



NWS Climate Services

April PEAC Audio Conference Call Summary

9 April, 1430 HST (10 April 2020, 0030 GMT)



University of
Hawai'i
M Ā N O A
UH/SOEST



March 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 | March | Inches | inches | JFM |
| Palau | 4.66 | 54 | 8.70 | -4.04 | 17.18 |
| Yap | 1.14 | 25 | 4.56 | -3.42 | 5.88 |
| Chuuk | 5.29 | 64 | 8.32 | -3.03 | 16.18 |
| Pohnpei | 9.05 | 69 | 13.17 | -4.12 | 24.73 |
| Kosrae | 11.33 | 71 | 16.06 | -4.73 | 40.28 |
| Kwajalein | 1.54 | 66 | 2.35 | -0.81 | 9.19 |
| Majuro | 5.32 | 81 | 6.58 | -1.26 | 23.44 |
| Guam NAS | 1.33 | 64 | 2.07 | -0.74 | 8.11 |
| Saipan | 1.47 | 78 | 1.89 | -0.42 | 5.63 |
| Pago Pago | 8.19 | 77 | 10.68 | -2.49 | 62.69 |
| Lihue | 15.62 | 603 | 2.59 | 13.03 | 19.61 |
| Honolulu | 3.76 | 476 | 0.79 | 2.97 | 5.77 |
| Kahului | 1.50 | 80 | 1.88 | -0.38 | 6.59 |
| Hilo | 27.95 | 259 | 10.78 | 17.17 | 49.46 |

Reports from around the Region

Hawaii: A persistent atmospheric blocking pattern in the North Pacific produced a split jet stream that allowed several low pressure systems aloft to move close to the main Hawaiian Islands in March. These systems produced several heavy rain events, making it the wettest March across most of the state since 2006 during the so-called “40 days of rain”.

March 2020 began with strong trade winds across the island chain and an upper tropospheric low pressure system northeast of the Big Island creating unstable conditions. Numerous showers affected the windward slopes of the state, but the strong low level flow kept the showers moving along which helped limit runoff over specific areas. The Hilo and Puna areas of the Big Island received 10 to 17 inches of rainfall during the first week of March but reports indicated only minor flooding issues. Brief periods of heavy rainfall over portions of Oahu and Maui on March 2 and March 4 produced minor flooding as well. Weather conditions across the state eased during the second week of the month with mainly light winds and generally dry conditions.

The second half March provided very unsettled weather conditions over the main Hawaiian Islands. On March 15, a kona low developed several hundred miles west of Kauai, which placed the island chain within the favored zone of heavy rainfall. Flash flooding started on the windward slopes of Oahu during the early afternoon of March 15 when Waikane Stream overflowed its banks and inundated Kamehameha Highway. Another section of Kamehameha Highway was also flooded near Kualoa Ranch. Heavy rainfall shifted to Kauai on March 16, and around mid-day, Hanalei River overflowed its banks and inundated Kuhio Highway, thus cutting off the town of Hanalei and communities west of the town from the rest of the island. Additional surges of flow within Hanalei River continued into March 17 and kept the highway flooded for a prolonged period. The main rain band with embedded heavy rainfall propagated eastward to Oahu and Maui County during the day on March 17, causing urban flooding in Honolulu, and minor flooding in parts of Molokai and Maui. The rain band reached the Big Island that night and caused flooding along the slopes of the Kau District which closed the Belt Highway at Kawa Flats for several hours. Early on March 18, a new rain band developed west of the main Hawaiian Islands and featured strong thunderstorms embedded within the band. These thunderstorms produced gusty winds as they swept rapidly across Kauai, but dissipated before reaching Oahu. Fortunately, the rapid progression of the thunderstorms produced only minor flooding issues.

After the kona low dissipated on March 19, rainfall diminished, but weather conditions remained unsettled as strong trade winds moved into the area on March 23. The trades remained strong and gusty through March 26. While this period did not have any flooding problems, there were several incidents involving downed utility poles and trees blocking roads.

