



NWS Climate Services

November PEAC Audio Conference Call Summary

14 November, 1430 HST (15 November 2019, 0030 GMT)



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



October rainfall totals reported

x x x c x x e x x c

	Rainfall	% Normal	Normal	Departure	3 mon
	13.94	118			41.59
x	8.54	70			28.94
	5.55				37.49
	21.01	138			56.22
x	10.69	98			37.08
x x	10.53	94			30.52
J x	14.95	117			39.37
x	10.59	93			51.54
x x	17.92				58.23
x x	9.71	105			23.59
	5.47				10.35
	1.15	91			3.46
x	0.21				0.69
	13.80				31.36

Reports from around the Region

Hawaii

October marked the start of the 2019-2020 Hawaiian Islands wet season. Although not as wet as October 2018, many areas of the state picked up near to above average rainfall. The main exceptions, with below average totals, were in Maui County and portions of the Hamakua and Kohala regions on the Big Island. The month started with moderate to fresh trade winds across the state. These winds faded as a weak cold front approached the island chain from the northwest on October 6. The front stalled and dissipated without reaching the main Hawaiian Islands on October 7. No other cold front got close to the state for the rest of the month, which meant that the first cold front passage of the wet season will be later than the average mid-October time frame.

The most significant heavy rain event of the month occurred a few days after the failed attempt at a cold front passage. On October 10 through 11, a low pressure system northwest of the state combined with an influx of deep tropical moisture to produce heavy rainfall over portions of Kauai, Oahu, and the Big Island. Since the western half of the state was closer to the low aloft, atmospheric conditions were more unstable, resulting in more intense rainfall and thunderstorms. Heavy rainfall over leeward Oahu in the early morning hours of October 11 produced flash flooding and deep ponding of roads in the Waianae area. Later that day, a burst of intense rainfall over central and north Kauai produced a flash flood in Hanalei River. The rapid rise in water level inundated and closed Kuhio Highway near the Hanalei Bridge for several hours, but fortunately did not produce any significant damage or injuries.

For the remainder of the month, above average sea surface temperatures combined with east to southeast low level winds kept the island chain within a humid air mass. Upper level disturbances moving over the area from October 28 through 31 produced unstable conditions that triggered afternoon heavy rainfall and thunderstorms in portions of all four counties. The heavy rainfall produced some minor flooding but there were no reports of significant damage.

On October 12, Tropical Cyclone Ema developed southwest of the island chain. The cyclone moved generally northwestward and became a post-tropical remnant low late on October 13. Ema was a small cyclone and did not affect rainfall over the main Hawaiian Islands.

Island of Kauai :

The October through April wet season started with most of the gages recording near to above average rainfall. The U.S. Geological Survey's (USGS) gage on Mount Waialeale had the highest monthly total of 27.71 inches (82 percent of average). This site also had the highest daily total of 4.75 inches on October 11, which was the day of the Hanalei River flash flood event. The Lihue Variety Station and Wailua UH Experiment Station posted their highest October rainfall totals since 2004 and 2009, respectively.

Most of the Kauai totals for 2019 through the end of October were near to above average. The few below average totals were mainly along the lower southern slopes from Koloa to Port Allen. Mount Waialeale had the highest year-to-date total of 258.28 inches (79 percent of average).

Island of Oahu:

October rainfall totals from Oahu were near to above average at most of the gages. Similar to Kauai, the main exceptions were along the lower south-facing slopes where several monthly totals were 40 to 70 percent of average. The USGS' Poamoho Rain Gage No. 1 had the highest monthly total of 19.83 inches (101 percent of average). The Waianae gage had the highest daily total of 4.24 inches associated with the flash flood event on October 11. This rain event also contributed to most of the monthly rainfall at this site and made it the wettest October since 1991.

Rainfall totals for 2019 through the end of October were near average at most of the gages on Oahu. The Manoa Lyon Arboretum gage had the highest available year-to-date total of 117.56 inches (95 percent of average).

Maui County:

Maui County was the driest county in the state with most of the gages posting below average monthly totals. The USGS' rain gage on Puu Kukui had the highest monthly total of 13.62 inches (52 percent of average) and the highest daily total of 5.84 inches on October 3. All of the gages in Maui's central valley and from Maalaea to Lahaina reported less than an inch of rain for the month. These dry conditions, which have consistently been in place for several months, have contributed to the outbreak of several significant brush fires since July.

