



Republic of the Philippines
Department of Environment and Natural Resources
MIMAROPA Region
Provincial Environment and Natural Resources Office

DENR MIMAROPA RECORDS SECTION
09 DEC 2022
EDD
INCOMING
OUTGOING
By November 23, 2022
TIME: 7K

MEMORANDUM

FOR : The Regional Executive Director
MIMAROPA Region

THRU : The OIC-ARD for Technical Services
DENR MIMAROPA

FROM : The OIC, PENR Officer
Oriental Mindoro

SUBJECT : SUBMISSION OF MONTHLY REPORT ON DATA
GENERATED FROM THE SCIENCE-BASED REAL-TIME
WATERSHED MONITORING INSTRUMENTS FOR THE
MONTH OF NOVEMBER 2022

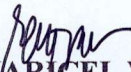
Forwarding is the monitored and analyzed data generated from the installed watershed instruments within Mag-Asawang Tubig and Bongabong Watersheds. A total of five (5) instruments within the watersheds were installed to secure an early warning device to nearby communities.

As compared to the month's data the level of water is much higher than the previous period. From 8.027 m to 9.390 m, the increase is about 1.363 m or an increase of 16.98%. This can be observed that during this month, the experienced typhoon Paeng and to the onset of Amihan.

Attached are the narrative report and data generated for this month.

For information and record.

For and in the absence of the OIC, PENR Officer:


MARICEL V. SUPLEO

Chief, Management Services Division
In-charge, Office of the PENRO



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TSD-CDS/aem



November 23, 2022

MEMORANDUM

FOR : The Regional Executive Director
MIMAROPA Region

TRHU : The OIC, PENR Officer
Oriental Mindoro

FROM : The Database Manager IT Specialist
CDS Personnel, PENRO Oriental Mindoro

SUBJECT : **SUBMISSION OF MONTHLY REPORT ON DATA
GENERATED FROM THE SCIENCE-BASED REAL-TIME
WATERSHED MONITORING INSTRUMENTS FOR THE
MONTH OF NOVEMBER 2022**

This is to submit the monitored and analyzed data generated from the installed instruments of watershed in Province of Oriental Mindoro.

At present, the downstream (Automated Weather Station: Department of Agriculture Compound, Victoria, Oriental Mindoro), midstream (Automated Weather Station: Macatoc Elementary School, Victoria, Oriental Mindoro), and upstream (Automated Weather Station: Bongabong, Oriental Mindoro) watershed instruments are all operational; data from the downstream and midstream are available, but no record from the Zentra Cloud platform is available for the upstream.

The Ground Water Level Monitoring Station in MinSU Compound is also now functioning; however, the Automated Water level Station in Calapan City need's replacement of battery and a purchase request is done.

For information and record.


ALISTER EARL M. MEMAN

**MONTHLY REPORT ON DATA GENERATED FROM THE SCIENCE-BASED REAL-TIME WATERSHED MONITORING INSTRUMENTS
NOVEMBER 2022**

I. INTRODUCTION

Mag-Asawang Tubig Watershed (Victoria, Oriental Mindoro)

The Mag-asawang Tubig Watershed (MTRW) is one of Oriental Mindoro's key watersheds, with 12,533 hectares proposed for rehabilitation in the 2013-2019 PDPFP. It is an important watershed because it provides irrigation to 40,000 hectares of rice fields in the flood basins of the Mag-asawang Tubig and Bucayao rivers. These two large rivers are linked by the Panggalaan River, which originates in Mag-asawang Tubig and flows through Calapan City before discharging to Calapan Bay.

The watershed is also expected to support the proposed hydroelectric power plant which is another vital support mechanism for the development and progress of the province and the whole island.

The Municipality of Victoria is 34 kilometers-about half an hour travel from Calapan City, the provincial capital of Oriental Mindoro, Victoria is bounded on the north by the Municipality of Naujan, on the southeast by the Municipality of Socorro, and on the southwest by the Municipality of Sablayan, one of the Municipalities of Occidental Mindoro. The town's geographical location is approximately 130° 11' latitude and 121° 17' longitude.

