NATIONAL REPORT
Submitted by the PHILIPPINES

BASIC INFORMATION

1. ICG/PTWS Tsunami National Contact (TNC)

Name: DR. TERESITO C. BACOLCOL
Title: Director IV
Organization: Philippine Institute of Volcanology and Seismology (PHIVOLCS)-Department of Science and Technology (DOST)
Postal Address: PHIVOLCS Bldg., C.P.
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[redacted]

2. ICG/PTWS Tsunami Warning Focal Point (TWFP) (not a person)

TWFP 24x7 point of contact (office operational unit, NOT a person)

TWFP Agency name: Philippine Institute of Volcanology and Seismology (PHIVOLCS)
TWFP Agency Contact Officer in Charge:
NAME: Dr. WINCHELLE IAN SEVILLA
Position: Chief Science Research Specialist, Seismological Observation and Earthquake Prediction Division (SOEPD)- PHIVOLCS
[redacted]

TWFP 24x7 point of Contact
Name of office, operational unit: Seismological Observation and Earthquake Prediction Division (SOEPD-PHIVOLCS)
[redacted]

National Tsunami Warning Centre (if different from above) (SAME AS ABOVE)

3. Tsunami Advisor if applicable (N/A)

4. Tsunami Standard Operating Procedures for a Local Tsunami

Time Elapsed
General Activity
Specific Activity

0-3 min

- Earthquake occurs
- Collect Earthquake Records and prepare for plotting
- Provide VMEPD personnel initial info (date/time/intensity)

4-13 min

- Issuance of EQInfo and Tsunami information
- xxx EQInfo:
    - Read of Earthquake Phases from unmanned stations

    - Locate the hypocenter (depth and epicenter)
    - Calculate the preliminary earthquake magnitude
    - Verify information from intensity meters
    - Verify EQP solution with SWIFT (M≥5.0)
    - Receive additional earthquake data from manned stations
    - Evaluate EQInfo by SOEPD Senior Officer
    - Issuance of EQInfo

- xxx Tsunami Info:
    - Simulate tsunami database after locating the earthquake
    - Prepare Tsunami information (Refer to the Criteria Table for Thresholds and template)
    - Verify local Sea-level Stations and sensors (ultra-sonic, wet sensor and dry sensor) data
    - Evaluate Tsunami Information by SOEPD Senior Officer
    - Issuance of Tsunami Information
- Aftershock Monitoring
- Continuous aftershocks count and issuance of Earthquake Information (as needed)

14-15 min
Send EQInfo – SMS to PHIVOLCS key Personnel
Director's Group (RUS; BCB; ICN)
SOEPD Seniors
SOEPD Cluster (Luzon, Visayas and/or Mindanao)
SOEPD Main Office
PHIVOLCS Senior Personnel

16 -18 min
Send EQInfo –
Fax to OCD
Sending the EQInfo and Tsunami Info to the Office of the Civil Defense (OCD)

19-20 min
Post EQInfo to official webpages
http://www.phivolcs.dost.gov.ph
http://www.facebook.com/PHIVOLCS
http://www.twitter.com/phivolcs_dost

20 min onwards
Information dissemination
Answer queries of stakeholders
Compilation of all Earthquake and Tsunami Information

Due to the proximity of coastal communities to local earthquake generators, there is not enough time for warning to come from PHIVOLCS, that is why PHIVOLCS emphasized awareness of residents regarding the natural signs of impending tsunami and the proper response to such events.

5. Tsunami Standard Operating procedures for Distant Tsunami (when distant tsunami hazard exists)

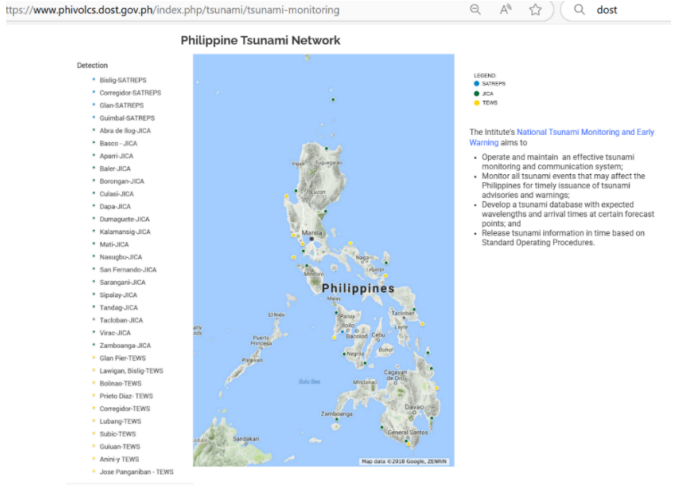
For each situation, please provide the following:

- *What organization identifies and characterizes tsunamigenic events?* PHIVOLCS

- *What is the threshold or criteria for declaring a potential tsunami emergency?*
  -Events that have potential to generate tsunami waves reaching Philippine coasts with a height of at least one meter (including tides), warning is issued to the public through the Office of Civil Defense and the LGUs
- *What organization acts on the information provided by the agency responsible for characterizing the potential tsunami threat?*
  -NDRRMC through OCD oversees actions taken and coordinates local and international humanitarian response to affected areas
- *How is the tsunami information (warning, public safety action, etc.) disseminated within the country? Who is it disseminated to?*
  -NDRRMC through OCD oversees actions taken and coordinates local and international humanitarian response to affected areas
- *How is the emergency situation terminated?*
  -Tsunami warning is terminated two hours after the last observed tsunami waves BUT tsunami wave action is still observed along coasts and ports and reported to NDRRMC
  -The coastal community can return once the LGU declares it after thorough inspection of its coasts.
- *For distant tsunami Procedures:*
  What actions were taken in response to the tsunami bulletins issued by PTWC, NWPTAC, and/or SCSTAC during the intersessional period?
  -For the Philippines side, as the official tsunami warning center, we validate information with our network and streaming data from global networks for distant events, we monitor the status of propagating tsunami waves and estimate wave heights and arrival times
  -For the Philippine coasts and we regularly issue tsunami information and updates, (transmitted to the OCD, released via PHIVOLCS Website and Social media accounts; media updates are also provided
  http://www.phivolcs.dost.gov.ph
  http://www.facebook.com/PHIVOLCS
  http://www.twitter.com/phivolcs_dost

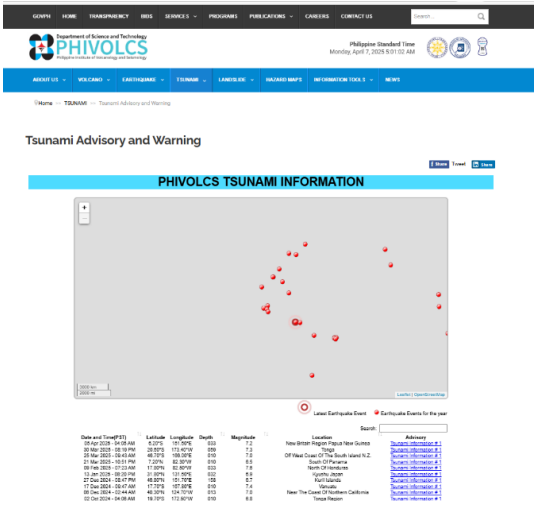
Note: Note

6. **National Sea Level Network**
   https://www.phivolcs.dost.gov.ph/index.php/tsunami/tsunami-monitoring



