Sea Level and Storm Surge Inundation Monitoring System with Artificial Neural Network
Project SURGE

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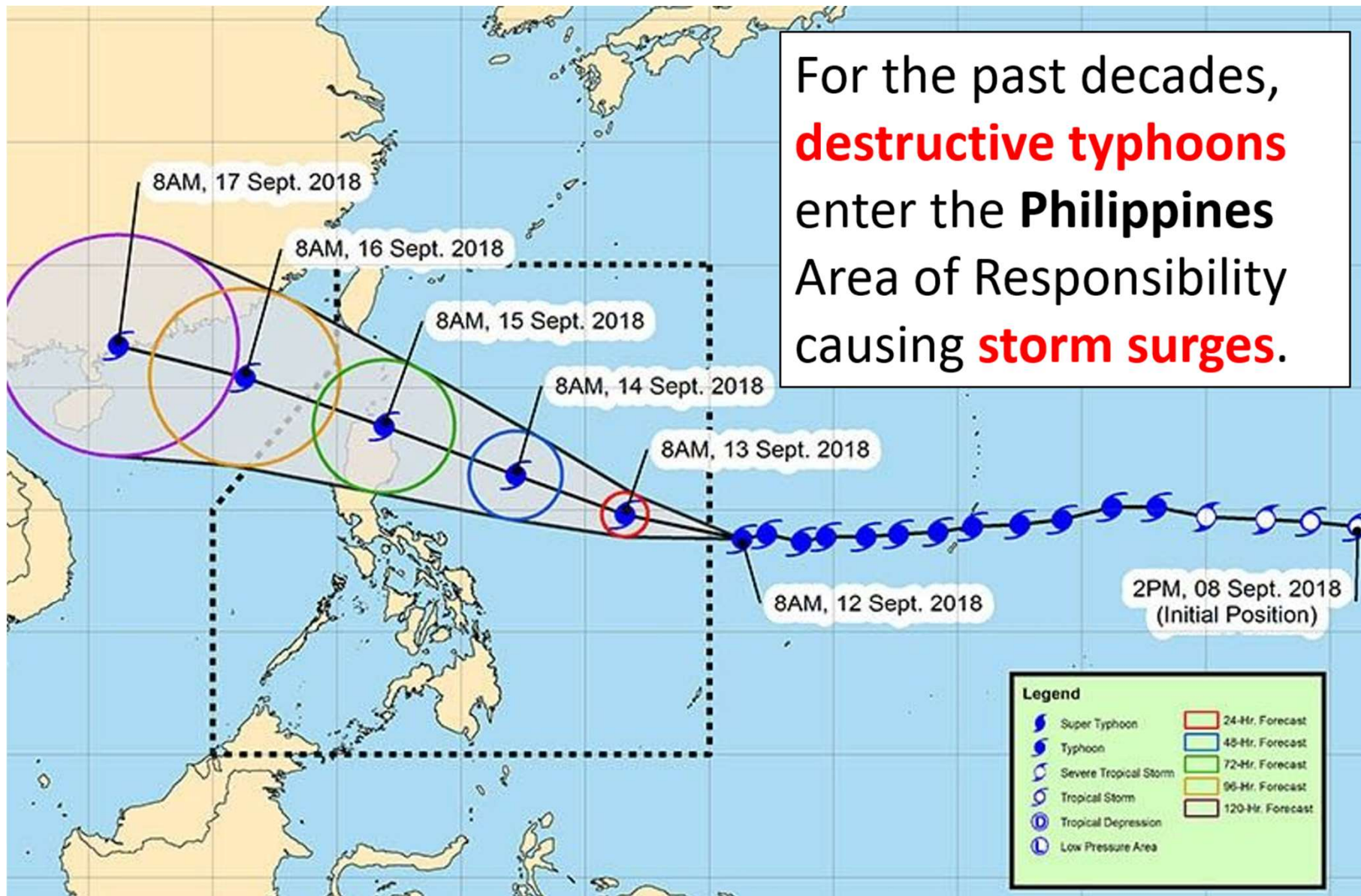**School of Graduate Studies**
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www.mapua.edu.ph

For the past decades, **destructive typhoons** enter the **Philippines** Area of Responsibility causing **storm surges**.