Status of Watershed Instruments Installed

At the moment, the downstream (Automated Weather Station: Department of Agriculture Compound, Victoria, Oriental Mindoro), midstream (Automated Weather Station: Macatoc Elementary School, Victoria, Oriental Mindoro), and upstream (Automated Weather Station: Bongabong, Oriental Mindoro) watershed instruments are all operational; data from the downstream and midstream are available, but no record from the Zentra Cloud platform is available for the upstream.

The Ground Water Level Monitoring Station in MinSU Compound is also now functioning; however, the Automated Water level Station in Calapan City need's replacement of battery and a purchase request is done.

II. DATA ANALYSIS

Mag-Asawang Tubig River Watershed (MATRW)

As stated earlier, Mag-Asawang Tubig River Watershed has two (2) AWS, one (1) GWMS, and one (1) AWLS.

Below is the Summary of the data from the watershed monitoring station in Mag-Asawang Tubig River Watershed for October 21- November 22, 2022.

The stream flow level averages to 8.33 m for period of October 21-November 22, 2022. The water level rose to a maximum of 9.39 m while the lowest was detected 6.47 m. It was noted that the maximum level of water was observed on October 29, 2022 at 5:00 pm while the lowest level was observed on November 08, 2022 at 8:45 pm.

Table 1. Summary of data from Automated Water Level Station (AWLS), Abaton Madlang Bridge, Parang Calapan City, Mag-Asawang Tubig River Watershed for November 2022.

Watershed Monitoring Instrument Parameter	Number of Instruments Installed	Period Covered	Average	Maximum	Minimum
Streamflow Level (m)	1	October 21- November 22, 2022	Water Level (mtrs): 8.33 System Battery(volts): 10.905	Water Level (mtrs): 9.39 System Battery(volts): 13.5	Water Level(mtrs): 6.47 System Battery(volts): 6.21

During the mid-week of November 2022, the installed battery of the AWLS in Abaton Maidlang Bridge, Parang Calapan City, was drained, an inspection and maintenance were done to dismantle the battery, and a request was made for an urgent replacement as soon as possible.

For the meantime, the battery was recharged with the intention of putting it back at the AWLS station to assure continuity of the data, but the following day the battery gave up and drained. As of present a purchased request is done for the replacement of the battery.

Table 2. Summary of data from Ground Level Water Station (GLWS), (MinSU Compound) Victoria, Mag-Asawang Tubig River Watershed for November 2022.

Watershed Monitoring Instruments Parameter GWMS MINSU	Number of Instruments	Period Covered	Average	Maximum	Minimum	Remarks
Groundwater level (mm)	1 (MinSU)	October 21 – November 22, 2022	7708.654	8650	5797	
Groundwater Temperature (°C)	1 (MinSU)	October 21 – November 22, 2022	26.64	26.7	26.6	
Conductivity (mS/cm)	1 (MinSU)	October 21 – November 22, 2022	0.289	0.299	0.279	

The groundwater level (mm) averages to 7708.654 mm for period of October 21-November 22, 2022, the maximum level reaches 8650 mm and the minimum groundwater level is 5797 mm. The battery condition per mV (Battery Voltage) in minimum is 7899mV.

The Figure 1. below shows the trends of the data trough graph indicating the different perimeter corresponds to groundwater level, groundwater temperature, and electrical conductivity.

Figure 1. Monthly Water level (mm) in MinSU Compound, Mag-Asawang Tubig River Watershed for October 21 – November 22, 2022.



Table 3. Summary of data from Automated Weather Station (AWS), DA Compound, Brgy. Alcate, Victoria, Mag-Asawang Tubig River Watershed for October 2022.

