

A photograph of a modern, multi-story building with a reddish-brown facade and white balconies. The building is identified by a logo and text on its side: 'DOST' above a circular logo with a blue and white pattern, and 'PHIVOLCS' written vertically in large, white, sans-serif letters. The background shows a blue sky and distant mountains.

# DOST-PHIVOLCS

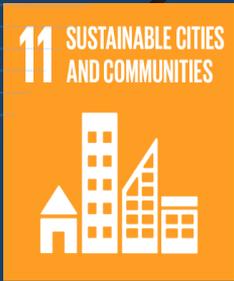
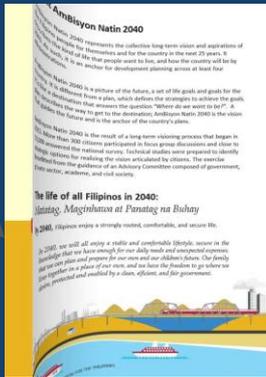
Science, Technology, and Innovation  
Programs on

**3R** *Risk Reduction and Resilience*

DRREALL Study Tour 2025

October 13-19, 2025 | Toulouse and Paris, France

# Ambisyon 2040



# Sustainable Development Goals

# Philippine Development Plan

# NDRRMP



PHIVOLCS

# PHIVOLCS Strategic Plan

# PHIVOLCS Modernization



# Philippine Institute of Volcanology and Seismology - Department of Science and Technology (DOST-PHIVOLCS)

## Monitoring and warning

Predict volcanic eruptions, earthquakes, tsunamis, and related geotectonic phenomena through **reliable and accurate detection, forecast, and warning systems;**

## Hazards and risk assessment

Determine how volcanic eruptions, earthquakes, tsunamis, and related geotectonic phenomena occur, the **possible hazards** thereof, and the **areas at risk** and

## Public information, education, products, and services for DRRM

Mitigate the impact of volcanic eruptions, earthquakes, tsunamis, and related geotectonic phenomena by providing appropriate volcano, earthquake, and tsunami **information, education, products, and services for disaster preparedness.**

# DOST-PHIVOLCS Strategy Map

## VISION

A leading global science and technology institution of empowered men and women helping develop communities safe from and resilient to volcanic eruptions, earthquakes, tsunamis and other related hazards.

## MISSION

We provide timely, quality and socially-inclusive information and services for warning, disaster preparedness and mitigation. This we do through the development and application of technologies for the monitoring and accurate prediction of and determination of areas prone to volcanic eruptions, earthquakes, tsunamis and other related hazards, and gender-responsive capacity enhancement for comprehensive disaster risk reduction.

**Societal Outcome:** Communities have achieved resilience to volcanic eruptions, earthquakes, tsunamis, and other related hazards.

### Enhanced safety through empowerment of men and women in communities

1. Accurately predicted and simulated geological phenomena
2. Provided highly accurate and timely warning & information
3. Developed cost-effective monitoring & warning system
4. Empowered partners to lead in reducing risks from geologic hazards down to the barangay level
5. Enhanced collaboration with stakeholders

### Highly responsive and competent organization

1. Highly prominent, globally recognized experts
2. Motivated, rewarded and competent staff
3. Effective and efficient systems, procedures, structures
4. Inspiring, dynamic leadership

