NWS Climate Services

March PEAC Audio Conference Call Summary

13 March, 1430 HST (14 March 2020, 0030 GMT)

February rainfall totals reported (Sony)

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

	Rainfall	% Normal	Normal	Departure	3 mon
	Inches	Feb	Inches	inches	DJF
Palau	10.50	112	9.34	1.16	22.38
Yap	3.28	63	5.19	-1.91	14.63
Chuuk	2.69	37	7.25	-4.56	30.80
Pohnpei	8.16	85	9.55	-1.39	36.85
Kosrae	20.45	158	12.93	7.52	39.01
Kwajalein	4.12	156	2.64	1.48	14.27
Majuro	11.19	163	6.88	4.31	31.15
Guam NAS	3.79	125	3.03	0.76	8.24
Saipan	2.63	102	2.59	0.04	7.80
Pago Pago	32.73	273	12.00	20.73	72.43
Lihue	2.39	130	1.84	0.55	11.01
Honolulu	0.88	89	0.99	-0.11	3.70
Kahului	2.23	208	1.07	1.16	7.29
Hilo	5.62	67	8.38	-2.76	32.70

Reports from around the Region

Hawaii: Shifts in the North Pacific weather pattern produced unsettled conditions across the main Hawaiian Islands during the first half of February. The initial bout of inclement weather arrived on February 5 in the form of a cold front. Moist post-frontal northerlies produced heavy rainfall along the north-facing slopes of Kauai on February 6. This caused Hanalei River to overflow its banks and inundate Kuhio Highway near the Hanalei Bridge for several hours. Rainfall associated with the cold front's cloud band also produced minor flooding over portions of Oahu, Molokai, and Maui as it moved eastward slowly across the state. While cool low level winds swept across the state, a reinforcing disturbance dropped in from the northwest and strengthened the area of low pressure northeast of the state. Strong northwest winds developed over the island chain on February 10 with embedded heavy rainfall areas moving toward the southeast. The rapid movement of these areas helped limit rainfall accumulations and resulted in only minor flooding problems. The close proximity of the low pressure system's cold core to the state lowered the snow level to just over 8000 feet and produced wintry conditions over the upper slopes of Haleakala on Maui, and Mauna Kea and Mauna Loa on the Big Island. An interesting side note to this event is that a similar low pressure system developed a year ago to the day in the same general area and produced similar types of impacts.

After the anomalous low pressure system dissipated on February 12 and 13, the rest of the month was dominated by periods of strong trade winds across the island chain. While these trade winds contained embedded shower areas, the resultant rainfall along the windward slopes occurred in generally small amounts with no significant flooding.

Island of Kauai: Most of the rain gages on Kauai recorded near to above average totals for the month of February. The main pocket of below average totals was along the lower elevations of southeast Kauai. The U.S. Geological Survey's (USGS) rain gage at Kilohana had the highest monthly total of 28.75 inches (197 percent of average) and the highest daily total of 6.85 inches on February 6. It is fairly common for Kilohana to have higher rainfall than Mount Waialeale during days with moist post-frontal northerly winds.

Rainfall totals for 2020 through the end of February were near to above average at most of the rain gages across Kauai. Below average totals were mainly from leeward locations from Hanapepe to Mana. The USGS gage on Mount Waialeale had the highest year-to-date total of 75.09 inches (153 percent of average).

Island of Oahu: February rainfall totals were near to above average at most of the gages on Oahu. Most of the below average totals came from the Koolaupoko region of the island. The highest monthly total came from the USGS' Poamoho Rain Gage No. 1, which recorded 14.79 inches (94 percent of average). This site also had the highest daily total of 4.34 inches associated with the cold front passage on February 6. The gages at Wheeler Army Airfield and the Waiawa Correctional Facility had their highest February totals on record.

Most of the gages on Oahu had near to above average rainfall for 2020 through the end of February. The Poamoho Rain Gage No. 1 had the highest year-to-date total of 35.11 inches (103 percent of average). Locations with below average totals for 2020 were mainly along the lower leeward slopes.