7. Information on Tsunami Occurrences

https://www.phivolcs.dost.gov.ph/index.php/tsunami/tsunami-advisory-and-warning3

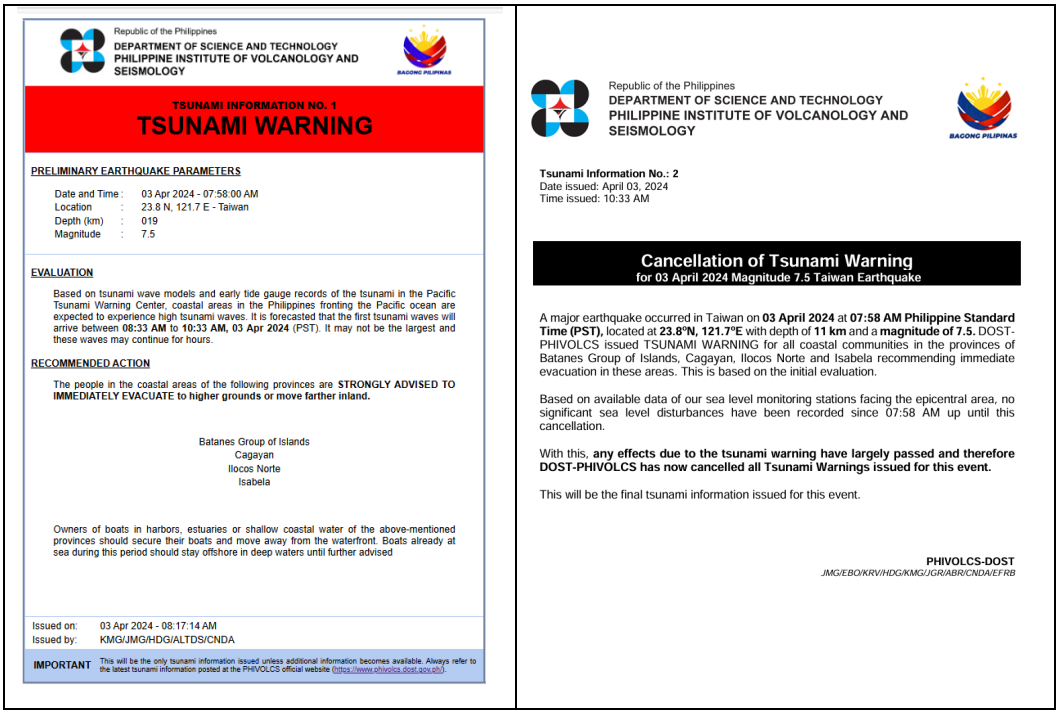


For January-December 2024, of the 22 offshore events that are potentially tsunamigenic, Tsunami Information #1 - No Tsunami Threat was relased by PHIVOLCS immediately after receiving information for the 21 events. Only in 1 event, the 3 April 2024 M 7.5 Taiwan, that PHIVOLCS Issued Tsunami Information No. 1- Tsunami Warning at 8:17 AM (Local time), and Cancellation of Tsunami Warning was issued at 10:33AM.

Table 1.

Search:

Date and Time(PST)	Latitude	Longitude	Depth	Magnitude	Location	Advisory
05 Apr 2025 - 04:05 AM	6.20°S	151.60°E	033	7.2	New Britain Region Papua New Guinea	Tsunami Information # 1
30 Mar 2025 - 08:19 PM	20.60°S	173.40°W	059	7.3	Tonga	Tsunami Information # 1
25 Mar 2025 - 09:43 AM	46.70°S	166.00°E	010	7.0	Off West Coast Of The South Island N.Z.	Tsunami Information # 1
21 Mar 2025 - 10:51 PM	7.20°N	82.30°W	010	6.5	South Of Panama	Tsunami Information # 1
09 Feb 2025 - 07:23 AM	17.80°N	82.50°W	033	7.6	North Of Honduras	Tsunami Information # 1
13 Jan 2025 - 08:20 PM	31.80°N	131.60°E	032	6.9	Kyushu Japan	Tsunami Information # 1
27 Dec 2024 - 08:47 PM	46.80°N	151.70°E	158	6.7	Kuril Islands	Tsunami Information # 1
17 Dec 2024 - 09:47 AM	17.70°S	167.80°E	010	7.4	Vanuatu	Tsunami Information # 1
06 Dec 2024 - 02:44 AM	40.30°N	124.70°W	013	7.0	Near The Coast Of Northern California	Tsunami Information # 1
02 Oct 2024 - 04:06 AM	19.70°S	172.50°W	010	6.8	Tonga Region	Tsunami Information # 1
02 Sep 2024 - 04:14 AM	6.70°S	155.50°E	055	6.6	Solomon Islands	Tsunami Information # 1
26 Aug 2024 - 07:29 AM	20.00°S	174.30°W	131	6.6	Tonga	Tsunami Information # 1
18 Aug 2024 - 03:10 AM	52.70°N	160.10°E	044	7.4	Off The East Coast Of Kamchatka Russia	Tsunami Information # 1
10 Aug 2024 - 11:28 AM	47.40°N	145.60°E	489	6.8	Sea Of Okhotsk	Tsunami Information # 1
08 Aug 2024 - 03:42 PM	31.80°N	131.70°E	033	6.9	Kyushu Japan	Tsunami Information # 1
03 Aug 2024 - 06:23 AM	8.11°N	127.02°E	10	6.5	Offshore of Surigao Del Sur	Tsunami Information # 1
19 Jul 2024 - 09:51 AM	22.80°S	68.00°W	170	7.4	Northern Chile	Tsunami Information # 1
11 Jul 2024 - 11:09 PM	49.90°N	129.90°W	011	6.6	Vancouver Island Canada Region	Tsunami Information # 1
11 Jul 2024 - 10:13 AM	6.11°N	123.35°E	651	6.5	Offshore Sultan Kudarat	Tsunami Information # 1
28 Jun 2024 - 01:37 PM	16.00°S	74.60°W	060	7.0	Near The Coast Of Central Peru	Tsunami Information # 1
27 May 2024 - 04:47 AM	19.50°S	174.50°W	157	6.6	Tonga	Tsunami Information # 1
27 Apr 2024 - 04:35 PM	27.90°N	140.00°E	538	6.9	Bonin Islands Japan Region	Tsunami Information # 1
15 Apr 2024 - 04:57 AM	5.90°S	151.10°E	081	6.5	New Britain Region Papua New Guinea	Tsunami Information # 1
09 Apr 2024 - 05:48 PM	2.70°N	127.10°E	033	6.6	Molucca Sea	Tsunami Information # 1
05 Apr 2024 - 07:03 PM	19.10°N	145.60°E	212	6.7	Mariana Islands	Tsunami Information # 1
03 April 2024 - 07:58 AM	23.8°N	121.7°E	19	7.5	Taiwan	Tsunami Information # 2 Tsunami Information # 1
09 Jan 2024 - 04:48 AM	4.87°N	126.36°E	76	7.1	Offshore Sarangani Island,Davao Occidental	Tsunami Information # 1
01 Jan 2024 - 03:10 PM	37.50°N	137.20°E	001	7.4	Near The West Coast of Honshu Japan	Tsunami Information # 1