Excellence

Innovation

Integrity

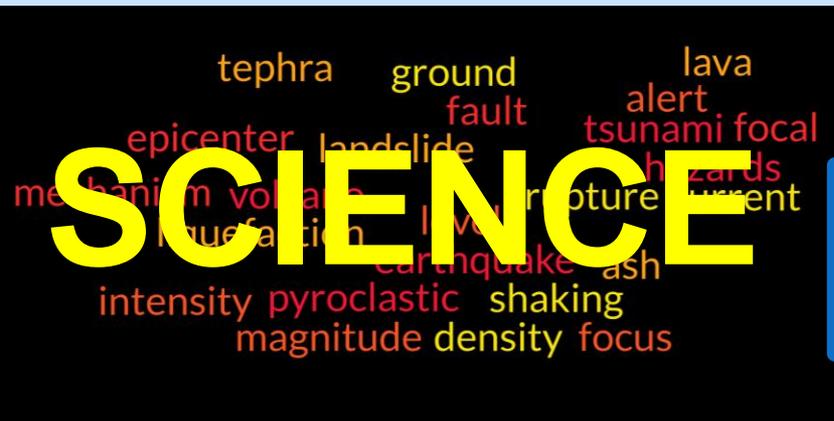
Service

People

# GOAL: 3R - RISK REDUCTION and RESILIENCE

**LINK:**

**SCIENCE AND RISK COMMUNICATION**



# 1. VOLCANO, EARTHQUAKE AND TSUNAMI MONITORING AND WARNING PROGRAM



**NATIONAL  
VOLCANO  
MONITORING  
AND WARNING**



**NATIONAL  
EARTHQUAKE  
MONITORING  
AND  
INFORMATION**



**NATIONAL  
TSUNAMI  
MONITORING  
AND WARNING**

# 1| VOLCANO EARTHQUAKE AND TSUNAMI MONITORING AND WARNING PROGRAM

## National Volcano Monitoring and Warning



01

Accurately predicted and simulated geologic phenomena

02

Provide highly accurate and timely warning and information

03

Developed or adapted cost-effective monitoring and warning system

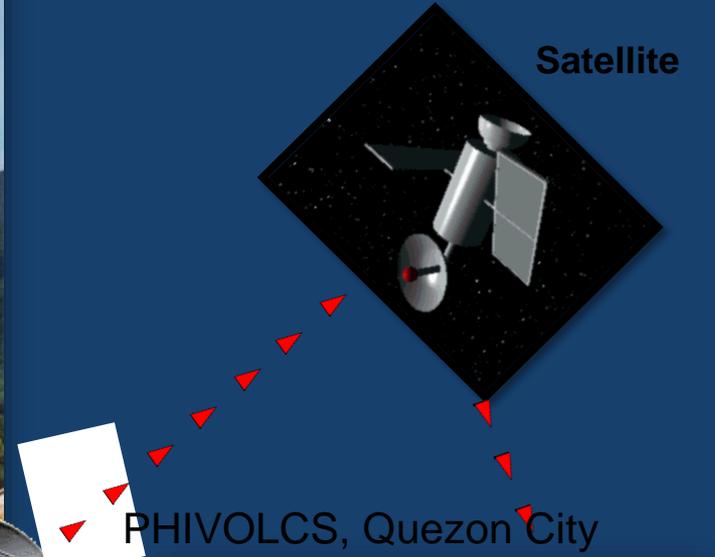
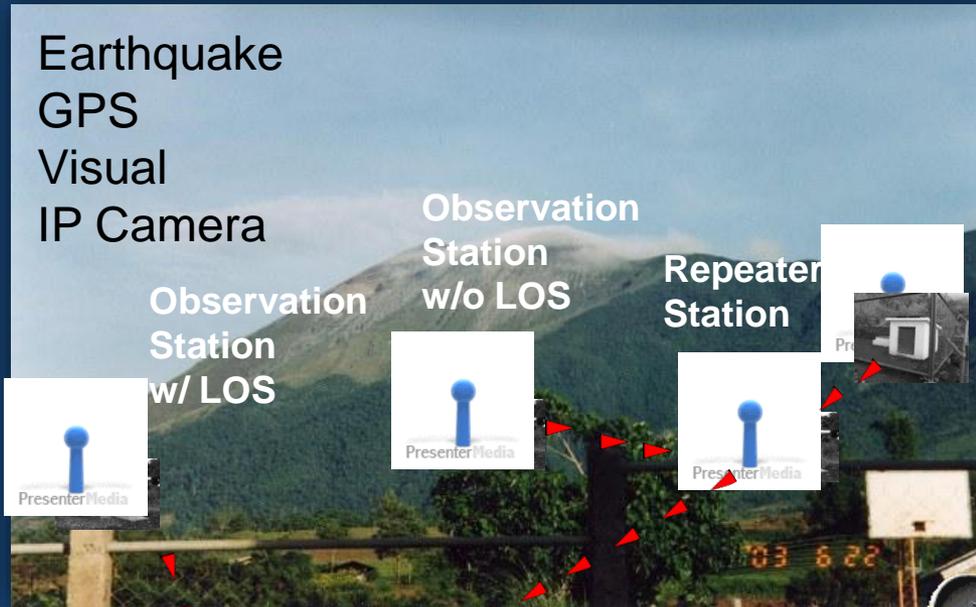
04

Enhanced collaboration with stakeholders

05

Effective and efficient system, procedures and structure

# Integrated Multi-Parameter Volcano Monitoring



La Carlota City





# VolcanoPH iNFO

## What is it?

A mobile application that provides the 24-hour observation summary in monitoring the active volcanoes at alert level 1 and above.



- ▶ The concise information are presented as infographics in English and Filipino that are easy to read and understand.



- ▶ It has a push notification feature that can alert its users when there is an update on the active volcanoes being monitored.

## Inside the APP

### 1 Bulletin

brief description or notice about the volcano events issued to the public



### 2 Observation Summary



- ▶ **Alert Level**  
Represents the overall condition of the volcano, with Alert Levels 1 to 5 corresponding to increasing severity of unrest.
- ▶ **Monitoring Parameters**  
Presents the results gathered from various monitoring techniques in volcano surveillance
- ▶ **Infographics**  
It includes icons with the name of the parameter and the result of observations or measurements.

### 3 Location



- ▶ **Map of location of the volcano and plotted volcanic earthquakes**

Earthquake Location  
 Past 24 hours: Total no. of volcanic earthquake: 0  
 Past 2 weeks: Total no. w/ enough record for location: 0

### ▶ Legend

### 4 Recommendations on appropriate actions



### 5 Reminders



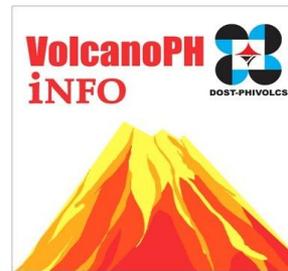
- ▶ Possible hazards that can occur:
  - steam-driven or phreatic or gas-driven explosions
  - volcanic earthquakes
  - minor ashfall
  - lethal accumulations or explosions of volcanic gas

### 7 Links for additional information



## VolcanoPH Info App

For Android Devices



VolcanoPH Info



Download link of apk:

<https://cutt.ly/volcanoinfoph>



# PHIVOLCS Local Active Volcanoes Archive or PHIVOLCS LAVA

(<https://wovodat.phivolcs.dost.gov.ph/>).



Welcome to PHIVOLCS-LAVA or Local Active Volcanoes Archive!

PHIVOLCS-LAVA is the database of multi-parameter monitoring data acquired through the years by instrumental and visual observation of the Philippines' eight most active volcanoes. This database is built upon the World Organization of Volcano Observatories Database or WOVODat schema, which was formulated by the Earth Observatory of Singapore (EOS) for global volcano monitoring data standardization and access.... [show more](#)

# 1 | VOLCANO EARTHQUAKE AND TSUNAMI MONITORING AND WARNING PROGRAM

## National Earthquake Monitoring and Information

01

To provide accurate and timely information in significant earthquake events that may significantly impact the Philippines

02

To empower stakeholders in the effective utilization of earthquake products of the program



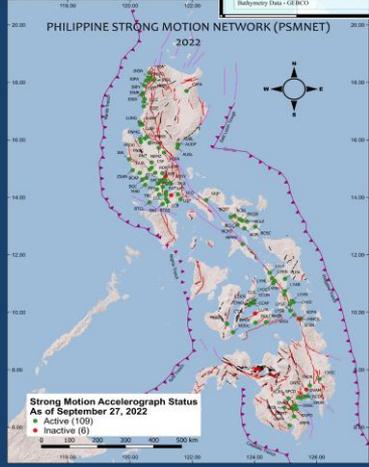
# EARTHQUAKE MONITORING NETWORK



*staff-controlled seismic stations*  
*satellite-telemetered seismic stations*  
*volcano-seismic stations with satellite telemetry*