Most of the rain gages across Maui County had near average rainfall totals for 2019 through the end of October. The USGS' rain gage at West Wailuaiki Stream had the highest year-to-date total of 174.12 inches (92 percent of average).

Island of Hawaii: October rainfall totals were near to above average at most of the Big Island rain gages. Below average totals were concentrated in the Hamakua and Kohala regions of the island. The dry conditions have persisted since the summer, with the main cause likely due to the shift in low level winds to an east to east-southeast direction instead of the more usual east-northeast direction. The Mountain View gage had the highest monthly total of 14.40 inches (109 percent of average). The highest daily total was 2.73 inches at the Waiaha rain gage on October 11, which was nearly matched by Mountain View's 2.72 inches on the same day.

American Samoa:

Monsoon trough has been in an out of the area but not tropical threat.

Kwajalein: (Jason)

Starting the transition from wet to dry season.

Majuro: (Nover)

Majuro got 14.95 inches of rain for the month of October 2019. Departure from normal was 1.68 inches. The Water Reservoirs level total for October was around 30 million gallons about 84% full and the people on Majuro did not complain too much about water.

As of November 10th the Reservoirs level had decreased a little bit to 28 million gallons about 82% full but still people on Majuro did not complain about water to support their needs.

Most of the second order stations in the Marshall Islands were wet enough on October except for Jaluit came out dryer than all other stations. We did not receive any complain on water shortages and other impacts from people on Jaluit till now, so we have wondered if there is something wrong with the rain gauge again or the observer at Jaluit just measured, recorded, and reported her observations incorrectly, so this is something we have to really double check with the station because it has been dry. This month we've seen some improvement on Jaluit rainfall but the measurements are still not really considerable.

After WFO Guam issued out the advisories on high surfs and possible inundations at Majuro on Thursday October 31st and Friday November 1st we confirmed some areas got inundated the next day or two especially during the high tides. There was no major inundation but only wave run-ups during the high tides. The main road near the bridge was flooded from the ocean side and also the road far end at the airport was but from the lagoon side. We also received calls from people at Rita far end east of the island saying sea water also came close to their homes from the ocean side during the high tides but there was no damage to their belongings.

Sea level in October was higher than normal at Majuro. The positive anomalies sea level was observed around 250-300mm.

Coral bleaching was observed near the Marshall Islands during the month of October at watch level alert.

Pohnpei: (Eden)

Flood statements were issued in October and reports of minor damages SE parts of the island. For early November, Pohnpei has seen a large amount a rain just within the first two weeks.

Kosrae: (Eden)

Still plenty of rain and no damages to report.

Chuuk: (Sanchez)

Yap: (Jay)

No news of reservoirs going dry so reservoir is still in good condition.

Palau:

The first half of October was pretty dry but the three separate monsoon trough events provided almost 2.53 inches (64.26mm) of rainfall. Several island heating events helped to bump up the numbers a bit. Up until Oct 21, WSO Palau was more than 60% below October's Climo at 4.18 in (106.17mm) but the trade-winds provided some low level convergence, troughs and toward the end of the month a weak circulation within the trough bringing October totals for WSO Palau over the Oct Climo at 13.94in (354.08mm) which is ~117% above normal (percentage based on the median as normal). Almost a similar situation for Peleliu State, for the first 17 days in October, rainfall totals were under an inch (25.4mm). By the last week of October, Peleliu's numbers increased substantially.

No reported hazards except for my own observations. The rainfall did more damage to pothole prone roads, it really doesn't take much considering that the roads are not properly patched up. Minor flooding of some areas in Koror and Airai due to continuous rainfall from a trade-wind trough that passed through Palau on Oct 28 and dumped 2.72 inches (69.09mm) of rain that day in Airai and a little more and a little less for the other stations. My observations only go as far as Koror to Airai because I live in Koror and work in Airai.

No King Tide inundation events to share for this past new moon.

Guam/CMNI:

Lot of tropical cyclones to the north. Spotty rainfall on the island. No damages to report and no inundations.

Tropical Cylone: (Lander)

Season has been well below average for typhoons.

PEAC Teleconference: Sea-Level Outlook—November 14, 2019

All values are in inches (1 inch=25.4 mm); Seasonal cycle removed.

