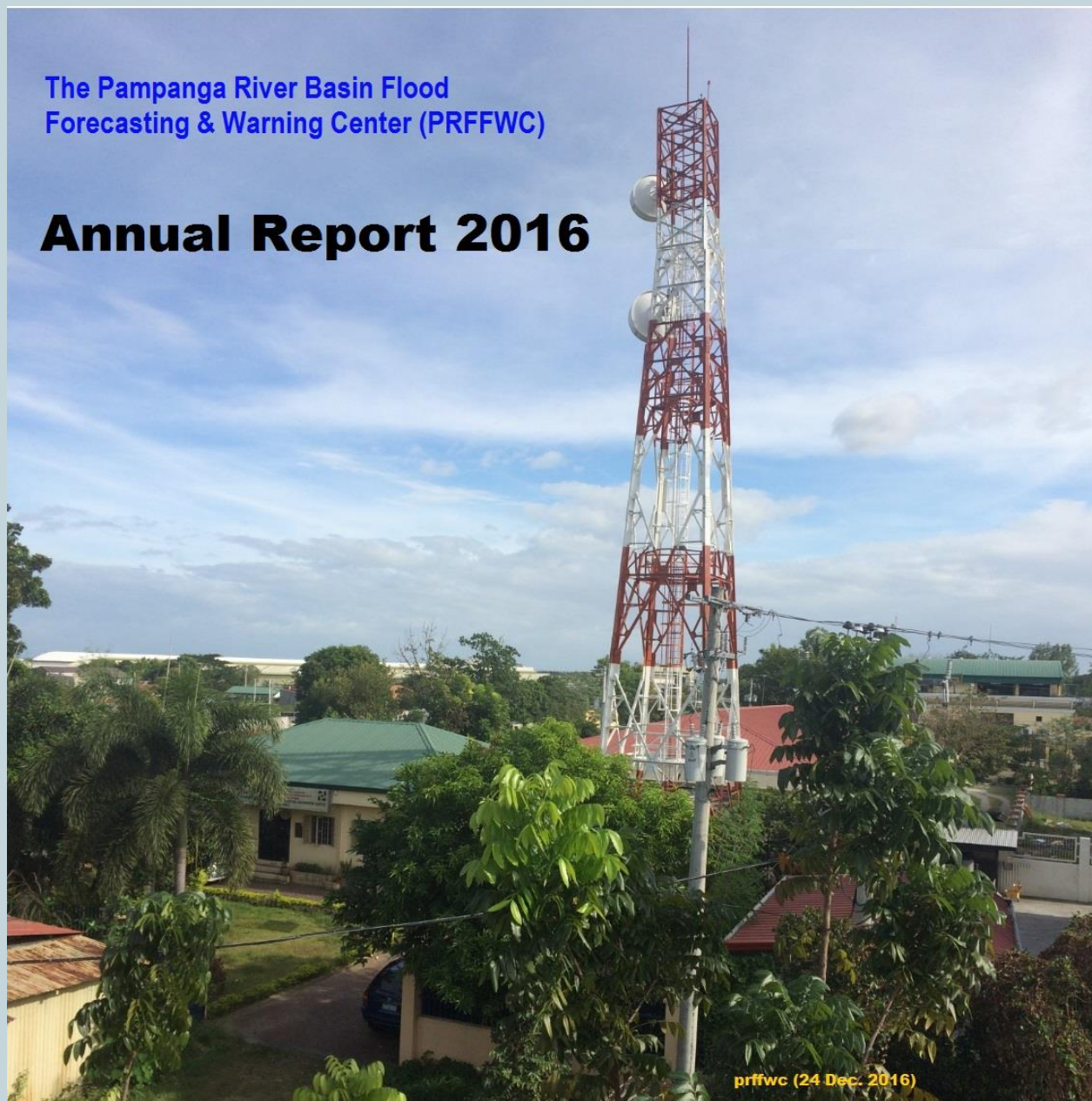


The Pampanga River Basin Flood
Forecasting & Warning Center (PRFFWC)

Annual Report 2016



prffwc (24 Dec. 2016)



Pampanga River Basin Flood Forecasting & Warning Center (PRFFWC)
Diosdado Macapagal Government Center (DMGC)
Barangay Maimpis, City of San Fernando, Pampanga 2000
Telephone / Fax: (045) 455-1701
E-mail: prffwc@pagasa.dost.gov.ph / prffwc_ffb@yahoo.com
(with FB and Twitter accounts)
Websites: prffwc.synthasite.com; prffwc.webs.com



PRFFWC in the Year 2016

On its 45th year of operational flood forecasting and warning service in the Pampanga River Basin, the Pampanga River Basin Flood Forecasting & Warning Center (PRFFWC) has remained steadfast and committed in providing quality flood-related information to target areas within the said basin. The continuing innovations of the PRFFWC in its operational flood-related information and warning activities has maintained its position as the prime flood forecasting & warning (FFW) service of PAGASA.

This year's center highlights are as follows:

- A total of 17 flood advisories (FAs) and 23 flood bulletins (FBs) were issued in 7 basin flood events;
- Year-round (366 days) daily updating of hydrological forecast and uploading of basin rainfall (RR) / water level (WL) status in center's own website (www.prffwc.webs.com / www.prffwc.synthasite.com);
- River stage validation in several WL telemetry stations with field validation resulting in the adjustments of several WL telemetry readings by the HMTS of HMD;
- Resource speaker on topics relating to the PRB and on hydrometeorological thematic area in some 40 occasions to more than 6,800 individuals representing various sectors within and outside the basin of concern including one international event;
- More than 50 tri-media interviews (mostly regional stations and networks) particularly during flood watch operations;
- Another milestone for the center is a developed project of a topographic scale model of the PRB showing important river systems, locations of telemetry stations, major road networks, and other basic features of the basin;



Students from different schools line-up to view the PRB scale model in the PRFFWC booth during the Regional Science & Technology Week Celebration of Reg. 3 at Walter Mart Activity Center, CSFP. (July 25-27)

- Initial draft of center's reference manual exclusively for PRB hydrologists / flood forecasters and hydro technicians on flood watch activities and on the overall PRFFWC system;
- Participation of the center's technician in the quarterly maintenance of all telemetry stations by the HMTSS-HMD;
- Some 491 station-months of various hydrological data encoded; 20 stn-months of RR & 10 stn-months of WL filled-in gaps / breaks; conversion of some 107 documents to e-file as a continuing program of the center's electronic filing system activity;
- Active participation in more than 30 meetings (including RDRRMC-3 PDRAs), seminars, conferences and other events relating mostly to DRRM issues; as an active partner in several regional and outside the basin undertakings to various DRRMOs, NGOs, and NGAs;
- Participation in international events and gatherings either as guest speaker, training and partnership-collaboration activities.

The center actively participated in several major events during year. Among them was a showcase booth of its flood forecasting and warning system with basin scale model during the Regional Science and Technology Week (NSTW) Celebration at Walter Mart, CSFP (Jul. 25 to 27) led by the DOST-3; a major supporter to the Bulacan Provincial Government through its Provincial Disaster Risk Reduction & Management Office (PDRRMO) in the 7th SHINe (School Hydrological Information Network) Annual Conference in 8 Waves Water Park & Hotel (Nov. 17); active collaborations with several international entities such as JICA, ICHARM, RIMES, KOICA and K water.

Data receptions were generally very good throughout the year with less than 10% of downtimes (d/t) for both RR and WL, respectively for all reporting telemetry stations. Mayapyap RR-WL telemetry station remained out of order for the whole year. There were few streamgaging activities made during the year due to limitations concerning outmoded and "un-calibrated" current meters. Streamgaging activities carried-out during the year included a trial river cross-sectioning in Abacan River at Mexico station and some telemetry-based river stage validation in several of the streamgaging stations. For the year 2017, a major focus on data build-up through

quality-control of previous data years, publication of an annual hydrological summary, at least one river cross-section at all streamgauging stations and an updated rating equations at each site.

I. Operational Activities

1.1 Flood Monitoring and Warning Activities

At least 7 basin flood events were monitored and covered by the center during the year. A combined total of 17 flood advisories (FAs) and 23 Flood Bulletins (FBs) were issued during those events. Events were mainly the yearly normal floods and no extreme event. Almost half of year 2016 was still an El Niño year coming from 2015 and was rated as one of the strongest on record (second strongest with a +1.7 °C ONI behind the 1997-98 event with +2.0 °C ONI or the Oceanic Niño Index; ONI - a running 3-month mean SST (Sea Surface Temperature) anomaly).

