

Pampanga River Basin Flood Forecasting & Warning Center (PRFFWC)

Annual Report 2014: Programs, Activities, Events and Accomplishments



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PRFFWC and the year 2014

The Pampanga River Basin Flood Forecasting & Warning Center (PRFFWC), on its 41st year of Flood Forecasting & Warning (FFW) operational services for the year 2014, has remained to be the foremost basin-based Flood Forecasting & Warning Center in the country. Being situated at the Government Regional Center in the City of San Fernando in Pampanga (CSFP), it has also become the hub of hydrometeorological information and related activities not only within Pampanga River Basin (PRB) but also throughout the whole of Region 3.

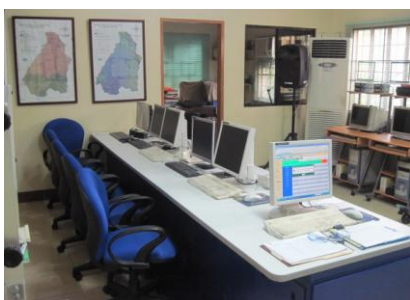
The year 2014 can be considered mediocre in terms of flood events within the Pampanga River Basin (PRB). There was no major (basin-wide) flooding during the year. With relatively less activity in its flood warning operational function for the year, the center still maintains its active involvement in information, education and communication programs not only within the basin itself or in the region but even outside of these limits.

Several highlights of programs and activities for the year 2014 included as follows:

- Issued 6 (six) flood advisories (FAs) and 17 flood bulletins (FBs) for the basin during 4 events
- Uploaded rainfall (RR) / water level (WL) data and updated hydrological forecast in the PRFFWC website (www.prffwc.webs.com) for 365 days
- Conducted a post-storm surge validation survey for the event T.Glenda (July 2014)
- As resource speakers on hydrometeorological-related topics in 68 occasions to an aggregate total of about 10,425 individuals from various sectors; Accommodated live and taped radio and TV interviews in regional stations particularly during center flood watch operations
- Participated in DRRM meetings at various levels (Regional, Provincial, City/Municipal & Barangay levels), and in other inter-agency related undertakings; active partner in several undertakings to various DRRMOs, NGOs, and NGAs within and outside the basin.

The center was also beset with several problems during the year. Data reception at the center was marred by frequent downtimes. The center has had more downtimes of system's data transmission for the year 2014 compared to previous years since its transfer to CSFP in 2009. Upper basin stations during the last quarter of the year particularly the month of December were almost all practically down. Center remains unable to maintain its telemetry stations due to certain limitations in both manpower and logistics. The center's other major regular activities such as hydrological / hydrographic measurements e.g. river cross-sectioning, river velocity measurements, post-flood surveys, and also even several other invitations and requests as resource person, participation in meetings, etc. were not met and plainly attributed to limitations on logistics, manpower, outdated and inoperative hydrographic equipment.

It appears that the center remains neglected of its necessary functional needs as per stipulations reached in the Grant-In-Aid project "Improvement of Flood Forecasting & Warning System in the Pampanga and Agno River Basins (Phase I)" as requested by the Government of the Philippines in 2001 from the Government of Japan, approved and implemented in 2003 and 2008, respectively. Since its transfer of operations in 2009 to its present location in CSFP, the PRFFWC remains logistically impaired without a service vehicle, a bit undermanned with only 6 persons (2 flood forecaster levels, 3 hydrological technicians and 1 systems communication technician) manning 24/7 shifting operations, outmoded/old (mostly not working and requires rehabilitation and / or calibration) hydrographic measuring equipment, infrequent delays in payments of utilities, etc.



The present limitations of the center in terms of its hydromet-related needs have caused some significant setbacks in operational requisites and regular functional activities of PRFFWC. Nonetheless the center has continued to lead other FFWS centers in the country in its operational flood forecasting and warning services. As always the center hopes to improve these services and further strengthen its rapport with LGUs, communities, with other entities within and outside the basin of concern.

I. Operational Activities

1.1 Flood Monitoring and Warning Activities

During regular or non-flood watch operations, the center provides updated (8:00 AM) daily hydrological forecast including updates on the past 24-hour rainfall totals and instantaneous water level readings of all telemetry stations within the basin. For its flood watch operational activities, the center issues two forms of messages to its basin recipients – Flood Advisory (FA) and a Flood Bulletin (FB).

Flood Advisory is hydrological information mainly used for situational flood awareness and preparedness purposes intended for specific area/s within the basin. Initialized anytime to start the flood watch period when the rivers and streams are generally likely to be affected by a relatively high streamflow or a possible flash flood.

Flood Bulletins are more specific flood information indicating forecasted river behavior and areas that are likely to be affected; it is issued whether or not being it is preceded by an FA during flood watch period. It can also be initialized anytime and issued normally at regular intervals or as need arises, thereafter until finalized when floodwaters have generally subsided or no significant increases in the present situation is expected further. FB is more detailed as to forecast of river level changes at monitoring points in terms of its rising and falling trends including the possible areas (towns/cities) to be affected. Intermediate FB issuance are done when situations warrants it.

Four events were covered by the center for the year with the following Flood Advisories (FAs) and Flood Bulletins (FBs) issued as per event below:

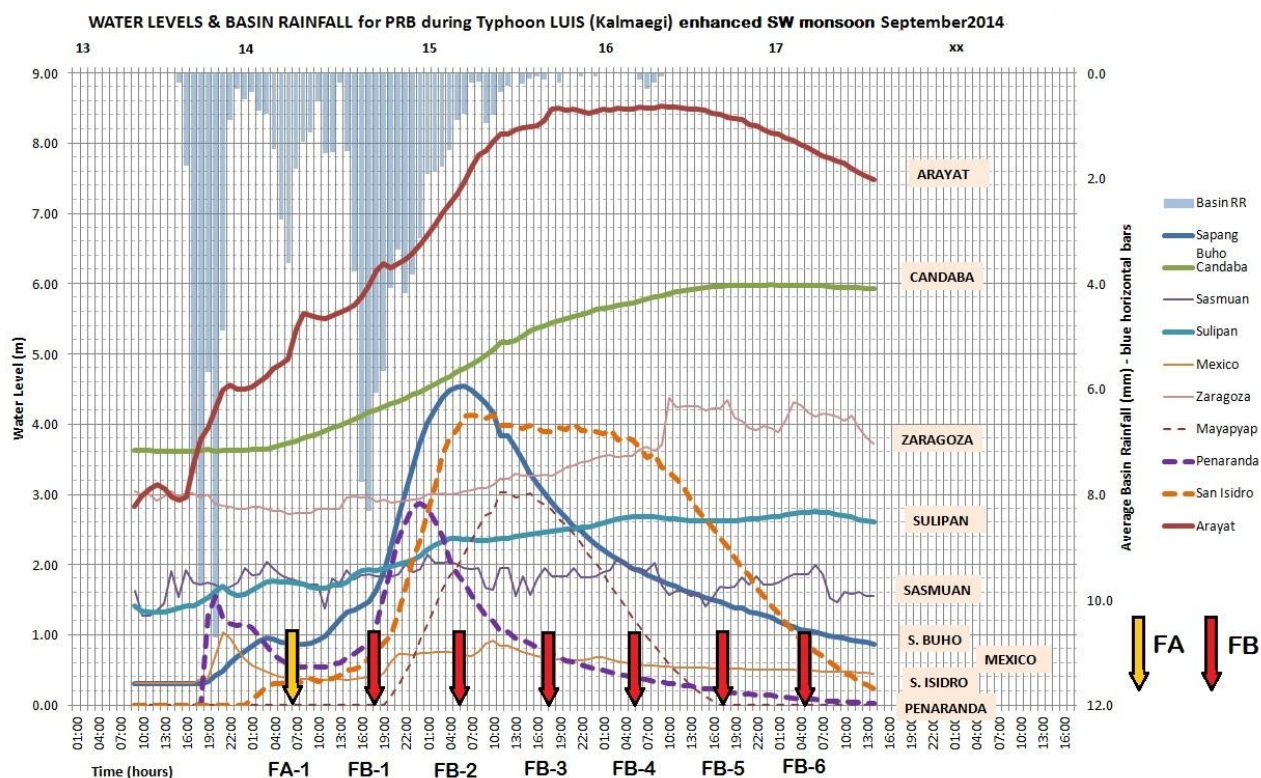
Event	Period	FA issued	FB issued
Typhoon Glenda (Rammasun)	July 13-17	1	5
SW Monsoon enhanced by Typhoon Luis (Kalmaegi)	September 14-17	1	6
SW monsoon enhanced by Tropical Storm Mario (Fung-Wong)	September 19-21	1	6
Typhoon Ruby (Hagupit)	December 07-09	3	
Total		6	17



Department of Science and Technology
PHILIPPINE ATMOSPHERIC, GEOPHYSICAL AND ASTRONOMICAL SERVICES ADMINISTRATION (PAGASA)
Pampanga River Flood Forecasting and Warning Center, Hydro-Meteorology Division / NCR-PRSD
Brgy. Maimpis, San Fernando, Pampanga (Gov. Site) <http://www.prffwc.webs.com>

FLOOD BULLETIN NO. 1 – PAMPANGA RIVER BASIN AND ALLIED RIVER SYSTEM				EXPECTED FLOOD SITUATION:	P = POSSIBLE T = THREATENING O = OCCUR F = PERSIST
ISSUED AT: 7:00 PM, 14 SEPTEMBER 2014 VALID UNTIL THE NEXT ISSUANCE AT 5:00 AM TOMORROW UNLESS THERE IS AN INTERMEDIATE BULLETIN BASIN RAINFALL AS OF 6:00 PM TODAY: PAST 6-HR = 28.8 MM FORECAST 24-HR = MORE THAN 100 MM					
BASIN EXPECTED RESPONSE:					
WATER LEVEL STATION (STN)	RIVER/ SWAMP WATER LEVEL (WL) TREND AT STATION	FLOOD SITUATION MESSAGE	PARTICULAR LOW-LYING AREAS		
SAPANG BUHO STN., PAMPANGA RIVER	NOW AT 1.63 M / TO REACH 3.70 M. ALERT WL TONIGHT	FLOODING IS POSSIBLE	PALAYAN CITY, BONGABON, LAUR, GEN. NATIVIDAD, LLANERA, CABANATUAN, STA. ROSA, SAN LEONARDO		
PEÑARANDA STN., PEÑARANDA RIVER	NOW AT 1.13 M STILL RELATIVE LOW; INCREASE IS EXPECTED	FLASHFLOOD (AND LANDSLIDES) IS POSSIBLE BEGINNING TONIGHT	GEN. TINIO, PEÑARANDA, SAN LEONARDO, GAPAN		
CANDABA STN., CANDABA SWAMP	NOW AT 4.21 M / TO REACH 4.50 M. ALARM WL BY THIS EVENING	FLOODING IS POSSIBLE BEGINNING TONIGHT	CANDABA (PAMPANGA); SAN MIGUEL & SAN ILDEFONSO (BULACAN)		
ARAYAT STN., PAMPANGA RIVER	NOW AT 6.18M GRADUALLY INCREASING	FLOODING IS POSSIBLE	ARAYAT, SAN LUIS, SAN SIMON, APALIT, MACABEBE, MASANTOL, CALUMPIT, HAGONYO		
ANGAT RIVER	STILL RELATIVE LOW; SLOW INCREASE IS EXPECTED	POSSIBLE FLOODING BEGINNING TONIGHT	RIVERSIDE AREAS ALONG ANGAT RIVER: ANGAT, NORZAGARAY, BUSTOS, BALIUG, PULILAN, PLARIDEL, CALUMPIT		
POSSIBLE COASTAL FLOODING IN THE LOW-LYING SEASHORE AREAS			HAGONYO, PAOMBONG		
COMMUNITIES AT MOUNTAINSIDE SLOPES ARE ALERTED FOR POSSIBLE LANDSLIDES; PEOPLE LIVING IN LOW-LYING AREAS PARTICULARLY THOSE ADJACENT TO THE ABOVEMENTIONED RIVERS AND THE DISASTER RISK REDUCTION AND MANAGEMENT COUNCILS CONCERNED ARE ADVISED TO TAKE NECESSARY APPROPRIATE ACTIONS					
HTH / RPY / PTH					

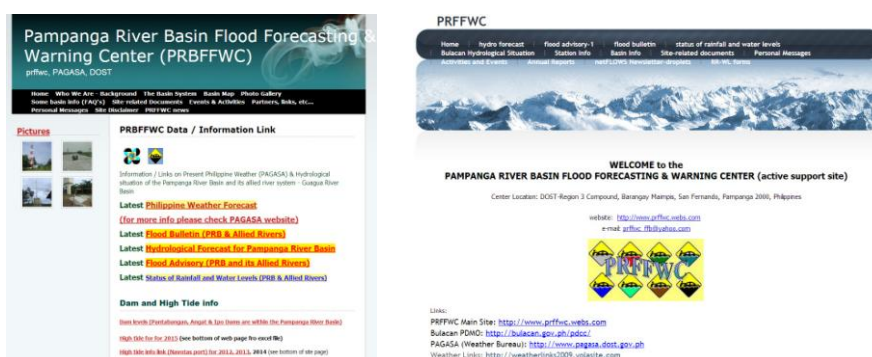
A sample flood bulletin issued during the Typhoon Luis enhanced SW monsoon (September 14 to 17) event as shown above.



Above shows the various station hydrographs and basin hyetograph including a timeline issuance of FAs and FBs during the flood event Typhoon Luis enhanced SW monsoon (September 14 to 17).