Tide Gauge stations	Seasonal Forecasts SON (mean) (ano)	SD of ASO (mean)	Monthly mean ¹ anomaly			Current State/ Trend JAS 2019	Seasonal Forecasts SON (mean) (ano)	SD of ASO (max)	Monthly max ² anomaly		
			Observed rise/fall						Observed rise/fall		
			Aug/ 2019	Sep/ 2019	Nov/ 2019				Aug/ 2019	Sep/ 2019	Nov/ 2019
Marianas, Guam	+3	3.5	+4.5	+4.5	+4	Above	+19	3.2	+20	+19	+19
Malakal, Palau	0	4.3	+2	+0.5	0.5	Normal	+36	4.3	+40	+39	+38
Yap, FSM	+3	4.7	**	+2	+2	Normal	+30	4.7	+32	+31	+32
Chuuk, FSM***	+3	*	+5.2			Above	+29				
Pohnpei, FSM	+4	3.8	+6	+6	+8	Above	+36	3.9	+39	+33	+38
Kapingamarangi	+4	**	+4	+4		**	**	**	+30	+25	+29
Majuro, RMI	+4	2.8	+5.5	+8	+5	Above	+40	3.5	+50	+50	+47
Kwajalein, RMI	+4	3.2	+3.5	+4.5	+4	Above	+40	3.7	+43	+43	+41
Pago Pago*	+7 [+10]	3.2	+10 [+15]	+7 [+12]	+7 [+12]	Above	(+35) [+40]	3.4	+40	+38	+38
Honolulu	+3	1.8	+5.5	+3	+4	Above	+28	2.4	+30	+20	+22
Hilo	+4	1.8	+5	+5	+6	Above	+28	2.3	+28	+25	+29

+/- indicate positive anomaly (rise) and negative anomaly (fall) respectively. Note that any changes between (0~ ±1) inch is considered to be negligible. Also note that changes within the range of (+/-) 2 inches are unlikely to cause any adverse climatic impact. *** (Experimental) Satellite Aviso Altimetry data, ** Data currently unavailable; Figures in parenthesis () for monthly-max anomaly indicates difference between the maximum anomaly for the given month and the long-term monthly average anomaly.

1: Difference between the mean sea level for the given month and the 1983 through 2001 monthly mean sea level value at each station (seasonal cycle removed); 2: Same as 1 except for maxima; SD stands for standard deviations.

* In Pago Pago, There was a level shift (approximately 5 inches) in American Samoa at the time of September 2009 earthquake. So, -5 inches has been adjusted (shown in parenthesis []) to the current tide-gauge values of Pago Pago.

Current Conditions: Models and expert opinion suggest that El Niño has already transitioned to ENSO neutral—

- While the ENSO status will most likely remain “neutral” over the next season, the atmosphere may respond in an El Niño Modoki-like (i.e. central Pacific) fashion at times.
- Since January 2019, the pattern of sea level variability corresponded very well with WP El Niño, where the positive sea level anomaly is located over/or near the central Pacific and maximum near 160°E-180 (i.e., Pohnpei, Kwajalein, and Majuro) and the negative SLA is located near 130°E-150°E (i.e., Koror) (also see [Kug, J.-S., et al. \(2009\)](#)).
- The MJO displays eastward propagating signal across eight phases from the Indian Ocean to the Pacific and later the western hemisphere.

Impacts: There are reports of minor-to-moderate inundations in the low-lying atolls with some minor damages.

Forecasts for OND: PEAC-CCA¹ Statistical model is predicting above-normal sea level to the north Pacific islands (Koror, Yap, and Chuuk). Other FSM stations (Chuuk, Pohnpei) and RMI's stations are likely to remain in higher than normal state. In Hawaii, both Honolulu and Hilo are likely to be elevated.

El Niño has already transitioned to ENSO neutral—this is most likely to continue through Northern Hemisphere winter 2019-20 (50-55% chance). So, the sea level is also likely to come back to normal by the end of 2019.

Kug, J.-S., et al. (2009). Two types of El Niño events: Cold tongue El Niño and warm pool El Niño. *J. Climate*, 22, 1499–1515 (available @ <https://journals.ametsoc.org/doi/pdf/10.1175/2008JCLI2624.1>).

Chowdhury M. R., Chu P.-S., and Guard C. (2014): An Improved Sea Level Forecasting Scheme for Hazards Management in the U.S.-Affiliated Pacific Islands. *Int. J. Climatology* 6, 2320-2329.