**Data Receiving Center**



**Philippine Earthquake Intensity Meter Network (PEIMNet)**

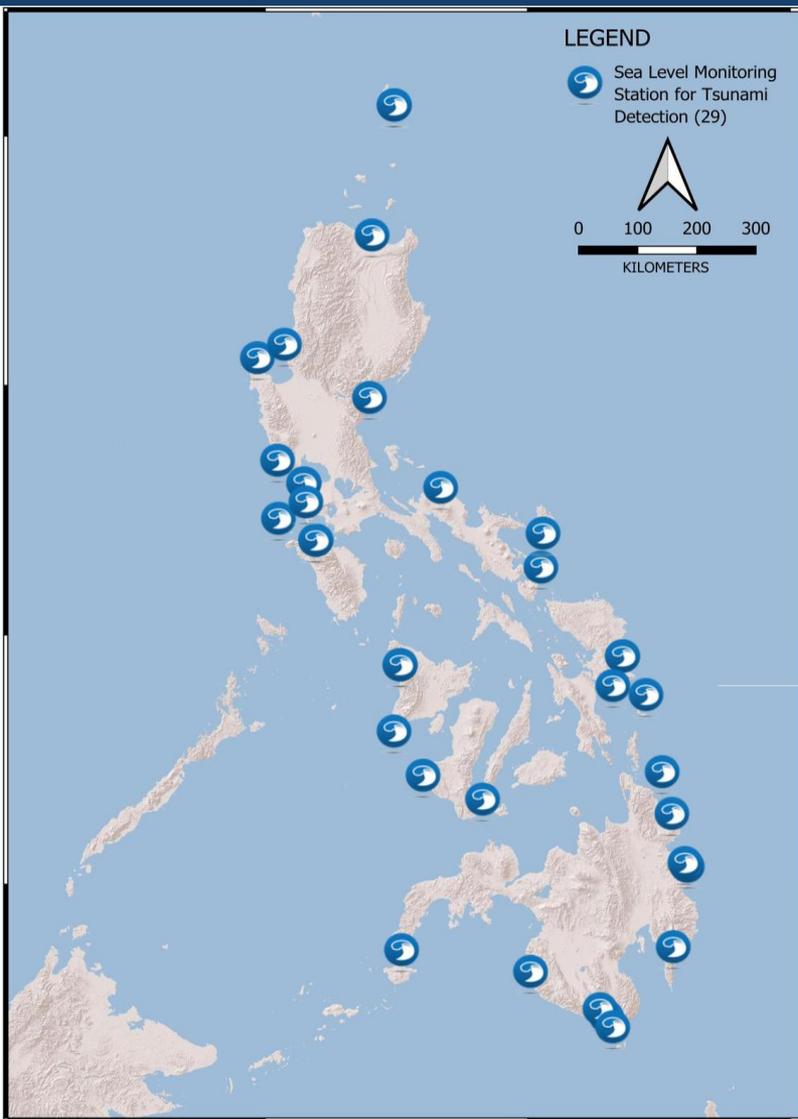


**satellite-telemetered seismic station**

**Philippine Strong Motion Network (PSMNet)**

# 1| VOLCANO EARTHQUAKE AND TSUNAMI MONITORING AND WARNING PROGRAM

## National Tsunami Monitoring and Warning

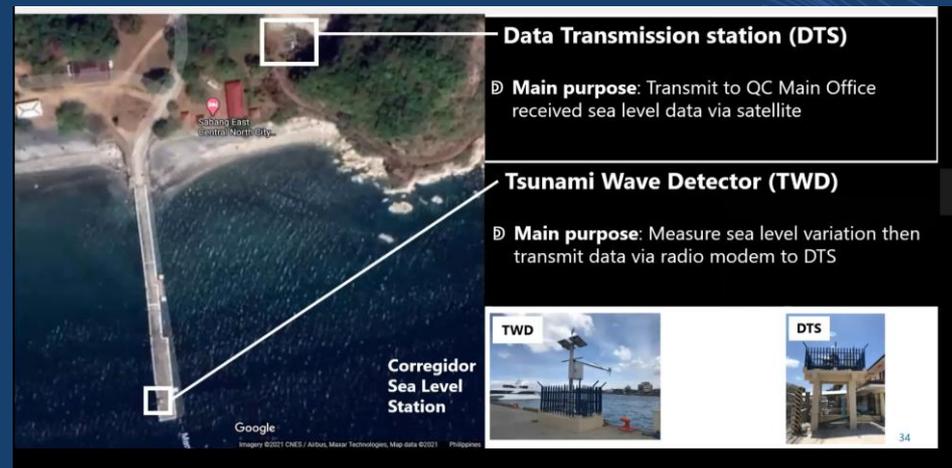


01

To provide accurate and timely information on significant tsunami events that may significantly impact the Philippines.