FAs and FBs issued are immediately sent by fax to the various disaster risk reduction and management offices (DRRMOs) – National (NDRRMO) thru the HMD and/or OCD-3, Regional (RDRRMO), and Provincial (PDRRMOs) within the basin and other regular recipients that includes the Regional PNP (Camp Olivas), DILG-3, PIA-3, FFWS-HMD and to the NCR-PRSD of PAGASA. There are instances of information directly being handed over to OCD-3 when there is a breakdown in communication link. The information is also provided to other entities (e.g. Regional TV and Radio stations, other LGUs, etc.) upon request. Information dissemination and sharing is further sustained by uploading them in the center's website, thru e-mails and thru social media accounts – Facebook and Twitter. Regular updates on the daily status of RR and WL data are done whole year round. The center's websites are:

["www.prffwc.webs.com](http://www.prffwc.webs.com) and/or www.prffwc.synthasite.com"



During the year Typhoon Glenda was the strongest tropical disturbance, in terms of wind strength, that came close to the basin. Other events such as tropical disturbances Typhoon Luis and Tropical Storm Mario were quite far from the basin however they both induced the southwest monsoon towards the west and southwest portions of the basin. Typhoon Ruby, which devastated a big part of eastern Visayas, only went passed below the basin. These events, however, did not cause any major widespread flooding in the basin. Flooding was generally localized at certain areas only within the basin.

1.2 PRB Dataset Status for the year (and Analysis)

The PRFFWC system has 17 RR and 10 WL (individual / combinational) telemetry stations within the provinces of Nueva Ecija, Pampanga and Bulacan. A digital tipping bucket rain gauge is manually monitored at the center.

Telemetry data reception during the year was rather poor with a relatively high number of data reception downtimes. Mayapyap RR-WL telemetry station was already down prior to the start of the year and was aggregately down for more than half of the year 2014. Other stations at the upper basin area had downtimes close to 10% for RR and more than 10% for WL. Additionally, one station, Sulipan RR-WL telemetry station, was also perceived to be reporting erroneous data especially during inclement weather events.

For year 2014, a total of 130,552 station-hours of rainfall data and 76,161 station-hours of water level data were received. Downtimes (D/T) for RR totaled 18,368 station-hours or 12.3% while WL downtimes were 11,439 or 13.06% station-hours, both having an increase of more than 6% from last year. Again, there were higher downtimes for WL stations as compared to RR stations. A table of the data matrix for the year is given below:

PRB RR telemetry stations

Station	Data Received (stn-hrs)	Downtimes (D/T) (stn-hrs)	% Downtimes for the year	Remarks
Muñoz	7416	1344	15.3	D/T due to repeater station problems
Sapang Buho	7419	1341	15.3	D/T due to repeater station problems
Calaanan	7412	1348	15.4	D/T due to repeater station problems
Mayapyap	3261	5499	62.8	Already down prior to start of the year
Gabaldon	7418	1342	15.3	D/T due to repeater station problems
Palali	7413	1347	15.4	D/T due to repeater station problems
Zaragoza	7413	1347	15.4	D/T due to repeater station problems
Peñaranda	7414	1346	15.4	D/T due to repeater station problems
San Isidro	7196	1564	17.9	Interference problems
Sibul Springs	8551	209	2.4	Interference problems
Arayat	8335	425	4.9	Interference problems
Candaba	8553	207	2.4	Interference problems
Porac	8555	205	2.3	Interference problems
Mexico	8551	209	2.4	Interference problems
San Rafael	8549	211	2.4	Interference problems
Sasmuan	8548	212	2.4	Interference problems
Sulipan	8548	212	2.4	Erroneous especially during RR events

PRB WL telemetry stations

Station	Data Received (stn-hrs)	Downtimes (stn-hrs)	% Downtimes for the year	Remarks
Sapang Buho	7432	1328	15.2	D/T due to repeater station problems
Mayapyap	3561	5199	59.3	Already down prior to start of the year
Zaragoza	7426	1334	15.2	D/T due to repeater station problems
Peñaranda	7446	1314	15.0	D/T due to repeater station problems
San Isidro	7635	1125	12.8	Interference problems
Arayat	8443	317	3.6	Interference problems
Candaba	8554	206	2.4	Interference problems
Mexico	8554	206	2.4	Interference problems
Sasmuan	8556	204	2.3	Interference problems
Sulipan	8554	206	2.4	Interference problems

Mayapyap RR and WL telemetry station had the most number of downtimes during the year; data reception was down more than half of the year. It can also be seen that stations at the upstream part of the basin had more downtimes as compared to downstream portion. Obviously, the essence of an earlier flood warning is reduced with the breakdown of the upstream stations especially during times of inclement weather.

1.3 PRB Data Summary for the year

Summary stats for RR and WL stations within the basin based on available data received at the center are as follows:

PRB Rainfall Stations

Station	Total RR for the year (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	(1,646)	102	July 6	(93)	(59)
Sapang Buho	(1,508)	97	July 3	(95)	(74)
Gabaldon	(1,880)	138	July 15	(106)	(39)
Zaragoza	(1,334)	85	July 26	(91)	(42)
Mayapyap	(861)*	(58)*	(July 26)*	(53)*	(47)*
Peñaranda	(1,589)	114	August 25	(99)	(62)
Calaanan	(1,553)	79	September 09	(97)	(36)
Palali	(1,480)	88	September 13	(111)	(40)
San Isidro	(1,178)	72	September 13	(91)	(38)
Arayat	(1,169)	106	September 19	(96)	(35)
Candaba	(1,305)	72	September 19	(96)	(48)
Sibul Spring	(1,691)	121	September 13	(115)	(43)
Sasmuan	(1,360)	74	September 19	(98)	(52)
Sulipan	(848)*	(68)**	October 01	(71)**	(48)**
Mexico	(1,346)	91	September 19	(101)	(38)
Porac	(1,263)	81	August 25	(98)	(53)
San Rafael	(1,379)	91	September 19	(105)	(34)
San Fernando	1,391	74.7	August 25	129	**
Baliuag University ++	1,456.5	81.3	June 27	107	78.2

PRB Water Level Stations

Staion	Max WL for the year (meters)	Time / Day of Max WL	Remarks (event of maximum WL for the year)
Sapang Buho	4.54	0600H / September 15	SW monsoon enhanced by T. Luis
Zaragoza	4.37	0900H / September 16	SW monsoon enhanced by T. Luis
Mayapyap	(3.03)**	1200H / September 15	SW monsoon enhanced by T. Luis
Peñaranda	2.87	0000H / September 15	SW monsoon enhanced by T. Luis
San Isidro	4.13	0700H / September 15	SW monsoon enhanced by T. Luis
Arayat	8.53	0900H / September 16	SW monsoon enhanced by T. Luis
Candaba	6.14	1200H / September 21	SW monsoon enhanced by T. Luis & T.S. Mario
Sasmuan	3.44	0700H / April 15	SW monsoon enhanced by T. Luis
Sulipan	3.13	1100H / September 20	SW monsoon enhanced by T. Luis & T.S. Mario
Mexico	1.17	2200H / September 19	SW monsoon enhanced by T. Luis & T.S. Mario