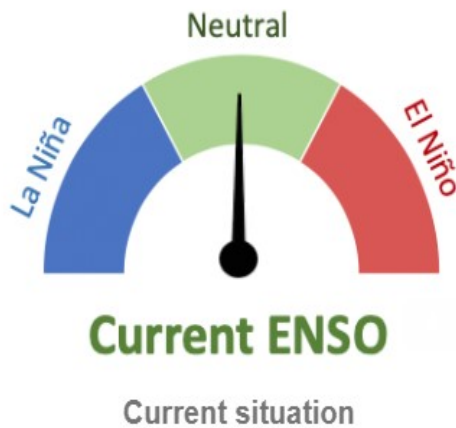
Synopsis: ENSO-neutral is favored during the Northern Hemisphere winter 2019-20 (~70% chance), continuing through spring 2020 (60 to 65% chance).

Near-to-average average sea surface temperatures (SSTs) were observed in the east-central tropical Pacific Ocean during October. In the most recent week, the SST indices in the westernmost Niño-4 and Niño-3.4 regions were +0.7°C and +0.5°C, respectively, while farther east in the Niño-3 and Niño-1+2 regions they were near-to-below average (+0.3°C and -0.6°C respectively). The subsurface temperature anomalies (averaged across 180°-100°W) were above average during the month as a downwelling oceanic Kelvin wave that began in September continued progressing eastward into the eastern Pacific. Low-level winds were near average during October, while easterly upper-level wind anomalies were observed over the eastern Pacific. Finally, tropical convection was suppressed near the Date Line and also over Indonesia, while somewhat enhanced convection prevailed over the western Pacific, northeast of Papua New Guinea. Overall, despite the recent anomalous warming across the east-central equatorial Pacific, the overall oceanic and atmospheric system reflected ENSO-neutral.

The majority of models in the IRI/CPC plume (Fig. 6) continue to favor ENSO-neutral (Niño-3.4 index between -0.5°C and +0.5°C) through the Northern Hemisphere spring. Many dynamical forecast models, including the NCEP CFSv2, suggest Niño-3.4 SST index values will remain near +0.5°C during November before decreasing toward zero. Forecasters believe this recent warmth reflects sub-seasonal variability and is not indicative of an evolution toward El Niño. The chances for El Niño are predicted to be near 25% during the winter and spring. In summary, ENSO-neutral is favored during the Northern Hemisphere winter 2019-20 (~70% chance), continuing through spring 2020 (60 to 65% chance; click [CPC/IRI consensus forecast](#) for the chance of each outcome for each 3-month period).

El Niño-Southern Oscillation Watch

Source: NIWA Island Climate Update:
November 2019



ENSO-neutral conditions continued during October 2019.

68% chance for ENSO-neutral conditions persisting during November 2019-January

considerably during October in the central Pacific but were still in the neutral range.

71% chance for ENSO-neutral conditions during February-April 2020.

The Southern Oscillation Index (SOI) was -0.5 in October (on the El Niño side of

Rainfall Verification and Outlooks for NDJ (Con't)

<i>Location</i>	<i>Rainfall Outlook</i>	<i>Final Probabilities</i>
Palau		
	X	30:50:20
FSM		
X	Avg-above	30:35:35
	Avg.	30:40:30
	X	30:35:35
X	Above	25:35:40
RMI		
X X	Above	25:35:40
J X	X	30:35:35
Guam and CNMI		
X	X	30:35:35
X X		30:40:30
American Samoa		
X X	X	30:35:35
State of Hawaii		
	X	30:35:35
	X	30:35:35
X	X	30:35:35
	X	30:35:35

Note:

R X e X C X
 X X 30:35:35 e X
 X X 35% X
 X e e X ex
 c X 35% X e
 e X ex X X c c
 X c X X c 30%
 X e ec X ex c
 X Also note that excess and deficit limit for each of the stations are b different

Drought monitoring updates.

Drought monitoring updates.