Republic of the Philippines
DEPARTMENT OF SCIENCE AND TECHNOLOGY
PHILIPPINE INSTITUTE OF VOLCANOLOGY AND SEISMOLOGY

BAGONG PILIPINAS

TSUNAMI INFORMATION NO. 1

TSUNAMI WARNING

PRELIMINARY EARTHQUAKE PARAMETERS

Date and Time : 03 Apr 2024 - 07:58:00 AM
Location : 23.8 N, 121.7 E - Taiwan
Depth (km) : 019
Magnitude : 7.5

EVALUATION

Based on tsunami wave models and early tide gauge records of the tsunami in the Pacific Tsunami Warning Center, coastal areas in the Philippines fronting the Pacific ocean are expected to experience high tsunami waves. It is forecasted that the first tsunami waves will arrive between **08:33 AM** to **10:33 AM, 03 Apr 2024** (PST). It may not be the largest and these waves may continue for hours.

RECOMMENDED ACTION

The people in the coastal areas of the following provinces are **STRONGLY ADVISED TO IMMEDIATELY EVACUATE to higher grounds or move farther inland.**

Batanes Group of Islands
Cagayan
Ilocos Norte
Isabela

Owners of boats in harbors, estuaries or shallow coastal water of the above-mentioned provinces should secure their boats and move away from the waterfront. Boats already at sea during this period should stay offshore in deep waters until further advised

Issued on: 03 Apr 2024 - 08:17:14 AM
Issued by: KMG/JMG/HDG/ALTDS/CNDA

IMPORTANT This will be the only tsunami information issued unless additional information becomes available. Always refer to the latest tsunami information posted at the PHIVOLCS official website (https://www.phivolcs.dost.gov.ph).

Republic of the Philippines
DEPARTMENT OF SCIENCE AND TECHNOLOGY
PHILIPPINE INSTITUTE OF VOLCANOLOGY AND SEISMOLOGY

BAGONG PILIPINAS

Tsunami Information No.: 2
Date issued: April 03, 2024
Time issued: 10:33 AM

Cancellation of Tsunami Warning
for 03 April 2024 Magnitude 7.5 Taiwan Earthquake

A major earthquake occurred in Taiwan on **03 April 2024** at **07:58 AM Philippine Standard Time (PST),** located at **23.8°N, 121.7°E** with depth of **11 km** and a **magnitude of 7.5.** DOST-PHIVOLCS issued TSUNAMI WARNING for all coastal communities in the provinces of Batanes Group of Islands, Cagayan, Ilocos Norte and Isabela recommending immediate evacuation in these areas. This is based on the initial evaluation.

Based on available data of our sea level monitoring stations facing the epicentral area, no significant sea level disturbances have been recorded since 07:58 AM up until this cancellation.

