal extreme values of sea level at 20 and 100-year return periods. All units are in inches. *Deviations are defined here as the difference between the mean sea level for the given month and the 1975 - 1995 mean sea level value computed at each station. Also, note that the forecasting technique adapted here does not account for sea level deviations created by other atmospheric or geological conditions such as tropical cyclones, storm surges or tsunamis.*

(i) Seasonal Sea Level Forecast *(deviations with respect to climatology)* **for JAS, ASO, and SON 2007**

Forecasts of the sea level anomalies in the USAPI are presented using CCA statistical model. Based on the independent SST values in AMJ 2007, the resulting CCA model was used to forecast the sea level of three consecutive seasons: JAS, ASO and SON (**Table 1**).

Table 1: **Forecasts of sea level deviation (in inches) for JAS, ASO and SON 2007**

Tide Gauge	JAS	ASO	SON	Forecast Quality[1]
Lead time[2]	**0**	**1M**	**2M**	
Guam	+6	+4	**	Good
Palau	+3	+3	+3	V. Good
Yap	+4	+3	+2	V. Good
Pohnpei	**	**	+2	Good
Kapinga-marangi	+2	+2	+3	Good
Majuro	**	**	+2	Fair
Kwajalein	**	**	**	Fair
Pago Pago	+4	+4	+3	V. Good

1. Forecast quality is a measure of the expected CCA cross-validation correlation skill. In general terms, these kinds of forecasts are thought to be of **useful (but poor) skill** if the CCA cross-validation value lies between 0.3~0.4 (see Fig. below). Higher skills correspond to greater expected accuracy of the forecasts. Skill levels greater than 0.4 and 0.6 are thought to be fair and good skills. Skill level greater than 0.7 are thought to be very good. For CCA cross-validation skill in JAS, ASO and SON, please refer to: **www.soest.hawaii.edu/MET/Enso/peu/2007_3rd/Sea_Level.htm.**

2. Lead time is the time interval between the end of the initial period and the beginning of the forecast period. For example, lead-0, lead-1M, and lead-2M means 'sea-level' of target season 0 (JAS), 1 (ASO), and 2 (SON) month leads based on SSTs of AMJ 2007.

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 of +/-1 in. are considered negligible and denoted by **. Deviations +/- 2 in. are unlikely to cause any adverse climatic impact.

With a mean skill greater than 0.65 (at 0 to 2-months lead time) in all three consecutive seasons (JAS, ASO, and SON), all tide gauge stations except Majuro and Kwajalein are well predicted. Other than Palau, the forecast values of sea-level for JAS, ASO, and SON **(see Table 1)** display rise in all the North Pacific islands. In the South Pacific, Pago-Pago displays rise as well. This rising trend is consistent with the on-going ENSO-neutral or transition from ENSO-neutral to La Niña conditions that is expected within the next 3 months; the USAPI are sensitive to ENSO events, with rising sea level observed during La Niña years.

(ii) Tide Predictions (July 1 to September 30, 2007)

Figure 2, right: Predicted water level plots from July 1-Sept 30 for 3 major stations (a) Marianas, Guam (b) Kwajalein, RMI and (c) Pago-Pago, American Samoa. X-axis: date/time (GMT); Y-axis: height in feet relative to mean lower low water level (MLLW); MR = Mean difference between high and low tides; SR = Difference between high and low tide during full moon (spring tide); and ML = Arithmetic means of high and low tides.

NOAA's website for tide and currents has been used to generate this water level plot for the next three months. Other tide-related monthly extreme data can be found in the web edition of this newsletter. *Observations reveal that the MR, SR, and ML for all these above stations are likely to record several inches rise during the JAS season. Guam, FSM, and Marshalls Islands are likely to experience a higher tide level (i.e., rise by 2 to 4 inches) and American Samoa may record a rise in tide of 4 to 6 inches during the next three months (July 1 to September 30).*