Maui County: The early February storm systems brought much needed rainfall to drought-affected areas and helped boost most of the monthly totals into near to above average levels across Maui County. The USGS' rain gage on Puu Kukui had the highest monthly total of 20.49 inches (78 percent of average). Their rain gage at West Wailuaiki Stream had the highest daily total of 4.96 inches during the cold front passage on February 6. The National Park Service's Puu Alii gage on Molokai had the same total on the same day.

Maui County rainfall totals for 2020 through the end of February were near to above average at most of the gages. The USGS' rain gage on Puu Kukui had the highest year-to-date total of 64.36 inches (112 percent of average).

Island of Hawaii: February totals from rain gages in the North and South Kohala Districts, the North and South Kona Districts, and the Hamakua District were mostly near to above average. Most of the February totals across the rest of the Big Island were near to below average. The USGS' rain gage at Kawainui Stream had the highest monthly total of 13.94 inches (146 percent of average). The Kamuela Upper gage, which recorded 4.76 inches on February 10, had the Big Island's highest daily total for the month. This is a rare distinction for this site. Its monthly total of 8.89 inches (182 percent of average) was also its highest February total since 2002.

Most of the Big Island's rain gages had above average rainfall totals for 2020 through the end of February. The USGS' Saddle Road Quarry gage had the highest year-to-date total of 65.62 inches (315 percent of average).

Reports around the Region Cont.

American Samoa: (not present)

Last month had a lot of monsoon activity and developing tropical cyclone around them. Several disturbances with plenty of rainfall. This month is quite drier. (Chip)

Kwajalein: (not present)

Rainfall percentage normal fall in line with Majuro and Kosrae. Expecting average to average above rainfall near the dateline. (Brandon)

Majuro: (Nover)

The first half of February was dry (less than an inch at Majuro). But on the second half it was wet bringing the monthly total for February to (11.19 inches). The ITCZ was shifted northward from its normal position and was bringing much rain to Majuro and some other stations across Marshall Islands on the second week of February. A surface trough on the 26th of February was bringing a lot of rain to Majuro (5.17 inches). Due to the heavy rain on that day, the main road was flooded and was lasted for several hours.

After receiving sufficient rain at Majuro on the second half of February the water company increased again the days of distributing the water to the residents from only Fridays to three days a week (Monday, Wednesday, and Friday). As of February 29th, the water reservoirs have increased from 24 million gallons to 28 million gallons (78% full).

All of the second order stations in the RMI received very little rain during February so water rationing persists on those islands. I talked to some of the observers on the islands and they mentioned vegetation still green and healthy. Most of them are not complaining because they still have their RO units operational.

We had advisories on high surfs and possible inundation at Majuro during February and this month due to the northern swells, but no inundation was observed.

Figure 1: Road to the hospital

Figure 2: Road to the College

Pohnpei: (Wallace)

Conditions were dry during the beginning of last month. Second half provided 1-11/2 inches of rain. Strong trade winds were observed and resulted in high wind advisory for a week. No inundations were reported. So far in March, Pingelap reported low levels of water. Other islands have not had any complaints on water levels as of yet.

Kosrae: (absent)

Two flood statements were issued last month along with high surf advisories. No reports of inundation.

Reports around the Region Cont.

Chuuk: (Sanchez)

February 2020 was quiet in terms of rainfall for WSO Chuuk as well as the outer islands due to the dry tradewind pattern that dominated throughout the month. Tradewind convergence, surface troughs and a thunderstorm that blew up on the 25th were the main producers of rain which totaled out to be less than half of the normal rainfall coming in at 2.69 inches for WSO. Lukunoch had the highest recording at 2.93 inches while the western island (Polowat) came up quite short only recording 0.98 inches of rain.

Small Craft and High Surf Advisories/Warnings were issued throughout most of the month. Small Craft Advisories were issued for 7-8, 12-17, 21-24 while High Surf Advisories were issued for 6-8, 12-14, 17-24 and both were mostly due to tradewinds and long period N swells. On the 12-13 some strong NE trade winds coupled with a shear line dipping southeastward from the Marianas increased the winds for Chuuk. Shear line was present up until the 15th so that along with N swell put us under High Surf Warning which was issued for 15-16. High Surf Warning downgraded to a High Surf Advisory after that. Interestingly enough though, no reports of inundation or small boat accidents from any of the reporting stations were received.