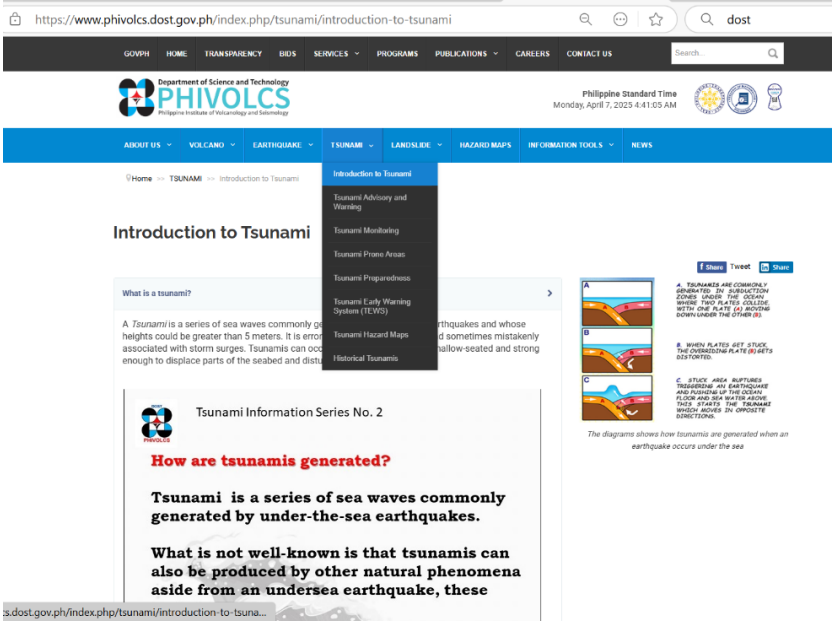
With this, **any effects due to the tsunami warning have largely passed and therefore DOST-PHIVOLCS has now cancelled all Tsunami Warnings issued for this event.**

This will be the final tsunami information issued for this event.

PHIVOLCS-DOST
JMG/EBO/KRV/HDG/KMG/JGR/ABR/CNDA/EFRB

8. Websites (URLs) of national tsunami-related web sites

https://www.phivolcs.dost.gov.ph/index.php/tsunami/introduction-to-tsunami



9. Summary of Plans for future tsunami warning and mitigation system improvements

-As of end of 2024, the Philippines has 123-station Seismic Monitoring Network operated by PHIVOLCS. By the end of 2028 we target to have 145 seismic stations. By the end of 2028, PHIVOLCS plans to have 100 sites for Sea Level Monitoring Station (SLMS) for the Philippines.

-Review and updating of Tsunami SOPs will be done in the next 2 years.

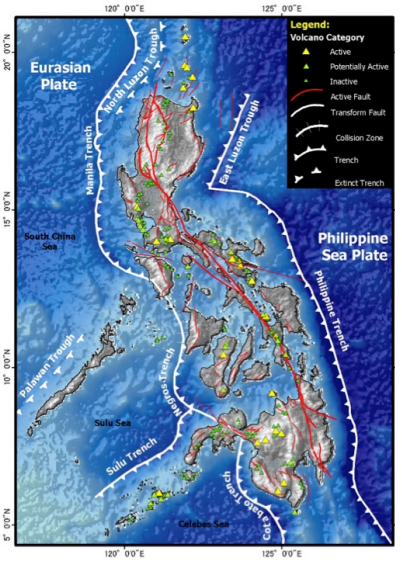
10. EXECUTIVE SUMMARY

(Please provide a brief statement of no more than 1 page addressing all items discussed in the narrative section of the National Report)

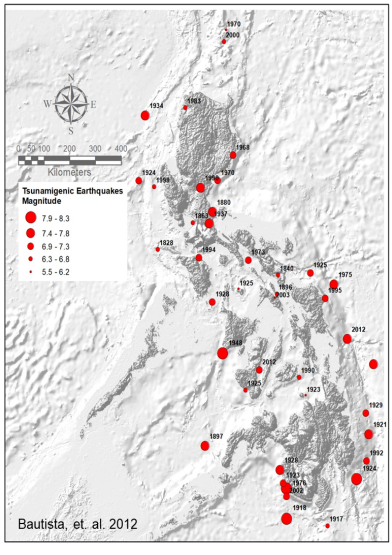
The Philippine Institute of Volcanology and Seismology (PHIVOLCS) an attached agency of the Department of Science and Technology (DOST) is the national government agency mandated to study, monitor, and provide warnings on earthquake, tsunami, and volcanic eruption occurrences. *There are 4 key actions for DRR: hazards and risks assessment, monitoring, communication and preparedness, mitigation response and recovery.*

Several major strategic initiatives that have been identified by DOST-PHIVOLCS namely: the National Earthquake Monitoring and Information, National Tsunami Monitoring and Early Warning, National Volcano Monitoring and Warning, Earthquake Hazards Assessment and Research and Development, PHIVOLCS Risk Information Management Assessment, Volcano, Earthquake and Tsunami Disaster Preparedness and Risk Reduction. The annual planned projects and activities of the agency contribute to these programs.