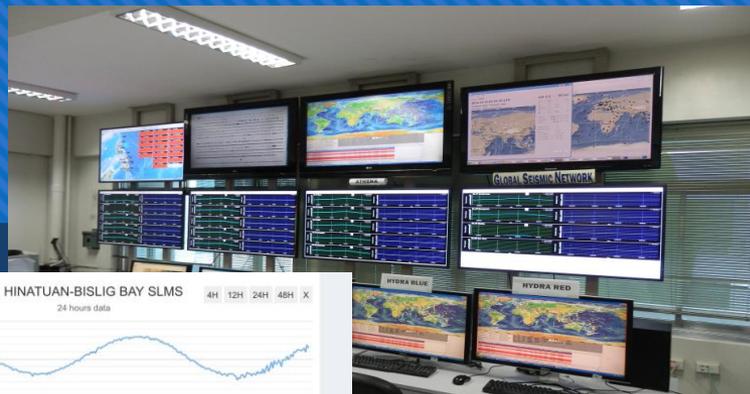
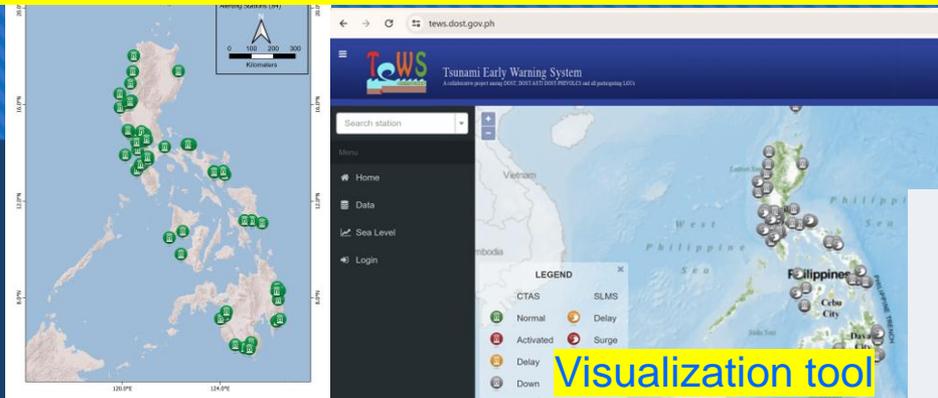
02

To empower stakeholders in the effective utilization of earthquake products of the program.

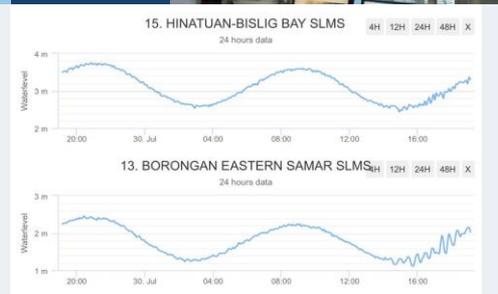


# Tsunami Decision Support Tools and Warning System

Sea Level Monitoring Stations (SLMS)  
Community Tsunami Alerting Stations (CTAS)



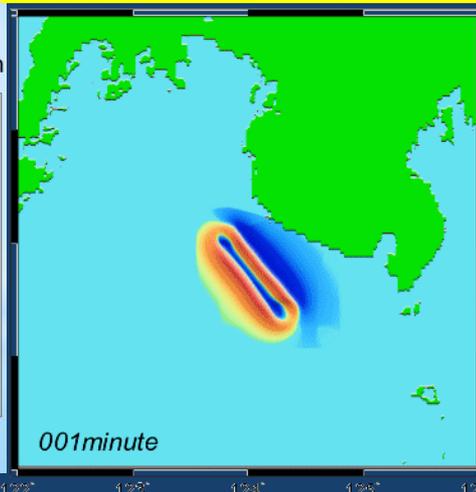
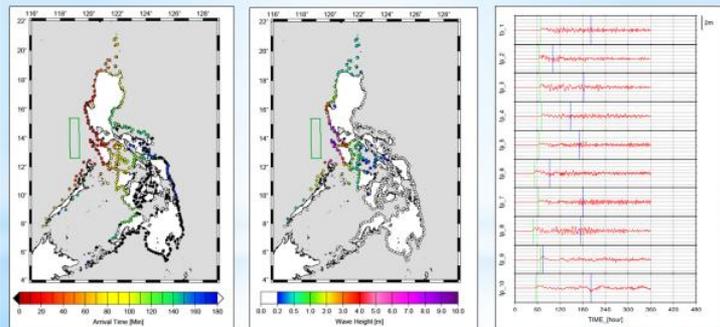
Data Receiving Center



