pacific ENSO update

2nd Quarter, 2005 Vol.11, No.2 ISSUED: MAY 24, 2005

**A Bulletin of the Pacific El Niño-Southern Oscillation (ENSO) Applications Center:**
**University of Guam • University of Hawaii • NOAA • Pacific Basin Development Council**

# *Pacific ENSO Update*

*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, with additional special reports on important changes in ENSO conditions as may be required from time to time.*

*For more information about this issue, **please contact:***

Nicole Colasacco
Editor, *Pacific ENSO Update*
Pacific ENSO Applications Center
University of Hawaii, Dept. of Meteorology
2525 Correa Road, HIG #350
Honolulu, HI 96822
Tel: 808-956-2324 Fax: 808-956-2877
WWW: http://lumahai.soest.hawaii.edu/Enso/index.html
E-mail:
nicole.colasacco@noaa.gov

*Publication of the* **Pacific ENSO Update** *is supported in part by the National Oceanic and Atmospheric Administration (NOAA), National Weather Service-Pacific Region Headquarters under contract no. AB133W-02-SE-056. 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.*

# CURRENT CONDITIONS

Extreme month-to-month variation in rainfall marked the first three months of 2005. At most recording locations, February's rainfall was very low; as low as one inch in several locations in Chuuk State and the Republic of Palau. A special abbreviated supplement to the ENSO Newsletter was issued to address islander's concerns that the very dry February would lead to a more sustained drought. Forecasters at PEAC felt that February's very low rainfall was an extreme short-term event that would abate in subsequent months. Throughout Micronesia, one month of very low rainfall is sufficient to cause substantial draw-down of stream flow on high islands (such as Pohnpei), problematic losses to rain catchments and other sources of surface water, stress to local crops, and wildfires on islands with large tracts of grasslands (such as Guam). In March and April 2005, rains returned in abundance to many islands, alleviating concerns of a prolonged drought.

According to the U.S. Climate Prediction Center (CPC), the **climate of the tropical Pacific is now in a transition to ENSO Neutral** after having entered a weak El Niño that began in the second half of 2004. The islands of Micronesia are typically drier than normal in the first few months during the year that follows an El Niño. With this in mind, PEAC's outlook was for moderately drier than normal conditions throughout most of Micronesia for the first several months of 2005. Despite February's very low rainfall, most islands have averaged near normal rainfall during the first quarter of 2005. February's very low rainfall is probably not related to changes in the status of ENSO, but rather to the influence of the Madden Julian Oscillation (MJO). The MJO, also referred to as the 30-60 day oscillation, is the main intra-annual (less than a year) fluctuation explaining weather variations in the tropics. The manifestation of the MJO signal at most islands of Micronesia is pronounced alternations of periods of wet weather with periods of hot dry weather.

For the first quarter of 2004, most of the islands of Micronesia and American Samoa had near normal to above normal rainfall (**Fig. 1a**, **1b**). Only the northernmost islands, such as the CNMI and Kwajalein, experienced persistent dryness that was considerably less than normal for this period.

*cont'd on page 2*

## CURRENT CONDITIONS

Near normal rainfall is anticipated throughout much of Micronesia and American Samoa for the next 3 to 6 months; however, large month-to-month variability is expected.

The general consensus among international computer climate forecasts is for a **continued slide away from weak El Niño conditions back toward ENSO Neutral conditions during mid-2005**. For more information, see the CPC ENSO Diagnosic Discussion for May on p. 12.

### SEA SURFACE TEMPERATURE (SST)

Sea surface temperature (SST) anomalies increased by more than 2°C in the extreme eastern equatorial Pacific during April, and by the end of the month, positive equatorial SST anomalies greater than +0.5°C (~0.9°F) were observed in most areas from Indonesia eastward to the South American coast. The increase in SST anomalies in the eastern equatorial Pacific during April was reflected by an increase in the SST

## CURRENT CONDITIONS

anomalies in the Niño 3 and Niño 1+2 regions and by an increase in the upper-ocean heat content in the eastern half of the equatorial Pacific. Subsurface cooling and a decrease in upper-ocean heat content have been evident in the central equatorial Pacific, associated with the upwelling phase of the Kelvin wave. This cooling is expected to propagate eastward, reaching the eastern equatorial Pacific during May.

### SEA LEVEL

See Experimental Sea Level Forecasts p. 9-10 for forecasts and 1st Quarter observed sea levels.

### SOUTHERN OSCILLATION INDEX (SOI)

During the second half of 2004, the SOI* was persistently negative with an average value of approximately -1.0. This was consistent with weak El Niño. For the past few months, the SOI has undergone some wild fluctuations with individual monthly index values of -1.1, + 0.3, -4.1, and -0.2 during December 2005, January, February and March 2005, respectively. February's SOI value of -4.1 was the second lowest value of the SOI recorded in over 100 years. The lowest value of the SOI ever recorded was -4.34 in June, 1877. This is just another indicator of the extreme departure from normal of the tropical Pacific climate during February 2005 – it was an extraordinary month by many measures. With the climate expected to continue its slide towards El Niño Neutral conditions, the SOI should average near zero for the next three to six months, with month-to-month fluctuations within the range of -1.0 to +1.0.

[*Note: The SOI is defined as the normalized pressure difference between Tahiti and Darwin. There are several slight variations in the SOI values calculated at various centers. The historical record of the SOI from 1866 to present was calculated based on the method given by Ropelewski and Jones (1987). The complete table can be found at <http://www.cru.uea.ac.uk/cru/data/soi.htm>.]

Ropelewski, C.F. and Jones, P.D., 1987: An extension of the Tahiti-Darwin Southern Oscillation Index. *Monthly Weather Review* 115, 2161-2165. ]