2016 Event	Period	FA issued	FB issued
Southwest Monsoon as enhanced by Typhoon Butchoy (Nepartak)	July 9 - 10	2	
Southwest Monsoon as enhanced by Super Ty. Carina (Nida)	Jul 31 – Aug 02	3	
Southwest Monsoon	Aug. 12 - 19	4	7
August 21 Event	Aug. 21	2	
Typhoon Karen (Sarika)	Oct. 14 - 19	2	10
Super Typhoon Lawin (Haima)	Oct. 19 - 22	1	6
Typhoon Nina (Nock-Ten)	Dec. 25 - 27	3	
	Total	17	23

REPUBLIC OF THE PHILIPPINES
Department of Science and Technology
Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)
PAGASA, Science Garden, Agham Road, Diliman, Quezon City 1100
Websites: www.pagasa.dost.gov.ph
www.prffwc.webts.com

PAMPANGA RIVER FLOOD FORECASTING & WARNING CENTER
Hydro-Meteorology Division/NCR-PRSD
DOST compound, Bgy. Malimpis, San Fernando, Pampanga 2000

=====

GENERAL FLOOD ADVISORY NO. 1(ONE)

PAMPANGA RIVER BASIN & ALLIED RIVERS
ISSUED AT 8AM, 21 AUGUST 2016
(VALID FOR THE NEXT 24-HOURS UNLESS THERE IS AN INTERVENING ADVISORY OR AN INITIAL FLOOD BULLETIN TO BE ISSUED)

Basin Rainfall As of 8:00 AM Today

PAST 24-HR OBSERVED RAINFALL: 23 millimeters

FORECAST 24-HR RAINFALL: LIGHT TO OCCASIONALLY MODERATE RAINS

AWARENESS INFORMATION:
A RAPID RISE OF UPSTREAM TRIBUTARIES CORONEL AND PEÑARANDA WAS OBSERVED LATE LAST NIGHT. LIKEWISE DURING SAID PERIOD BRIEF HEAVY RAINS WAS RECORDED ON THE EASTERN PART OF THE BASIN.

WATERCOURSES LIKELY TO BE AFFECTED:	PARTICULAR LOW-LYING RIVERSIDE AREAS ALONG THESE WATERWAYS:
• MIDDLE AND LOWER MAIN PAMPANGA RIVER	SAN ISIDRO, JAEN, CABAJO, ARAYAT, CANDABA, SAN LUIS, SAN SIMON, APALIT, CALUMPIT, HAGONÓY, MACABEBE, MASANTOL, CANDABA SWAMP AREA
• CANDABA SWAMP AREA	CANDABA SWAMP AREA

FLOOD WARNING:
RESIDENTS AND LOCAL DISASTER RISK REDUCTION AND MANAGEMENT COUNCILS (DRRMCs) ADJACENT TO AND / OR ALONG THE ABOVE-MENTIONED AREAS ARE ADVISED TO BE ALERT FOR POSSIBLE FLASH FLOODS AND RIVER OVERFLOWING.

Prepared by:

PRFFWC – HTH / JRD / RFD

PHILIPPINE ATMOSPHERIC, GEOPHYSICAL AND ASTRONOMICAL SERVICES ADMINISTRATION (PAGASA)
Pampanga River Flood Forecasting and Warning Center, Hydro-Meteorology Division / NCR-PRSD
Bgy. Malimpis, San Fernando, Pampanga (Sci. Site) | <http://www.prffwc.webts.com>

FLOOD BULLETIN NO. 7 (SEVEN) – PAMPANGA RIVER BASIN AND ALLIED RIVER SYSTEM
ISSUED AT: 5:00 AM, 18 OCTOBER 2016
VALID UNTIL THE NEXT ISSUANCE AT 5:00 PM TODAY UNLESS THERE IS AN INTERMEDIATE BULLETIN
BASIN RAINFALL AS OF 5:00 AM TODAY: PAST 24-HR = 5.6 MM FORECAST 24-HR = 5 MM

BASIN EXPECTED RESPONSE:

WATER LEVEL STATION (STN)	RIVER/ SWAMP WATER LEVEL (WL) TREND AT STATION	FLOOD SITUATION MESSAGE	PARTICULAR LOW-LYING AREAS
SAN ISIDRO STN, PAMPANGA RIVER	NOW AT 2.30 M / SLOW RECEPTION TO CONTINUE FURTHER WAY BELOW 3.5 M. ALERT WL	FLOODING IS NO LONGER POSSIBLE (A FINAL MESSAGE)	JAEN, SAN ISIDRO, SAN ANTONIO, CABAJO
ZARAGOSA STN, RIO CHICO RIVER	NOW AT 2.88 M / HAD LEVELED-OFF AND TO REMAIN ABOVE 2.50 M. ALARM WL UNTIL THIS AFTERNOON	FLOODING IS STILL POSSIBLE	SAN ANTONIO, LAPAZ, ZARAGOSA, ALIAGA
ARAYAT STN, PAMPANGA RIVER	NOW AT 8.52 M / VERY SLOW RECEPTION IS NOW IN PROGRESS TO REACH BELOW 8.50 M. CRITICAL WL BY NOON TODAY	FLOODING TO PERSIST	ARAYAT, SAN LUIS, SAN SIMON, CABAJO
CANDABA STN, CANDABA SWAMP	NOW AT 5.78 M / SLOW FILLING-UP M. ABOVE 5.00 M. CRITICAL WL TO LEVEL-OFF JUST ABOVE 6.0 M WL LATER TODAY	FLOODING TO PERSIST	CANDABA SWAMP AREA
SASMUAN STN, GUAGUA RIVER	NOW AT 2.72 M / TO FLUCTUATE (TIDE INFLUENCED) BUT TO REMAIN BELOW 3.2 M WL	FLOODING IS STILL POSSIBLE	SASMUAN, LUBAO, GUAGUA
SULPAN STN, PAMPANGA RIVER	NOW AT 2.64 M. VERY SLOW RISE TO CONTINUE BUT TO REMAIN BELOW 3.00 M. ALERT WL UNTIL THIS AFTERNOON	FLOODING IS THREATENING	APALIT, MACABEBE, MASANTOL, CALUMPIT, PACOMBONG, HAGONÓY
ANGAT RIVER	STILL RELATIVELY LOW; SLIGHT INCREASE IN RIVER STAGE	FLOODING IS STILL POSSIBLE	RIVERSIDE AREAS OF: ANGAT, NORZAGARAY, BUSTOS, SAN RAFAEL, BALUAG, PULUAN, PLARDEL, CALUMPIT

COASTAL FLOODING IN THE LOW-LYING SEASHORE AREAS (TIDE INFLUENCED)
HAGONÓY, PACOMBONG, MACABEBE, MASANTOL

PEOPLE LIVING IN LOW-LYING AREAS PARTICULARLY THOSE ADJACENT TO THE ABOVE MENTIONED RIVERS AND THE LOCAL DISASTER RISK REDUCTION AND MANAGEMENT COUNCILS CONCERNED ARE ADVISED TO CONTINUE TO TAKE NECESSARY APPROPRIATE ACTIONS.

HTH / NBN / JRD / PTH / RFD

EXPECTED FLOOD SITUATION:

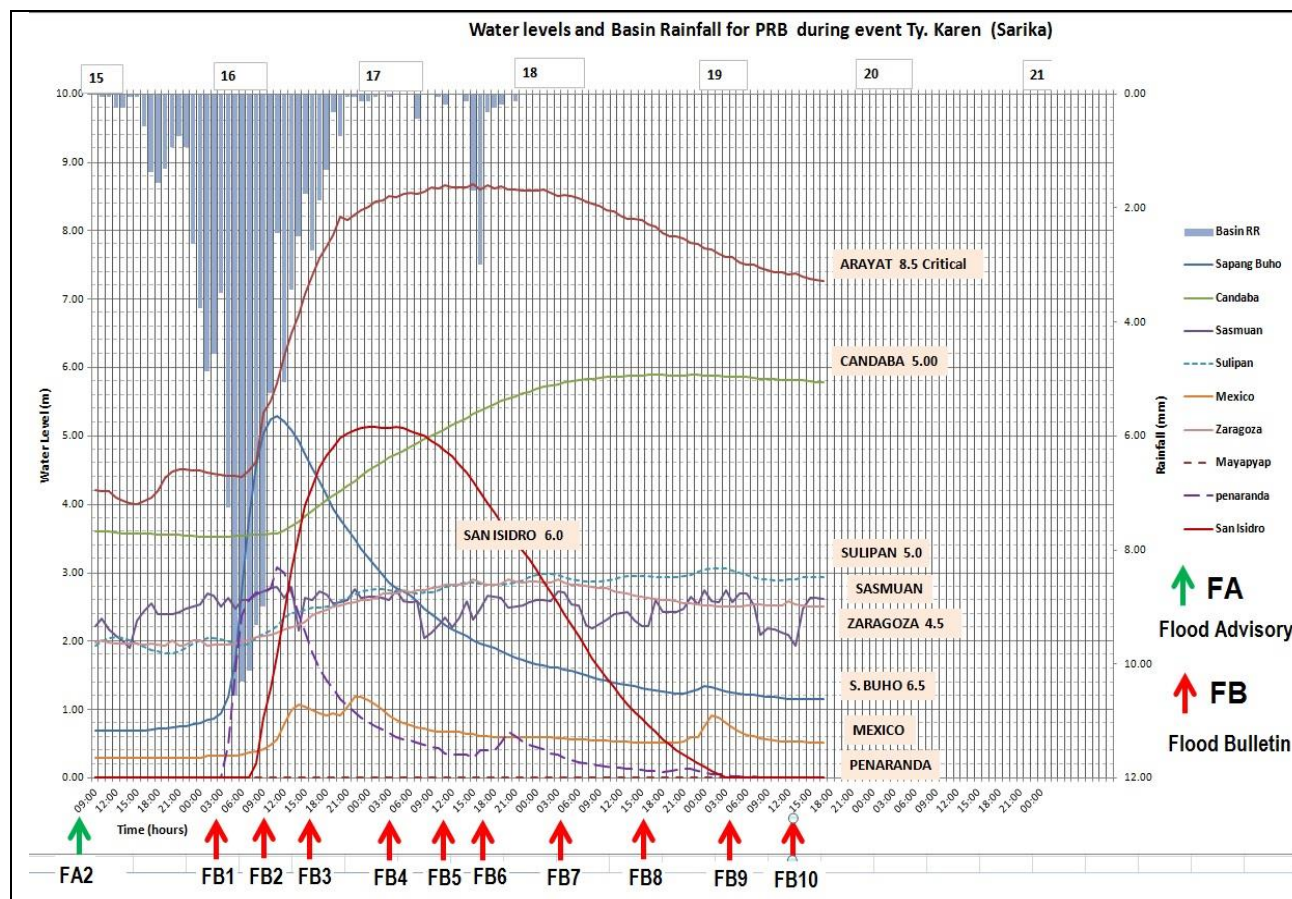
P = POSSIBLE
T = THREATENING
O = OCCUR
F = PERSIST