The Philippines is situated with subduction zones both to its east and west. As it is surrounded by major bodies of water (Pacific Ocean, South China Sea, Celebes Sea), PHIVOLCS has identified coastal communities as vulnerable to tsunamis from locally generated earthquakes. Communities in its eastern coastline facing the Pacific Ocean is also vulnerable to long-distance tsunamis.



Earthqauke generators in the Philippines

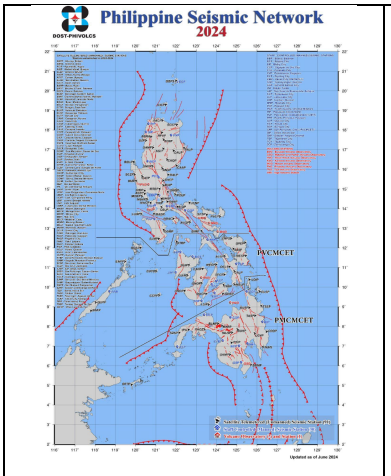


Historical Tsunamis in the Philippines

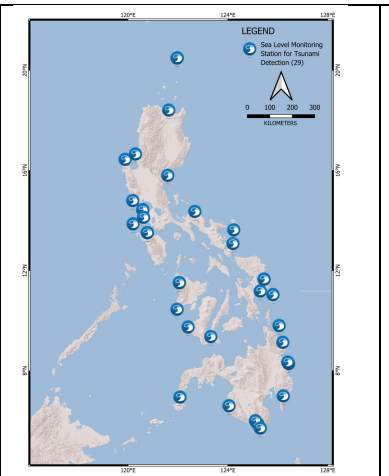
Its long history of tsunami occurrences, can be found in the Philippine Tsunami and Seiches (Tsunami and Seiches). PHIVOLCS also characterized the identified earthquake sources (Manila Trench, East Luzon Trough, Sulu Trench, Negros Trench, Cotabato Trench and the Philippine Trench, which could generate tsunamis (Salcedo, 2010). Input parameters were identified (magnitude cases, depth, and strike angles for some faults) and used for the simulation. A database has been created and being maintained which contains total of 30,000 event-based Tsunami Scenarios.

Based on geologic studies, 30 provinces have tsunami prone coastal areas. Tsunami hazard maps of various level and detail have been generated. Refinement of first-generation hazard maps are also being conducted. Available tsunami hazard maps are accessible via the PHIVOLCS official website (HAZARD MAPS).

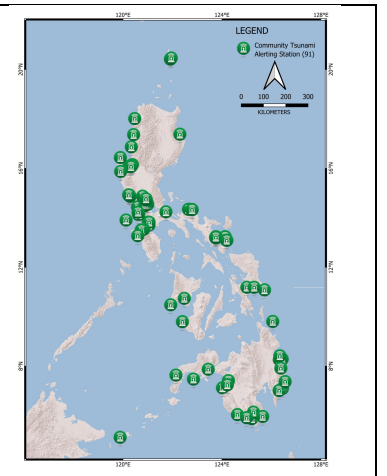
PHIVOLCS currently operates the Philippine Seismic Network with 29 staff-controlled and 94-satellite-telemetered seismic stations distributed all over the country, including 7 volcano observatories. For redundancy and to ensure continuity of operations and public service, the Tagaytay City Mirror Seismic Station, PHIVOLCS Mindanao Cluster Monitoring Center for EQ and Tsunami (PMCMCET) as well as the PHIVOLCS Visayas Cluster Monitoring Center for EQ and Tsunami (PVCMCER, in 2024) were established. As mirror stations, these are set up similar to the PHIVOLCS Quezon City Data Receiving Center (QCDRC), so that in an event that the QCDRC operations is disrupted, the other three can continue on its operations.