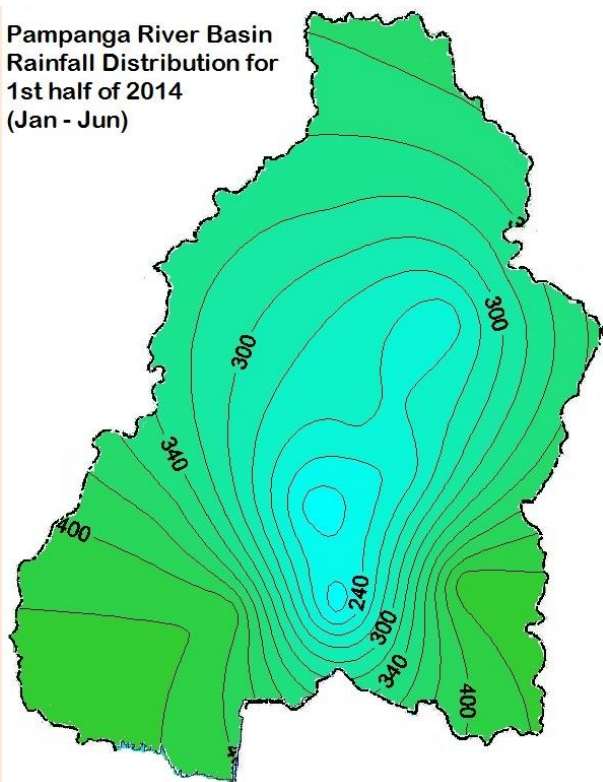
Legend: () – with data gaps; ()* - month/s of data gaps; ()** - with erroneous readings during rain periods ** - n/a

++ - SHINE observation station

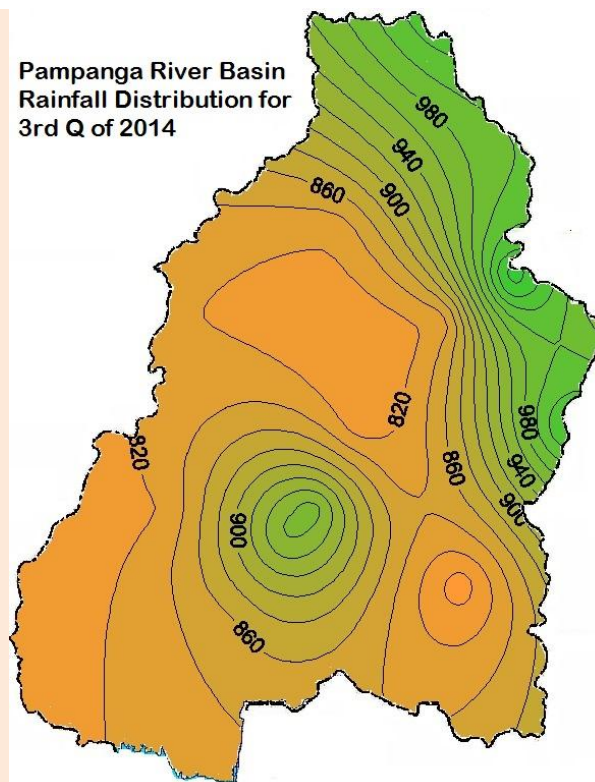
Limitations and problems brought about by data reception downtimes at the center have partly affected the data quality-control activities. At any rate, the center has continued to process the center's dataset (available only for the year) as to annual total; maximum 24-hr (meteorological day), date of maximum 24-hr RR, number of RR days, maximum observed water level for the year at each station, etc.

Continuing and regular manual RR observations at the center (San Fernando RR station) using digital tipping bucket resulted at processed information that includes annual and monthly RR total, maximum 24-hour (met day) RR, day of occurrence of maximum 24-hour RR, and the number of RR days for each month. The center has also been receiving monthly RR observations from Baliuag University (BU) which is attached to the SHINE program in Bulacan. Similar processing of their (BU) observations has also been carried-out at the center.

**Pampanga River Basin
Rainfall Distribution for
1st half of 2014
(Jan - Jun)**



**Pampanga River Basin
Rainfall Distribution for
3rd Q of 2014**



PRB Rainfall Distribution for first half of year 2014, January to June, (top left) and for the third quarter (top right). No annual distribution and/or last quarter of the year distribution map were produced due to data observation downtimes.

1.4 Telemetry System and Station Physical Maintenance:

The center started the year 2014 with Mayapyap station already inoperational for both RR and WL data reception. Prior to the year the said station was already down since October 2013 as a result of the effects of Typhoon Santi. Mayapyap station continued to have its WL data reception down until June 2014 while the RR data already went through almost half of that month.

System's frequency interference had been an intermittent problem in the transmission-reception of data from telemetry stations throughout the whole year. Other problems normally originate at the repeater stations. The failure of data reception at upstream stations for almost whole of December was traced to the Gapan Repeater station. Other problems that beset the PRFFW system included server systems error (date and time issues), repeater cable problems either cut or vandalized, antenna requiring realignment / reorientation due to Typhoon Santi, etc.

The PRFFW network system is generally maintained by the HMTSS-HMD (Hydromet Telecom Services Section of the Hydromet Division). The PRFFWC's resident technician participates and provides support during quarterly routine maintenance. There were four maintenance trips undertaken during the year 2014 as follows: March 03-11, June 01-08, September 04-11, and November 6-11. It is quite unfortunate though that the maintenance team seldom does provide the center (only when asked) with activity report after each trip. Hence, details of repairs to stations cannot be qualified nor quantified in this annual report. Telemetry system and station's physical maintenance are important and necessary regular activities in the continued operational function of an FFWS services.

Center's physical maintenance for the year included repair and rehabilitation of DEG room entrance canopy (right picture) which was destroyed during passage of Typhoon Glenda; cleaning and repair of air conditioning units; installation of an additional cut-off valve to the main pipe going to the outside comfort room; and test / check of the water pump motor by ETSD personnel. There were talks of repainting of telemetry stations carried-out by the administration; unfortunately the center is not fully aware of this since there were no reports provided/forwarded for such activities... as always, a rather sad practice being carried-out within the agency.



1.5 Hydrographic Works and hydrological related activities

Hydrographic and hydrological activities are part of the tasks and responsibilities of every river basin center. These include river cross-sectioning, river discharge measurements, update of elevation of zero level of staff gauges, post-flood surveys, inundation extent mapping, etc. River cross-sectioning should be undertaken regularly, after every flood event or at least every year, since riverbed conditions are constantly changing. Discharge measurements, on the other hand, are also relatively important in updating the assessment flood levels and for flood modeling purposes. These activities are regular basic activities required in the improvement and the enhancement of flood forecasting and warning operational activities of every river center.