Yap: (Justin)

Vegetation on island is still green. High surf advisories were issued last month so no reports of anything related. Outer islands had less than an inch of rain. Two wildfires took place beginning of March on the northern parts of the island. Water reservoir levels are decreasing relatively quick.

Palau: (Kikuko's written report)

For majority of February, trade-winds were moderate to fresh, frequently gusting to strong, and on two occasions gusting to near gale strength (Feb 10: G28KT and Feb 12: G34KT). For the most part, February warranted issuance of regional and local advisories for hazardous seas and surf. Prior to February 28 rainfall totals for Koror was about 60% of the Normal and Airai was at 78%. On Friday, February 28, convergent trade-winds northeast of a trough and weak circulation located south of the main islands of Palau generated sporadic showers and at times continuous rain over Palau. On that day, Koror recorded 2.06 inches (52.3 mm) of rainfall and Airai at 2.78 inches (70.6 mm). No mudslides/landslides were reported. The final outcome for February placed Koror Below Normal at 86 % and Airai Above Normal at 108%.

Guam/CMNI: (Chip, Brandon)

During February 1-4, there was a shear line that interacted with a weak circulation south of Guam that provided 80% of Guam's rainfall. Rest of the month was dry in Guam. Some fires in the southern mountains where vegetation is dry. Northern areas were greener. Saipan were in similar conditions as Guam. A drought statement will be issued from WFO Guam very soon for Guam.

*A follow up on WSOs to provide low water levels in the outer islands and to share information with WFO Guam

Tropical Cylone: (Chip)

Conditions have been quiet. Some development in American Samoa but no damage reports.

Current State of ENSO and predictions: **ENSO Alert System Status:** ***Not Active***

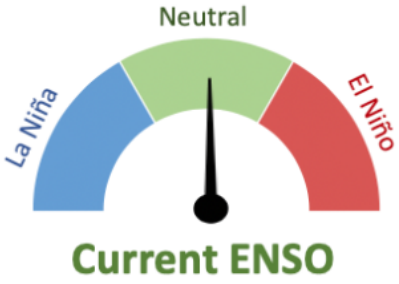
March 12, 2020

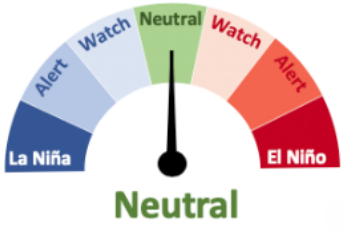
Synopsis: **ENSO-neutral is favored for the Northern Hemisphere spring 2020 (~65% chance), continuing through summer 2020 (~55% chance).**

During February 2020, above-average sea surface temperatures (SSTs) were evident across the western, central, and far eastern Pacific Ocean. The latest weekly Nino-3.4 and Nino-3 indices were near-to-above average (+0.5°C and +0.1°C, respectively), with the Nino-4 and Nino-1+2 indices warmer, at +1.1°C. Equatorial subsurface temperatures (averaged across 180°-100°W) remained above average during the month, with positive anomalies spanning the western to the east-central equatorial Pacific, from the surface to ~150m depth. Also during the month, low-level westerly wind anomalies persisted over the western tropical Pacific Ocean, while upper-level wind anomalies were mostly westerly over the eastern half of the basin. Tropical convection remained suppressed over Indonesia and was enhanced near and just west of the Date Line. While the equatorial Southern Oscillation index (SOI) was negative, the traditional SOI was near average. Overall, the combined oceanic and atmospheric system remained consistent with ENSO-neutral.