Top left, a customized flood advisory that was issued in August 21 during an unexpected increase of river stages at several upstream tributaries for some localized rains that were not covered by the present rainfall station network. Though the sudden rise of river did not reach alert levels at forecasting points nonetheless the issuance was made to raise awareness of the communities that are along these tributaries; Top right shows one of the flood bulletins (FB), flood FB No. 7, issued during event Typhoon Karen in October of 2016.

Flood information can be customized, such as the issued flood advisory mentioned above top left, based on an existing situation in the basin. For example, the FA above is not the usual patterned advisory. The awareness information immediately follows the basin rainfall statement. Further, to highpoint the flood information there are areas mentioned that are likely to be affected aside from the usual waterways as possible flood source. The flood warning statement then clips the whole advisory at the end. This is a special case where the center has to update the public on the existing situation and make them aware of possible flood effects (flash flood or river overflowing) even when there are no significant weather disturbances, except for some unmonitored localized rains, prevailing over the basin. Again, this is a customized FA mainly done for awareness purposes and to somewhat heighten alertness of communities


identified along these waterways. It is also important to be consistent with statements from issued flood message to the next issued information taking note of the continuity of the scenario in the flood episode.

The main flood event for the basin during the year 2016 was Ty. Karen (International name: Sarika). Though the episode was not a major one, it did, however, flooded several riverside areas and mainly the Candaba swamp area. Graph below shows the event basin hyetograph and forecast point hydrographs during Ty. Karen (October 15 to 20).



PRFFWC @PRFFWC - 24 Dec 2016

status of basin rainfall and water levels at 11 am, 25 dec. 2016:

PAMPANGA RIVER BASIN				prffwc	
Rainfall and Water Level Status		Year:		2016	
Time Update: 11:00 AM		Date:		Dec. 25	
Time		9:00 AM	10:00 AM	11:00 AM	
Basin rainfall (mm)		0.00	0.00	0.00	
Water Levels (meters)					
Station	River				
Sapang Buho	Pampanga R.	0.42	0.42	0.41	
Mayapyap	Pampanga R.	xx	xx	xx	
Zaragoza	Rio Chico	0.35	0.36	0.36	
Peñaranda	Peñaranda	0.00	0.00	0.00	
San Isidro	Pampanga R.	0.00	0.00	0.00	
Arayat	Pampanga R.	0.81	0.80	0.81	
Candaba	Candaba Swamp	1.50	1.50	1.51	
Mexico	Abacan	0.00	0.00	0.00	
Sasmuan	Pasac-Guagua	1.92	1.91	2.07	
Sulipan	Pampanga R.	1.37	1.37	1.36	

The figure graph above also shows the issued FA and FBs along the time axis. The rise and peak of hydrographs and the issued FA (no. 2) and FBs clearly shows that the center was able to provide more than 24-hour lead time of warning information to targeted areas within the basin during the said event.

Added information shared by the center through its Facebook and Twitter accounts during flood watch operation is a table showing the past 3 hours of basin rainfall and the corresponding instantaneous water level readings at all reporting stations. Left figure shows one of these uploaded tables as seen in center's twitter account.

This information is updated and uploaded every 3 hours during flood watch operation from 8am till 8pm and / or 11pm of the day.

Daily Hydrological Information:

The center provides daily basin hydrological forecast issued on or before 6:00 AM. In its status of basin rainfall and water level page, updates on the past 24-hour rainfall totals ending at 5:00 AM and the instantaneous water level readings (5:00 AM data) at all reporting telemetry stations are regularly updated even during flood watch operations.

PRFFWC

[Home](#) | [hydro forecast](#) | [flood advisory-1](#) | [flood bulletin](#) | [status of rainfall and water levels](#) | [PRB Map](#)
[Bulacan Hydrological Situation](#) | [Station Info](#) | [Basin Info](#) | [Site-related documents](#) | [Personal Messages](#)
[Activities and Events](#) | [Annual Reports](#) | [netFLOWS Newsletter-droplets](#) | [RR-WL forms](#)

PAMPANGA RIVER BASIN AND ALLIED RIVER BASIN OF PASAC-GUAGUA

HYDROLOGICAL FORECAST

JANUARY 5, 2017

6:00 AM (LST)

PARTLY CLOUDY TO CLOUDY SKIES WITH ISOLATED RAINSHOWERS OR THUNDERSTORMS WILL BE EXPERIENCED WITHIN THE BASIN FOR THE NEXT 24 HRS. WATER LEVEL OF MAIN PAMPANGA RIVER STILL AT LOW LEVEL CONDITION. SLIGHT FLOODING AT LOW-LYING RIVERSIDE AND COASTAL AREAS AFFECTED BY HIGH TIDE.

(BAHAGYANG MAULAP HANGGANG SA MAULAP NA PAPAIRIN NA MAY PULU-PULONG MGA PAG-ULAN O PAGKIDLAT-PAGKULOG ANG MARARANASAN SA SUSUNOD NA 24-ORAS. ANG ANTAS NG TUBIG NG KABUUANG ILOG NG PAMPANGA AY SADYANG MABABA PA RIN. BAHAGYANG PAGBABAHA SA MGA MABABANG LUGAR SA DALAMPASIGAN AT TABING ILOG NA APEKTADO NG HIGH TIDE.)

(HIGH TIDES FOR 2016 (See files below) and from previous years (2015, 2014, 2013 & 2012))

[PRB Map page link](#)

[high_tides2017.xls](#)
 Size : 46 Kb
 Type : xls

[high_tides2016.xls](#)
 Size : 46 Kb
 Type : xls

[DAM status \(Pantabangan, Angat and Ipo Dams within PRB\)](#)

Date: JANUARY 5, 2017
Time Update: 6:00 AM (LST)

Observed Values (Past 24-hr rainfall ending at 5 AM (LST)) (Instantaneous Water Level Data 5 AM (LST))			
Station	Rainfall (mm)	Water Level (m)	Water Level Trend
Munoz	0		
Sapang Buho	0	0.54	--
Calaanan	0		
Mayapyap	*	*	-
Gabaldon	0		
Palali	0		
Zaragoza	0	0.02	--
Penaranda	0	0	-
San Isidro	0	0	-
Sibul Spring	0		
Arayat	0	1.23	--
Candaba	0	1.89	--
Porac	0		
Mexico	0	0	-
San Rafael	0		
Sasmuan	0	2.50	--
Sulipan	0	1.56	--
San Fernando	0		

Above shows the daily updated basin “hydrological forecast” (top left) and the basin’s “status of rainfall and water levels” (top right) as how it appears when uploaded in the center’s website.