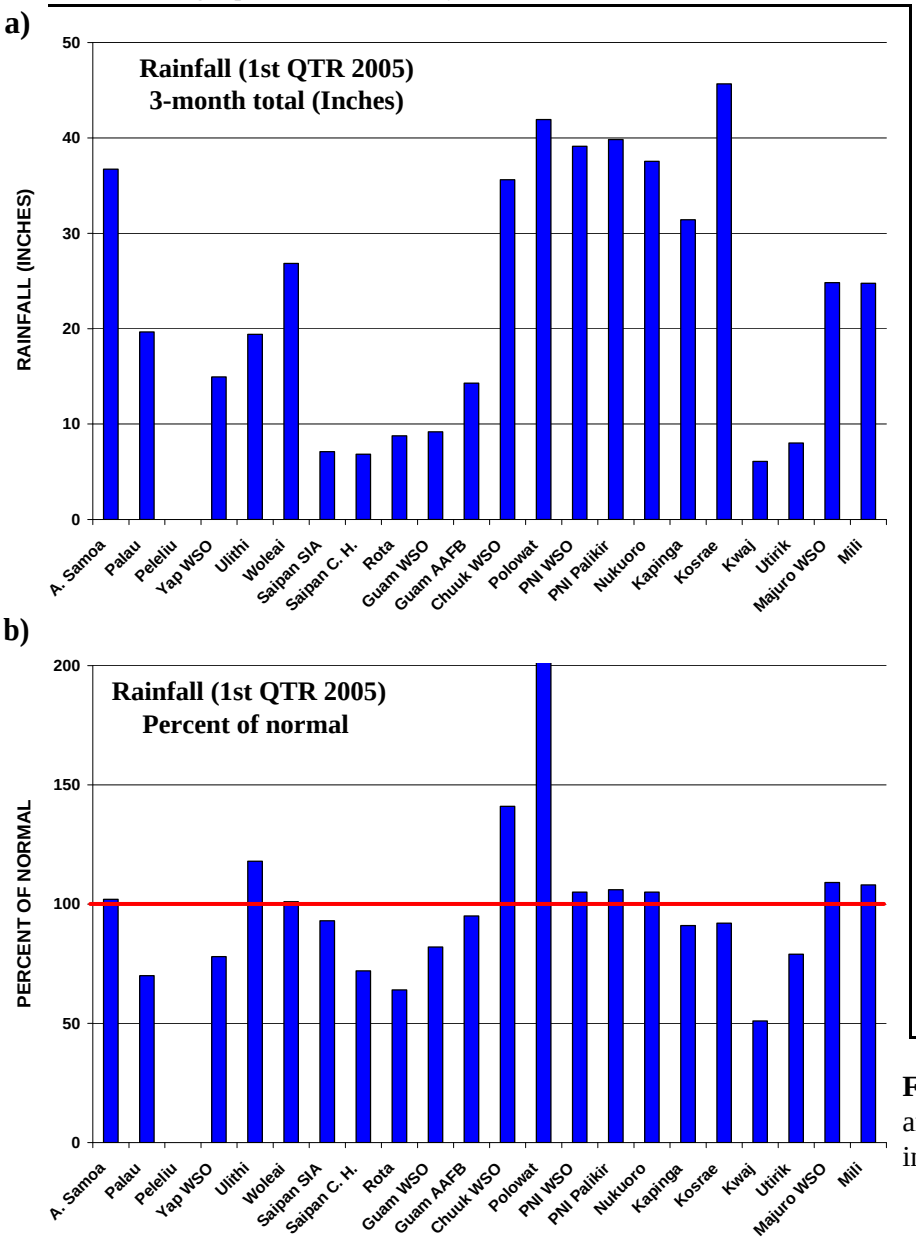



**Figure 1. (a)** Rainfall totals (in inches) and **(b)** anomaly (expressed as percent of normal) at the indicated islands for the 1st Quarter 2005.

# TROPICAL CYCLONE

## TROPICAL CYCLONE OUTLOOK

Since 2000, the Laboratory for Atmospheric Research (LAR) at City University of Hong Kong has been issuing real-time predictions of the annual number of tropical cyclones affecting the western North Pacific (WNP) and the South China Sea. For 2005, all the predictors suggest slightly below-normal overall tropical cyclone activity; the predictor related to the subtropical high forecasts activity much below normal. For the number of tropical storms and typhoons, most of the predictors forecast below-normal activity except for the ENSO predictor that suggests near-normal activity. Thus, it is expected that the overall TC activity over the WNP is likely to be slightly below normal. A similar prediction can be made for the number of tropical storms and typhoons as well as the number of typhoons. No above-normal activity is expected in any of the categories. The quantitative predictions are given in **Table 1**.

**Table 1**. LAR predictions of 2005 tropical cyclone activity
http://aposf02.cityu.edu.hk/~mcg/tc_forecast/2005_forecast_APR.htm

| ENTIRE WESTERN NORTH PACIFIC | 2005 FORECAST |
|---|---|
| All tropical cyclones (TD+TS+TY) | near normal to slightly below normal |
| Tropical storms and typhoons (TS+TY) | below normal |
| Typhoons (TY) | near normal to slightly below normal |

The International Research Institute for Climate Prediction (IRICP) issued an outlook in May 2005 for the tropical cyclone activity expected to occur in the western North Pacific for the 4-month period July through October. According to the IRICP, the forecast for the number of named tropical cyclones in the western North Pacific during the 2005 peak season is equally divided among the three categories: below normal, normal, above normal (**Table 2**).

**Table 2**. IRICP predictions of 2005 tropical cyclone activity
http://iri.columbia.edu/forecast/tc_fcst/wn_pacific/tp_may2005.html

| WESTERN NORTH PACIFIC | 2005 PEAK FORECAST (July to Oct) |
|---|---|
| Below Normal (<17 tropical cyclones) | 33% chance |
| Normal (17-20 tropical cyclones) | 33% chance |
| Above Normal (>20 tropical cyclones) | 33% chance |

Tropical Storm Risk (TSR)at the Benfield Hazard Research Centre, University College London also issues a northwest Pacific typhoon forecast. According to their May update, TSR anticipates a near average season for northwest Pacific typhoon activity in 2005 (**Table 3**). The forecast spans the full western North Pacific season from January 1 to December 31.

**Table 3.** TSR predictions of 2005 tropical cyclone activity
http://tropicalstormrisk.com

| NW Pacific System numbers in 2005 | Intense Typhoons | Typhoons | Tropical Storms |
|---|---|---|---|
| TSR Forecast (± Forecast Error) 2005 | 8.9 (±2.6) | 17.5 (±2.9) | 27.6 (±2.6) |
| 40yr Climate Norm (± SD) 1965-2004 | 8.6 (±3.0) | 16.9 (±3.7) | 26.4 (±4.5) |

## PEAC'S TROPICAL CYCLONE OUTLOOK SUMMARY

The three forecasts for western North Pacific tropical cyclone activity presented differ slightly: one calls for slightly below normal activity, while the other two indicate that activity will be close to normal. The greatest effect of the ENSO cycle on the tropical cyclones of the western North Pacific is on the locations where they form. During El Nino years, the tropical cyclones of the basin tend to form east of normal, and during La Nina years, the tropical cyclones tend to form west of normal. During the year immediately following an El Niño, the number of tropical storms and typhoons is typically reduced. A weak El Niño occurred in 2004, making 2005 the follow-on year to El Niño. This factor would favor reduced tropical cyclone activity for 2005. However, the recent El Niño was weak, and the climate state of 2005 is expected to gradually revert to ENSO Neutral; therefore, we expect the **numbers and locations of the tropical cyclones in the western North Pacific to be close to the long-term average**. We agree with the Hong Kong LAR outlook that no above-normal activity is expected in any category (e.g., number of typhoons and number of intense typhoons). Caution: the annual number of tropical cyclones in the western North Pacific basin is approximately 30, and is the highest of any basin in the world. **Even reduced activity** in this basin still **represents a large number of tropical cyclones**, and though the risk of a typhoon affecting any of the islands in Micronesia might be reduced, the risk is not zero.

## TROPICAL CYCLONE ACTIVITY (1ST QUARTER SUMMARY)

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 Japanese Meteorology Agency (JMA), which is the World Meteorological Organization's Regional Specialized Meteorological Center (RSMC) for the basin. PEAC archives South Pacific tropical cyclone names, track coordinates, central pressure, and 10-minute average

## TROPICAL CYCLONE

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 when appropriate.

During January through April 2005, the JTWC numbered three tropical cyclones in the western North Pacific: TC 01W (January), TC 02W (March), and TC 03W (April). The JMA named them Kulap, Roke, and Sonca, respectively. During the same four-month period, the JTWC numbered nine tropical cyclones in the South Pacific: TC 08P (Kerry), TC 15P (Meena), TC 16P (Harvey), TC 18P (Nancy), TC 19P (Olaf), TC 20P (Percy), TC 21P (Rae), and TC 22P (Ingrid). Only one tropical cyclone named by a South Pacific warning center (Tropical Storm Sheila as per the Nadi RSMC) did not receive a number from the JTWC. Sheila was a weak tropical storm that passed over Niue in late April.

The three tropical cyclones in the western North Pacific through April 2005 represented a normal distribution of tropical cyclones during this normally quiet period. Each formed in association with monsoon depression type disturbances in the Caroline Islands. According to the JTWC, two of these cyclones became typhoons (Roke, and Sonca), and Kulap nearly became a typhoon with a peak wind of 60 kt. The South Pacific was relatively quiet until February 2005 when six tropical cyclones formed in the basin. Four of these became major hurricanes with sustained wind speeds in excess of 120 mph. Hurricane Olaf (TC 19P) was the most intense of the cyclones when its intensity peaked at 170 mph 1-minute sustained wind on February 16. Olaf caused substantial damage to some of the islands of American Samoa.