8AM, 17 Sept. 2018

8AM, 16 Sept. 2018

8AM, 15 Sept. 2018

8AM, 14 Sept. 2018

8AM, 13 Sept. 2018

8AM, 12 Sept. 2018

2PM, 08 Sept. 2018 (Initial Position)

Legend

Super Typhoon — 24-Hr. Forecast
Typhoon — 48-Hr. Forecast
Severe Tropical Storm — 72-Hr. Forecast
Tropical Storm — 96-Hr. Forecast
Tropical Depression — 120-Hr. Forecast
Low Pressure Area

https://www.philstar.com/headlines/2018/09/12/1850894/typhoon-ompong-enters-par
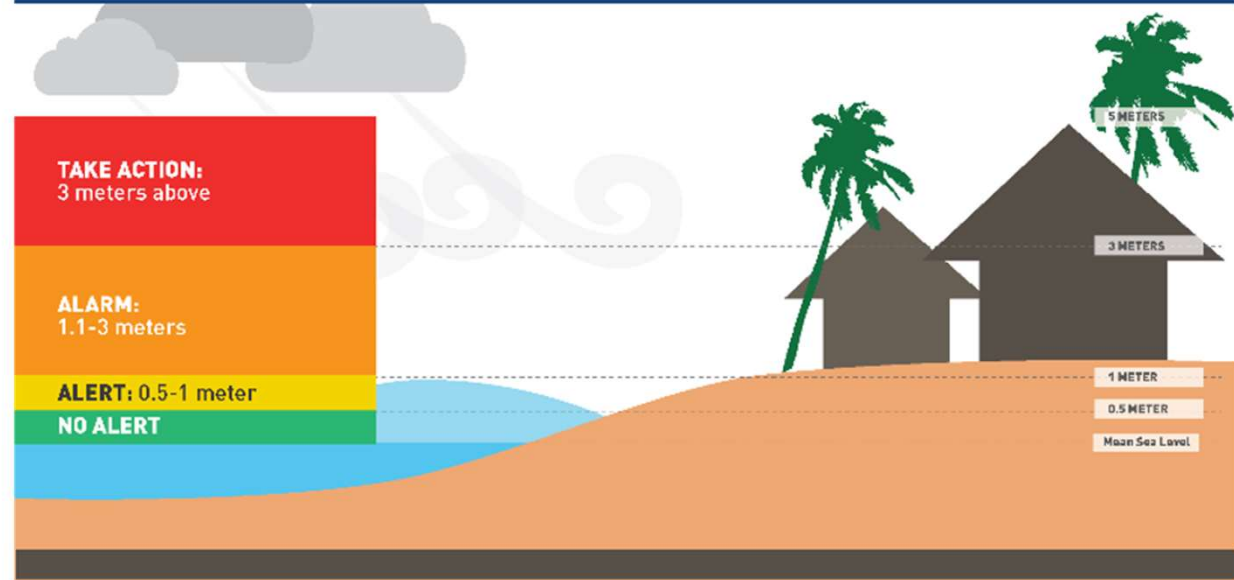
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Storm surge

abnormal rise in sea level along the path of storm.

The Philippine Atmospheric Geophysical and Astronomical Services Administration (PAG-ASA) under the Department of Science and Technology (DOST) developed a storm surge categorization with a color-coded warning system depending on the storm surge expected height in the area.

STORM SURGE Color-Coded Warning System

TAKE ACTION: 3 meters above

ALARM: 1.1-3 meters

ALERT: 0.5-1 meter

NO ALERT

5 METERS
3 METERS
1 METER
0.5 METER
Mean Sea Level

| STORM SURGE WARNING LEVEL	EXPECTED HEIGHT	ACTION TO BE TAKEN
RED **TAKE ACTION**	3 meters above	**Storm surge is CATASTROPHIC.** There is significant threat to life. Mandatory evacuation is enforced.
ORANGE **ALARM**	1.1 to 3 meters	**Storm surge is EXPECTED.** Conditions could become life threatening. All marine activities must be cancelled. Follow evacuation guidelines from local authorities.
YELLOW **ALERT**	0.5 to 1 meter	**Storm surge is POSSIBLE.** Stay away from the coast or beach. Preparation measures must be carried out.
GREEN **NO ALERT**		**No action required.**