The basin hydrological forecast and the status of rainfall and water levels issued by the center are likewise uploaded at its Facebook (top left) and Twitter (top right) accounts every day. To access PRFFWC’s Facebook and Twitter accounts just search for PRFFWC. During flood watch status, all info such as issued FA or FB is uploaded after every issuance to the center’s social accounts as well as in the center’s websites. Below is a view of the front page of the center’s websites. left: prffwc.webs.com ; right: prffwc.synthasite.com

Pampanga River Basin FLOOD Forecasting & Warning Center (PRFFWC)

PRFFWC Data / Information Link

- Information Links on Pampanga Weather (PAGASA) & Hydrological Situation of the Pampanga River Basin and its allied river system: Taguig River Basin (For more info please check PAGASA website)
- Latest [Flood Bulletin \(FB\)](#) & [Flood Advisory \(FA\)](#)
- Latest [Hydrological Situation \(HS\)](#) of Pampanga River Basin
- Latest [Flood Bulletin \(FB\)](#) and [Flood Advisory \(FA\)](#)
- Latest [Status of Rainfall and Water Levels \(SRWL\)](#) of PRB & Allied Rivers

Dams and High Tide Info

Dams: (Pantabangan, Angat & Ipo Dams are within the Pampanga River Basin)

High Tide Info for 2017 (see bottom of web page for exact file)

High Tide Info for 2016 (see bottom of web page for exact file)

Other activity links

- Community-based Flood Forecasting System (CFFS)
- Bulacan Province
- Bulacan River, La Mesa Dam
- Northwest Luzon Flood Forecasting
- Guidelines on CFFS (see bottom of web page)

School activity / other links

- School Hydrological Information Network (SHIN) in Bulacan Province
- SHIN in Pampanga Province
- PRFFWC Annual Report (see bottom of web page)

For bulletin please e-mail: prffwc@prffwc.com

relaying of flood warning updates

Example Newsletter - 18022016

How to link to prffwc website - 010116

PRFFWC

[Home](#) | [hydro forecast](#) | [flood advisory-1](#) | [flood bulletin](#) | [status of rainfall and water levels](#) | [PRB Map](#)
[Bulacan Hydrological Situation](#) | [Station Info](#) | [Basin Info](#) | [Site-related documents](#) | [Personal Messages](#)
[Activities and Events](#) | [Annual Reports](#) | [netFLOWS Newsletter-droplets](#) | [RR-WL forms](#)

WELCOME to the PAMPANGA RIVER BASIN FLOOD FORECASTING & WARNING CENTER (active support site)

Center Location: DOST-Region 3 Compound, Barangay Mampis, San Fernando, Pampanga 2000, Philippines

website: <http://www.prffwc.webs.com>
e-mail: prffwc_ffb@yahoo.com

Links:

- PRFFWC Main Site: <http://www.prffwc.webs.com>
- Bulacan PDMO: <http://bulacan.gov.ph/pdpc/>
- PAGASA (Weather Bureau): <http://www.pagasa.dost.gov.ph>
- Weather Links: <http://weatherlinks2009.yolasite.com>

Flood information (FAs and FBs) issued during flood watch operations are also immediately relayed, through other means e.g. fax, e-mails, and SMS, to its identified immediate recipients - the RDRRMC-3, OCD-3, HMD, PDRRMC/O, etc., and also upon requests by other entities and the regional television and radio stations.

1.2 PRB received data for the year

The present PRFFWC system is composed of 17 RR and 10 WL (individual / combinational) telemetry stations situated within the provinces of Nueva Ecija, Pampanga and Bulacan. However, one station, Mayapyap RR-WL telemetry station, remains not operational during the whole year 2016. A digital tipping bucket rain gauge is also manually monitored through an LCD at the center as a complementary rainfall monitoring station.

A summary of received RR and WL data (stn-hrs) for each station by month with total and percentage of data received for the year 2016 are shown below:

Telemetry RR stations Data Reception Summary (2016)														
Monthly Telemetry RR data received (station-hours)														
Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total (stn-hrs)	% data received
Muñoz	744	693	733	703	672	624	744	739	718	744	720	744	8578	97.7
Sapang Buho	744	693	733	703	672	624	744	739	720	744	720	711	8547	97.3
Calaanan	744	693	733	703	680	624	744	739	720	744	720	744	8588	97.8
Mayapyap	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Gabaldon	744	693	733	703	678	624	744	739	720	744	720	744	8586	97.7
Palali	744	693	734	703	679	624	744	739	720	744	720	744	8588	97.8
Zaragoza	744	693	734	703	674	624	744	739	720	744	720	744	8583	97.7
Peñaranda	744	693	734	703	668	624	744	739	720	744	720	744	8577	97.6
San Isidro	744	693	733	703	722	430	738	736	645	736	714	723	8317	94.7
Sibul Spring	744	693	733	703	726	624	744	744	659	744	720	726	8560	97.4
Arayat	742	672	715	703	705	624	660	636	649	714	712	719	8251	93.9
Candaba	744	693	734	703	726	624	744	744	659	744	720	726	8561	97.5
Porac	744	693	735	703	724	624	744	744	659	744	720	726	8560	97.4
Mexico	744	693	735	703	725	624	744	744	659	742	720	726	8559	97.4
San Rafael	744	694	735	703	727	624	744	744	659	744	720	726	8564	97.5
Sasmuan	744	694	733	703	726	624	742	742	659	744	718	726	8555	97.4
Sulipan	744	694	733	703	726	624	744	744	659	744	720	726	8561	97.5

Mayapyap telemetry station remained non-operational for the whole year 2016.

Telemetry WL stations Data Reception Summary (2016)														
Monthly Telemetry WL data received (station-hours)														
Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total (stn-hrs)	% data received
Sapang Buho	744	695	733	705	698	625	744	740	720	744	720	744	8612	98.0
Mayapyap	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Zaragoza	744	695	735	705	702	625	744	740	720	744	720	744	8618	98.1
Peñaranda	744	696	734	705	696	480	744	740	720	744	720	744	8467	96.4
San Isidro	744	695	734	705	732	625	744	744	653	740	719	725	8560	97.4
Arayat	741	682	730	705	726	625	699	687	654	729	716	723	8417	95.8
Candaba	744	695	734	705	735	625	744	744	659	744	720	727	8576	97.6
Mexico	744	695	734	705	735	625	744	744	659	743	720	727	8575	97.6
Sasmuan	744	695	734	705	735	625	744	744	659	744	720	727	8576	97.6
Sulipan	744	695	735	705	732	625	744	744	659	744	720	727	8574	97.6

Mayapyap telemetry station remained non-operational for the whole year 2016.

By standards, data reception for the year was quite good with few downtimes (d/t) mostly below 4-8% for both RR and WL except for Mayapyap station. The above figures are all straight data received reports without any quality-control being applied yet to the actual observed values. Data downtimes or breaks and gaps in the time series will be (or were) filled-up by merging the downloaded data from the station's data logger.

1.3 PRB observed data summary for the year

Summary stats of observed RR and WL data within the basin based on available data received (without data quality-control applied) at the center are as follows:

PRB Rainfall Stations

Station	Annual RR (mm)	Maximum 24-hr RR (mm) Met. day	Date of 24-hr Max RR (Met. day)	Number of RR days (Met. day)	Maximum 1-hr (fixed) RR (mm)
Muñoz	1758	102	15 Oct	114	75
Sapang Buho	1751	272	18 Oct	127	53
Gabaldon	2313	241	15 Oct	162	58
Zaragoza	1497	121	04 Oct	108	73
Mayapyap					
Peñaranda	1470	73	15 Oct	105	48
Calaanan	1836	115	15 Oct	123	42
Palali	1421	102	15 Oct	130	33
San Isidro	1440	111	25 Sept	104	61
Arayat	1430	93	04 Oct	95	58
Candaba	1325	96	12 Aug	110	37
Sibul Spring	1785	84	20 Aug	130	46
Sasmuan	1588	144	15 Aug	93	53
Sulipan	1357	89	13 Aug	112	39
Mexico	1525	193	16 Aug	92	59
Porac	1623	110	12 Aug	96	56
San Rafael	1584	94	16 Aug	114	70
PRFFWC (CSFP)	1652	227.3	12 Aug	125	