123-station Seismic Network



29 Sea Level Monitoring Stations



91 Community Tsunami Alerting Stations

As of end of 2024, PHIVOLCS has 123-station Seismic Monitoring Network. By the end of 2028 we target to have 145 seismic stations. By the end of 2028, PHIVOLCS plans to have 100 sites for Sea Level Monitoring Station (SLMS).

For the Tsunami Monitoring Network, PHIVOLCS has 29 Sea Level Monitoring Stations. In collaboration with the local government units, is able to establish and operate 91 Community Tsunami Alerting Stations (CTAS).

Considering the history of local tsunami-generating earthquakes with 41 confirmed tsunami events based on historical accounts and earthquake events catalogues from 1828 to 2012, and

very little time for warning, it is important to emphasize the importance of awareness for natural signs of tsunami- “Shake, Drop, Roll”.

For Hazard and Impact assessment, PHIVOLCS developed REDAS, a software and HazardHunterPH, (HazardHunterPH - Hazard assessment at your fingertips)

Earthquake (Earthquake Preparedness) and Tsunami information materials (Tsunami Preparedness), in local languages, not only in English and Tagalog (official languages), were developed through the years. The aim is to be inclusive, and context driven. PHIVOLCS also has a program for conduct of capacity building activities in collaboration with the Local Government Units (LGUs) etc. The Philippines since 2016 have participated in the observance of WTAD through various collaborative activities.

Since 2005, PHIVOLCS has been active in Tsunami preparedness and Community-based Tsunami Early Warning System though selected pilot sites. As early as 2022, we have introduced the Tsunami Ready Recognition Program, and Philippines is now in the process of setting up and establishing the National Tsunami Ready Board (NTRB), which the Office of Civil Defense will head, with PHIVOLCS as member.

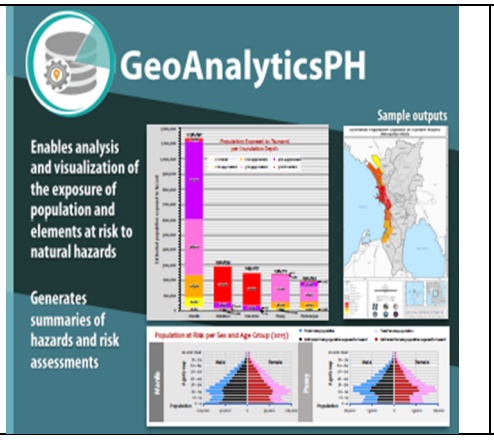
11. NARRATIVE

(Detailed description of innovations or modifications to National Tsunami warnings procedures or operations since last National Report, tsunami research projects, tsunami mitigation activities and best practices (especially in preparedness and emergency management), tsunami exercises, as well as public education programs or other measures taken to heighten awareness of the tsunami hazard and risk)

As of end 2024, the following are specific projects/activities that directly contribute to the goals of Tsunami DRR.

a. Innovations or modifications to National Tsunami Warnings, procedures or operations

1. *Management, Operation and Implementation of Systems for Tsunami Monitoring and Warning (MOIST).* The project aims to provide accurate Tsunami Information, Warnings, and Advisories using the information from a well-managed Network of Sea Level Monitoring Stations for Tsunami Detection and Early Warning Systems. The issuance of the warning shall be backed up by other international tsunami warning systems and information. Tsunami Information shall be of use by relevant response agencies for risk management for tsunami-prone coastal communities in the Philippines. MOIST also utilizes ready information from the Tsunami Scenario Database (30,000 scenarios) developed as early as 2010.
2. *Geospatial Information Management and Analysis Project for Hazards and Risk Assessment in the Philippines (GeoriskPH initiatives).* Development and continuous enhancement of online platforms for hazards assessment, collection of exposure information and coping capacity measures. DRRM Officers and planners of various Local Government Units have been trained and are continuously being trained on how to utilize and integrate GeoRiskPH in their local planning.