The strong trades eased on March 27 in response to a low pressure system aloft that approached the state from the northwest. While the wind problems eased, the low destabilized the atmosphere over Kauai and Oahu, resulting in thunderstorms and intense rainfall late on March 27 and into the morning of March 28. Heavy rainfall on Kauai focused on the central and east sections of the island. Between 2:00 AM and 5:00 AM HST, the North Wailua Ditch and Wailua Experiment Station rain gages recorded 4.35 and 5.17 inches, respectively. Radar data indicated higher amounts occurred northwest of Lihue in an area without rain gage coverage. The Wailua River system featured a massive flood wave with preliminary peaks that exceeded the levels recorded in the April 15, 2018 flash flood event. The East Branch of the North Fork of Wailua River posted a peak flow of 11,300 cubic feet per second (cfs) before the data feed was lost, presumably due to the damage or loss of the sensor. This flow value is a bit higher than the amount from the April 15, 2018 flood and is the third highest on record for this site. The record flow stands at 18,400 cfs on November 12, 1955. The South Fork of Wailua River posted a massive peak flow of 48,200 cfs with a water level increase of about 15 feet. This flow is second only to the 68,800 cfs value recorded on April 15, 1963. In Hanalei River, the flooding was not nearly as prolonged as in April 2018, but a sharp rise in flow peaked at 31,100 cfs before rapidly dropping. This peak was just below the 31,300 cfs recorded at the peak of the April 15, 2018 flood event. Several properties along the banks of the Wailua River were inundated and 20 residents were evacuated from the area. The Wailua River Bridge on Kuhio Highway was closed for several hours due to the massive amounts of debris that jammed up against the structure. Kuhio Highway near the Hanalei River Bridge was also closed for most of the day, and several public roads were closed from Lihue to Kapaa.

Island of Kauai: All of the rain gages across Kauai had above average totals for the month of March. In fact, most were more than twice their average value. The U.S. Geological Survey's (USGS) rain gage on Mount Waialeale had the highest monthly total of 84.75 inches (224 percent of average), and the highest daily total of 16.53 inches on March 16. The daily total was part of a 27.96 2-day total for March 16 and 17. The Mount Waialeale gage also recorded 30.97 inches from March 27 through March 30. Some places in the state don't receive that much rain in an entire year. The Hanapepe rain gage's monthly total of 12.18 inches (361 percent of average) registered as the highest March total on record. Monthly totals from Mount Waialeale, Kalaheo, Lihue Variety Station, and Omao were the highest March amounts since 2006. Lihue Airport had its third wettest March in a data record going back to 1950.

Rainfall totals for 2020 through the end of March were above average at nearly all of the rain gages on Kauai. The USGS gage on Mount Waialeale had the highest year-to-date total of 159.84 inches (184 percent of average).

Island of Oahu: March rainfall totals were above average at most of the gages on Oahu. There were a few near average totals in east Oahu. The USGS' Kahana rain gage had the highest monthly total of 29.85 inches (268 percent of average) and the highest daily total of 8.27 inches from the flash flood event on March 15. Several gages posted their highest March totals since 2006, including Hakipuu Mauka, Kahuku, Kii, Maunawili, Mililani, Pacific Palisades, St. Stephens Seminary, Waianae, Waianae Boat Harbor, Waiawa Correctional Facility, and Waipio.

Nearly all of the gages on Oahu had near to above average rainfall totals for 2020 through the end of March. The USGS' Poamoho Rain Gage No. 1 had the highest year-to-date total of 64.52 inches (117 percent of average).

Reports around the Region Cont.

Maui County: Rainfall totals from Maui County were near to above average at most of the gages. A few below average totals were from Molokai and leeward West Maui sites. The USGS' rain gage at West Wailuaiki Stream had the highest monthly total of 29.01 inches (100 percent of average), while their gage on top of Puu Kukui had the highest daily total of 4.26 inches on March 6. Since Maui County was the driest area in the state during the month, it had the lowest amount of notable totals. These include West Wailuaiki and Kihei, which had their highest March totals since 2005 and 2009, respectively.

For 2020 through the end of March, most of the gages across Maui County had near to above average totals. The USGS' rain gage on Puu Kukui had the highest year-to-date total of 92.26 inches (96 percent of average).

Island of Hawaii: Big Island rainfall totals were above average at most of the rain gages. There were a few below average totals from the lower Hamakua and Kohala Mountain sites. The Mountain View rain gage had the highest monthly total of 30.44 inches (168 percent of average) and the highest daily total of 9.81 inches on March 3. Hilo Airport's 9.56 inches on the same day was noteworthy as well. Kealahou had its wettest March since 1997. Glenwood, Honaunau, Kona Airport, Kapapala Ranch, Mountain View, Pali 2, and Pahala all had their highest March totals since 2006.

Most of the Big Island's rain gages had above average rainfall totals for 2020 through the end of March. The USGS' Saddle Road Quarry gage had the highest year-to-date total of 85.02 (232 percent of average).