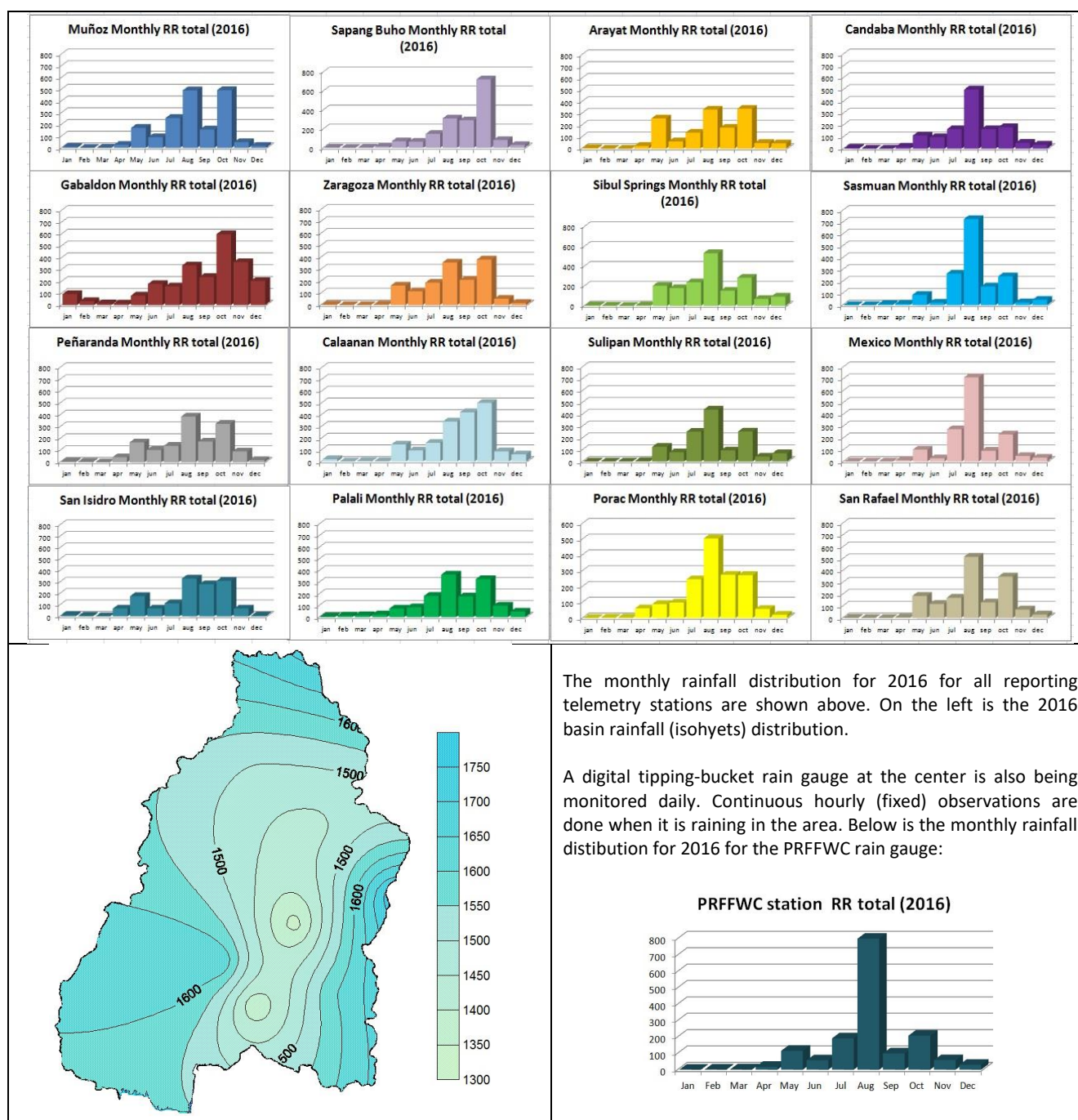
PRB Water Level Stations

Station	Max WL for the year (meters)	Time / Day of Max WL	Remarks (event of maximum WL for the year)
Sapang Buho	5.30	1100H / 16 Oct	Ty. Karen
Zaragoza	3.96	1800H / 31 Aug	Southwest Monsoon
Mayapyap			
Peñaranda	3.08	1100H / 16 Oct	Ty. Karen
San Isidro	5.14	0100H / 17 Oct	Ty. Karen
Arayat	8.68	1500H / 17 Oct	Ty. Karen
Candaba	5.89	1600H / 18 Oct	Ty. Karen
Sasmuan	2.94	1200H / 05 Oct	
Sulipan	3.24	0300H / 22 Oct	S.Ty. Lawin
Mexico	2.02	1900H / 20 Aug	Southwest Monsoon

Database buildup is one of the priority programs of the center. Unfortunately, data quality-control is not as simple as it looks and requires some skills specially when identifying erroneous or doubtful rainfall values. WL errors are a lot easier to identify but will require on site validation as well. Filling-in gaps and breaks are again major setbacks in the buildup of datasets. Short period gaps and breaks for WL are less problematic. Longer gaps of more than a day can sometimes be a problem. For now, the center has focused its data quality-control activities to specific flood events. There is also a plan to come up with a publication of an annual hydrological summary for the Pampanga River Basin probably starting with the year 2016.

Aside from the regular database management of the center, e-filing of old documents such as reports and related papers are done through manual encoding and/or scanning. The list of dataset managed and e-filing tasks carried-out by the center for the year 2016 are as follows:

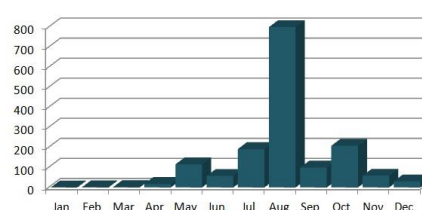
- Encoded 117 telemetry RR stn-months and 68 telemetry WL stn-months
- Some 20 rainfall station-months and 10 water level station-months of data gaps for the PRB were filled-in (November 2014 until March 2015)
- Encoded 12 RR station-months for PRFFWC station (2016)
- Encoded 204 station-months of historical RR-WL data from other various stations
- Scanned 107 documents (reports and various papers, etc.)



The monthly rainfall distribution for 2016 for all reporting telemetry stations are shown above. On the left is the 2016 basin rainfall (isohyets) distribution.

A digital tipping-bucket rain gauge at the center is also being monitored daily. Continuous hourly (fixed) observations are done when it is raining in the area. Below is the monthly rainfall distribution for 2016 for the PRFFWC rain gauge:

PRFFWC station RR total (2016)



1.4 Telemetry System and Station Physical Maintenance:

The maintenance of all telemetry stations and center's general telemetry-related system is usually carried-out every quarter. This activity is led by the HMTSS-HMD group and supported by the center's lone technician. Maintenance is mainly focused on communications and electronic aspects of the system without data validation being undertaken.

As part of the management of the center's dataset, WL validation (staff gauge reading vs. telemetry reading) was carried-out at several of the streamgauging stations. The validation resulted in the calibration and adjustments of several telemetry readings tied-up with actual river staff gauge reading.

Station	Actions Taken	Day / Time adjustments made
San Isidro	Decreased by 0.22 meters	22 Sept / 1845H
Arayat	Decreased by 0.05 meters	23 Sept / 0730H
Mexico	Increased by 0.03 meters	23 Sept / 1105H
Sasmuan	Increased by 0.67 meters	23 Sept / 1219H
Sulipan	Increased by 0.24 meters	23 Sept / 1730H

While it may seem that adjustments made for San Isidro, Arayat, Mexico and Sulipan WL are not that significant from its previous settings, adjustment for corrections carried-out for Sasmuan would surely require data adjustments for previous observations for quite a period of time.

Mayapyap RR-WL telemetry station remained totally down (out-of-order) for the whole year. A proposal for its transfer of location had been discussed with PAGASA resident JICA consultants and personnel of the HMTSS-HMD. A report which includes the setting-up of additional stations within the basin was also prepared and shared accordingly.

Quarterly and emergency maintenance (only with reports provided to the center) carried-out by the HMTSS-HMD as supported by the center's lone technician are as follows

- Cleaning of center's server, PCs and repair of transfer switch of gen set; general telemetry station maintenance and retrieval of RR-WL data (May 18-25)
- Emergency repair of Peñaranda station and pull-out of Mayapyap telemetry equipment (Sept. 16-18)
- Calibration / Adjustments of WL readings and general station maintenance (Sept. 21-28)
- Routine maintenance of all telemetry stations (Dec. 08-16)

Physical maintenance of stations, which is supposed to be undertaken by the center, has been carried-out by the personnel of ETSD (Engineering and Technical Services Division). For year 2016, repair of Mexico station's bridge path support was carried-out by the group. Further, general cleaning and maintenance of center's air conditioning system were also carried-out during the year. Unfortunately, the group is not providing the center with their activity report.



Top left: Zaragoza staff gauge (S.G.) at a reading of about 3.90 meters and a telemetry reading of 3.15 meters at time of WL validation trip; for now the station's WL telemetry reading has yet to be readjusted by HMTS. (Above, 2nd, 3rd & 4th pictures) The Mexico, Sulipan and Sasmuan staff gauges at the time of WL validation surveys. All 3 stations were readjusted last September.

1.5 Streamgaging and hydrological related activities

Similar to 2015, there were few streamgaging activities carried-out by the center for the year. A trial river cross-sectioning at Abacan River in Mexico station, several WL validation surveys and a flood verification survey at several areas within Pampanga province during SW monsoon of August 2016 were all that was carried-out during the year. The WL validation surveys were carried-out at a time when river stages at forecasting stations were still relatively high (August 18, 19 and 23). No discharge measurements were undertaken pending the availability of a calibrated current meter.



Above left and middle pictures: trial river cross-sectioning at Mexico station with OJT students from Bulacan State University (BulSU); top right: a still flooded stretch of McArthur Hi-way along the San Fernando-Apalit route during the flood verification survey relating to the SW monsoon event of August 2016.

Streamgaging and hydrological activities are regular tasks and responsibilities of every river basin center. It includes river cross-sectioning, river discharge measurements, update of elevation of zero level of staff gauges, post-flood surveys, inundation extent mapping, etc. These regular basic activities are required in the improvement and the enhancement of flood forecasting and warning operational activities of every river centers.

II. Public Information, Data provision, Trainings and other related Center Functions

2.1 Presentations & lectures in events, various occasions and functions

The PRFFWC, being situated in the Regional Government Center of Region 3, has always been tapped in a lot of IEC (Information, Education and Communication) activities mainly on topics relating to Hydromet issues within the PRB, in other areas in Region 3, and even outside of the region. IEC activities occupy a big part of the center's year-long operational activities especially during rainy season and flood events within the basin. As another priority activity, the center had tried to accommodate all requests from various entities but unfortunately, due to limited personnel and related resources there were several events that were forwarded to the NCR-PRSD. An aggregate total of 6,836 individuals were provided presentations and orientations on Hydromet-related information in some 40 occasions within and outside the basin of concern.