The majority of models in the IRI/CPC plume favor ENSO-neutral (Nino-3.4 index between -0.5°C and +0.5°C) through the Northern Hemisphere fall. Despite elevated Nino 3.4 index values in the near-term, the forecaster consensus expects the Nino-3.4 index values will decrease gradually through the spring and summer. In summary, ENSO-neutral is favored for the Northern Hemisphere spring 2020 (~65% chance), continuing through summer 2020 (~55% chance; click CPC/IRI consensus forecast for the chance of each outcome for each 3-month period).

El Nino-Southern Oscillation Watch





Source: NIWA Island Climate Update: March 2020

Current situation

ENSO-neutral conditions continued in February 2020.

Sea surface temperatures in the central equatorial Pacific were above average during February but still in the neutral range.

The Southern Oscillation Index during February was -0.2 (in ENSO-neutral territory).

Forecast situation

70% chance for ENSO-neutral conditions persisting during March-May 2020.

57% chance for ENSO-neutral conditions during June-August 2020.

Rainfall Verification and Outlooks for DJF (Sony)

The verification result of **DJF** rainfall forecasts was 8 hits and 6 misses (Heidke score: 0.2655). The 6 stations we missed were: Palau, Yap, Kosrae, Guam, Saipan, and Pago Pago.

Location	UKMO	ECMWF	CA	NASA	NCEP	IRI	APCC	PEAC CCA	Rainfall Outlook	Final Probs	3 mo Verification		
											% norm	Total (in)	Tercile
Palau													
Airai 7° 22' N, 134° 32' E	Avg.	Avg-above	Avg.	**Above**	**Below**	**Above**	Avg.	Clim.	Avg.	**20:50:30**	75	22.40	**Below**
FSM													
Yap 9° 29' N, 138° 05' E	Avg.	**Above**	Avg-below	Avg.	**Below**	Clim.	Avg.	Avg-above	Avg.	**30:40:30**	73	14.63	**Below**
Chuuk 7° 28'N, 151° 51'E	Avg-above	**Above**	Avg.	Avg-below	Avg.	Avg.	**Above**	Avg-above	Avg-above	**30:35:35**	108	30.80	**Avg.**
Pohnpei 6° 59'N, 158° 12'E	**Above**	**Above**	Avg.	Avg-below	Avg.	Clim.	**Above**	Avg-above	Avg-above	**30:35:35**	95	36.85	**Avg.**
Kosrae 5° 21'N, 162° 57'E	**Above**	**Above**	**Above**	**Above**	Avg.	**Above**	**Above**	Avg.	Avg-above	**30:35:35**	85	39.01	**Below**
RMI													
Kwajalein 8° 43'N, 167° 44'E	**Above**	**Above**	Avg-above	**Above**	**Above**	**Above**	**Above**	Avg-above	Avg-above	**30:35:35**	115	14.27	**Avg.**
Majuro 7° 04' N, 171° 17'E	**Above**	**Above**	**Above**	**Above**	**Above**	**Above**	**Above**	Avg.	Avg-above	**30:35:35**	120	31.15	**Above**
Guam and CNMI													
Guam 13° 29'N, 144° 48' E	**Above**	Avg.	Avg-below	Avg-below	Avg.	**Above**	**Above**	Avg-above	Avg.	**30:40:30**	68	8.24	**Below**
Saipan 15° 06'N, 145° 48' E	**Above**	Avg.	Avg-below	Avg-above	Avg.	Clim.	Avg.	Avg-above	Avg.	**30:40:30**	87	7.80	**Below**
American Samoa													
Pago Pago 14° 20'S, 170° 43'W	**Below**	**Above**	Avg-below	Avg-below	Avg-below	**Below**	Avg.	Avg-above	Avg.	**30:40:30**	**190**	72.43	**Above**
State of Hawaii													
19.7° - 21.0' N, 155.0° - 159.5' W													
Lihue	**Above**	Avg.	Avg-above	Avg.	Avg.	**Above**	Avg.	Avg-above	Avg-above	**30:35:35**	**152**	11.01	**Avg.**
Honolulu	**Above**	Avg.	Avg-above	Avg.	Avg.	**Above**	Avg.	Avg-above	Avg-above	**30:35:35**	107	3.70	**Avg.**
Kahului	**Above**	Avg.	Avg-above	Avg.	Avg.	**Above**	Avg.	Clim.	Avg-above	**30:35:35**	121	7.29	**Avg.**
Hilo	**Above**	Avg.	Avg-above	Avg.	Avg.	**Above**	Avg.	Clim.	Avg-above	**30:35:35**	119	32.70	**Avg.**