Watershed Monitoring Instruments Parameter AWS-DA compound	Number of Instruments	Period Covered	Average	Maximum	Minimum	Remarks
Rainfall (mm)	1	October 21- November 22, 2022	0.248	23	0	
Air temperature (° C)	1	October 21- November 22, 2022	26.01	33.4	20	
Relative Humidity (%)	1	October 21- November 22, 2022	96.38	101.5	67.3	
Wind Velocity (m/s)	1	October 21- November 22, 2022	0	0	0	
Wind Direction (AWS DA Victoria)	1	October 21- November 22, 2022	0	0	0	
Solar Radiation (W/m ²)	1	October 21- November 22, 2022	95.099	826.2	0	
Soil Moisture (%)@10m	1	October 21- November 22, 2022	-22.560	39.7	-43	negative value indicates that there is an error on reading of the sensor
Soil Moisture (%)@30m			0	0	0	

Based on the AWS on Table 3. the average rainfall of 0.248 mm and maximum rainfall of 23 mm, this indicate that rainfall event is high from October 21- November 22, 2022, the amount of water along the downstream is at high level.

Table 4. Summary of data from Automated Weather Station (AWS), Macatoc Elementary School, Victoria, Mag-Asawang Tubig River Watershed for October 2022.

Watershed Monitoring Instruments Parameter AWS-Macatoc Elementary	Number of Instruments	Period Covered	Average	Maximum	Minimum	Remarks
Rainfall (mm)	1	October 21- November 22, 2022	0.188	18.4	0	
Air temperature (° C)	1	October 21- November 22, 2022	27	33.6	27.3	
Relative Humidity (%)	1	October 21- November 22, 2022	98.32	108.5	62.8	
Wind Velocity (m/s)	1	October 21- November 22, 2022	0.305	4.2	0	
Wind Direction (AWS Macatoc)	1	October 21- November 22, 2022	102.80	359	0	
Solar Radiation (W/m ²)	1	October 21- November 22, 2022	108.144	792.8	0	
Soil Moisture (%)@10m	1	October 21- November 22, 2022	0	0	0	negative value indicates that there is an error on reading of the sensor
Soil Moisture (%)@30m			6.83	17.5	-9.2	

Based on the AWS on Table 4. the average rainfall of 0.188 mm and maximum rainfall of 18 mm, this indicate that rainfall event is high from October 21- November 22, 2022, the amount of water along the midstream is also at high level.

Bongabong River Watershed (BRW)

Table 5. Summary of data from Automated Weather Station (AWS), DENR CENRO Roxas Brgy Hagan, Bongabong, Oriental Mindoro 9ranger Station), Bongabong River Watershed for October 2022.

Watershed Monitoring Instruments Parameter AWS-Bongabong	Number of Instruments	Period Covered	Average	Maximum	Minimum	Remarks
Rainfall (mm)	1	October 21 – November 22, 2022	-	-	-	There is no record shown from the ZENTRA Cloud system.
Air temperature (° C)	1	October 21 – November 22, 2022	-	-	-	There is no record shown from the ZENTRA Cloud system.
Relative Humidity (%)	1	October 21 – November 22, 2022	-	-	-	There is no record shown from the ZENTRA Cloud system.
Wind Velocity (m/s)	1	October 21 – November 22, 2022	-	-	-	There is no record shown from the ZENTRA Cloud system.
Wind Direction (AWS Bongabong)	1	October 21 – November 22, 2022	-	-	-	There is no record shown from the ZENTRA Cloud system.
Solar Radiation (W/m ²)	1	October 21 – November 22, 2022	-	-	-	There is no record shown from the ZENTRA Cloud system.
Soil Moisture (%) @10m	1	October 21 – November 22, 2022	-	-	-	There is no record shown from the ZENTRA Cloud system.
Soil Moisture (%) @30m		October 21 – November 22, 2022	-	-	-	There is no record shown from the ZENTRA Cloud system.

Based on one-unit Automated Water Station in Bongabong River Watershed, there were no data shown from the Zentra cloud system platforms. Based on the monitoring from the site station the instruments were in-tack and the power source is in good condition. To be able to retrieve and have a complete data of the station a travel to the station is scheduled, the process of retrieving the data is by using a laptop with Zentra Utility software and communication cable to be connected to the installed logger, if no issues concerning the battery. Another option is manually download of data or by clicking upload to software.