DOST-PAGASA | PCDSPO | GOV.PH

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Storm surge is **catastrophic**.
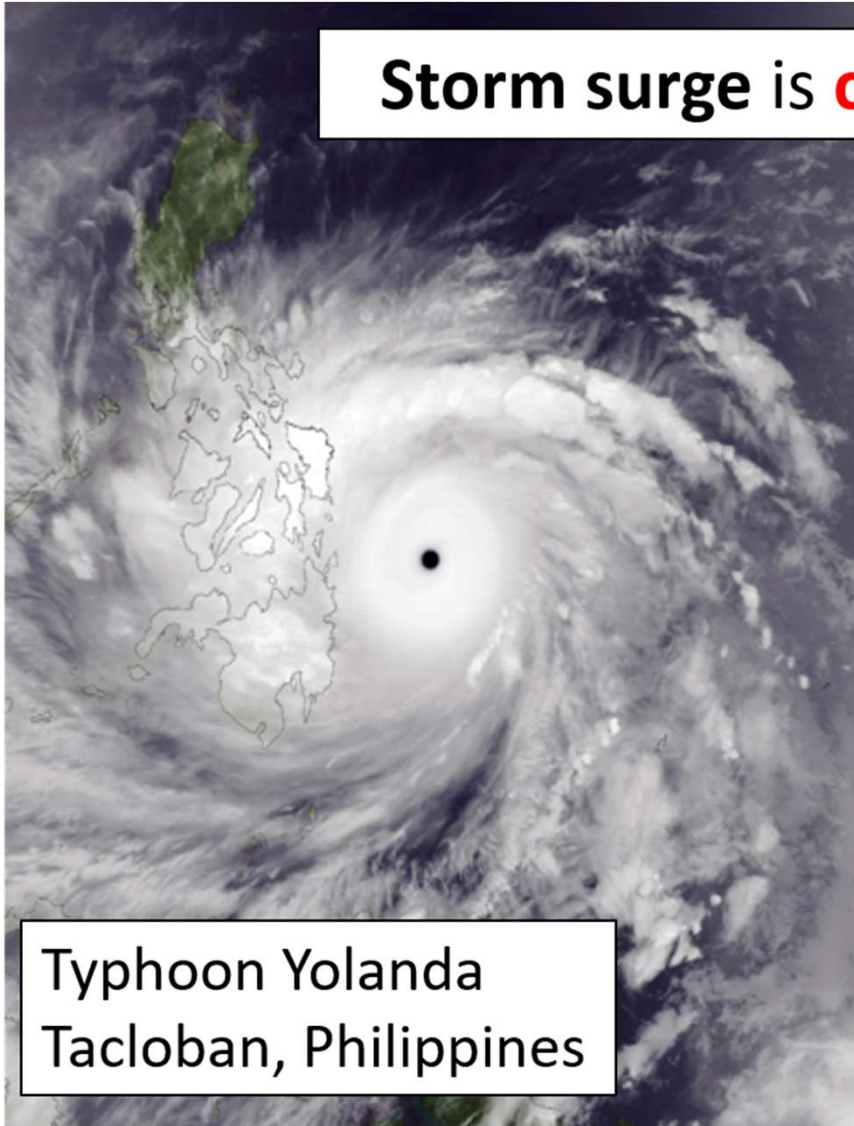
Typhoon Yolanda
Tacloban, Philippines

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Project Title:

Sea Level and Storm Surge Inundation Monitoring System with Artificial Neural Network (**Project SURGE**)
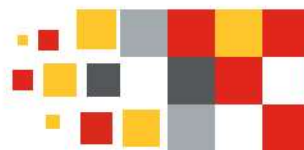
Objective 1:

Design and develop
sea level monitoring system
using different **sensors**
(tide level, air pressure,
air temperature, wind speed)
capable of sending through
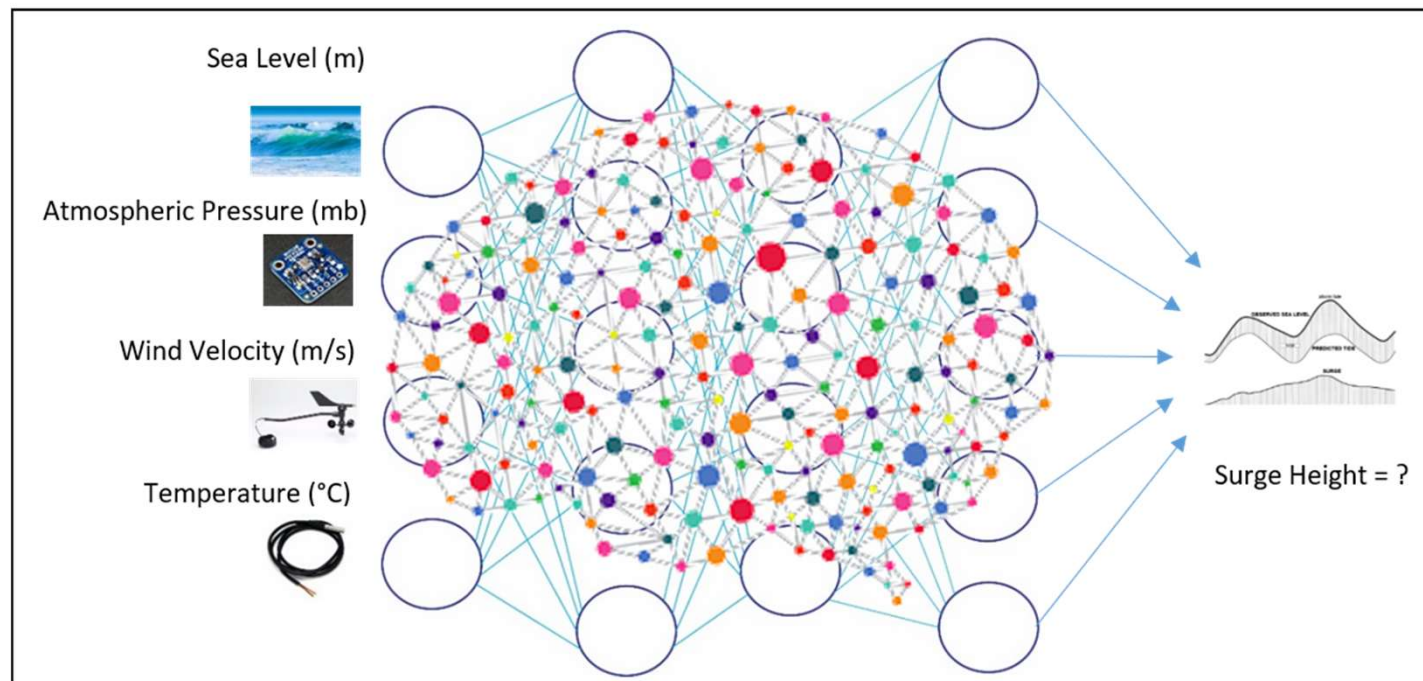wireless communication.