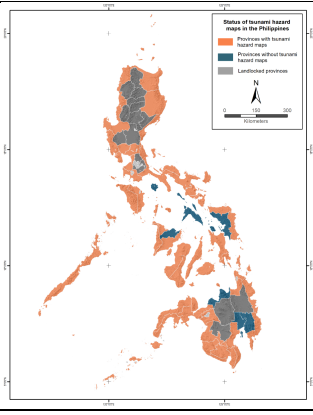


3. *Development and continuous enhancement of REDAS Software.* Tsunami Simulation and Impact Assessment (TsuSIM) Module which can simulate tsunami hazard, perform simulation and animation, compute for tsunami impacts and plot tsunami evacuation maps. DRRM Officers and planners of various Local Government Units have been trained and are continuously being trained on how to utilize and integrate REDAS in DRRM planning.

b. Tsunami Research Projects:

1. *"Coast Assessment, Mapping and Research of Tsunami Hazards in the Philippines (CoAsT PH).* Aims to strengthen the country's resilience to tsunami threats by assessing and mapping coastal areas at risk of tsunami hazards and conducting research on both past and present events. Using tsunami source-to-coast propagation modeling, geographic information system (GIS) techniques, and geological and geophysical investigations of paleotsunamis, the project provides critical data for disaster risk reduction, supporting planning, early warning systems, and emergency response strategies.

	No. of Provinces	Year Generated
Tsunami Prone Areas with Hazard Map	30	2007-2013
Tsunami Inundation Maps (with specific inundation depths)	29	2018-2022 as of 2024 Tsunami Hazard Maps:80 **municipal scale** maps
No tsunami hazard map	8	
Landlocked Provinces	15	



2. *Evaluation of PHIVOLCS' Roles in Risk Communication and Policymaking in Tsunami-Prone Localities.* PHIVOLCS plays a key role in mitigating tsunami risks through non-structural strategies, but policymaking remains underexplored. This study examined PHIVOLCS' contributions to local policymaking and risk

communication, offering recommendations for improvement. Factors influencing tsunami risk perception include past negative experiences including proxy experiences, communication with professional information brokers, socio-cultural and religious beliefs, and political power dynamics. While PHIVOLCS provides science-based information, the study highlights the need for better communication strategies. It recommends further trust-building through transparency in methods, collaborating with influential local actors to incorporate diverse risk perceptions into assessments and policymaking, and integrating local and indigenous knowledge with science for a more holistic risk communication.

c. Tsunami mitigation activities and best practices

1. *3R (Risk Reduction and Resilience)-Tsunami Ready community*. With the implementation of various activities related to the development of tsunami-ready community, this project assists communities to be tsunami-ready. For the year 2023-2024, selected pilot sites were identified (e.g. Bolinao, Pangasinan and Calatagan, Batangas)
2. *Tsunami Observation for community Warning Evacuation and Resilience (TOWER).* The project's goal is to expand the Philippine Tsunami Network by continuously populating Community Tsunami Alerting Station (CTAS) to all communities prone to tsunamis and to initiate the formulation of their community evacuation plans including for awareness, preparedness, and response. All stations shall likewise be of use by relevant response agencies for risk management for the residents of tsunami-prone coastal communities in the Philippines. The project highlights the importance of planning the response during a tsunami event. This project is complementary with 3R.

   Both projects aim to support LGUs to be a Tsunami Ready Community in preparation for the IOC/UNESCO Tsunami Ready Recognition Program.

3. In discussion with the Office of Civil Defense (OCD) of the NDRRMC, the creation of National Tsunami Ready Recognition Board is currently underway.

d. Public education programmes

1. Continous production of earthquake- and tsunami-related information materials

- New sticker on “Shake, Drop and Roar”
- Sourcebooks on Earthquake and Tsunami in 6 local languages (2024-2025) (DANAS- Disaster Narratives for Experiential knowledge-based Science Communication)

These are in addition to the previously produced materials that PHIVOLCS continually reproduce as per public demand such as (1) PHIVOLCS-produced posters on general information about Tsunami in 5 local languages (2006-2007); the 4 Comics – Stories of Filipinos in Japan during the 11 March 2011 Great East Japan Earthquake (2013); and others.

2. *Observance of the World Tsunami Awareness Day.* Since 2016, the Department of Science and Technology – Philippine Institute of Volcanology and Seismology (DOST-PHIVOLCS) has been implementing activities in collaboration with various sectors and stakeholders to promote tsunami disaster risk reduction. The Institute

conducted tsunami orientations, planning workshops, and press briefings; set up interactive exhibits; initiated SMS broadcasting services; held slogan and digital poster-making online contests; disseminated print and digital tsunami information; and organized tsunami evacuation drills.

In 2024, the WTAD activity further expanded tsunami awareness and advocacy to wider stakeholders and more communities through an information campaign in partnership with the local government unit and/or private sector in the target site. It aimed to contribute to the 12 indicators under the Tsunami Ready Recognition Programme of the Intergovernmental Oceanographic Commission (IOC)-UNESCO.