Observation

A total of four (4) watershed monitoring instruments (1 AWSLS, 1 GWMS, and 2 AWS) in Mag-Asawang Tubig River Watershed, and only one (1) Automated Weather Station in Bongabong River Watershed were installed in the Watershed are of Oriental Mindoro.

Base on the gathered data there is an increase in water level due to rainfall, the temperature often increases and the area is much cooler compared to previous month. The weather systems have a great effect to the increase of water level during this period, the easterlies, shearline, low pressure areas, monsoon, and tropical cyclones.

Further, the AWS in Hagan, Bongabong, Oriental Mindoro is for manual retrieval of data and was scheduled to complete all un-recorded data before the submission of the 4th Quarter Report. Also, a problem was encountered on the Automated Water Level Station in Abaton Maidlang Bridge, Parang, Calapan City a procurement of new battery was requested for replacement of the drained battery. While the remaining installed watershed instruments within the province has a complete raw data provided.

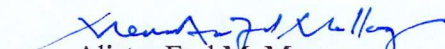
The watersheds showed that rainfall is high at its peak season, more rainfall was measured within the given period of reading. Further, the groundwater level is also in a high level thus rainfall is frequent within the period of observation rainfall is heavy.

Recommendations

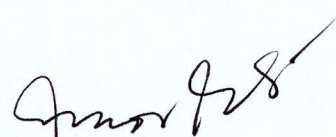
Though the system has already been developed, it is still considered to be in the monitoring phase. This would mean that further site monitoring will have to be conducted to eliminate any possible glitches and problems in the system. This is necessary because of the perilous data showcased in the system and which is very critical to the users or community.

The installed watershed instruments system for water-level station, weather station is established in the region. This particularly gives a localized interpretation of the threshold values for the water-level, and different weather parameters (precipitation, soil moisture, humidity and etc.,) which makes it easier for the users to understand. Moreover, as the system will send the water level and rain level updates, the local authorities will have enough time for decision making such as early evacuation, in order to prevent death casualties brought by flooding.

Prepared by:

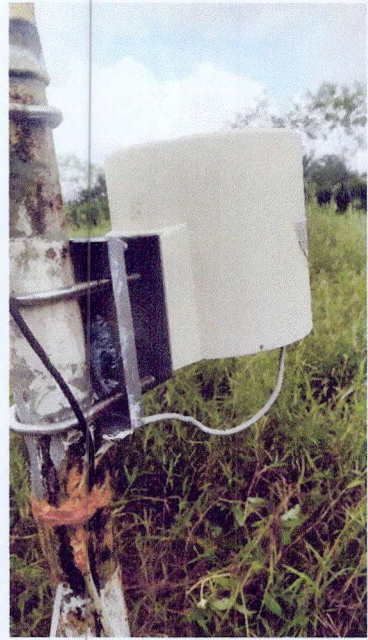

Alister Earl M. Meman
Database Manager IT Specialist

Noted by:


AMOR D. ASI
Chief, Conservation and Development Section



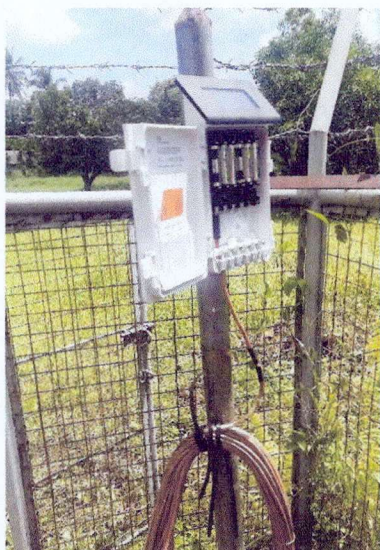
Automated Weather Station (AWS) at Macatoc Elementary School, Victoria, Oriental Mindoro.



Automated Weather Station (AWS) at Department of Agriculture Compound, Barangay Alcate, Victoria, Oriental Mindoro



Automated Water Level Station (AWLS) at So. Abaton, Barangay Parang, Calapan City, Oriental Mindoro



Ground Water Level Station (GWLS) at Mindoro State University, Barangay Alcate, Victoria, Oriental Mindoro