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Objective 2:

Predict the highest storm surge height given a lead time using Artificial Neural Network and NARX model

Sea Level (m)

Atmospheric Pressure (mb)

Wind Velocity (m/s)

Temperature (°C)

Surge Height = ?

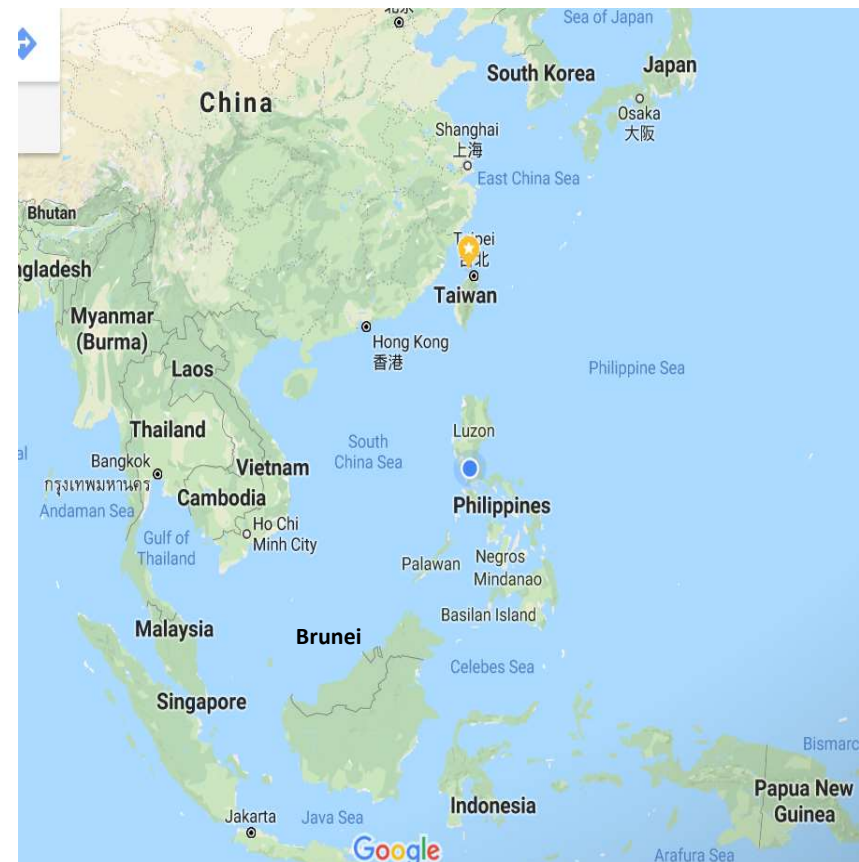MAPÚA UNIVERSITY

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Objective 3:

Conduct **actual testing** using the **sea level monitoring** system and comparing the predicted and actual values of surge height.

Locations that are susceptible to **storm surge**!

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ASEAN IVO - ICT for Environment Protection and Disaster Prevention

Thank you very much.
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https://di.church/unity-in-diversity/

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