There were few hydrographic / hydrological related activities undertaken by the center during the year and mostly restricted to assistance and supporting roles only. The hydrographic / hydrological related activities undertaken are as follows:

- Participated in the river trekking / ocular survey along Pampanga River at Hagonoy and at Bebe-Masantol cut-off channel organized by a student taking up Masters course at Delft University Technology; survey activities were also supported by PDRRMO-Bulacan (January 16)
- Participated and assisted ICHARM (International Center for Water Hazard and Risk Management under the auspices of UNESCO) group in their activity survey re: research program on flood recovery plan on two areas (Calumpit and Guagua) within the Pampanga River Basin (March 14-15)
- Participated and assisted ICHARM flood team in their interview / survey at various agencies and areas re: SOUSEI program on flood damage assessment in the PRB (March 18-20)
- Assisted and participated in data collection activities of the ICHARM researcher, Mr. Kamimera, in his field visits and surveys within Region 3 in connection with the research program entitled "Assessment of GSMaP satellite rainfall products in Asian monsoon region" (August 12-13)
- Conducted storm surge validation survey after the passage of Typhoon Glenda that affected the lower sections of the PRB including coastal areas of Bataan (August 20-26)



(Top Left) River trekking and ocular survey of Pampanga River with Delft University Masteral student and member of PDRRMO-Bulacan; (Middle) meeting-presentation of ICHARM-PRFFWC with the DSWD-3 regional and division heads and (Top Right) visit - interview with the Mayor of Municipality of Guagua, Pampanga. ICHARM conducted interviews and surveys of various agencies including LGUs within target areas as supported by PRFFWC in their "SOUSEI" and flood recovery programs in the PRB.

(Right) ICHARM & PRFFWC interview with PDRRMO-Pampanga officials; (Far right) ICHARM personnel, Mr. Kamimera, with PRFFWC personnel during a visit at the Clark Synoptic station in Angeles City, Pampanga.





(Left) PRFFWC personnel doing field surveys of coastal areas during validation of storm surge effects brought about by T. Glenda (August).

The center, during the year, had also assisted the Department of Science and Technology (DOST-3) region 3 in the hydrological assessment, identification and validation of locations for setting-up of additional automatic rain gauges (ARGs) and water level monitoring sensors (WLMS) within the PRB and in Region 3.

It is quite unfortunate that the center is unable to take a lead in hydrographic works and hydrological surveys mainly due to logistics limitations, and partly lack of personnel. Another restriction is the center's outmoded and mostly non-functioning old hydrographic equipment, mostly of which requires calibration and maintenance.

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

2.1 Presentations / lectures in various events, occasions and functions

Similar to previous years, public information through invitations in special events has continued to be the top activity of the center. Being strategically situated in the government regional center of Region 3, requests for presentations, lectures, orientations and information sharing has been a year-round affair. Requests and invitations as a resource person or as a particular topic speaker / lecturer were 100% painstakingly accommodated by the center. This included requests coming from various entities (LGUs, NGAs, NGOs, academe, etc.) within and outside the basin.

The center was able to provide presentations and lectures to an estimated aggregate total of 10,425 individuals in about 68 events / occasions with varied range of topics that included the usual "Tropical Cyclone / Flood Hazards Awareness and Mitigation", "Flood Early Warning Systems", "Climate Outlook", Updates on Tropical Cyclone events, and other subjects such as "Storm Surge", "Basics of Hydromet Devices". etc.

Following is the list of the topics presented / lectured in events and occasions for the year 2014:

- "Local Flood Early Warning Systems Program (Hydrographic Survey, Flood Alerts & Warning Levels)" to the GIZ pilot LFEWS barangays of Juban and Irosin Municipalities of Sorsogon (January 13, 40 persons)
- "Hydromet Hazards; Awareness & Mitigation" in the BDRRMC Summit 2014 organized by Baliuag-MDRRMC. (30 January, SM-Baliuag Mall, 800 barangay officials from 27 BDRRMOs of said municipality)
- "Local Flood Early Warning Systems Program (Set-up and Operations)" to local officials of Tabaco and Malinao in Albay (February 08, 32 persons); for Naujan, Victoria and PDRRMO officials of Oriental Mindoro (February 10, 20 persons)
- "Storm Surge Hazard Mapping in the Philippines" in the Philippine Meteorological Society Convention (February 21; Bantayog ng mga Bayani; 88 persons)
- "Storm Surge Assessment and Hazard Mapping" for Las Piñas (February 21; Eurotel Zapote; 88 participants); for Paranaque (February 25; PNHS; 66 participants); for Navotas (February 28; Navotas City Hall; 67 participants)



PRFFWC personnel involvement as resource speakers on various events within and outside the PRB: (Top left) at Legazpi, Albay with LGU officials (February 08); (Top middle) Baliwag Barangay DRRM Summit held in SM Baliwag (January 30); (Top right) at Juban, Sorsogon with Municipal and Barangay officials (January 13).

- "Real-time Monitoring in PRB" in the NWRB-KOICA funded project on "Establishment of an integrated 3D GIS-based Water Resources Information System in the Provinces of Pampanga and Bulacan". (March 13; Luxent Hotel, Q.C.; more than 60 persons from various agencies were present)
- "Storm Surge Hazard Mapping" for Malabon (March 28)

- “Climate Outlook for April to August of 2014” in the Bulacan PDRRMC Meeting (April 14; Hiyas Convention, Malolos; more than 45 persons from various provincial departments were present)
- “Basics on Hydromet Devices: Observations/Interpretations” in the Bataan Provincial Engineers Monthly Coordination Meeting (April 16; Municipality of Bagac; around 35 persons from the provincial and municipal / city engineer’s offices in attendance)
- “Climate Outlook for the 2nd - 3rd Quarter of the year” at the RDRRMC 2nd Quarterly meeting (May 16; SACOP, San Fernando; 115 persons in attendance)
- “Climate Outlook” in a joint PDRRMO-Bulacan & MDRRMO-Baliwag meeting. (May 20; Baliwag, Bulacan; 25 persons in attendance)
- “Typhoon Emergency Preparedness” and “Tropical Cyclone tracking” in the INCHEM company program on DRR (May 21; Guiguinto, Bulacan; 21 employees in attendance)
- “CBFFWS” and on “PRB and PRFFWC” to visiting Myanmar, Vietnamese and GIZ-Philippines representatives who are on a study visit regarding implementation of LFEWS in their country (May 23; 30 persons)
- “Hydromet Hazards and Warning System” in the various Provincial summit led by the RDRRMC-3 as follows:
 - Bataan Province (May 22; Balanga City; 150 DRRMOs & Local Chief Executives in attendance)
 - Aurora Province (May 28; AMCO, Baler; 75 DRRMOs & LCEs in attendance)
 - Pampanga province (June 05; Clark area; 215 DRRMOs & LCEs in attendance)
 - Tarlac province (June 10; 390 DRRMOs & LCEs in attendance)
 - Zambales province (June 23; 160 DRRMOs & LCEs in attendance)
 - Bulacan Province (June 26; 480 DRRMOs & LCEs in attendance)