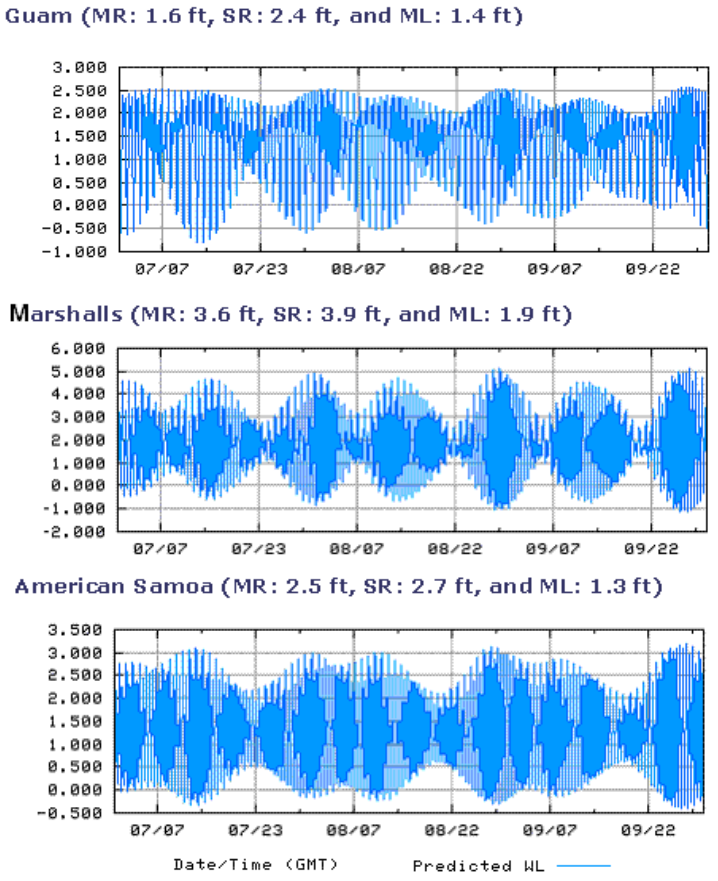


Figure 2: Predicted water level for JAS 2007 at (a) Marianas, Guam (b) Kwajalein, RMI and (c) Pago-Pago, American Samoa.

EXPERIMENTAL SEA LEVEL FORECASTS

(iii) Observed monthly sea level deviation in Apr-May-Jun (AMJ), 2007

The monthly time series (April - June) for sea level deviations have 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. See **Figure 3** (below) for location of these stations.

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

Tide Gauge Station	Apr.	May	Jun.
Marianas, Guam	+2.6 (3.2)	+5.0 (2.9)	+7.6 (2.8)
Saipan, CNMI	+3.5 (4.6)	+5.7 (4.7)	n/a (4.2)
Malakal, Palau	-1.7 (4.6)	-2.1 (4.7)	-0.5 (4.2)
Yap, FSM	n/a (3.8)	n/a (3.4)	n/a (4.1)
Kwajalein, Marshalls	+7.4 (3.0)	+8.7 (2.9)	+8.0 (2.6)
Majuro, Marshalls	+5.8 (2.0)	+3.0 (2.3)	n/a (2.7)
Pohnpei, FSM	+6.2 (2.1)	+8.2 (2.5)	n/a (2.2)
Kapingamarangi, FSM	+3.7 (1.9)	+3.1 (1.9)	+0.7 (2.1)
Pago Pago, A. Samoa	+3.3 (3.7)	+4.6 (4.3)	+5.5 (3.6)

Note: - indicate negative deviations (fall of sea-level from the mean), and + indicate positive deviations (rise of sea-level from the mean), n/a: data not available, and figures in parenthesis are year-to-year SD (standard deviations) for the month.

Table 2 (left) provides the monthly observed sea level deviations (in inches). A considerable positive deviation has been observed in most of the tide-gauge stations in AMJ. While the previous three quarters recorded rise, the rise in AMJ is particularly high. As mentioned, the sea-level variation in the USAPI is sensitive to ENSO-events, with low sea-level typically recorded during El Niño and high sea-level during La Niña events. Consistent with the on-going transition from ENSO-neutral to La Niña conditions, the sea level in this year has already started rising in the vicinity of the USAPI.

Note: Due to technical problems, sea-level data for Yap is not available for the AMJ season.