~30,000 Event-Based  
Tsunami Scenario Database

Tsunami Simulations

Arrival Time Tsunami Height Tsunami Waveform



Community Tsunami early  
Warning System



## 2. VOLCANO, EARTHQUAKE AND TSUNAMI HAZARDS MAPPING, RISK ASSESSMENT, AND RESEARCH AND DEVELOPMENT PROGRAM



**Earthquake Hazards  
Assessment, Research  
and Development**



**Volcano Hazards  
Assessment, Research  
and Development**



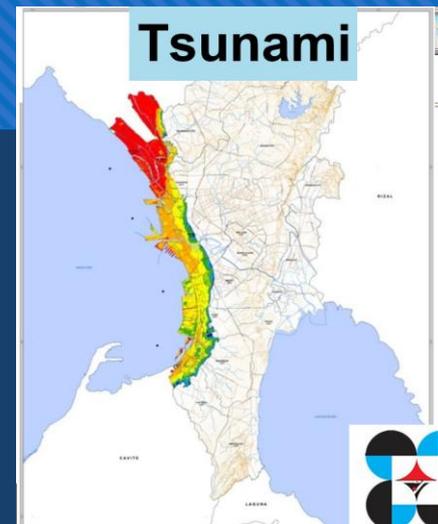
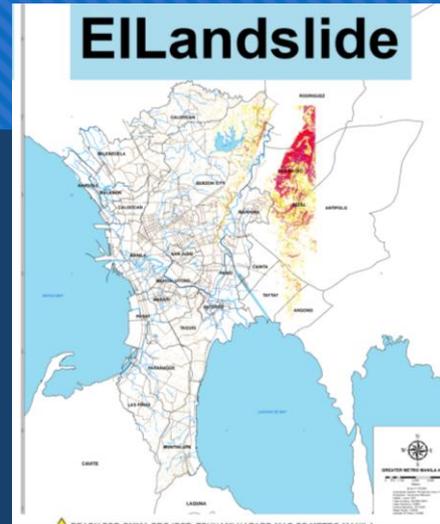
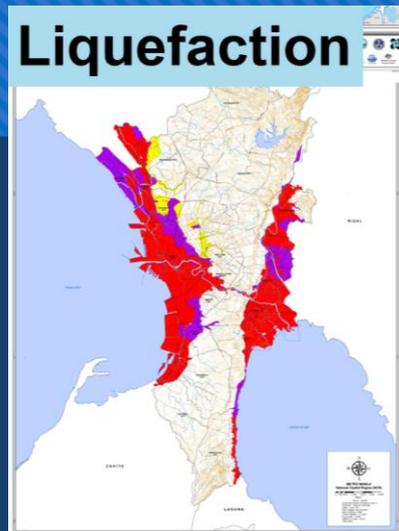
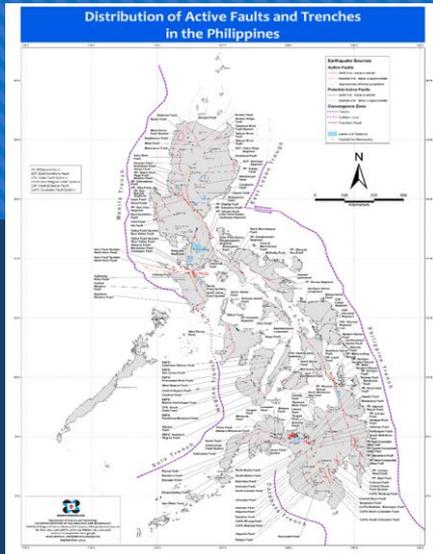
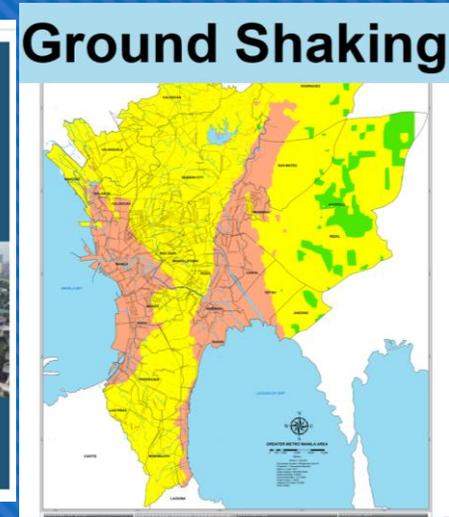
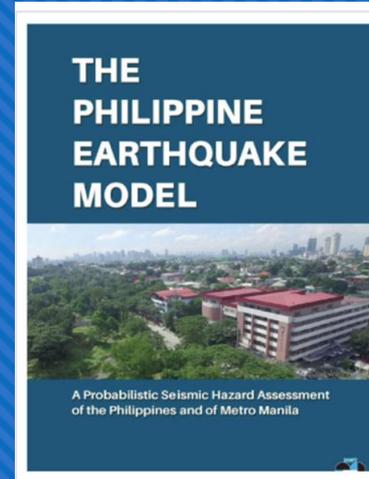
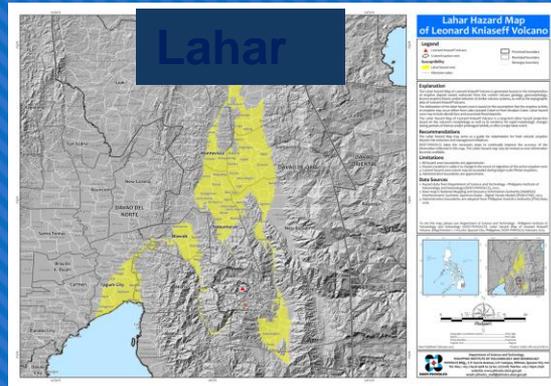
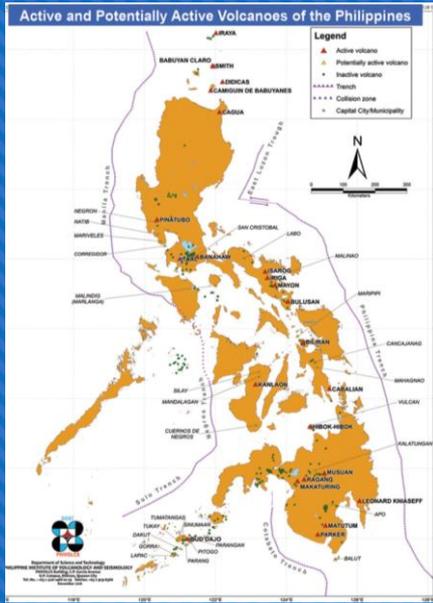
**PHIVOLCS Risk Information  
Management and  
Assessment**



**Landslide Monitoring,  
Early Warning and Risk  
Assessment**

# Hazard Maps

PHIVOLCS produces maps showing areas prone to earthquake or volcanic hazards.



# GeoRisk Philippines Initiative

INNOVATIONS FOR RESILIENCE

Transforming complex risks into understandable information, empowering communities to build resilience and make informed decisions

## DATA INPUT



**GeoMapperPH**  
GEORISKPH

For the Development of the  
**NATIONAL EXPOSURE  
DATABASE**

Pre- and Post- Disaster  
For Government Agencies,  
Local Government Units

## HAZARDS ASSESSMENT



**HazardHunterPH**  
GEORISKPH

For ONE-STOP SHOP  
**HAZARD  
ASSESSMENT SERVICE**

For Individuals and  
Institutions

## RISK ANALYSIS



**GeoAnalyticsPH**  
GEORISKPH

**VISUALIZATION &  
ANALYTICS**

Development of Various  
Plans  
For Government Agencies,  
Local Government Units