American Samoa: (not present)

Kwajalein: (Jason)

Weather in past month in Kwajalein has been dry and normal/lighter precipitation. Ground cover is in small foliage and slightly brown. For the month of April so far it is 1" of precipitation.

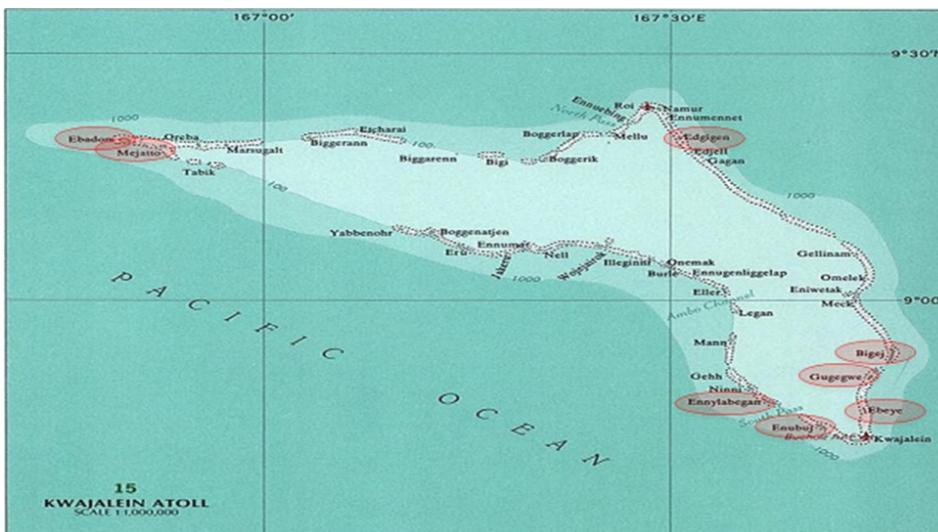
Majuro: (Nover)

Most of the stations in the RMI were dry during March including Majuro. The exception was Jaluit and Mili atolls. Both islands received more than 10 inches of rain during March. Ailinglaplap in the central region and the islands further north, Utirik and Wotje were very dry (much drier). Wotje reported only one day of having little rain of 0.85 of an inch and that was also the total for the whole month. Utirik and Wotje both reported water rationing and grass turning brown.

The water reservoirs on Majuro have been decreasing from February, and as of March 31st it was around 26 mil. gallons about 72% full.

There was no inundation observed and reported during the month of March for Majuro.

Kwajalein was also very dry with the total of 1.54 inches for March. Mr. Scott Paul who works for the Kwajalein Atoll Local Government (KALGov't) reported also water rationing due to no rain for a while on the islands northwest on Kwajalein (see map); Mejatto and Ebadon during his COVID-19 outreach program to the islands. He reported that all the water catchments on both islands are empty and the only water catchment the residents are now drinking from is the one at the hospital which is half way full. He also reported the RO units on both Mejatto and Ebadon are not functional anymore.



This is the map of Kwajalein showing the affected islands, Mejatto and Ebadon (Top-left)

Reports around the Region Cont.

Pohnpei: (Wilfred)

Frist two weeks of the month there was water rationing in Kolonia town as a precautionary measure due to water reservoir levels at two thirds capacity. Dry conditions on eastern side of the island.

Kosrae: (Wilfred)

Majority of the rainfall were consisted of the three day of precipitation.

Chuuk: (Sanchez)

The month of March 2020 was dominated by trade winds to the north and some disturbances popping up either south or farther east of Chuuk Lagoon. Taking that into account a little improvement was observed overall in terms of rainfall for Chuuk Lagoon (with exception to the islands farther north) while much better results were seen in the southern Mortlock Islands. The most significant rain producer for the northern half (from Chuuk Lagoon extending through northern islands) came 3 weeks into the month as a disturbance meandered to the south near the equator. Convergent trade flow on the north side of the disturbance produced steady showers at WSO Chuuk, with over 2 inches of rain recorded there. A total of 5.26 inches was recorded (about 3 inches below the normal of 8.81 inches for the month) after a much drier value of 2.69 inches recorded for the month of February. The Mortlocks received a much more generous amount of rain from that same disturbance along with the ITCZ that was present from the 25th to 26th. Lukunoch ended with a total of 12.04 inches (about an inch and a half more than the normal of 10.65 inches for March) with the other islands in that area reporting high amounts as well (compared to last month's rainfall totals). The islands in the north were not as fortunate with reported rainfall amounts as low as 0.30 inches on Onoun Island in the northwest and 2.95 inches for Piis Paneu on the northern edge of Chuuk Lagoon. An assessment for Polowat could not be made at this time due to unfortunate circumstances. Small Craft Advisories were issued on the 21st, 28th, and 29th due to gusty tradewinds of about 15-25 knots. No High Surf Advisories were issued during the month. In response to the dry conditions a total of 1,500 cases of bottled water have been delivered so far to the outer islands in need. Water was delivered to the Namonuito islands in the northwest as well as to all the islands in the Mortlocks. Thank you for the very useful information. Yes, WSO Chuuk was very fortunate to get that rain event in the middle of the month but not so much for the islands farther north. According to locals on Weno vegetation does look like they are browning and here are a few recent pictures.