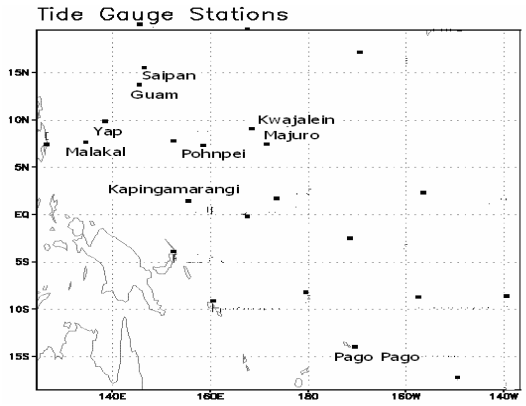


Figure 3, left: Locations of tide gauge stations in the USAPI.

(iv) Seasonal Extremes for JAS at 20 and 100-year return periods

Table 3: GEV	Sea Level Rise (inches)	
Station	**20 year RP**	**100 year RP**
Marianas, Guam	6.2 ~ 8.9*	10.8 ~ 17.2*
Saipan, CNMI	6.9 ~ 8.3	9.7 ~ 16.9
Malakal, Palau	8.0 ~ 9.0	10.1 ~ 12.1
Yap, FSM	8.3 ~ 9.5	11.2 ~ 13.3
Kwajalein, RMI	4.0 ~ 4.6	5.1 ~ 6.1
Majuro, RMI	5.1 ~ 6.5	6.8 ~ 9.5
Pohnpei, FSM	5.7 ~ 6.9	6.9 ~ 9.4
Kapingamarangi, FSM	3.5 ~ 5.0	4.2 ~ 6.9
Pago Pago, A. Samoa	4.0 ~ 5.1	5.3 ~ 7.4

Note: Upper boundaries of rise are calculated at the 90% confidence interval. RP stands for Return Period. Bootstrap methods with 5000 iterations were used to estimate these upper limit values of sea level rise.

The *Generalized Extreme Value (GEV)* products define the thresholds beyond the seasonal tidal range that have low but finite probabilities of being exceeded on a seasonal scale. Results of the GEV analysis for the season JAS is presented in **Table 3** (left). The extreme values are calculated from the 6-hourly sea-level data. The upper limit (at 90% confidence interval) of rise has been shown in the right side of the column, the left side is the estimated rise based on observations. For example, the predicted rise of 6.2 ~ 8.9 inches at Marianas (*) indicates that this station may experience sea level rise of 6.2 to 8.9 inches during JAS within any 20 year period (20 year RP). Likewise, about once every 100 years we can expect the highest JAS tide at Marianas to be as much as 17.2 inches above normal (100 year RP).

Note that some of the stations (Marianas, Saipan, Malakal and Yap) display higher potential rise than other locations, particularly at the 100 year RP. These higher values are due to the effects of past storm events, which significantly increased the tidal ranges of the stations within the swath of the storm path. Therefore, while sea levels at Marianas, Saipan, Malakal and Yap were severely affected by a typhoon or tropical storm, other stations remained more or less unaffected by the same storm.

For plots of extreme values from 1-year to 100-year RP for all stations, please see the web edition of this newsletter at **www.soest.hawaii.edu/MET/Enso/peu/2007_3rd/Sea_Level.htm**.

Pacific ENSO Update

MONTHLY PACIFIC ENSO DISCUSSION FOR MICRONESIA AND AMERICAN SAMOA
Excerpts from July Discussion — Issued by NOAA-NWS-Guam WFO

Conditions in the region now exhibit an ENSO-neutral pattern, with some La Niña-like traits. For example, tropical cyclone activity to-date has been below normal and displaced to the west. Rainfall has returned to near-normal over most areas, but typical of the ENSO-neutral pattern, there is high month-to-month variability in the rainfall. As Typhoon Man-Yi was developing around July 8-10, it brought minimal tropical storm conditions to the Mariana Islands and to Yap State. Yap and Palau received enhanced rainfall from the associated monsoon flow, but rainfall in the Marianas was not plentiful.

The South Pacific Convergence Zone has been fairly active over the Samoa region, keeping conditions wetter than expected. This pattern is expected to continue and should keep the region wetter than normal. Easterly trade winds should continue to dominate the flow in eastern Micronesia (Pohnpei and eastward), and keep rainfall average to slightly below average. Monsoon and storm activity will have more influence in western Micronesia (Chuuk and westward), and these areas will likely see average to slightly above average rainfall. The Marianas will have near average rainfall. Trade winds and sub-surface heating in the western North Pacific will keep sea levels above normal.