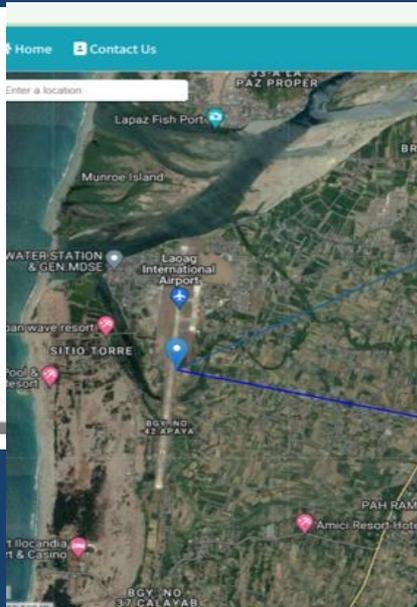
**PlanSmart**  
Ready to Rebuild

# GeoRisk Philippines Initiative

INNOVATIONS FOR RESILIENCE



**HazardHunterPH**<sup>TM</sup>  
HAZARD ASSESSMENT AT YOUR FINGERTIPS



Assessment Results	
<b>SEISMIC HAZARD ASSESSMENT</b>	
Nearest Active Fault	Approximately 14.4 km west of the West Ilocos Fault System: West Ilocos Fault System
Ground Rupture	Safe
Ground Shaking	Prone; Intensity VIII
Earthquake-Induced Landslide	Safe
Liquefaction	Highly Susceptible
Tsunami	Prone
<b>VOLCANIC HAZARD ASSESSMENT</b>	
Nearest Active Volcano	Approximately 158.1 km southwest of Camiguin_de_babuyanes
Nearest Potentially Active Volcano	Approximately 341.5 km north of Negron; No immediate volcanic hazard threat
Ashfall	Prone
Nearest Inactive Volcano	Approximately 112.9 km northwest of Ambalatungan Group; No immediate

Assessment Results	
<b>HYDRO-METEOROLOGICAL HAZARD ASSESSMENT</b>	
Flood (MGB)	High Susceptibility; 1 to 2 meters flood height and/or more than 3 days flooding
Storm Surge (PAGASA)	Safe
Severe Wind (PAGASA)	117.1 - 220 kph (20-year return period); 117.1 - 220 kph (500-year return period)
<b>NEAREST CRITICAL FACILITIES</b>	
Nearest Public Elementary School	Cavit-araniw Es (1.1 km)
Nearest Public Secondary School	Gabu Nhs (1.1 km)
Nearest Government Health Facility	Gabu Barangay Health Station (1.2 km)
Nearest Private Health Facility	Gertes Clinic And Hospital (6.2 km)
Nearest Primary Road Network	Manila North Rd; Ilocos Norte (first District) (6.1 km)
Nearest Secondary Road Network	Laoag-Airport Rd; Ilocos Norte (first District) (595 m)

**MULTI-HAZARD ASSESSMENT**

# 3D Philippines



Legend



Water Body

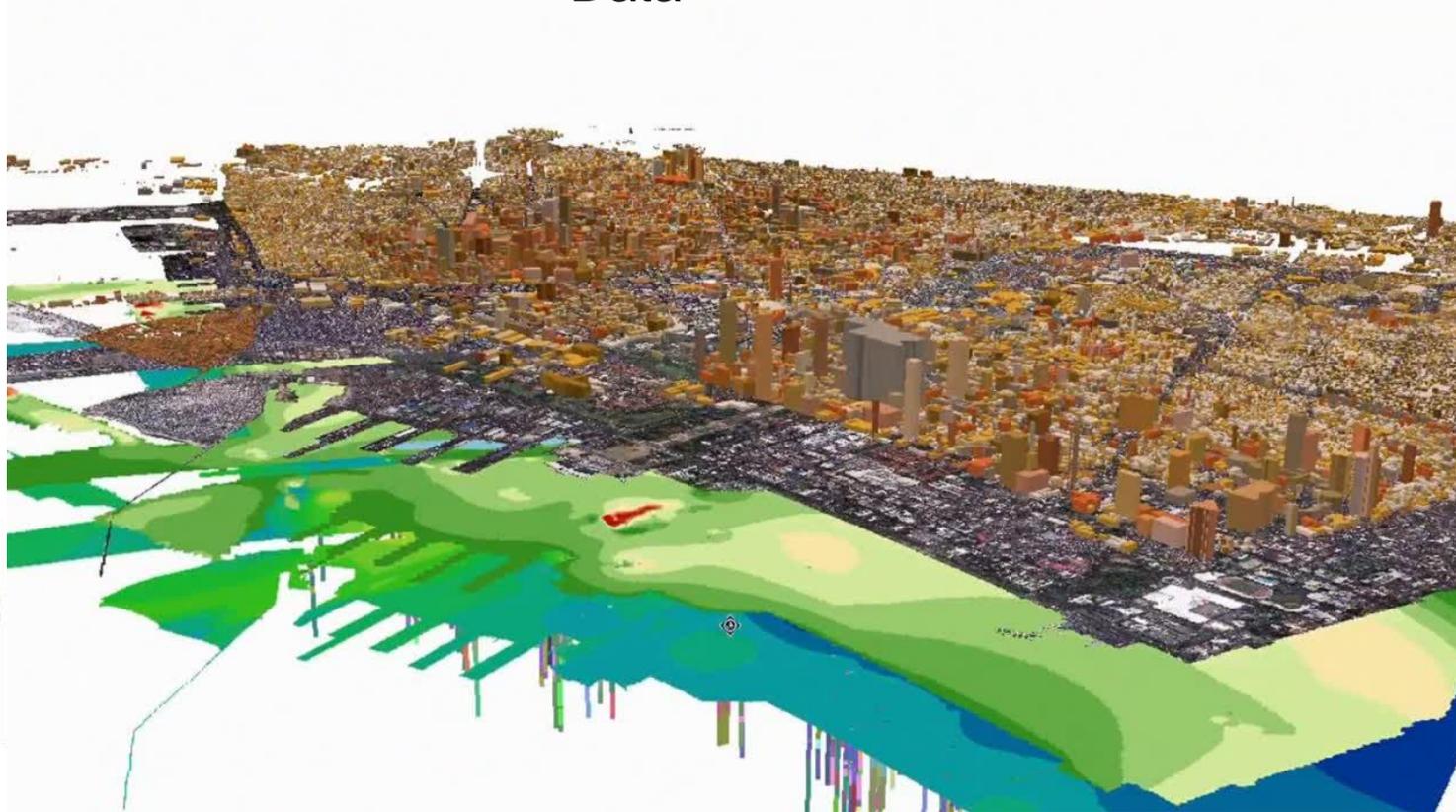


Satellite Imagery



Borehole Data

## 3D Visualization of Surface and Subsurface Data



# Landslide Monitoring, Early Warning and Risk Assessment

01

To maintain and enhance the operational readiness of the landslide monitoring and early warning systems by integrating new technologies and refining existing protocols.