## LOCAL SUMMARY AND OUTLOOK

**American Samoa:** The total rainfall of 36.73 inches in American Samoa during the first quarter of 2005 was normal (100%). Rainfall at Pago Pago could have been much higher had major Hurricanes Olaf, Nancy or Percy passed only 100 miles or so closer. The Manua Islands (Ofu, Olosega and Ta'u) to the east of Pago Pago were hit almost directly by Olaf, and experienced great destruction from high winds, and enormous waves.

**America Samoa Rainfall Summary 1st Quarter 2005**

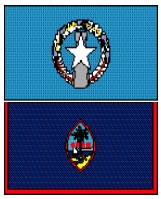
| Station | | Jan. | Feb. | Mar. | Total |
|---|---|---|---|---|---|
| **Pago Pago WSO** | **Rainfall (inches)** | 13.25 | 10.55 | 12.93 | **36.73** |
| | **% of Normal** | 105% | 83% | 115% | **100%** |

**Climate Outlook:**

Computer forecasts and a consensus of outlooks from several regional meteorological centers indicate that **rainfall in American Samoa is likely to be near normal through the winter dry season**. Long-range computer rainfall forecasts, however, have only limited skill in the tropical Pacific islands. Predicted rainfall for American Samoa from June 2005 through May 2006 is:

| Inclusive Period | % of long-term average |
|---|---|
| **Jun - Oct 2005 (Dry Season)** | **90%** |
| **Nov 2005-Jan 2006 (Onset of Next Rainy Season)** | **100%** |
| **Feb - May 2006 (Heart of Next Rainy Season)** | **100%** |

## LOCAL SUMMARY AND FORECAST



**Guam/CNMI:** Rainfall on Guam during the first quarter of 2005 was near normal to slightly drier than normal at most locations. At the University of Guam on Guam's central east coast, the total rainfall of 8.21 inches for January, February, and March was drier overall than at the central interior station (GIA at 9.19 inches) and at northern station (Anderson Air Force Base at 14.29 inches).

**Guam and CNMI Rainfall Summary 1st Quarter 2005**

| Station | | Jan. | Feb. | Mar. | Total |
|---|---|---|---|---|---|
| **Guam International Airport** | **Rainfall (inches)** | 1.55 | 5.17 | 2.47 | **9.19** |
| | **% of Normal** | 35% | 138% | 83% | **82%** |
| **Anderson Air Force Base** | **Rainfall (inches)** | 5.35 | 4.25 | 4.69 | **14.29** |
| | **% of Normal** | 94% | 81% | 115% | **95%** |
| **University of Guam** | **Rainfall (inches)** | 1.52 | 4.65 | 2.04 | **8.21** |
| | **% of Normal** | N/A | N/A | N/A | **N/A** |
| **Saipan International Airport** | **Rainfall (inches)** | 1.76 | 3.10 | 2.24 | **14.29** |
| | **% of Normal** | 55% | 129% | 112% | **93%** |
| **Capital Hill** | **Rainfall (inches)** | 2.10 | 1.17 | 3.57 | **6.84** |
| | **% of Normal** | 53% | 39% | 143% | **72%** |
| **Tinian Airport** | **Rainfall (inches)** | 2.15 | 1.49 | 1.89 | **5.53** |
| | **% of Normal** | 54% | 50% | 76% | **58%** |
| **Rota Airport** | **Rainfall (inches)** | 2.44 | 3.25 | 3.09 | **6.84** |
| | **% of Normal** | 46% | 69% | 84% | **64%** |

* Long term normal is not established for these sites

Each of the first three tropical cyclones of 2005 passed close enough to Guam to influence the weather. Tropical Storm Kulap passed about 100 miles east of Guam producing some high surf on the east side of the island, the tropical

## LOCAL SUMMARY AND FORECAST

disturbance that became Typhoon Roke passed south of Guam giving some much-needed dry season rainfall, and the disturbance that became Typhoon Sonca passed to the south depositing some much-needed dry season rainfall. Wildfires in Guam's grasslands have been occurring regularly throughout the current dry season, but have not been excessive. During the first quarter, trade winds were unusually strong and hazardous surf was experienced on many days.

In the heart of its dry season, most of CNMI's rainfall stations during the first quarter of 2005 reported less rainfall than on Guam--both in inches and as a percent of normal. Saipan International Airport and Capital Hill were at 93% of normal and 72% of normal respectively, Rota was also drier at 64% of normal. The rainfall recorded at Tinian during the first quarter of 2005 was the lowest amount at any recording station in Micronesia at 5.53 inches (58% of normal).

Eruptions of Anatahan volcano, located about 90 miles north of Saipan and 200 miles north of Guam, have sent episodes of hazy volcanic smog (vog), fumes and volcanic ash southward to Guam and the islands of the CNMI. More information on these events and current volcanic activity is available through USGS and the Hawaii Volcano Observatory website, <http://hvo.wr.usgs.gov/cnmi/>.

**Climate Outlook:**

With the demise of weak El Niño conditions in 2005, **the threat of a typhoon for Guam and the CNMI during the upcoming year is near normal**. During an average year, three or four tropical storms and one or two typhoons pass within 200 miles of any location. The odds of typhoon force winds (or greater) at any given location on Guam or in the CNMI during any given year (status of ENSO not considered) are approximately 1 in 7. During El Nino years, the odds of typhoon force winds on Guam or in the CNMI rise to about 1 in 3. During non-El Nino years the odds fall back to around 1 in 10. Dangerous surf from a typhoon does not require that the typhoon pass close to any location, so it is certain that at least one episode of dangerous typhoon-generated waves will occur. Every year several lives are lost due to hazardous surf.

Based on the gradual demise of weak El Niño conditions during 2005, **conditions are anticipated to be drier than normal for Guam and the CNMI through the upcoming dry season and into the onset of the summer rainy season**.

Predicted rainfall for the Mariana Islands from Jun 2005 through May 2006 is as follows:

| Inclusive Period | % of long-term average | |
|---|---|---|
| | Guam/Rota | Saipan/Tinian |
| Jun-Jul 2005 (Onset of Rainy Season) | 80% | 75% |
| Aug-Oct 2005 (Heart of Rainy Season) | 100% | 90% |
| Nov 2005-Jan 2006 (Next Dry Season Onset) | 95% | 90% |
| Feb - May 2006 (Heart of Next Rainy Season) | 85% | 80% |

## LOCAL SUMMARY AND FORECAST

**Federated States of Micronesia**

**Yap State:** The rainfall at most recording locations in Yap Island was below normal, mostly a result of a very dry February. 1st Quarter totals were near normal at the southern Woleai Atoll (101% of normal) and slightly less than normal on Yap Island (78% of normal) and at Ulithi (78% of normal).

**Yap State Rainfall Summary 1st Quarter 2005**

| Station | | Jan. | Feb. | Mar. | Total |
|---|---|---|---|---|---|
| Yap WSO | Rainfall (inches) | 6.94 | 2.04 | 5.97 | **14.95** |
| | % of Normal | 95% | 34% | 100% | **78%** |
| Dugor* | Rainfall (inches) | 6.80 | 2.00 | 6.94 | **15.74** |
| Gilman* | Rainfall (inches) | 8.14 | 1.29 | 3.12 | **12.55** |
| Luweech* | Rainfall (inches) | 7.30 | 2.01 | 6.04 | **15.35** |
| Maap* | Rainfall (inches) | 4.58 | 1.37 | 5.33 | **11.28** |
| North Fanif* | Rainfall (inches) | 4.29 | 1.42 | 4.31 | **10.02** |
| Tamil* | Rainfall (inches) | 7.99 | 1.42 | 4.48 | **13.89** |
| Ulithi | Rainfall (inches) | 12.68 | 1.92 | 4.81 | **19.41** |
| | % of Normal | 204% | 38% | 95% | **78%** |
| Woleai | Rainfall (inches) | 17.75 | 2.16 | 6.93 | **26.84** |
| | % of Normal | 166% | 29% | 83% | **101%** |

* Long term normal is not established for these sites.