A chronological order of IEC conducted in various events and occasions for the year are as follows:

Date	Topic / Presentation	Event / (Venue)	Remarks
January 15	Pampanga River Basin & the PRFFWC-System	Educational field visit of Pura Elementary School from Tarlac Province / (PRFFWC)	393 students, parents and teachers
January 22	Pampanga River Basin & the PRFFWC-System	Educational field visit of Tarlac West Elementary School, Tarlac City / (PRFFWC)	300 students, parents and teachers
February 18	Floods in the Pampanga River Basin	Workshop on "Evidence-based Flood Contingency Planning" organized by ICHARM / (Luxent Hotel, Q.C.)	40 persons from various NGAs, NGOs and from ICHARM
March 01	Pampanga River Basin Flood Forecasting & Warning System – The pilot FFWS in the Philippines	Asian Water Cycle Symposium (AWCS) 2016 / (Tokyo University, Tokyo, Japan)	120 persons from various international institutions, agencies, etc.
March 17	Updates on the Flood Situation in the Province of Pampanga	Pampanga Province Flood Summit / (Bren Guiao Convention Center, CSFP)	4000 Barangay, Municipal, City and Provincial DRRMOs
March 18	Climate Outlook: March to August 2016	1 st Quarter RDRRMOs meeting led by OCD-3 / (OCD-3 Conference room, CSFP)	50 LDRRMO officers present
March 31	Climate Outlook: March to August 2016	Regional Project Monitoring Committee Meeting led by NEDA-3 / (NEDA-3 Conference room, CSFP)	26 persons from various regional offices



(L to R) Orientation of visiting students and teachers from the Tarlac West Elementary School (January 15); Participants and Guest speakers in the Workshop on "Evidence-Based Flood Contingency Planning" organized by ICHARM posed for a group picture (February 18); PRFFWC personnel as a panel speaker in the Asian Water Cycle Symposium 2016 in Tokyo University (March 01)

April 01	Climate Outlook: April to August 2016	Public Consultation Workshop on the formulation of an Integrated Climate-responsive Master Plan for the Pampanga River Basin (PRB) led by NEDA-3 / NEDA-3 Conference room, CSFP)	60 persons from different regional agencies and from various sectors
April 15	El Nino Updates and its effects	Tarlac-PDRRMO led Hacienda Luisita Locators regular meeting / (URC compound, Tarlac)	20 persons from various industrial corporations within the compound
April 26	Climate Outlook and Weather systems that may affect the country from May to Sept. 2016	PDRRMC-Tarlac quarterly meeting / (Tarlac City)	100 LGU personnel from the provincial and various municipal offices

May 05	Updates on the present El Niño and Climate Outlook	RDRRMC-3 First Coordination Meeting of the Disaster Preparedness Cluster / (OCD-3 Conference room, CSFP)	30 representatives from various Regional Agencies
May 31	Climate Outlook from June to October 2016	DRRM Orientation for Media personnel in Central Luzon organized by OCD-3 and supported by PIA-3 / (King's Royale, CSFP)	25 media and DRRM personnel
June 02	Climate Outlook: June to October 2016	DOH-3 sponsored orientation of Health Emergency Staff (HEMS) of Reg. 3 / (Eurotel, Angeles City)	50 HEMS officers
June 03	Climate Outlook: June to October 2016	OCD-3 organized Region-3 LDRRMOs meeting / (SACOP, CSFP)	76 LDRRMOs
June 16-17	SHINE program and Weather-Climate Information	UPVFI and Christian Aid "RISE" program in the island of Gigantes / (Granada National High School, Ballesteros Campus in Gigantes Island, Carles Iloilo)	25 secondary students and 3 teachers / advisers
July 18	Center Orientation	Field visit of MTC 2016 trainees / (PRFFWC)	42 trainees and coordinators
July 25	Hydromet hazards awareness and mitigation	DSWD-3 training for Quick Response Team (QRT) / (Redd Condotel, CSFP)	52 participants



(L to R) SHINE Program at Granada National High School in Gigantes Island, Iloilo (June 16-17); MTC trainees posed in front of the center during their visit (July 18); Cabiao National High School students being oriented by PRFFWC personnel on the operation of the center's system. (September 02)

July 26	Center Orientation: Pampanga River Basin & the PRFFWC-System	JICA experts field visit / (PRFFWC)	5 JICA experts and 3 local consultants
July 29	Hydromet Hazards and Warning Systems	NDCM 2016 Disaster Symposium of Olongapo CDRRMO / (SM City Olongapo Cinema 3)	200 participants from various sectors
August 11	Orientation on PRB and PRFFWC	Nueva Ecija LDRRMO's meeting and IEC on FFWSO for the province (Cabiao, N.E.)	102 LDRRMO personnel
September 02	Center Orientation: Pampanga River Basin & the PRFFWC-System	Educational field visit of Cabiao National High School, Nueva Ecija / (PRFFWC)	20 students & 4 teachers
September 06	Center Orientation: Pampanga River Basin & the PRFFWC-System	PDRRMO-Pampanga Orientation of new Job Order Geologists	2 PDRRMO-Pampanga Geologists
September 09	Center Orientation: Pampanga River Basin & the PRFFWC-System	Center visit by Holy Angel University Civil Engineering Students / (PRFFWC)	4 CE students
September 20	Center Orientation and field station visit	Visit from Mindanao Development Authority Officials / (PRFFWC, Mexico station and Guagua LGU)	3 MINDA, 2 LGUs, 2 HMD representatives
September 22	Climate Change Hazards and Projections	Orientation-Workshop on Climate & Disaster Risk Assessment (CDRA) for LGUs / (Majarah Hotel, Angeles City)	40 participants from various LGUs in Region 3
October 07	SHINE Orientation	SHINE program 2016 of the PDRRMO-Bulacan / (Dr. Felipe de Jesus National High School in Plaridel, Bulacan)	40 students & 2 group advisers
October 11	SHINE Orientation	SHINE program 2016 of the PDRRMO-	40 students & 2 group

		Bulacan / (Virgen de las Flores High School in Baliwag, Bulacan)	advisers
October 12	Climate Change Hazards and Projections	DILG-3 Orientation-Workshop on Climate & Disaster Risk Assessment (CDRA) for LGUs / (Travelers' Hotel, Subic)	43 LGU officers from 15 LGU areas in Region 3
October 13	SHINe Orientation	SHINe program 2016 of the PDRRMO-Bulacan / (Meycauayan National High School (Annex), Meycauayan, Bulacan)	40 students & 2 group advisers



New Bulacan Province SHINe school beneficiaries for the year 2016 (From top left to bottom right): Bajet-Castillo High School in Pulilan, Bulacan; Virgen de las Flores High School in Baliwag, Bulacan; Meycauayan National High School Annex in Meycauayan, Bulacan; and Dr. Felipe de Jesus National High School in Pulilan, Bulacan.

October 14	SHINe Orientation	SHINe program 2016 of the PDRRMO-Bulacan / (Bajet-Castillo High School, Pulilan, Bulacan)	40 students & 3 group advisers
October 18	Workshop on Rainfall issues	SHINe school revisit 2015 of the PDRRMO-Bulacan / (Angat National High School))	40 students & 2 advisers
October 18	Workshop on Rainfall issues	SHINe school revisit 2015 of the PDRRMO-Bulacan / (Binagbag National High School)	40 students & 2 advisers
November 02	Center Orientation and station field visit	Center visit by Bhutan's Department of Hydro-met Services personnel / (PRFFWC, Mexico & Arayat stations))	7 personnel from Bhutan's Department of Hydro-met Services and 2 Filipinos from AICE
November 17	SHINe updates	7th SHINe Conference organized by PDRRMO-Bulacan together with DepEd-Bulacan, Save the Children and various M/CDRRMOs in the said province / (8 Waves Hotel and Water Park, Bulacan)	370 students, teachers and guests



Delegate students in the 7th SHINe Annual Conference posed in 3 groups for the event pictorial (November 17)

December 01	Climate Change related Hazards and Projections	DILG-3 Orientation-Workshop on Climate & Disaster Risk Assessment (CDRA) for LGUs / (Majarahaj Hotel, Angeles City)	95 participants from 31 LGUs in Reg. 3
December 06	PAGASA's latest Climate	Tarlac-PDRRMC General Meeting / (La	70 provincial council

	Outlook	Majorica Hotel. Tarlac City)	members
December 07	Climate Change related Hazards and Projections	DILG-3 Orientation-Workshop on Climate & Disaster Risk Assessment (CDRA) for LGUs / (Majorajah Hotel, Angeles City)	110 participants from 34 LGUs in Reg. 3
December 08 & 09	Basics of Flood Forecasting & Warning	CMO conference for the NCR-PRSD personnel / (Alaminos, Pangasinan)	21 NCR-PRSD personnel
December 12	"Rainfall: The What, How and When..."	Rainfall Information for School Empowerment on DRR (RISE on DRR) program of MS Dev. Comm. Students of UP Los Baños in Taguig City Science High School / (Taguig Science H.S)	30 students, 6 teachers and 8 Dev. Comm. members
December 23 & 24	Tropical Cyclone Nina Updates	PDRA on T.C. Nina as called for by RDRRMC-3	10 council members



(L to R) PRFFWC personnel doing a presentation during the Tarlac-PDRRMC General Meeting (December 06); Participants and resource speakers posed for a group picture in the NCR-PRSD CMO Conference (December 08-09); PRFFWC personnel receives a Certificate of Appreciation from the Dean of Dev. Comm., UP-Los Baños as resource speaker in the RISE program of MS Dev. Comm. students in Taguig City Science High School (December 12).