PRFFWC personnel participation in various PDRRM summits within the region: (Top uppermost) Pampanga PDRRMC Summit (June 05); (Top) Bulacan PDRRMC Summit (June 26); (Left) PRFFWC personnel providing a presentation in one of the summit events; (Far left) PRFFWC personnel in red shirt & other guest speakers from other agencies during the Aurora PDRRMC Summit (May 28)

- “PRB and PRFFWC” in the IEC for FFWSDO for Pantabangan Dam target areas - downstream municipalities (June 04; Cabanatuan; 30 persons in attendance)
- “Operation of Hydromet Devices and Interpretation of Data generated by these instruments” to DOST-3 Regional and Provincial personnel. (June 09, DOST-3 conference room; 35 DOST regional and provincial officers)
- “Weather Updates” in the RDRRMC-3 general meeting for preparations for the celebration of the National Disaster Consciousness Month 2014. (June 13; OCD-3 conference hall, 30 persons)
- “Hydromet Hazards and Warning Systems” in CLTV36 seminar on “Broadcast Media, News Reporting and Coverage of Disasters” for its news reporters (June 14; LGC training ctr., SFDO; around 40 persons in attendance)
- Center Operations Orientation to OJT trainees of Hydrologist Training Course:
 - First Batch composed of 7 persons (June 09 to 13)
 - Second Batch composed of 8 persons (June 16 to 20)
 - Third Batch composed of 8 persons (June 30 to July 04)
 - Fourth Batch composed of 8 persons (July 07 to 11)
- Orientation on PRFFWC System to Davao del Norte DRRMO and HMD personnel (July 01; 4 from Davao del Norte DRRMO & 2 from HMD)
- “Weather Issues and Effects of Dam Discharge to Pampanga Province” in the Orientation on the Different Programs of the National Government Agencies for the Barangay Executives of Pampanga Province (July 04; Clark, Pampanga; 170 Barangay Officials in attendance)



- “Climate Change and Climate-related Hazards” in the Angeles City Public Schools Stakeholder’s Orientation on DRR (July 01; Gabaldon Hall, Pulung Bulu, Angeles City; 117 participants) – Left picture
- “Multi-Hazard Maps” in the GMMA READY IEC Campaign” (July 07; Malolos, Bulacan; 180 participants)

- “Hydromet-related Hazards” in the Development of Social Enterprise and Resilient Livelihood by the Partnership of Philippine Support Services Agencies (PHILSSA), Caucus of Development NGO Networks (CODE-NGO), Center for Emergency Aid and Rehabilitation, Inc. (Concern, Inc.) with support from the Peace & Equity Foundation (PEF). (July 11; SACOP, CSFP; 20 concerned participants in attendance)
- Orientation on the conduct of Flood Drill in Bgy. San Antonio Uno, Noveleta, Cavite (July 12; whole barangay participated)
- PRB & PRFFWC Orientation to members of the TC WGH AOP2 during their visit to the center in connection with the project Extreme Flood Forecasting System (July 14; 7 WGH members and 2 PAGASA personnel)
- “Hydromet Hazards and Warning Systems” in the Disaster Fair and Symposium organized by Olongapo City DRRMO (July 28; Olongapo City Convention Center; around 100 persons present)
- PRB & PRFFWC Orientation to members of Malabon City DRRMO and ACCORD personnel in connection with their program on DRRM Capacity Building (August 13; 24 Malabon DRRMO-ACCORD and 1 HMD personnel)



- PRB & PRFFWC Orientation to members of Malabon City DRRMO and ACCORD personnel in connection with their program on DRRM Capacity Building (August 13; 24 Malabon DRRMO-ACCORD and 1 PAGASA personnel)
- “Storm Surge” during the PAGASA-DOST Media Seminar Workshop (August 15-17; Holiday Mansion, Alfonso, Cavite; 30 persons in attendance) – Left picture

- GMMA-READY IEC in Cavite (Sept 01 to 05, Trece Martirez, Cavite; 933 participants in 4 clusters)
- “Hydromet-hazards awareness and EWS” in the Project of National Nutrition Council regarding the expansion of the Food and Nutrition Security – Early Warning System to various their target Municipalities. (Sept. 03; Botolan, Zambales; 33 Barangay and Municipal personnel participated)
- Center Briefing and Orientation to JICA Evaluation Team (September 18; Ms. Mishima and a support person plus 1 HMD personnel)
- “Climate Change Hazards and Projections” in the Local Climate Change Adaptation Plan (LCCAP) of 14 target municipalities of Region 3 as organized by DILG-3 (Sept. 16; Olongapo; 49 municipal officers in attendance)
- “Climate Outlook for the Last Quarter of 2014” in the Joint-PDRRMC-C/MDRRMC Meeting of the Province of Bulacan (Sept. 24; Malolos; 135 persons in attendance)
- Orientation of School Hydrological Information Network for Assemblywoman Felicitas G. Bernardino Memorial Trade School in Marilao, Bulacan as organized by Bulacan-PDRRMO and Marilao-MDRRMO (Sept. 30, Marilao; 40 students and 4 advisers participated)
- Orientation on School Hydrological Information Network as follows:
 - Obando National High School (Oct. 01; Obando, Bulacan; 40 students, 13 teachers and 3 MDRRM officers)
 - Iluminada R. Mendoza Memorial High School (Oct. 02; Bocaue, Bulacan; 40 students, 1 teacher-adviser and 1 MDRRM officer)
 - Sto. Cristo National High School (Oct. 07; SJDM, Bulacan; 40 students, 3 teacher-advisers and 3 MDRRM officers)

- SHINe Revisits & Orientations as follows:
 - Norzagaray high School (Oct. 08; Norzagaray, Bulacan; 40 students and 1 teacher-adviser)
 - Tibagan National High School (Oct 08; Bustos, Bulacan; 40 students and 2 teacher-advisers)
 - Binagbag High School (Oct. 09; Angat, Bulacan; 40 students and 1 teacher-adviser)
 - San Rafael National Trade School (Oct. 09; San Rafael, Bulacan; 40 students, 2 teacher-advisers and 1 MDRRM officer)
 - Angat National High School (Oct. 13; Angat, Bulacan, 40 students, 1 teacher-adviser, and 1 MDRRMMO personnel present)
 - SJDM National High School (Oct. 14; SJDM, Bulacan, 40 students, 3 teacher-adviser, and 2 MDRRMMO)
 - Fortunato F. Halili Agricultural School (Oct. 14; Sta. Maria, Bulacan, 40 students, 2 teacher-adviser, and 2 MDRRMMO)
 - Akle High School (Oct. 15; San Ildefonso, Bulacan; 40 students & 2 teacher-advisers)
 - DRT High School (Oct. 15; DRT, Bulacan; 40 students & 2 teacher-advisers)