**Climate Outlook:**

The **tropical cyclone threat** at Yap during 2005 should be **near normal**. So far this year, two tropical cyclones — Roke and Sonca — passed north of Yap without incident. During an average year approximately two to three tropical cyclones pass close enough to Yap (and/or its outer islands) to cause gales, but a direct strike by a typhoon at any Yap location does not occur. The threat of a direct strike by a typhoon at Yap Island and at Ulithi is roughly one-half to two-thirds that of Guam and the CNMI. The threat is even less further south at Woleai. While we expect no direct strikes by a typhoon of any island or atoll of Yap State during 2005, residents should always be prepared for the possibility.

Predicted rainfall for Yap State from Jun 2005 through May 2006 is as follows:

## LOCAL SUMMARY AND FORECAST

| Inclusive Period | % of long-term average | |
|---|---|---|
| | Yap and Ulithi | Woleai |
| Jun–Jul 2005 (Onset of Rainy Season) | 90% | 100% |
| Aug – Oct 2005 (Heart of Rainy Season) | 100% | 110% |
| Nov – Dec 2005 (Onset of next Dry Season) | 95% | 100% |
| Jan 2006 – May 2006 (Next Dry Season) | 90% | 90% |

**Chuuk State:** Rainfall was abundant throughout most of Chuuk State during the first quarter of 2005, with substantial month-to-month variation. During January 2005, rains associated with the year's first tropical cyclone (Tropical Storm Kulap) helped end the moderately dry weather that had persisted in the last three months of 2004. The January 2005 monthly totals were quite high, with reports in excess of 20 inches at some locations. February was very dry, with rainfall totals of 2 inches or less at most locations. Rainfall was again abundant in March and in April. Polowat was the wettest location in Chuuk State during the 1st Quarter of 2005 with 41.92 inches. This was over 200% of normal, which was the highest percent of normal at any location in Micronesia.

**Chuuk Rainfall Summary 1st Quarter 2005**

| Station | | Jan. | Feb. | Mar. | Total |
|---|---|---|---|---|---|
| **Chuuk Lagoon** | | | | | |
| Chuuk WSO | Rainfall (inches) | 20.93 | 1.91 | 12.78 | **35.54** |
| | % of Normal | 196% | 21% | 152% | **141%** |
| Piis Panew* | Rainfall (inches) | 11.26 | 1.95 | 6.03 | **19.24** |
| Xavier High School* | Rainfall (inches) | N/A | N/A | 12.17 | **N/A** |
| **Mortlocks** | | | | | |
| Lukunoch* | Rainfall (inches) | 16.86 | .42 | 19.56 | **36.84** |
| Ettal* | Rainfall (inches) | 13.74 | .38 | 15.82 | **29.94** |
| Ta* | Rainfall (inches) | 10.51 | 1.16 | 18.37 | **30.04** |
| **Hall Islands** | | | | | |
| Fananu* | Rainfall (inches) | 13.47 | 2.26 | 4.86 | **20.59** |
| **Eastern Atolls** | | | | | |
| Losap* | Rainfall (inches) | 20.07 | 1.71 | 15.24 | **37.02** |
| Nama* | Rainfall (inches) | 18.45 | 1.45 | 19.22 | **39.12** |
| **Western Atolls** | | | | | |
| Polowat | Rainfall (inches) | 23.92 | 4.24 | 13.76 | **41.92** |
| | % of Normal | 299% | 68% | 220% | **204%** |

* Long term normal is not established for this site
N/A Not Available

LOCAL SUMMARY AND FORECAST

**Climate Outlook:**

The **tropical cyclone threat for Chuuk State** during 2005 is expected to be **near normal**. Normal indicates that one or two tropical storms and one typhoon should pass through some parts of Chuuk State, accompanied by gales and high surf. A direct hit by a typhoon at any of the islands and atolls of Chuuk State is not expected.

Based on the gradual demise of weak El Niño conditions during 2005, **rainfall** at islands in the Chuuk Lagoon and on the atolls of **Chuuk State should be near normal** for the next 3 to 6 months, with large month-to-month variations. Predictions for Chuuk State from Jun 2005 through May 2006 are as follows:

| Inclusive Period | % of long-term average | | | |
|---|---|---|---|---|
| | Losap/Nama | Polowat | Hall Is. | Mortlocks |
| Jun–Sep 2005 | 95% | 95% | 100% | 90% |
| Oct–Dec 2005 | 90% | 95% | 95% | 90% |
| Jan–May 2006 | 100% | 95% | 90% | 100% |

**Pohnpei State:** When averaged over the first three months of 2005, the rainfall at most locations on Pohnpei Island and the atolls of Pohnpei was near normal. There was, however, extreme month-to-month variation not reflected in this 3-month average. Rainfall during February 2005 was less than half of normal at many locations, followed in March and April by abundant rainfall. Pohnpei Island experienced a tremendous range of rainfall values, from a near record dry month (February) to an extreme 24-hour heavy rain event (April 30th). On the last day of April, Pohnpei experienced an extreme rainfall event in which the WSO in Kolonia received nearly 11 inches of rain in 24 hours. During the 13-year period 1990-2002, the WSO Pohnpei received over 10 inches in 24 hours only two times (**Figure 2**). During this event there were two reported

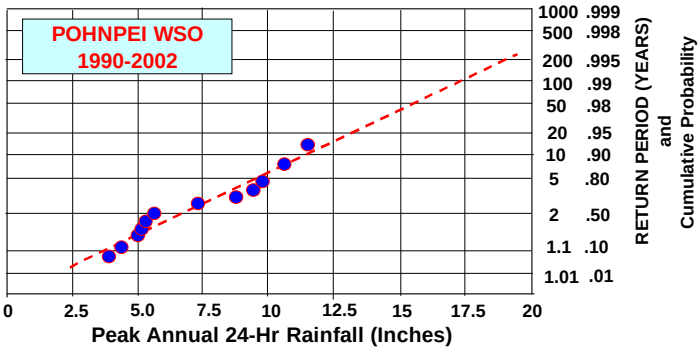



**Figure 2.** Method-of-moments (ranking method) computations of 24-hour return period extreme rainfall events at Pohnpei WSO.

casualties: one was a drowning in rough seas and another occurred when a tree was blown over on top of a person. The cause of this event was a large meso-scale convective complex (not a tropical cyclone) that formed in the trade-

## LOCAL SUMMARY AND FORECAST

wind trough. Through April of 2005, there have been large month-to-month fluctuations in cloudiness and rainfall (most likely associated with the MJO).