Reports around the Region Cont.

Yap: (Brandon)

Overall dry conditions.

Palau: (Kikuko)

Moderate to fresh trade-winds were mostly dry half way into March. Rain gauges were looking somewhat dehydrated with Nekken recording the highest at 1.62 inches (41.1mm) and remaining stations falling below that number. Within that time frame, man-made fires were observed in a few areas of the big island with no hazards, injuries or evacuations to report. By the end of the month, rainfall deficits were apparent across all stations with Peleliu recording the least amount of rainfall for the month of March. Peleliu observer informed WSO Palau that water levels "are still ok". Angaur on the other hand has had to purchase bottled water from Koror. Other issues that Angaur has had to face were generators and water pumps not functioning at times. Currently, on the big island of Babeldaob, Ngerikiil watershed is slightly below Normal (8ft) at 6.9ft and Ngerimel Dam is also a tad below Normal (23ft.) at 22.10ft. The National Emergency Committee (NEC) has requested Palau Public Utilities Corporation (PPUC) to update their water conservation announcement issued last week to bring awareness to the public to continue to conserve water as Palau is still in its dry season. Sadly, additional human induced fires were observed in the last few days of March but fortunately there are no hazards, injuries or evacuations to report.

Guam/CMNI: (Chip, Brandon)

Dry conditions remain for the island. Browning of vegetation is occurring with mild fires taking place on the island.

Tropical Cylone: (Mark)

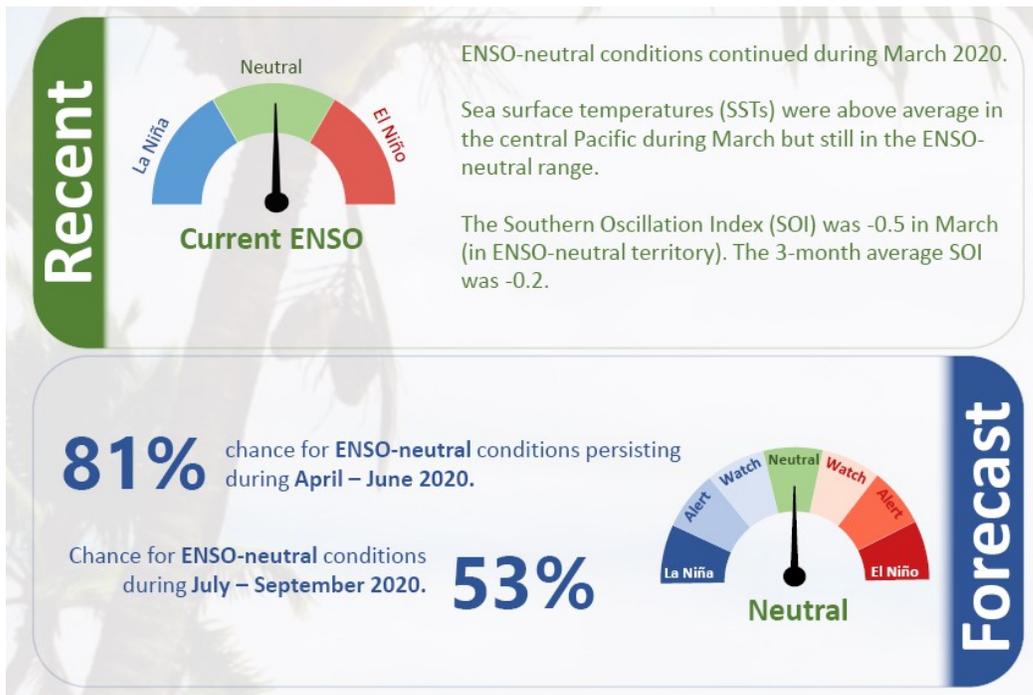
Southern hemisphere is coming towards end of it's season. Harold was the strongest one for the year.

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).