	Hit
	Miss
Heidke:	**0.2655**
RPSS:	**-0.0821**

	Koror	Yap	Chuuk	Pohnpei	Guam	Saipan	Majuro	Kwaj	Lihue	Honolulu	Kahului	Hilo	Pago Pago	Kosrae
below (<)														
33.33%	26.42	17.47	25.39	34.23	11.41	8.66	24.24	11.78	7.45	3.68	4.64	19.58	35.2	43.72
near														
66.66%	37.21	25.53	32.01	45.42	16.49	11.56	30.01	16.47	13.98	8.62	8.68	33.29	46.65	53.68
above (>)														
Rainfall in inches														

Rainfall Outlook for March, April, May (MAM 2020)

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

Note:

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

Drought monitoring updates.

A. End-of-February Monthly Drought Assessment:

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

ii. February was dry (less than the 4- or 8-inch monthly minimum needed to meet most water needs) across most of the USAPI; only Koror, Pohnpei, Mwoakilloa, Pingelap, Kosrae, Majuro, & Pago Pago were above the monthly minimums. The end-of-February monthly analysis (February 29) is consistent with the weekly analyses for February 25 and March 3. Compared to the end-of-January monthly analysis:

A. The USDM status worsened one category for the RMI stations except Utirik & Wotje, which worsened 2 categories.
Mili D0-S; Utirik & Wotje D2-S; rest of RMI stations D0-S.

B. The USDM status worsened one category for the FSM stations except Pohnpei, Pingelap, Kosrae (which remain D-Nothing).
D1-S at Yap, Woleai, Lukonor; D0-S at the other stations.

C. In the Marianas, Guam improved from D1-S to D0-S, Saipan worsened from D0-S to D1-S; Rota stayed at D0-S.

D. Palau stayed at D0-S.

E. Tutuila stayed at D-Nothing.

F. Fananu was plotted as missing (could not be analyzed) due to missing data for the last 5 months.

iii. Some February 2020 precipitation ranks:

A. Lukonor: 3rd driest February in their 36-year record, driest November-February through April-February

B. Nukuoro: 6th driest February (38 years)

C. Kapingamarangi: 4th driest December-February (25 years)

D. Woleai: 3rd driest July-February (27 years), 2nd driest March-February (24 years)

E. Yap: 4th driest January-February (69 years), 2nd driest March-February (68 years)

F. Ailinglapalap: 4th driest April-February (34 years).

G. At the other end of the scale, Pago Pago: wettest February (54 years).

B. Current (Weekly) Drought Conditions: The discussion above is the monthly (end of February) analysis. The latest weekly USAPI USDM assessment may show different USDM classifications. The latest weekly USAPI USDM assessment is for March 10.

i. The March 10 analysis shows worse conditions in the Marianas and improvement for some RMI stations; otherwise it is the same as the February 29 analysis.

C. February 2020 NCEI State of the Climate Drought Report: The February 2020 NCEI SotC Drought report went online March 11.

i. The web page url is: https://www.ncdc.noaa.gov/sotc/drought/202002#det-reg-pacis-usapi

D. North America Commission for Environmental Cooperation Survey: As part of a project to improve drought indices, drought monitoring, and drought products in the US, Canada, & Mexico, a group of us are working with a contractor to run a survey on drought indices used in the 3 countries. We plan to have the contractor send the survey request to you for USAPI input, so please do participate in the survey! **The survey has been completed and reviewed and is being translated into all 3 languages (English, French, Spanish). The contractor (Ernest Cooper Environmental Consulting) expects to have the survey online soon.**

Drought monitoring updates (CON'T).