**Pohnpei Rainfall Summary 1st Quarter 2005**

| Station | | Jan. | Feb. | Mar. | Total |
|---|---|---|---|---|---|
| **Pohnpei Island** | | | | | |
| **Pohnpei WSO** | **Rainfall (inches)** | 14.33 | 3.16 | 21.64 | **39.13** |
| | **% of Normal** | 110% | 29% | 160% | **105%** |
| **Palikir*** | **Rainfall (inches)** | 14.19 | 3.91 | 21.73 | **39.83** |
| **Song Kroun*** | **Rainfall (inches)** | 11.27 | 3.76 | 23.31 | **38.34** |
| **Atolls of Pohnpei State** | | | | | |
| **Nukuoro** | **Rainfall (inches)** | 11.63 | 4.33 | 21.59 | **37.55** |
| | **% of Normal** | 99% | 41% | 159% | **105%** |
| **Pingelap** | **Rainfall (inches)** | 14.49 | 14.62 | 15.07 | **44.18** |
| | **% of Normal** | 117% | 120% | 104% | **113%** |
| **Mwokilloa*** | **Rainfall (inches)** | 8.14 | 1.29 | 3.12 | **12.55** |
| **Kapingamarangi** | **Rainfall (inches)** | 16.21 | 7.41 | 7.80 | **31.42** |
| | **% of Normal** | 155% | 72% | 56% | **91%** |

* Long term normal is not established for this site
N/A Not Available

**Climate Outlook:**

The frequency of named tropical cyclones passing Pohnpei is less than once every three years within 75 n mi, with a sharp gradient that features almost no tropical storms south of 5° N to more than one tropical storm or typhoon passing within 75 n mi of locations several hundred miles to the north and west of Pohnpei. During 2005, one or two tropical storms may pass to the north of Pohnpei Island bringing heavy rain showers, gusty southwest winds, and high surf. El Niño increases the risk of a tropical storm directly affecting Pohnpei; this year marks the one-hundred year anniversary of an intense and deadly typhoon that made a direct hit at Pohnpei Island during the strong El Niño year of 1905. Since the climate of 2005 is anticipated to be El Niño Neutral, a direct strike by a strong tropical storm or a typhoon is unlikely at any island in Pohnpei State.

Based on the gradual transition of the climate to El Niño Neutral conditions during 2005, **rainfall at Pohnpei Island and at Pohnpei's atolls should be near normal** for the next 3 to 6 months, with large month-to-month variations.

Predicted rainfall for Pohnpei State from Jun 2005 through May 2006 is as follows:

## LOCAL SUMMARY AND FORECAST

| Inclusive Period | % of long-term average | |
|---|---|---|
| | Pohnpei Islands/ Atolls | Kapingamarangi |
| Jun - Oct 2005 | 100% | 95% |
| Nov 2005 - Jan 2006 | 95% | 100% |
| Feb - Mar 2006 | 90% | 95% |
| Apr - May 2006 | 100% | 90% |

**Kosrae State:** Rainfall was abundant on Kosrae during January 2005, then fell to about half of normal during both February and March. During the 1st quarter of 2005, the 3-month rainfall at Kosrae Supplemental Aviation Weather Reporting Station (SAWRS) (located on the northwest side of the island) was 45.68 inches. This was the highest recorded 3-month rainfall total in Micronesia for the first quarter of 2005.

**Kosrae State Rainfall Summary 1st Quarter 2005**

| Station | | Jan. | Feb. | Mar. | Total |
|---|---|---|---|---|---|
| **Kosrae Airport (SAWRS)** | **Rainfall (inches)** | 26.91 | 8.47 | 10.30 | **45.68** |
| | **% of Normal** | 187% | 52% | 55% | **92%** |
| **Utwa*** | **Rainfall (inches)** | 26.05 | 7.31 | 7.53 | **40.89** |
| **Nautilus*** | **Rainfall (inches)** | 22.80 | 8.03 | 10.34 | **41.17** |

* Long term normal is not established for these sites.

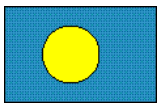
**Climate Outlook:**

During 2005, one or two tropical storms may pass to the north of Kosrae bringing heavy rain showers, gusty southwest winds, and high surf. Kosrae, fortunately, is located close enough to the equator so that a direct strike by a strong tropical storm or a typhoon is very unlikely, although it did occur 100 years ago. The same intense typhoon that hit Pohnpei in 1905 also hit Kosrae.

Based on the gradual transition of the climate to ENSO Neutral conditions during 2005, **rainfall at Kosrae should average near normal** for the next year, with some large month-to-month variations.

Predicted rainfall for Kosrae State from Jun 2005 through May 2006 is as follows:

| Inclusive Period | % of long-term average |
|---|---|
| Jun- Oct 2005 | 100% |
| Nov 2005 - Feb 2006 | 95% |
| Mar -May 2006 | 110% |



**Republic of Palau:** The January 2005 monthly totals were near normal throughout Palau. February however was very dry, with rainfall totals of 2 inches or less at most locations. Adequate rainfall returned in March and in April.

The second half of 2004 was very dry at all Palau locations. During the 1st quarter of 2005 dry conditions continued at

## LOCAL SUMMARY AND FORECAST

Palau (70% of normal). The rainfall total for August 2004 through March 2005 at WSO Koror was 54.26 inches, or only 54% of the normal 92.00 inches that typically falls in this 8-month period.

**Republic of Palau State Rainfall Summary 1st Quarter 2005**

| Station | | Jan. | Feb. | Mar. | Total |
|---|---|---|---|---|---|
| **Koror WSO** | **Rainfall (inches)** | 11.39 | 1.03 | 7.24 | **19.66** |
| | **% of Normal** | 106% | 11% | 88% | **70%** |
| **Nekken*** | **Rainfall (inches)** | 7.61 | 1.39 | N/A | N/A |
| **International Airport*** | **Rainfall (inches)** | 9.21 | 1.08 | N/A | N/A |
| **Peleliu** | **Rainfall (inches)** | 9.65 | .77 | N/A | N/A |
| | **% of Normal** | 90% | 9% | N/A | N/A |

* Long term normal is not established for these sites.
N/A Not Available

**Climate Outlook:**

Dry conditions in Palau during the second half of 2004 and during the first quarter of 2005 were consistent with the onset of El Niño conditions during the second half of 2004, and a gradual return to El Niño Neutral conditions during 2005. **This dryness is expected to ease in the next three to six months.**

A direct strike by a typhoon is not likely to occur in Palau during 2005, but westerly gales may occur two or three times in response to typhoons passing to the north of Palau during the period August through November.

Predicted rainfall for Palau from Jun 2005 through May 2006 is as follows:

| Inclusive Period | % of long-term average |
|---|---|
| **Jun - Oct 2005** | **100%** |
| **Nov 2005- Jan 2006** | **95%** |
| **Feb - May 2006** | **90%** |

**Republic of the Marshall Islands (RMI):** In all but the northern atolls, rainfall at most locations in the RMI was abundant in the first quarter of 2005. It was above normal at most atolls south of 8° N (only Jaluit was below normal in this region). North of 8° N it was quite dry, with Kwajalein and Wotje receiving only half of their normal rainfall. The most rainfall recorded in the RMI during the 1st Quarter of 2005 was at Laura with 26.62 inches. The 5.52 inches at Wotje was the lowest recorded total in Micronesia, just edging out the 5.53 inches at Tinian in the CNMI as Micronesia's driest location.