- PRFFWC Orientation to visiting KOICA representatives and NWRB personnel (Oct. 14; 3 KOICA representatives and 1 NWRB personnel)
- “Storm Surge and Climate Outlook for the last Quarter of 2014” to various critical coastal municipalities and barangays of Pampanga (Oct. 24; Pampanga Capitol; around 60 provincial, municipal and barangay officials)
- PRFFWC Orientation to visiting DPWH-JICA teams (Oct. 29; 6 JICA representatives and 7 DPWH personnel)
- SHINe Revisits & Orientations as follows:
 - SHINe Schools in Calumpit and Hagonoy (Nov. 05; Calumpit & Hagonoy; 80 students, 4 teachers)
 - Vedasto High School and John J. Russell High School (Nov. 06; San Miguel, Bulacan; 80 students, 4 teachers)
- “Pakikiisa at Kaunlaran ng Kabataan: Kalamidad at Sakuna Kayang Iwasan.” in the Angat National High School Symposium (Nov 11; Angat NHS; 100 secondary students from 8 secondary schools of Angat including 10 teachers in attendance)
- Oriented 1 personnel of Mindanao-PRSD in the operations of PRFFWC and daily monitoring of PRB (Nov. 10-14; PRFFWC)
- “Hydromet Hazards Awareness & Mitigation” in the DRRM Summit of the Municipality of Cabangsan, Zambales (Nov. 18; Angeles City; 48 municipal DRRM employees in attendance)
- “LFEWS 101: The Science of Flood Early Warning System” to various GIZ established LFEWS personnel (Nov. 18; Tacloban; 25 persons)
- “Storm Surge and other Hazards” to Region 4-B (MIMAROPA) DRRMOs (Nov. 19; Manila)
- “SHINe updates” in the 5th Bulacan SHINe conference (Nov. 21; 8 Waves Resort, San Rafael Bulacan; 260 student & teacher participants (related link: www.bulacanshine.webs.com)

(Below left) 5th SHINe Welcome tarp at the entrance to 8 Waves Hotel; (Below middle) PRFFWC personnel presenting SHINe updates; (Below right) The main venue of the 5th SHINe conference inside the 8 Waves Hotel.



- Updates on Tropical Cyclone Ruby in the PDRA-emergency meeting of RDRRMC-3”; PRFFWC is PAGASA’s representative/member of PDRA group for the region (Dec. 05; OCD-3 Conference Room, San Fernando, Pampanga; 30 RDRRMC-3 members present)

- Updates on T.C. Ruby in the PDRA-emergency meeting of PDRRMC-Bulacan (Nov. 05, Malolos City, Bulacan; 60 council members present)



(Far left) B. Z. Guiao Convention Center filled with Barangay officials during the 443rd Pampanga Day Celebration. (Left) Governor "Nanay" Pineda & Vice-Gov. "Delta" Pineda presenting a certificate of appreciation to PRFFWC.

- "Typhoon & Storm Surge" in the 443rd Pampanga Week-long Celebration (Dec 06; CSFP; 4,040 barangay officials from 505 barangays of Pampanga) – Top pictures
- "Hydrometeorological Hazards and Overview of PRFFWC" during the DRRM-CCA Summit 2014 of the City of San Jose del Monte, Bulacan (Dec. 12; Conference Hall Grotto Vista; 110 Municipal and Barangay officials in attendance)

2.2 Public information through Radio, TV and Newsprint interviews

The center has generally been at the forefront in providing updates on PRB hydrometeorological conditions and weather situations within the region. It has actively supported the various media practitioners in the region not only during times of disasters (flood events) but also during other related events and occasions. Radio and TV station interviews and talk show programs have also been a part of the center's "end to end" public information drive.

Some media "encounters" during the year are as follows:

- Pre-recorded interviews on PRB Situation and Dam Water Levels by CLTV-36 (June) – bottom left picture
- Media Press conference briefing by RDRRMC members at Hiyas ng Bulacan, Malolos in preparation for the celebration of National Disaster Consciousness Month. (June) – bottom middle picture
- Live Press briefing with RDRRMC-3 officials at the PRFFWC lobby during passage of Typhoon Glenda close to the basin. (July 15) – bottom right picture



- Live radio interview at the program "Talakayan Ngayon" at 95.1 DWRW-FM, CSFP (July 16) – bottom left picture
- Live TV interview on the morning update program on regional TV channel CLTV-36, CSFP (July 16) – bottom middle & right pictures





- Various live and pre-recorded interviews by various CLTV-36 regional TV reporters (above L to R) during Typhoon Glenda by Sarah (July 15); Post-Glenda situations by Liezl (July 18); during the SW Monsoon enhanced by Typhoon Luis event by Joshua (Sept. 19)
- Regular basin condition updates were also provided through the radio station GV-AM 792 Khz; other networks such as SOLAR News, UNTV, and newsprint Bulacan Daily particularly during the passage of Typhoon Glenda and SW monsoon-related events in July and September, respectively.

III. Participation in events & other undertakings (meetings, seminars, workshops, conferences and other activities)

The center has maintained its active involvement and has supported many undertakings related primarily to hydrological situation and monitoring, information and operational activities within the PRB; other extra-curricular activities throughout the year considering its limited logistical resources and manpower. Participation in local, regional, national and even international undertakings, meetings and other similar gatherings remain as a major social commitment of the center; sharing of hydrological information and technical expertise has benefitted also quite a number of entities who have been, in one way or another, partner of the center in several successful joint programs and project undertakings.

- Assisted the JICA evaluation group in their interviews and in their conduct of post-evaluation on improvement of Flood Forecasting & Warning System for Pampanga River Basin. (January 23-24)
- Participated in the Post-Disaster Needs Assessment (PDNA) activity in various areas of Visayas affected by Typhoon Yolanda. (January 11-26; 1 center personnel participated)
- Participated in the Science for Safer Community Program of DOST IEC campaign entitled “Iba na ang Panahon” as part-presenter / facilitator during breakout session as follows:
 - Region 3 (March 03); Oxford Hotel, Clark; 2 center personnel participated
 - Region 4A (March 06); Batangas; 1 center personnel participated
 - Zamboanga (April 07); 1 center personnel participated
- One personnel participated in various GMMA-READY activities as follows:
 - Peer reviews (March 11, April 15, October 15 and October 29)
 - IEC activity for Pasay and Manila (April 04, 24-25)
 - General meeting (September 16, Quezon City)
 - Progress Report and Planning meeting (November 10-11; Clark, Pampanga)
 - Final peer review and planning (December 11-12, Cocoon Hotel)
- Attended NRCP General Assembly for Division 12 (March 26-27; Manila Hotel & October 10; Science Garden)
- One center personnel attended the proposal presentation on “Tidal and Fluvial Flooding at the Pampanga Delta” by the graduate student, Engr. Arnold Van’t Veld, of TU Delft; event was spearheaded by DILG-3 (May 07; Angeles, Pampanga)
- Attended the project launching of the NGO - Save the Children, entitled “Enhancing the Resilience of Urban Communities to Disasters and Climate Change (ENCORE)” as per invitation by said NGO. (May 14, UP-Diliman)
- Assisted Property personnel and COA representatives in the inventory check of equipment and facilities within the PRB center compound. (June 19)
- Participated in the meeting organized by NWRB regarding the project entitled “Establishment of an integrated 3D-GIS based Water Resources Management Information System in the Provinces of Pampanga and Bulacan” which is being funded by KOICA. (July 14; NWRB, Q.C.; 1 center personnel participated)
- Participated, as agency player for men, in the 2014 DOST Bowling Tournament held in Starmall, Alabang, Muntinlupa. (September)