2.2 Public information and Briefings (Multi-media)

Media exposures during inclement weather conditions and during flood events in the basin are regular happenings for the center. The center is at constant rapport with regional media (print, TV and radio) including the PIA-3 (Philippine Information Agency Reg. 3) which are all recipients of flood-related information for PRB. The center also provides similar information to non-media entities such as local contractors and the like.

For the year 2016, quite a number of media-related appearances were conducted especially during flood events in the PRB. Below is a list of media-related public information and briefings by the center:

- Interviewed by a video crew commissioned by Philippine Red Cross for a video presentation on issues regarding Local Flood Early Warning Systems (Jan. 26)
- Pre-recorded interview by CLTV-36 Regional TV on effects of El Niño in the province of Pampanga (March 16)
- Radio guest and with live radio interview in the regional radio program "Talakayan Ngayon" at station DWRW 95.1 FM (June 01; CSFP)
- Live interviews on weather forecasts "on air" in 7 occasions (June 01, 06, 07, 09, 10, 11, 27) to DWRW 95.1 FM radio station during the station program "Talakayan Ngayon".
- Live phone patch interview on the program of PDRRMO-Bulacan over at Radyo-Bulacan 98.3FM on topics relating to La Niña, etc. (June 28)
- Provided weather forecast live "on air" in 03 occasions (July 09, 11, 12) to DWRW 95.1 FM radio station during the station program "Talakayan Ngayon".
- Pre-recorded interview by CLTV-36 on updates and status of rivers within PRB during the SW monsoon as enhanced by Ty. Butchoy (July 11)
- Pre-recorded and live interviews on the effects of SW monsoon on the rivers within PRB by CLTV36 (Aug. 14 & 15); regular radio interviews on updates on effects of SW Monsoon and on daily weather updates for region 3 (Talakayan Ngayon Program hosted by Perry Pangan; 95.1 FM); Print media interviews (Sunstar and Inquirer) on the effects of SW Monsoon over PRB (from August 15 to 18)
- Live and pre-recorded interviews during the passage of Ty. Karen and STy. Lawin by the following radio and TV stations (Oct. 14 to Oct. 20): (DWRW 95.1 FM interviewed by Mr. Perry Pangan (7 times); DWRW 95.1 FM

interviewed by Mr. Joel Mapiles; CLTV 36 interviewed by Chastine Sayo (4 times); ABS-CBN Pampanga by Mark Gida & Pauline Manalo (2 times); CNN-Pampanga; DZMM interviewed by Noli de Castro; GNN-44 interviewed by Paolo Marcelo

- Resource person on issues relating to Climate Change in the OCD-3 Radio Program “OCD in Action” at station Bright FM 91.9, CSFP (Dec. 13)
- Pre-recorded TV interview by CLTV36 (regional TV) regarding status of Pampanga River after passage of Ty. Nina (Dec. 27)



(L to R) Video crew commissioned by Philippine Red Cross for a video presentation on Local Flood Early System (January 26); CLTV-36 reporter Jen Salenga's pre-recorded interview on effects of El Niño in the Pampanga Province (March 16); “Talakayan Ngayon” radio program on DWRW 95.1 FM, from left to right: radio anchor host Boy Santiago, PRFFWC personnel, OCD-3 ARD Loctoc, and host John Mapiles (June 01)



(L-R) Pre-recorded interviews by CLTV-36 field reporters Aaren regarding status of Pampanga River (July 11); and by field reporter Chastine on effects of SW monsoon on Pampanga River (August 14 and 15) and during Ty. Karen (October 17)



(from top to bottom and from L-R) Prerecorded interviews by field reporters from ABS-CBN Pampanga; by CLTV 36 on 2 occasions, by GNN-44 station, and by CNN-Pampanga during the passage of Super Typhoon Lawin over Luzon (October); Radio guest at 91.9 Bright FM station on the Radio Program “OCD in Action” (December 13)

III. Participation in various events, occasions & other undertakings (meetings, seminars, workshops, conferences, etc.)

The PRFFWC, as part of its continuing public information promotional service, has maintained active involvement in many undertakings that are mainly related to hydrological issues, flood monitoring, including Hydromet-related information sharing and operational flood forecasting and warning especially during PDRA (Pre-Disaster Risk Assessment); participation in extra-social curricular activities considering the center's limited logistical resources and manpower. Other participation in local, regional, national and even international undertakings, meetings and other similar gatherings which remain as a major social commitment of the center; providing its technical expertise has also benefitted quite a number of entities who have been partners in joint programs and project undertakings. The various activities and gatherings that the center attended for the year are chronologically listed below:

- Support and assisted the ICHARM visiting team in their pre-disaster recovery planning and SOUSEI project in two barangays of the Municipality of Calumpit, Bulacan (Jan. 12-14)
- Orientation on program of ICTO on fiber optics cable (FOC) for the DMGC (Jan. 19; NEDA-3 conference room)
- Presentation of the Climate Change and Vulnerability Assessment (CCVA) for the PRB as prepared by the PRB Committee Secretariat of NEDA-3 (Jan. 20, NEDA-3 Conference room)
- Scoping workshop on the value of RADAR technology for flood early warning in the Philippines with Potsdam University (Jan. 28-29, Amihan Conference room, Q.C.)
- 1st quarter 2016 DMGC-MANCOM cum Assembly meeting called for by DMGC-MC Chairperson, DILG RD Dijan. (Feb. 04, NEDA-3 Conference room)



Above: participants, guests and resource speakers gather for a group picture in the Asian Water Cycle Symposium 2016 held at Tokyo University (March 01-02)



(Top) PRFFWC, OCD, ICHARM & MDRMO-Calumpit personnel during a briefing with Mayor De Jesus of Calumpit, Bulacan (Jan. 12)

- Orientation on Cyber Security Roadshow: "Safe and Security Cyberspace for Juan and All" conducted by ICTO-DOST (February 19; Club Royale, Malolos, Bulacan)
- Meeting of the "Alyansa ng mga Baybay Bayan ng Bulacan at Pampanga" (ABB-BP) hosted by the Municipality of Masantol (February 23; Masantol Town hall)
- Preparation meeting with ICHARM for the Asian Water Cycle Symposium 2016. (February 28-29; Tokyo, Japan)
- Asian Water Cycle Symposium 2016 at Tokyo University, Japan (March 01)

(Related links: <http://wci.t.u-tokyo.ac.jp/events/awcs2016/photo.html>)



- Three (3) center personnel attended and participated in the celebration of WMO day at the PAGASA Science garden grounds, Quezon City (March 29)
- Organizational meeting on RAIN (Roadmap to Address the Impact of El Niño) called for by NEDA-3 (April 07; NEDA-3 Conference Hall)
- The center hosted the Google Cap resource group (picture above) in their presentation of possible development and enhancements on the formulation of basin flood information and warnings (April 12; 6 personnel coming from HMD, ETSD and WD)
- Meeting with DOST-3 officials with regards to the participation and preparations to the upcoming Regional-based NSTW celebrations (May 26; DOST conference room)
- RDRRMC meeting on thematic "Prevention and Mitigation" aspect led by DOST-3 (June 21; OCD-3 Conference room)
- Participated via phone patch report on T.D. Ambo in the PDRA emergency meeting as organized by the RDRRMC-3 (June 26; 10 RDRRMC members in attendance)

- Teleconference PDRA organized by RDRRMC-3 during the SW monsoon as enhanced by Ty. Butchoy (July 08; OCD-3 Conference room)
- PDRA meeting and RDANA (Rapid Damage Assessment and Needs Analysis) organized by RDRRMC-3 for SW monsoon as enhanced by Ty. Butchoy (July 11; OCD-3 Conference room)
- Participated with a booth exhibit in the Regional Science and Technology Week Celebration of DOST Region 3 (July 25 to 27; Walter Mart, CSFP)
- Diosdado Macapagal Government Center Mancom meeting (July 25; NEDA Conference room)
- Teleconferencing PDRA for T.D. Carina called for by RDRRMC-3 (July 29; OCD-3 Conference room)
- Emergency meeting by RDRRMC-3 re: effects of SW Monsoon on Reg. 3 (Aug. 13; OCD-3 Conference room)
- DMGC management committee meeting on the fiber optics and government center security issues (Sept. 07; NEDA-3 Conference room)
- RDRRMC-3 meeting re: Effects of the SW Monsoon (Sept. 09, OCD-3 Conference room)



Top: RDRRMC-3 member agencies representatives during a Pre-Disaster Risk Assessment (PDRA) meeting in preparation for the SW monsoon effects over the Region (July 08)



Above, the PRFFWC booth exhibit during its participation in the Regional Science & Technology Week celebration at Walter Mart, CSFP (July 25-27)



Participation of the center in the Regional Science & Technology Week Celebration included a brief message during the event's opening program. Above picture from the right, DOST-3 Regional Director J.C. Sicat, Philippine Science H.S. Clark representative, PRFFWC personnel & DOST-3 official.