Source: NIWA Island Climate Update:

April 2020

Rainfall Outlook for April, May, June (AMJ 2020)

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

Note:

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

Drought monitoring updates.

A. End-of-March Monthly Drought Assessment:

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

ii. March was dry (less than the 4- or 8-inch monthly minimum needed to meet most water needs) across the northern and western portions of Micronesia; only southeastern stations Lukonor, Nukuoro, Kapingamarangi, Pohnpei, Kosrae, Jaluit, Mili, and Pago Pago were above the monthly minimums. The end-of-March monthly analysis (March 31) is consistent with the weekly analyses for March 31 and is the weekly analysis. Compared to the end-of-February monthly analysis:

a. The USDM status worsened in the Marianas, western Yap State, and the northern RMI:

1. Rota & Guam went to D1-S; Saipan, Ulithi & Yap went to D2-S; Wotje went to D3-S.
2. Pingelap (in the eastern FSM) went to D0-S.

b. The USDM status improved in the southern FSM & southern RMI:

1. Lukonor, Ailinglapalap & Majuro went to D0-S; Kapingamarangi, Jaluit & Mili went to D-Nothing.

c. The USDM status stayed the same at the other stations:

1. D2-S at Utirik; D1-S at Woleai & Kwajalein; D0-S Palau, Chuuk & Nukuoro; D-Nothing at Pohnpei, Kosrae, & Pago Pago.

d. Fananu was plotted as missing (could not be analyzed) due to missing data for the last 6 months.

iii. Some March 2020 precipitation ranks:

a. Yap: 3rd driest March in their 69-year record, 4th driest Jan-Mar & Apr-Mar

b. Ulithi: 4th driest Mar (37 years)

c. Woleai: 5th driest Jan-Mar (34 years), 3rd driest Apr-Mar (24 years)

d. Kapingamarangi: 5th driest Dec-Mar (24 years)

e. Kosrae: 5th driest Nov-Mar (40 years), 3rd driest Jun-Mar (33 years)

f. Lukonor: 4th driest Jan-Mar (36 years), driest Jul-Mar & May-Mar (23 years)

g. Pingelap: 6th driest Jan-Mar (35 years)

h. Chuuk: 7th driest Feb-Mar (69 years)

i. Guam: 5th driest Dec-Mar (63 years)

j. Ailinglapalap: 4th driest Apr-Mar (34 years).

Drought monitoring updates (CON'T).

k. Kwajalein: 6th driest Jun-Mar (68 years)

l. At the other end of the scale, Pago Pago: wettest Jan-Mar (54 years).

B. Current (Weekly) Drought Conditions: The discussion above is the monthly (end of March) analysis. The latest weekly USAPI USDM assessment may show different USDM classifications. The latest weekly USAPI USDM assessment is for April 7.

i. The April 7 analysis shows worse conditions in the Marianas, Palau, FSM, & RMI:

a. D3-S at Yap, Utirik & Saipan; D2-S at Kwajalein & Woleai; D1-S at Chuuk, Palau & Ailinglapalap

b. otherwise it is the same as the March 31 analysis.

C. March 2020 NCEI State of the Climate Drought Report: The March 2020 NCEI SotC Drought report will go online Monday, April 13.

i. The web page url will be:

A. <https://www.ncdc.noaa.gov/sotc/drought/202003#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 are having the contractor (Ernest Cooper Environmental Consulting) send the survey request to you for USAPI input, so please do participate in the survey! **The survey has been completed and is online; you should have received an invitation email to take the survey (please find time to do this!).**

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).

a. Claire, Curtis, & Brad have authored besides Ahira & me.

iii. **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 shape files).**

Drought monitoring updates (CON'T).

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.

ii. 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.**

lii. 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).

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.

Participants:

NWS Climate Services Program Managers (CSPMs):

WSO Climate Service Focal Points (CSFPs):

(Majuro)

(Kosrae)

Kiku (Palau)

Mark (Guam & CNMI)

Sanchez (Chuuk)

(Yap)

Jason (Kwajalein)

Wilfred(Pohnpei)

(Pago Pago)

PEAC Principal Research Scientist: Rashed Chowdhury

WERI Scientist:

CPC Forecaster: Luke He

WFO Guam : Brandon, Chip

NWS MIC, Honolulu: Christopher Brenchley

NCEI: Richard Heim

Pacific RISA:

NWS Hydrologist: Kevin Kodama

Additional Attendees:

***** Next Call– 14 May 2020, 1430 HST (15 May 2020, 0030 GMT)*****