02

To support the sustainability of community-based early warning systems through targeted capacity-building and institutionalization efforts.

03

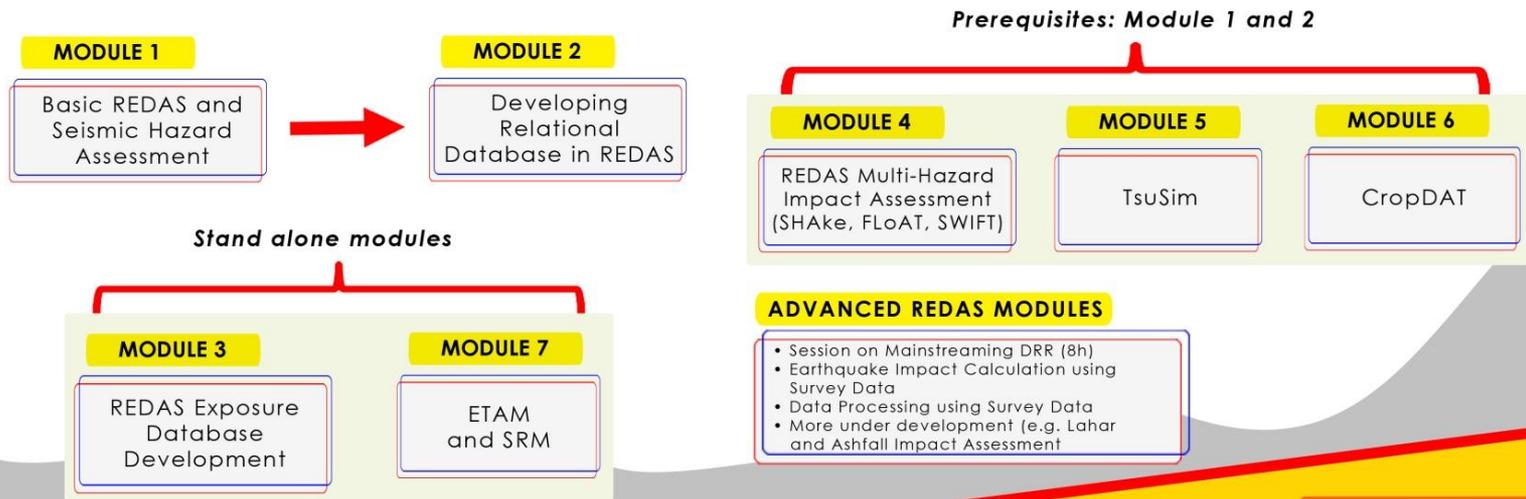
To advance scientific knowledge of landslide and debris flow through strategic collaboration with partner agencies and external research



# Hazard and Impact Assessment Software

## REDAS by DOST-PHIVOLCS

### TRAINING MODULES



**SHake**  
EARTHQUAKE

**SWIFT**  
SEVERE WIND

**FloAT**  
FLOOD

**EDM**  
REDAS EXPOSURE DATA MAPPER USING GEOMMAPPERH  
EXPOSURE DATABASE DEVELOPMENT

**ETAM**  
EARTHQUAKE AND TSUNAMI ALERTING MODULE

**SRM**  
SATELLITE RAINFALL MONITOR  
MONITORING & WARNING TOOLS

### REDAS IMPACT ASSESSMENT MODULES

**TsuSIM**  
TSUNAMI

**CropDAT**  
AGRICULTURE

**QLIST**  
LAHAR

# How Safe is My House Tool for Earthquake Safety of Houses

## Full Scale Shaking Table Test for Philippine Concrete Hollow Block Houses

**MODEL B : Non-Engineered model**  
(Typical field construction model)

Wall : CHB 4" (400x200x100mm)  
Vertical bar : 6mm @ 300mm  
Horizontal bar : 6mm@600, 3 layers  
Joint Mortar : 1 : 4 (Not compacted)

**MODEL A : Engineered model**  
(Following Building code)

Wall : CHB 6" (400x200x150mm)  
Vertical bar : D10mm @ 400mm  
Horizontal bar : D10mm@600, 3 layers  
Joint Mortar : 1 : 4 (Compacted)



## HOW SAFE IS MY HOUSE?

Self-check for Earthquake Safety  
of Concrete Hollow Block (CHB) Houses  
in the Philippines

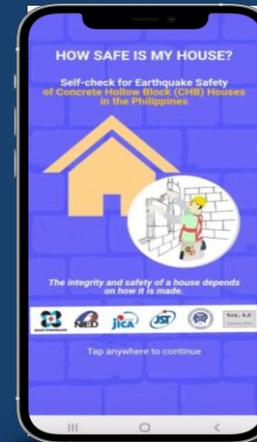


The integrity and safety of a house depends on how it was made.



Ver. 1.0  
February 2014

## Accessible and downloadable app



<https://howsafeismyhouse.phivolcs.dost.gov.ph/>



### **3. VOLCANO, EARTHQUAKE AND TSUNAMI DISASTER PREPAREDNESS RISK REDUCTION PROGRAM**

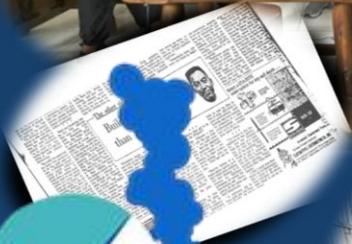
To build safer and more resilient communities by raising awareness and strengthening grassroots capacity through information campaigns and trainings, enabling people to understand geologic hazards and take action to reduce their impacts.