- Resource person in the focus group discussions (FGD) on the issues "The Language of Disaster Communication in Farming and Fishing Areas in the Philippines: Kapampangan" organized and hosted by UP-Clark under their DA project (Sept. 16; Oasis Hotel, Clark)
- Coordination meeting on Science & Technology Research Partnership for Sustainable Development (SATREPS) with various NGAs as per organized by ICHARM (Sept. 21; UP, Diliman)
- PDRA meeting for STy. Lawin called for by RDRRMC-3 (Oct. 18, Oct. 19 (3 times); OCD Conference room)
- Assisted and provided site location information to JICA telecom expert / consultants involved in the project on "Strengthening Capacity of Integrated Data Management for FFW" (Oct. 24; PRB area)
- One personnel attended the presentation on "Pampanga Megalopolis: Well into the 21st Century" as per organized by the provincial government of Pampanga (Oct. 14; CSFP)
- Assisted and supported "Google CAP" team in their activities in the center (Nov. 15)
- Assisted JICA-NK consultants in their field visit of various stations within PRB; Oriented them in PRB / PRFFWC (Nov. 18; 2 JICA-NK consultants)
- Participated as chairman of workshop group on the topics "Infrastructure Development, Technology and Innovation and Ecological Integrity" in the Regional Consultation on the formulation of Philippine Development Plan 2017 – 2022 organized by NEDA-3 (Nov. 21; NEDA-3 Conference room)
- Participated in the DM Government Center's Unified Flag Ceremony hosted by the CHR-3 (Dec. 05; NEDA-3 grounds)
- 7th SHINE Annual Conference hosted by Provincial Government of Bulacan through the PDRRMO and supported by Provincial DepEd and various MDRRMOs in the province; (November 17; 8 Waves Water Park & Hotel, San Rafael, Bulacan) (*Related link: <http://bulacanshine.yolasite.com/7th-shine-conf-2016.php>*)



(L-R) Participants in the FGD on “The Language of Disaster Communication in Farming and Fishing Areas in the Philippines: Kapampangan” organized and hosted by UP-Clark in Oasis Hotel, Angeles City (September 16). Center visit of hydrologists and technicians from Bhutan’s Department of Hydro-met Services (November 02)



(Left) The 7th SHINE (School Hydrological Information Network) Annual conference with PRFFWC together with LDRRMO officers from various municipalities / city within the Province of Bulacan. (Right) Vedasto R. Santiago High School SHINE delegates demonstrate their prototype developed water level warning sensor during the 7th SHINE Annual Conference in 8 Waves Hotel and Water Park (November 17).

IV. Trainings

Trainings and other enrichment programs (seminars, workshops, etc.) that were granted / provided to center personnel during the year:

- PAGASA Technology Transfer Training (March 30 to April 08; National Engineering Center, UP, Diliman)
- Two (2) center personnel participated in the In-house training for the new version of the RRI (Rainfall-Runoff-Inundation) Model in GUI format as conducted by ICHARM and CTIE. (March 14-18; San Roque Power Corporation)



(L-R) GAD Seminar in Ilocos Sur; RRI in-house training at San Roque Dam Activity Center; International-based country training on GIS Operations & Management in South Korea.

- Gender and Development (GAD) seminar (May 4-6; Ilocos Sur)
- Country training program on “Improving Decision Making using GIS Operation and Management” managed by KOICA and co-sponsored by K-Water (June 9-25; South Korea)
- Training on Physical Planning Applications of Geographic Information System (GIS) (32 hours of training) as managed by NEDA-3 and RDC-III Pampanga River Basin Committee (July; Angeles City, Pampanga)
- International Training Program in Hydrological and Hydraulic Modeling for Flood Forecasting from August 21 to November 18, 2016 at Asian Institute of Technology in Bangkok, Thailand as organized and managed by the Regional Integrated Multi-Hazard Early Warning System (RIMES).

- Training of Trainors for the program of UPLB's Center for Strategic Planning and Policy Studies on the Adaptation and Mitigation Initiative in Agriculture (AMIA2). (November 28 to December 2; Green Sun Hotel, Makati City)
- Training participant in the CMO Conference for NCR-PRSD (December 7-8; Alaminos, Pangasinan)

On the other hand, the center also hosted a number of On-the-Job (OJT) trainees from various universities and colleges within Region-3. The usual training on center functions that were given to these trainees included data / information, documents handling through encoding, scanning and e-filing (for Information Technology or IT course). Depending on their area of concern, some trainees (Environmental Science course) were oriented on field activities such as river cross-sectioning and field validation surveys. During the period November 2015 until late quarter of 2016, a total of 17 students from various institutions rendered OJT tasks for the center. There were 6 Environmental Science students from Bulacan State University (BuSU), 2 commerce and 3 IT students from the Don Honorio Ventura Technological State University (DHVTSU), 4 Information Secretarial students from International School for Technology & Skills Development (ISTSD), and 2 IT students from the Nueva Ecija University of Science and Technology (NEUST).



(L-R) On-the-Job trainees from DHVTSU & NEUST; from ISTSD; and from BuSU together (with PRFFWC personnel)

V. Published Reports (In-house), features and other hydrological-related materials



Aside from the Annual report for 2015, other reports and documents that were prepared during the year included as follows:

- Proceedings on the 7th Annual School Hydrological Information Network (SHINE) Conference
(<http://bulacanshine.yolasite.com/resources/7th%20SHINE%20Conference-Nov2016.pdf>)
- Initial draft on the following PRFFWC reference manuals which are still being edited:
 - Reference Manual No. 1: General Information on Floods, Telemetry System, the Pampanga River Basin and Operational Activities for Flood Forecasting & Warning of the PRFFWC
 - Reference Manual No. 2: PRFFWC Flood Forecaster / Operational Hydrologist (& Hydro Technician) Guide in the preparation and Issuance of Flood Advisories and Flood Bulletins (with relevant information & other related issues); Flood Watch operational activities

VI. Recognitions for 2016

2016 PRFFWC received certificates of participation, completion, recognitions, appreciations, awards (individual and for the center), etc., for its uncommitted service and involvement in many FFW & DRR activities:

- Certificate of Participation in the Workshop on Evidenced-based Flood Contingency Planning given by ICHARM, PAGASA and Calumpit Municipality (February 18; Luxent Hotel, Q.C.)
- Certificate of Appreciation for outstanding presentation and contribution to the discussion of Flood Session in the Asian Water Cycle Symposium 2016 organized by University of Tokyo, PWRI, Asian Water Cycle Initiative and ICHARM (March 1-2; University of Tokyo, Japan)
- Certificate of Appreciation as resource person in the 1-day DRRM Orientation for Media Personnel in Central Luzon organized by RDRMC-3 / OCD-3 (May 31; King's Royale Hotel, Bacolor, Pampanga)

- Certificate of Appreciation as resource speaker during the SHINE Orientation and Training in Granada National High School in Gigantes Island, Carles, Iloilo given by RISE Gigantes Project coordinators Christian Aid and UP Visayas Foundation (June 17; Carles, Iloilo)
- Certificate of Participation for the PRFFWC in the Regional Science and Technology Week 2016 given by DOST-3 (July 25-27; Activity Center of Walter Mart, CSFP)
- Certificate of Appreciation given by DOST-3 for sharing invaluable expertise, knowledge, time and skills during the Regional Science and Technology Week 2016 (July 25; Walter Mart, CSFP)
- Certificate of Appreciation as resource speaker in the Orientation on Project SHINE given by Dr. Felipe de Jesus National High School in Plaridel, Bulacan (October 07, Plaridel, Bulacan)
- Certificate of Recognition as resource speaker in the SHINE Orientation Program at Virgen De Las Flores High School (October 11; Baliwag, Bulacan)
- Certificate of Appreciation for valuable insights as speaker in the Rainfall Information for School Empowerment on DRR Orientation & Workshop for Taguig Science High School (December 12; Taguig City)
- Bakas Parangal ng Kagitingan Awarded to 2 center personnel in recognition for their timely information shared during the passage of Super Typhoon Lawin. Award given by RDRRMC-3 (December 14)
- Bakas Parangal ng Kadakilaan: Pampanga River Flood Forecasting & Warning Center for provisions of timely warnings and flood information during the passage of Tropical Cyclones Karen and Lawin. Award given by RDRRMC-3 (December 14)
- Gawad PAGASA Best Hydrological Aide for 2016 (December 22; Science Garden, Q.C.)
- Gawad PAGASA Best Hydrologist for 2016 (December 22; Science Garden, Q.C.)
- Gawad PAGASA Innovation Outstanding Award; The Pampanga River Basin Scale Model (December 22; Science Garden, Q.C.)





2015 Awards that were given to the PRFFWC (center & individual) during the WMO celebrations at the PAGASA Science Garden Compound in Quezon City on March 29, 2016:

- Gawad PAGASA Best Hydrological Aide for 2015
- Gawad PAGASA NCR-PRSD Model Employee for 2015
- Gawad PAGASA Best Hydrologist for 2015
- Gawad PAGASA Best Flood Forecasting & Warning Sub-Center for 2015



PRFFWC production 2016-17

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<http://prffwc.synthasite.com/annual-reports.php>

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