## LOCAL SUMMARY AND FORECAST

**RMI Rainfall Summary 1st Quarter 2005**

| Station | | Jan. | Feb. | Mar. | Total |
|---|---|---|---|---|---|
| **RMI Central and Southern Atolls** | | | | | |
| **MajuroWSO** | **Rainfall (inches)** | 5.59 | 9.92 | 9.31 | **24.82** |
| | **% of Normal** | 66% | 161% | 112% | **109%** |
| **Laura*** | **Rainfall (inches)** | 5.96 | 10.57 | 10.09 | **26.62** |
| **Arno*** | **Rainfall (inches)** | 4.12 | 9.83 | 12.17 | **26.14** |
| **Alinglaplap*** | **Rainfall (inches)** | 4.28 | 9.00 | 5.11 | **18.39** |
| **Mili*** | **Rainfall (inches)** | 4.86 | 6.99 | 12.90 | **24.75** |
| **RMI Northern Atolls** | | | | | |
| **Kwajalein** | **Rainfall (inches)** | 3.42 | 1.41 | 1.26 | **6.09** |
| | **% of Normal** | 75% | 44% | 31% | **51%** |
| **Utirik** | **Rainfall (inches)** | 1.97 | 3.42 | 2.62 | **8.01** |
| | **% of Normal** | 51% | 124% | 75% | **79%** |
| **Wotje** | **Rainfall (inches)** | 0.63 | 2.75 | 2.14 | **5.52** |
| | **% of Normal** | 15% | 95% | 55% | **50%** |

* Long term normal is not established for this site

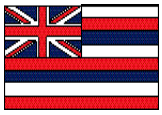
**Climate Outlook:**

Based on the gradual demise of weak El Niño conditions during 2005, conditions are anticipated to be **slightly drier than normal** in the **northern atolls of the RMI**. The **central and southern atolls** should continue to have **near normal rainfall.**

Predicted rainfall for the RMI from Jun 2005 through May 2006 is as follows:

| Inclusive Period | % of long-term average | | |
|---|---|---|---|
| | S. of 6°N | 6°N to 8°N | N. of 8°N |
| **May - Oct 2005** | **100%** | **95%** | **95%** |
| **Nov 2005 - Jan 2006** | **100%** | **95%** | **90%** |
| **Feb - May 2006** | **95%** | **95%** | **85%** |

**Rainfall normals and predicted rainfall outlooks are provided by University of Guam WERI.**



**FIRST QUARTER 2005**
**MONTHLY PRECIPITATION**
**STATE OF HAWAI'I SUMMARY**

**January:** Most areas in the State of Hawaii experienced a very wet start to 2005 and a continued lack of sustained trade winds. The last time the main Hawaiian Islands experienced sustained trade winds lasting more than one day was back in early December 2004....A strong storm with a slow moving cold front that threatened the island chain at the end of December 2004 impacted Kauai on January 1 with 3 to 6 inches of rain, creating a very wet New Year's Day.... The storm pushed eastward, bringing 1 to 3 inches of rain and minor flooding on Oahu and Maui County by January 2. Areas along the south and west side of the Big Island also received 1 to 3 inches of rain on January 3 as the storm dissipated, with the Hamakua, Hilo, and Puna areas seeing less than 2 inches....On January 8, a strong and rapidly moving cold front brought heavy rains and severe thunderstorms to the western half of the state. A tornado touched down in Waimea, Kauai and damaging wind gusts of 50 to 70 miles per hour blasted several areas of Kauai and Oahu....See [the NWS-HFO] severe storm event summary for more details.... The period from January 12 through 25 saw relatively dry weather conditions, especially over the windward slopes of Maui and the Big Island....January closed out with the return of very unsettled weather. On January 29, a diffuse frontal boundary destabilized by a passing short wave trough brought heavy rainfall to south and east Oahu during the morning and early afternoon hours.

**February:** Unsettled weather over the Hawaiian Islands that started from the end of January continued through the first week of February. The unstable conditions were produced by a strong low pressure system that moved over the island chain from the west. Heavy rains affected all of the main islands in the state and flash flooding occurred on Kauai and the Big Island...The departure of the week-long storm marked the return of sustained trade winds to the Hawaiian Islands. A strong shear line reached Kauai and Oahu on February 11, bringing periods of heavy rains and strong northeast winds...The rest of February saw persistent trades in the moderate to fresh range punctuated by weak shear line passages on February 22-24 and on February 26. The shear lines brought enhanced trade wind showers but no associated flooding problems.

**March** Non-trade wind conditions dominated the first 3 weeks of March with the main Hawaiian Islands in the low level westerly belt. On March 9 and 10, a cold front pushed across the island chain bringing with it an increase in rain shower activity. However, for Oahu and Molokai it was the pre-frontal convergence bands ahead of the cold front that dropped the most rain during the night of March 8 with several locations reporting over 2 inches within a 12-hour period....The last cold front of the month reached Kauai on March 25 and evolved into a shear line configuration. The shear line marked the return of persistent trades that continued through the end of the month as well as the start of very wet conditions for the windward areas of the state.

**Kevin R. Kodama, Senior Service Hydrologist**
**National Weather Service Forecast Office, Honolulu, Hawaii**

**Editor's Note:** The Monthly Precipitation Summaries for Hawaii are issued monthly as a public service. Individual rainfall station information and specific island information for Hawaii can be found in the Monthly Precipitation Summaries which are located online at <http://www.prh.noaa.gov/hnl/pages/hydrology.php>.

## NEW – Experimental Sea level Forecasts *(deviations w. r. t. climatology)* for the U.S-affiliated Pacific Islands

In addition to seasonal rainfall forecasts, there is a strong demand for sea level forecasts with a lead time of a season or longer in the US-affiliated Pacific Islands (USAPI). This demand was raised by the representatives of the user community in the last Pacific ENSO Applications Center (PEAC) review meeting held in Honolulu, Hawaii (USA) June 1-3, 2004 (a draft summary is available in the web <http://research.eastwestcenter.org/climate/PEAC/>). In order to address this need, PEAC developed an experimental statistical sea level forecast which **predicts seasonal sea level deviations from mean sea level one to two months in advance.**

In this issue of newsletter, we introduce an experimental **statistical forecasting model** using Canonical Correlation Analysis (CCA). This statistical sea level forecast is based on the teleconnections, or air-sea interactions over great distances, between tropical SST and sea level in the USAPI. This CCA model predicts the seasonal sea level variability in real-time at a considerably long lead-time (**one to two months**). Results have been found to be skillful.

**Observed monthly sea level deviation in JFM, 2005**

This following **Table 4** contains monthly values of sea level deviations as reported from the UH Sea Level Center from January to March 2005. Units for the sea level deviations are in centimeters. Deviations are defined here as the difference between the mean sea level for the given month and the 1975 to 1995 mean sea level at that station. The full time series is available at: <http://ilikai.soest.hawaii.edu/uhslc/woce.html>

## NEW – Experimental Sea level Forecasts (con't)

**Table 4**: Monthly observed sea level deviations in cm (std deviation in parentheses)

| Tide Gauge Station | Jan | Feb | Mar |
|---|---|---|---|
| Marianas, Guam | **n/a** (10) | **-2.6** (10) | **+11.8** (9) |
| Saipan, CNMI | **-11.4** (8) | **-9.1** (8) | **n/a** (8) |
| Malakal, R. Palau | **-9.4** (12) | **-12.6** (13) | **-4.4** (11) |
| Yap, FSM | **-14.7** (10) | **-17.4** (10) | **-11.9** (10) |
| Pohnpei, FSM | **+4.6** (11) | **+3.4** (8) | **+5.8** ( 6) |
| Kapingamar, FSM | **+12.8** (9) | **+6.3** (10) | **+3.1** (9) |
| Majuro, Marshalls | **+5.2** (9) | **+6.0** (6) | **+7.2** (4) |
| Kwajalein, Marshalls | **0** (7) | **+1.9** (6) | **+3.2** (5) |
| Pago-Pago, A Samoa | **+6.4** (5) | **+5.7** (7) | **-9.6** (9) |

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, Figures in parenthesis are year-to-year SD (standard deviations) for the month.