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

i. The OCONUS (USAPI) USDM became an operational product at the beginning of March, with authorship rotating amongst the NCEI, NDMC, USDA, & CPC authors.

ii. There are 7 USAPI USDM (OCONUS) authors: Ahira Sanchez-Lugo and myself (Richard Heim) from NCEI; Curtis Riganti, Claire Shield, and Deb Bathke from NDMC; Brad Rippey (from USDA); Anthony Artusa (from CPC). Claire, Curtis, & Brad have authored besides Ahira & me.

With the June 4 map, the U.S. Virgin Islands have been added to the USDM product suite. The USDM web site (https://droughtmonitor.unl.edu/) has been revised so that two USDM products (sets of maps) are produced each week: a CONUS USDM and an OCONUS USDM. The OCONUS USDM includes the USAPI and the US Virgin Islands (dots), while the CONUS USDM is what has been done for years (50 States & Puerto Rico) (polygon shapefiles).

F. Automated Ingest of Daily Rainfall Data: -- NO CHANGE IN STATUS

i. Automated Program: -- NO CHANGE IN STATUS—I modified the automated program that ingests the USAPI station daily data to send out a master file of the current data to the authors, in case NCEI's web pages go down because of a future government shut down or for other reasons.

i. **Updates and Fixes**

A. Follow up on why Kwajalein & Pago Pago are not getting into the automated process.

1. Kwajalein is in the Super Form in WxCoder III, but it is not in the regular station list. Question: Can Kwajalein's data be automatically transmitted daily from WxCoder III into the NOAAPort data feed? (need to find out station I.D. and other info to get it in to the NOAAPort feed)

B. Find out why Saipan's ASOS data are being transmitted and getting into our automated process instead of the manual gauge WxCoder III data.

C. Add new stations to the automated process (Capital Hill 1, Nimitz Hill, Palau International Airport, Mwoakilloa). I need to identify the WxCoder I.D. call sign and the COOP station numbers for these stations, then find them in our (NCEI) metadata base, then determine if they are being captured from the NOAAPort feed.

i. Web interface: url is:

A. https://www.ncdc.noaa.gov/temp-and-precip/drought/usapi-pcp/

B. The "All Indicators" tab is the most used tab by USDM authors:

1. https://www.ncdc.noaa.gov/temp-and-precip/drought/usapi-pcp/all

C. The "Weekly", "Monthly", and "Seasonal" tabs have data tables as well as maps plotting the values.

D. The web page is updated automatically every day by a computer program that automates the ingest and processing of the data. The program runs every morning at 10 a.m. EST; it also sends out an email every day containing daily and weekly rainfall totals for several USAPI stations.

E. Some data on the web page are color coded to indicate wet or dry conditions (weekly and monthly precipitation totals), missing days (grey), and USDM categories (monthly and seasonal rank percentiles).

F. The web page is for internal use by NWS Pacific Island personnel and USDM author personnel. It is not for public release (NCEI does not have the staff to answer questions from the public and media and other users about why there is missing data).

Drought monitoring updates (CON'T).

G. USAPI Listserv: -- NO CHANGE IN STATUS

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

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

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

Discussion: **Based on impacts and longer term precip ranks, I'm considering lowering the Dx a category at Yap, Woleai, Lukonor, Chuuk, Pingelap next week.** Toa Ridge & Siufaga Ridge less than Pago Pago is an issue… talk to Dave Simeral.

Participants:

NWS Climate Services Program Managers (CSPMs):

WSO Climate Service Focal Points (CSFPs):

(Majuro) Sanchez (Chuuk) Wallace (Pohnpei)
(Kosrae) Justin (Yap) (Pago Pago)
(Palau) (Kwajalein)
Chip, Brandon, Mark (Guam & CNMI)

PEAC Principal Research Scientist: Rashed Chowdhury

WERI Scientist:

CPC Forecaster:

WFO Guam : Brandon, Chip

NWS MIC, Honolulu: Christopher Brenchley

NCEI: Richard Heim

Pacific RISA:

NWS Hydrologist: Kevin Kodama

Additional Attendees:

***** Next Call– 12 March 2020, 1430 HST (13 March 2020, 0030 GMT)*****