- Understanding disaster risk

R&D

- Transdisciplinary research (geosciences, social sciences, history, communication, perceptions, knowledge, behavior, and experiential knowledge)
- Media research
- Policy research
- Organizational research
- Stakeholders feedback



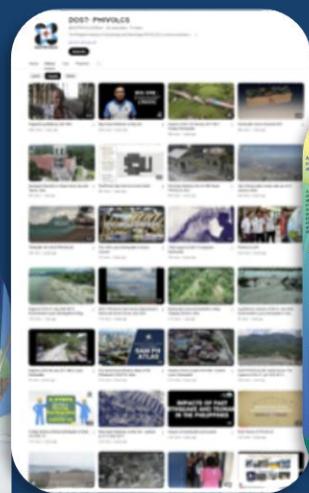
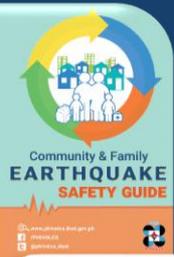
partially destroyed by earthquake, 1600"  
 destroyed by the earthquake of 1645"  
 destroyed by the earthquake of 3 June 1863"



- Multi-media
- Multi-lingual
- Multi-sectoral
- Gender and culture-sensitive and disability inclusive
- Stakeholder-specific

- Developing risk information tools

## MATERIALS DEVELOPMENT



- Developing risk information tools

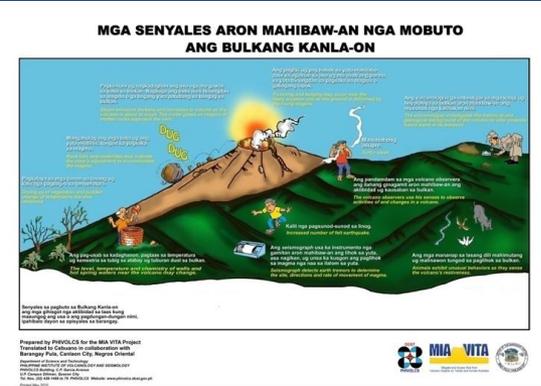
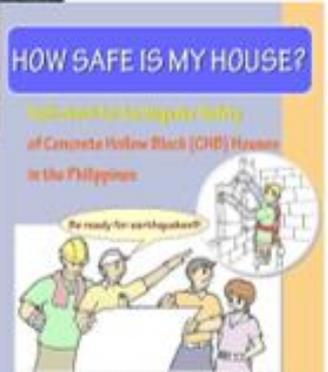
## MATERIALS DEVELOPMENT



**Scientific Information Dissemination Thru Exhibit Development**



**Audio Visual Production, Documentation and Archive System**



**Development and Publication of PHIVOLCS DRR materials**





- Multi-channel
- Multi-directional
- Stakeholder-responsive



DOST-PHIVOLCS PBS 1278 KHZ RPB RADIO PULPIT ALERT BANGSA PILIPINAS

# AKO at GEO

USAPANG KALIGTASAN with PHIVOLCS

TUWING LUNES | 1:00-2:00 NG HAPON

A promotional banner for the 'AKO at GEO' program. It features logos for DOST-PHIVOLCS, PBS, RPB (Radio Pulpit Alert), and the Philippine flag. The text reads 'AKO at GEO' and 'USAPANG KALIGTASAN with PHIVOLCS'. The broadcast time is 'TUWING LUNES | 1:00-2:00 NG HAPON'.

## COMMUNICATION

- Communicating risk

A blue and red graphic with the word 'COMMUNICATION' in white. Below it, a black rounded rectangle contains the bullet point '• Communicating risk'.

- Stakeholder analysis
- Needs assessment
- Module development
- Collaborations, linkages
- Piloting
- Stakeholder-specific



## CAPACITY BUILDING

- Capacitating stakeholders





**TEACH VETDRR**  
Training  
Educators and  
Administrators for  
a Collective  
Headway towards  
Volcano,  
Earthquake, and  
Tsunami DRR



**3R**  
Risk Reduction  
and Resilience  
Campaign  
LGUs  
Partner Agencies



**3R TRC**  
Risk Reduction  
and Resilience for  
Tsunami Ready  
Community

**CAPACITY  
BUILDING**

- Capacitating stakeholders

# Guidebooks and Manual

## Disaster Readiness and Risk Reduction for Volcano, Earthquake, and Tsunami Hazards

*A Guidebook for Senior High School Teachers*

2020  
Department of Science and Technology  
Philippine Institute of Volcanology and Seismology

## Communicating Volcano, Earthquake, and Tsunami Hazards, their Disaster Prevention and Mitigation Measures

*A Manual for High School Science Teachers*

2020  
Department of Science and Technology  
Philippine Institute of Volcanology and Seismology

## Communicating Volcano, Earthquake and Tsunami Impacts

*A Guidebook for DepEd Elementary Teachers*

2020  
Department of Science and Technology  
Philippine Institute of Volcanology and Seismology

## Guidebook for 3R (Risk Reduction and Resilience) Campaign for LGUs

Department of Science and Technology – Philippine Institute of Volcanology and Seismology

## Volcano, Earthquake, and Tsunami Preparedness

*A Guidebook for DepEd DRR Focal Persons*

2020  
Department of Science and Technology  
Philippine Institute of Volcanology and Seismology



# Key Messages

- The Philippines is prone to natural hazards;
- These natural hazards can result to disaster losses, however, we can reduce disaster risks;
- **Science, Technology, and Innovations for 3R (Risk Reduction and Resilience) are available for communities to be safer.**



[www.phivolcs.dost.gov.ph](http://www.phivolcs.dost.gov.ph)



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