Excepts from El NINO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION
Issued by NOAA NWS Climate Prediction Center - 12 July 2007

Synopsis: *ENSO-neutral conditions are expected to continue for the next 2 months, with ENSO-neutral or La Niña conditions equally likely thereafter.*

The evolution toward La Niña conditions slowed during June 2007. The upper-ocean heat content in the central and east-central equatorial Pacific remained below-average, but departures were less negative. The low-level easterly winds remained stronger than average in the west-central equatorial Pacific, with suppressed convection across the equatorial Pacific and a weak area of enhanced convection over parts of Indonesia and northern Australia. Collectively, these oceanic and atmospheric patterns are consistent with ENSO-neutral conditions.

Nearly all of the model forecasts predict below-average SSTs in the Niño 3.4 region (5°N-5°S, 120-170°W) during the remainder of the year. A majority of the statistical models indicate a continuation of ENSO-neutral conditions through the summer months, with several statistical models forecasting weak La Niña conditions during the fall or winter. In contrast, most dynamical models, including the NCEP Climate Forecast System (CFS), continue to predict a transition to La Niña within the next three months. However, several of the dynamical models have recently been predicting a stronger and more rapid cooling than has actually occurred. Given the large spread in ENSO forecasts, along with the slower than expected decrease in observed SSTs over the past few months, it is reasonable to expect either a slower evolution toward La Niña conditions or the continuation of ENSO-neutral conditions.

The Pacific ENSO Update is a bulletin of the Pacific El Niño-Southern Oscillation (ENSO) Applications Center (PEAC). 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, LT(jg) Sarah Jones, at peac@noaa.gov or at the address listed below.

PEAC is part of the Weather Forecast Office (WFO) Honolulu's mission and roles/responsibilities. All oversight and direction for PEAC is provided by the Weather Forecast Office Honolulu in collaboration with the Joint Institute for Marine and Atmospheric Research (JIMAR) at the University of Hawaii. Publication of the Pacific ENSO Update is supported by the National Oceanic and Atmospheric Administration (NOAA), National Weather Service-Pacific Region Climate Services. The views expressed herein are those of the author(s) and do not necessarily reflect the views of NOAA, any of its sub-agencies, or cooperating organizations.

ACKNOWLEDGEMENTS AND FURTHER INFORMATION

PACIFIC ENSO APPLICATIONS CENTER:
HIG #340, 2525 Correa Road, Honolulu, Hawaii 96822
LT(jg) Sarah Jones, PEAC Editor, at 808-956-2324
for information on PEAC, the Pacific ENSO Update and ENSO-related climate data for the Pacific Islands.
Dr. Rashed Chowdhury, PEAC Research Scientist, at 808-956-2324
for information on ENSO and sea level variability in the USAPI.

UNIVERSITY OF HAWAII (UH)
JOINT INSTITUTE OF MARINE AND ATMOSPHERIC RESEARCH (JIMAR),
SCHOOL OF OCEAN AND EARTH SCIENCE AND TECHNOLOGY (SOEST),
DEPARTMENT OF METEOROLOGY:
HIG #350, 2525 Correa Road, Honolulu, Hawaii 96822
Dr. Tom Schroeder, PEAC Principal Investigator at 808-956-7476
for more information on hurricanes and climate in Hawaii.

NOAA NATIONAL WEATHER SERVICE
WEATHER FORECAST OFFICE (WFO) HONOLULU:
HIG #250, 2525 Correa Rd., Honolulu, HI, 96822
James Weyman, PEAC Director, at 808-973-5270

WEATHER FORECAST OFFICE (WFO) GUAM:
3232 Hueneme Road, Barrigada, Guam, 96913
Chip Guard, Warning Coordination Meteorologist,
at 671-472-0900 for information on tropical cyclones and climate in the USAPI.

UNIVERSITY OF GUAM
WATER AND ENVIRONMENTAL RESEARCH INSTITUTE (WERI):
UOG Station, Mangilao, Guam 96913
Dr. Mark Lander, PEAC Meteorologist, at 671-735-2685
for information on tropical cyclones and climate in the USAPI.