A. End-of-October Monthly Drought Assessment:

- i. With WxCoder III data, we have 23 stations in the monthly analysis.
- ii. October was dry (less than the 4- or 8-inch monthly minimum needed to meet most water needs) in parts of the RMI (Jaluit & Utirik) & eastern FSM (Chuuk, Lukonor, Pingelap), but wet most everywhere else. The end-of-October monthly analysis (October 31) is consistent with the weekly analyses for October 29 and November 5 (and, in fact, is identical to the November 5 analysis). Compared to the end-of-September monthly analysis:
 - a. Drought/Abnormal dryness improved in the northern RMI, FSM, & American Samoa:
 1. D0 improved to D-Nothing at Wotje, Kapingamarangi, Nukuro, and Tutuila
 - b. Conditions stayed the same at Jaluit (D2) and at Lukonor and Woleai (D0)
 - c. Others: The rest of the stations continued at D-Nothing (no drought or abnormal dryness)
 - d. Ulithi was missing for the last several months, and Fananu for the last 2 months, so they could not be analyzed for this month.
- iii. Jaluit: considering the issues with the rain gauge or questionable rainfall reports from Jaluit, should we start classifying Jaluit as No Data? A possible alternative is to take average of Mili, Majuro, Ailinglapalap rainfall and use it for Jaluit – we are leaning toward setting Jaluit as No Data until the problem is identified and fixed. But first confirm with local office. Guam will take the lead to investigate Jaluit and I will wait until I hear from Chip before going No Data for Jaluit. (Mark: There is no difference between the historical Majuro and Jaluit precip during the time the Japanese ran the islands.)
- iv. Some October 2019 precipitation ranks:
 - a. Third driest October at Chuuk (in 69 years of data) and Jaluit (36 years)
 - b. Jaluit: driest July-Oct (36 years) thru Nov-Oct (33 years)
 - c. Lukonor: 4th driest October (35), 2nd driest Sep-Oct (35) and Aug-Oct (23), 5th driest Nov-Oct (23)
 - d. Pingelap: 5th driest October (36), 3rd driest Sep-Oct (36) and Aug-Oct (35)
 - e. Ailinglapalap: 6th driest October (36), 4th driest Sep-Oct (36) & Apr-Oct & Mar-Oct (out of 35 yrs), 5th driest Nov-Oct (33)
 - f. Woleai: 5th driest October (35), 2nd driest Jul-Oct, and 4th driest (Nov-Oct), but it should be noted that October had 9 days missing
 - g. Wet: 3rd wettest Oct at Saipan (39), 5th wettest Oct at Pohnpei, 2nd wettest Oct at Mili (36)

B. Current (Weekly) Drought Conditions: The discussion above is the monthly (end of October) analysis. The latest weekly USAPI USDM assessment may show different USDM classifications. The latest weekly USAPI USDM assessment is for November 12.

- i. The November 12 analysis is the same as the end of October analysis.

Drought monitoring updates (CON'T).

- C. October 2019 NCEI State of the Climate Drought Report: Since I was in Australia for the GEO Ministerial Summit the last 2 weeks, the October 2019 NCEI SotC Drought report hasn't been written.
- i. When it goes online, the web page url:
 - a. <https://www.ncdc.noaa.gov/sotc/drought/201910#det-reg-pacis-usapi>
- D. Next Week & Next 2 Months: I will be OCONUS USDM author for 5 of the next 7 weeks (through end of this year). In January I will be attending the AMS Annual Meeting in Boston (January 12-16).
- E. 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! **CEC has selected the contractor (Ernest Cooper Environmental Consulting) and we and they are in the process of putting together the survey.**
- F. SAPI 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.
- A **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).**
- B
- G. 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 & Palau are not getting into the automated process.**
 1. **Thank you, Chip, for getting the metadata for Jaluit and Woleai changed so they are getting into the automated system!**
 2. **Chip: 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)**
 3. **Chip: C/would you send me the COOP station i.d. number and NWSLI**

Drought monitoring updates (CON'T).

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.

d. I had a good meeting with Bill Ward (when I was in Honolulu last month) about getting automated observations set up.

iii. 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).

H. 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.

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

Participants:

NWS Climate Services Program Managers (CSPMs):

WSO Climate Service Focal Points (CSFPs):

(Majuro)

Wilfred (Kosrae)

Kikuko (Palau)

Sanchez (Chuuk)

Jay (Yap)

Jason (Kwajalein)

Eden (Pohnpei)

(Pago Pago)

Chip (Guam & CNMI)

PEAC Principal Research Scientist: Rashed Chowdhury

CPC Forecaster:

NWS MIC, Honolulu: Christopher Brenchley

Pacific RISA: Krista

Additional Attendees: Dave, Lee

WERI Scientist:

WFO Guam : Chip Guard

NCEI: Richard Heim

NWS Hydrologist: Kevin Kodama

***** Next Call– 12 December 2019, 1430 HST (13 December 2019, 0030 GMT)*****