Average seasonal sea level deviation: Jan-Feb-Mar

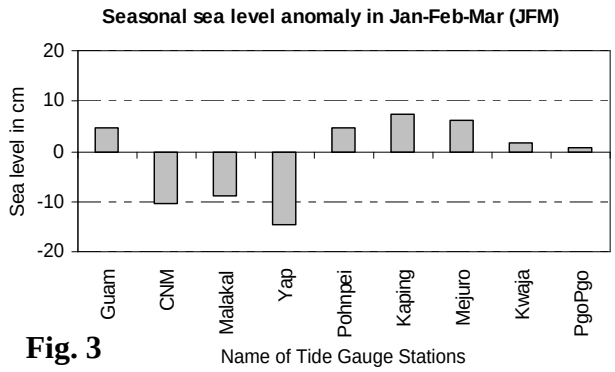



**Fig. 3**

With the exception of Guam in March (which had a sharp rise), a negative deviation was recorded in most of the northwestern Pacific Islands (i.e., Saipan, Malakal, and Yap) from January to March, 2005. In contrast, the low latitude Pacific Islands (i.e., Pohnpei, Kapingamarangi) and the central Pacific islands (i.e., Majuro and Kwajalein) had a positive deviation during the same time period. The sea level of the lone south Pacific station, American Samoa (Pago-Pago) displayed a slightly positive deviation in Jan and Feb; however, in March, a sharp drop is observed (**Table 4**). Consistent to the monthly sea level variations, the seasonal average sea level deviation of January-February-March (JFM) also displayed similar variations (**Fig. 3**).

This quarter (JFM) had more significant variations than the last quarter (October-November-December) of 2004. During October November December (OND) 2005, the average sea-level deviations in most of the tide gauge stations remained close to normal. In contrast during JFM 2005, a negative deviation *(lower than long term average sea level)* was observed in the northwest Pacific while a positive deviation (*higher than long term average sea level*) was observed in the region of central to southern Pacific.

### Seasonal Sea Level Forecast for AMJ, MJJ, and JJA, 2005

Forecasts of the sea level deviations in the USAPI are presented here using CCA statistical model. Based on independent SST values in JFM 2005, the CCA model was used to forecast the sea level for a moving-average season of three consecutive months: April-May-June (AMJ), May-June-July (MJJ), and June-July-August (JJA) (**Table 5**). 1-season ahead of CCA cross-validation forecast skills *(cross-validation is conducted to evaluate the overall forecasting skill of the CCA model)* are also presented (**Fig. 4**). A short summary of forecast quality is presented (**Table 5**).

The deviations of sea level are relatively small at the present time, but are consistent with a weak El Niño pattern that is gradually weakening. As the El Niño condition is gradually weakening, the sea level variation may not display any significant variations during the 2nd quarter of 2005.

**Table 5**: Forecasts of sea level deviation in cm (AMJ: April-May-June, MJJ: May-June-July, and JJA: June-July-August)

| Tide Gauge Station | AMJ | MJJ | JJA | *Forcst. quality |
|---|---|---|---|---|
| Guam | +5 | +5 | +6 | High |
| Saipan | * | * | +4 | Fair |
| Malakal | -4 | * | * | High |
| Yap | -3 | * | * | High |
| Pohnpei | +5 | * | * | High |
| Kapingamari | * | * | * | High |
| Majuro | +3 | * | * | High |
| Kwajalein | +6 | +5 | +3 | Good |
| Pago Pago | * | * | 3 | High |

* Forecast quality is a measure of the expected CCA cross-validation skill. In general terms, these kinds of forecasts are thought to be of **useful skill** (or at least fair skill) if the CCA cross-validation value is greater than 0.3 (**Fig.4**). Higher skills correspond to greater expected accuracy of the forecasts. Skill levels greater than 0.5 are thought to be good, while skill levels greater than 0.6 are thought to be high.

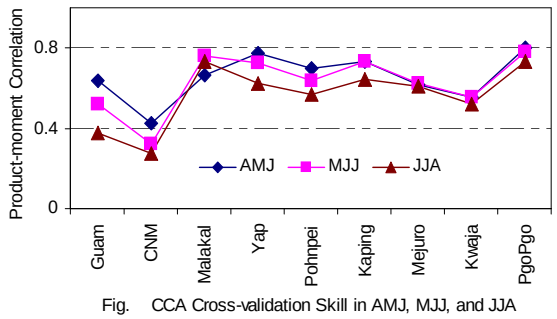



Fig. CCA Cross-validation Skill in AMJ, MJJ, and JJA

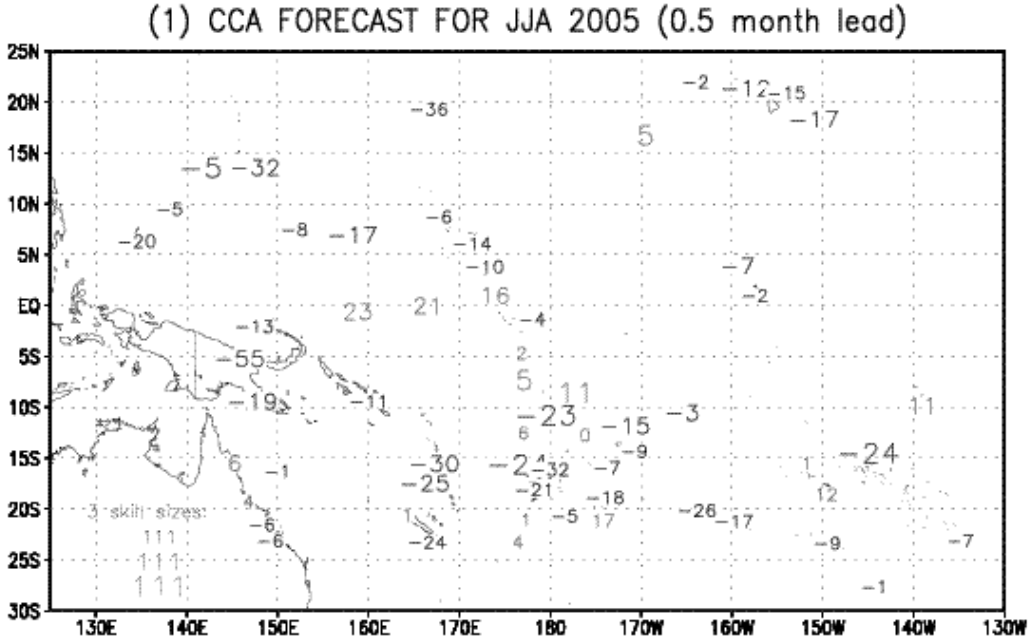
**Fig. 4**

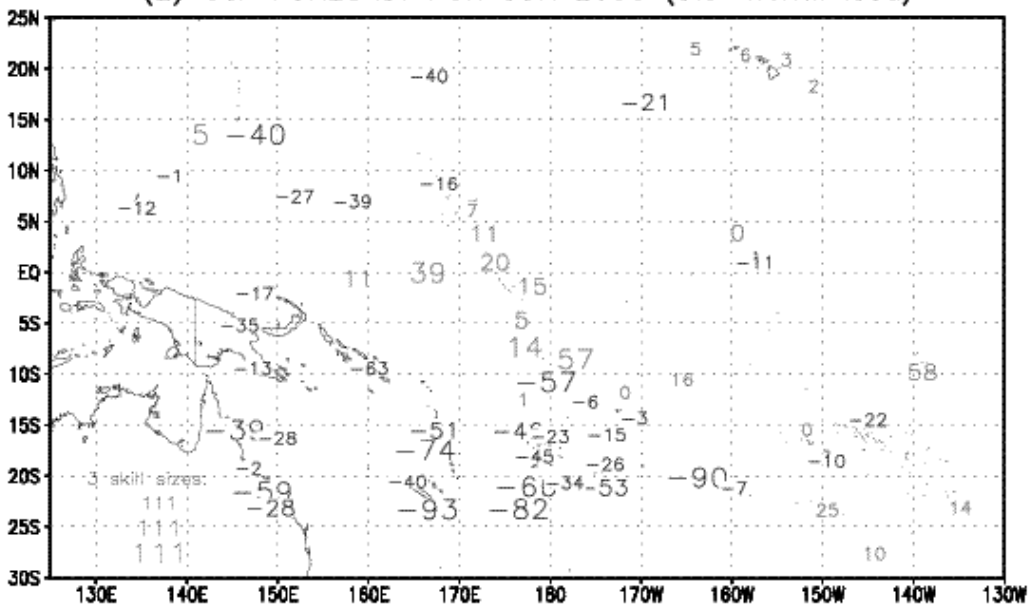
Note: For +/-, see notes in Table 4. Any deviations between (0~ ±2) cm is considered as negligible and denoted by *
*REMARKS: Deviation of less/above than 5 cm is unlikely to cause any adverse impact. For example CNMI, Yap, and Palau recorded 10~15 cm of negative deviation in AMJ of 1997*