- Participated in the RDRRMC-3 emergency meeting on “Pre-Disaster Risk Assessment (PDRA)” called for by OCD-3 (July 20; OCD-3 conference room)
- Attended and represented PAGASA in the meeting called for by NEDA-3 re: possible collective internet service restructuring for offices within the government center. (19 August; NEDA-3)
- Attended and participated in the meeting called for by DILG-3 regarding Formulation of the Local Climate Change Adaptation Plan (LCCAP) for the Component Cities and HUCs of Reg. 03. (Sept. 04; DILG-3, CSFP)
- Attended and participated in the PDRA meeting called for by the RDRRMC-3 prior to passage of Typhoon Luis (Sept 12; OCD-3 conference room; 1 center personnel participated)
- Participated in the Unified Flag Raising Ceremony within the government center organized by DOST-3, CSC-3, and SSS-3 (Sept. 15; NEDA grounds; 1 center personnel participated)
- Attended and participated in the general meeting of DMGC (Diosdado Macapagal Government Center) Management Committee on issues pertaining to policies and guidelines of various agencies within the government center. PRFFWC-PAGASA is a member of the management committee. (Oct. 09; NEDA-3 conference room)
- Participated, and as part organizer, in the 5th SHINe Annual Conference for Bulacan Province together with various activity partners, Provincial Government of Bulacan, PDRRMO-Bulacan, Save the Children, DepEd-Bulacan, etc. (November 21; 8 Waves Hotel and Water Park, San Rafael, Bulacan; 260 students and teachers from 26 elementary and secondary schools within the Province)



(Top left) SHINe delegates gather around the main venue room at 8 Waves Hotel; (Top middle) Elementary delegates do their school cheer during the event; (Top right) School SHINe group receiving their personal computer award from Bulacan-PDRRMO; (Below) SHINe groups display various cool design shirts during the event.



(SHINe Conference related pics: <https://www.facebook.com/raul.agustin.906/posts/10201852657276341>)

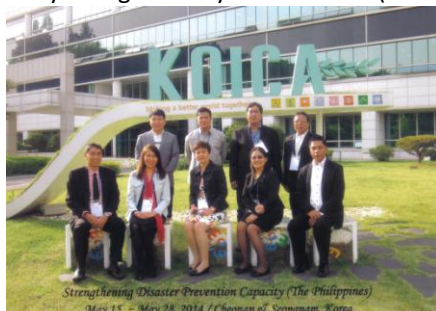
(SHINe Conference proceedings link: <http://bulacanshine.yolasite.com/5th-shine-conf-2014.php>)

- Attended and participated in the PDRA orientation and year-end Conference of RDRRMC-3 (Nov. 28; Hacienda Gracia, Lubao)
- Relayed by fax the Angat Dam Hydrological Situationers, #'s 1 to 7 from December 24 to 31 to various concerned agencies, e.g. OCD-3, Bulacan-PDRRMO, Calumpit and Hagonoy MDRRMOs, etc. as per draft Angat Dam Info warning dissemination protocol.

IV. Trainings

Trainings and enrichment programs that were granted to center personnel during the year:

- “Refresher Course on Meteorological Observations, Practices and Procedures” for NCR-PRSD personnel (March 11-15; Baguio; 1 center personnel participated)
- “Training course for PAGASA Forecasters, Hydrologists, and Researchers: Capacity Enhancement for Doppler Radar Application in Nowcasting” (March 25-28, PAGASA training center, 1 center personnel participated)
- Overseas training on “Strengthening of Disaster Prevention Capacity” sponsored by KOICA (May 14 to 28; South Korea, 1 center personnel participated) – Bottom left picture
- REDAS Training of GMMA-READY for PAGASA & MGB partners (December 01-05; Amihan, PAGASA C.O.)
- International training program entitled “Knowledge Sharing Program of Flood Forecasting System & Hydrologic Survey for PAGASA” (December 08-12; South Korea) – Bottom middle & right picture



The center, as always and a rather depressing practice, received few trainings and enrichment programs as compared to Central Office and the WFFC Compound-based agency personnel. On the other hand, the center was a host and a training area for On-the-Job trainees of the Hydrologist Training Course (HTC) 2014. The trainees were provided orientation on basin monitoring and center operational activities including tasks on working-out hydrological data analyses for basin hydrological information and enhancement of flood forecasting & warning services. A total of 31 OJTs in 4 batches (1 week each) were trained at the center from the period June to July.



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

There were relatively few reports produced by the center during the year and are listed below. This again is another indication of the lack of hydrological field activities as a result of center limitations in both mobility and manpower. All materials are available upon request at the center although some materials (from previous years) can be downloaded at the center's website (www.prffwc.webs.com) or at other supported websites.



- Draft report on the Post Storm Surge verification survey due to Typhoon Glenda in the coastal areas of Bataan, Bulacan and Pampanga. (August 2014)
- Proceedings on the 5th School Hydrological Information Network (SHIne) Conference, (November 2012) (Conference proceedings link: <http://bulacanshine.yolasite.com/5th-shine-conf-2014.php>)

VI. Recognitions

The center prides itself with several certificates of appreciation as resource speaker / lecturer or plainly just providing support and sharing technical knowledge / expertise received in various occasions and events within and outside the PRB. It is worth noting that the center has continued its efforts in accommodating various entities in the area of

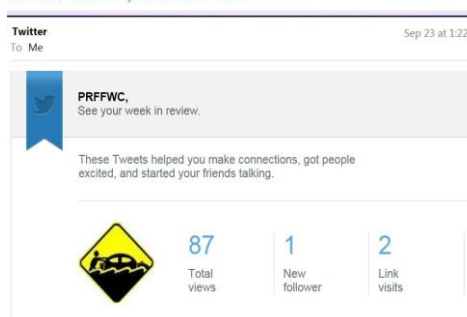
knowledge sharing and public information throughout the year considering its limitations in both personnel and logistics.



The center's website was also a "hit" during the year; it had been appreciated, reposted, and shared several times; FAs and FBs issued were also re-tweeted numerous times especially during events... below are some of the picked-up posts / accounts that were posted in the social media "facebook", and also report of views of the center's website.



PRFFWC, check out your week on Twitter



SiteWit Monthly Report



PRFFWC, check out your week on Twitter





PRFFWC production 2014

Previous annual reports available at the following link:

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

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