**Experimental Forecasts for Pacific Island Rainfall**

The latest results from the CPC statistical model for all predicted locations are shown below. This map-like presentation applies only to two particular seasons (Jul - Aug 2005 and Sep - Nov 2005) of the 13 three month periods out to a year in advance that are available from the model. The full time series in graphs and tables are updated monthly on the internet at: <http://www.cpc.ncep.noaa.gov/pacdir/CCA11.html>.

Negative numbers are forecasts for less than normal rainfall while positive numbers are forecasts for greater than normal rainfall. The *size* of the number (*not* the value of the number) indicates how accurate the forecast is expected to be, on the average, for the station at the given time of year and the forecast lead time. There are three sizes: the smallest size indicates low skill, the medium size indicates moderate skill, and the largest size indicates a relatively high skill. The value of the numbers tell how large a deviation from normal is expected. These values are in standardized units that indicate how typical (or atypical) the rainfall conditions are expected to be relative to the station's normal climatology. For example, numbers from 0 to 25 (or 0 to -25) are small deviations, indicating conditions that would be considered typical of the climate for the station and the time of year. Deviations from 25 to 60 (or -25 to -60) are moderate deviations, indicating somewhat wetter (or drier) conditions than would be expected for the station and the time of year. Deviations of over 60 (or less than -60) are large deviations, indicating much wetter (or drier) conditions than normal for that location and time of year.




**Sites Covered**
(list not complete, selected sites only)
1. Hilo, Hawaii
2. Kahului, Hawaii
3. Honolulu, Hawaii
4. Lihue, Hawaii
5. Anderson AFB Guam
6. Guam WSMO
7. Johnston Island
8. Koror WSO, Palau
9. Kwajalein Atoll
10. Majuro WSO, RMI
11. Pohnpei WSO, FSM
12. Wake Island
13. Yap WSO, FSM
14. Chuuk WSO, FSM

# Pacific ENSO Update

## ENSO FORECAST

**PROGNOSTIC DISCUSSION FOR LONG-LEAD OUTLOOKS**
**NOAA NWS - Climate Prediction Center - Camp Springs MD- 8:30 am EST Thursday May 19, 2005**
**Summary of the Outlook For Non-Technical Users**
http://www.cpc.ncep.noaa.gov/products/predictions/long_range/fxus05.html

Current observations indicate that the weak warm episode conditions (El Niño) that have prevailed over the equatorial pacific since JJA 2004 have ended. A temporary increase in both surface and subsurface temperatures in the vicinity of the equator during late April and early may was due to the arrival of a strong Kelvin wave in the eastern Pacific, but the most recent observations show that SSTs are returning rapidly to normal over the eastern equatorial pacific with only one small area of SST anomalies greater than 1.0 degree Celsius remaining near 105W. Elsewhere pacific equatorial SSTs are generally 0.5 degrees C or less above normal. A consensus of sea surface temperature (SST) prediction tools indicates that ENSO-neutral conditions will prevail through the summer and into the fall, although the consensus indicates the possibility of a warming to borderline weak warm event (El Niño) conditions by next winter…. any influences on the climate during the next several seasons from the equatorial pacific are expected to be primarily from variable MJO activity that does not produce useful seasonal climate signals…

---

**EL NIÑO/SOUTHERN OSCILLATION (ENSO) DIAGNOSTIC DISCUSSION**
**issued by NOAA NWS Climate Prediction Center-May 5, 2005**
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/

***Synopsis**: ENSO-neutral conditions are expected to prevail during the northern summer (June-August), in spite of recent increases in SST anomalies associated with strong Madden-Julian Oscillation (MJO) activity*

Surface and subsurface water temperatures increased substantially in the eastern equatorial Pacific during April, associated with the arrival of the downwelling phase of a strong oceanic Kelvin wave. Sea surface temperature (SST) anomalies increased by more than 2°C in the extreme eastern equatorial Pacific during April, and by the end of the month, positive equatorial SST anomalies greater than +0.5°C (~0.9°F) were observed in most areas from Indonesia eastward to the South American coast. The increase in SST anomalies in the eastern equatorial Pacific during April was reflected by an increase in the SST anomalies in the Niño 3 and Niño 1+2 regions and by an increase in the upper-ocean heat content in the eastern half of the equatorial Pacific. Subsurface cooling and a decrease in upper-ocean heat content have been evident in the central equatorial Pacific, associated with the upwelling phase of the Kelvin wave. This cooling is expected to propagate eastward, reaching the eastern equatorial Pacific during May. Thus, the effects of the warming along the west coast of South America should be brief.

Cloudiness, precipitation and low-level winds displayed considerable week-to-week variability during the month, associated with strong MJO activity. During the first ten days of April enhanced precipitation (negative OLR anomalies) was observed over Indonesia, while stronger-than-average easterlies prevailed over the central equatorial Pacific. The enhanced precipitation moved eastward into the western tropical Pacific during mid-April, accompanied by anomalous westerly low-level winds over the extreme western equatorial Pacific. However, during the last ten days of April the OLR anomalies and low-level wind anomalies weakened over the central equatorial Pacific and drier-than-average conditions developed over Indonesia. Continued strong week-to-week variability in the patterns of tropical atmospheric circulation and precipitation is likely during May.

A majority of the statistical and coupled model forecasts indicate that ENSO-neutral conditions will prevail during the northern summer (June-August). The spread in the forecasts indicates increasing uncertainty during the last half of 2005.

---

## ACKNOWLEDGEMENTS and FURTHER INFORMATION:


**PACIFIC ENSO APPLICATIONS CENTER:**
**HIG #350, 2525 Correa Road, Honolulu, Hawaii 96822**
Contact Nicole Colasacco at 808-956-2324 for more information on the *Pacific ENSO Update* and ENSO-related climate data for the Pacific Islands.
Contact Dr. R. Chowdhury at 808-956-2324 for more information on ENSO and sea level variability in the USAPI.

**University of Guam (UOG)**
**WATER AND ENERGY RESEARCH INSTITUTE (WERI):**
UOG Station, Mangilao, Guam 96923
Contact Dr. M. Lander at 671-735-2685 for information on tropical cyclones and climate in the Pacific Islands.

**NOAA National Weather Service-Pacific Region**
**WEATHER SERVICE FORECAST OFFICE (WSFO)**
3232 Hueneme Road, Barrigada, Guam, 96913
Contact C. Guard at 671-472-0900 for further information on tropical cyclones and climate in the Pacific Islands.

**University of Hawaii (UH) School of Ocean and Earth Science and Technology (SOEST)**
**DEPARTMENT OF METEOROLOGY:**
HIG #350, 2525 Correa Road, Honolulu, Hawaii 96822
Contact Dr. T. Schroeder at 808-956-7476 for more information on hurricanes and climate in Hawaii.