

# Strengthening Disaster Resilience of MSMEs through Science-based Pre-disaster Planning Using GeoRiskPH Platforms (HazardHunterPH, GeoMapperPH, GeoAnalyticsPH)



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DOST-PHIVOLCS

May 26, 2022



**GeoRiskPH**  
INNOVATIONS FOR RESILIENCE

## What is GeoRisk Philippines?

- ❖ **Governance Platform** where different government agencies and their stakeholders (Government-to-Government, Government-to-Citizens, Government-to-Business) can collaborate to share, standardize, agree and think of new ways to optimally use information for risk valuation, planning or good governance
- ❖ **ICT and Geospatial Platform** where tools, such as database systems, mobile and web applications are developed for data integration, management and analysis of information for planning, risk assessment, research and other purposes

# GeoRisk Philippines Initiative

I N N O V A T I O N S F O R R E S I L I E N C E

## VISION

Philippines' **central source of information** for accurate and efficient hazards and risk assessment to help government increase the nation's resilience to natural hazards



# TIMELINE: 2005-2018

2005



**REINA PROJECT**  
Pagpapatibay ng Kapasidad ng Paghahanda sa Disaster na Dulot ng Panlupa at Pangmeteorolohiyang Panganib sa mga Bayan ng Real, Infanta at Heneral Nakar (REINA), Lalawigan ng Quezon



2006-2013

**READY Project: Hazards Mapping and Assessment for Effective Community-Based Disaster Risk Management**



Supported by



MAIN IMPLEMENTER AND EXECUTING AGENCIES:



RESPONSIBLE AGENCIES:



2010-2014

**GMMA-Risk Analysis Project**



2012-2014

**GMMA-READY Project**



2017

**CCOP-BGR**




2018

**GeoRisk Philippines**



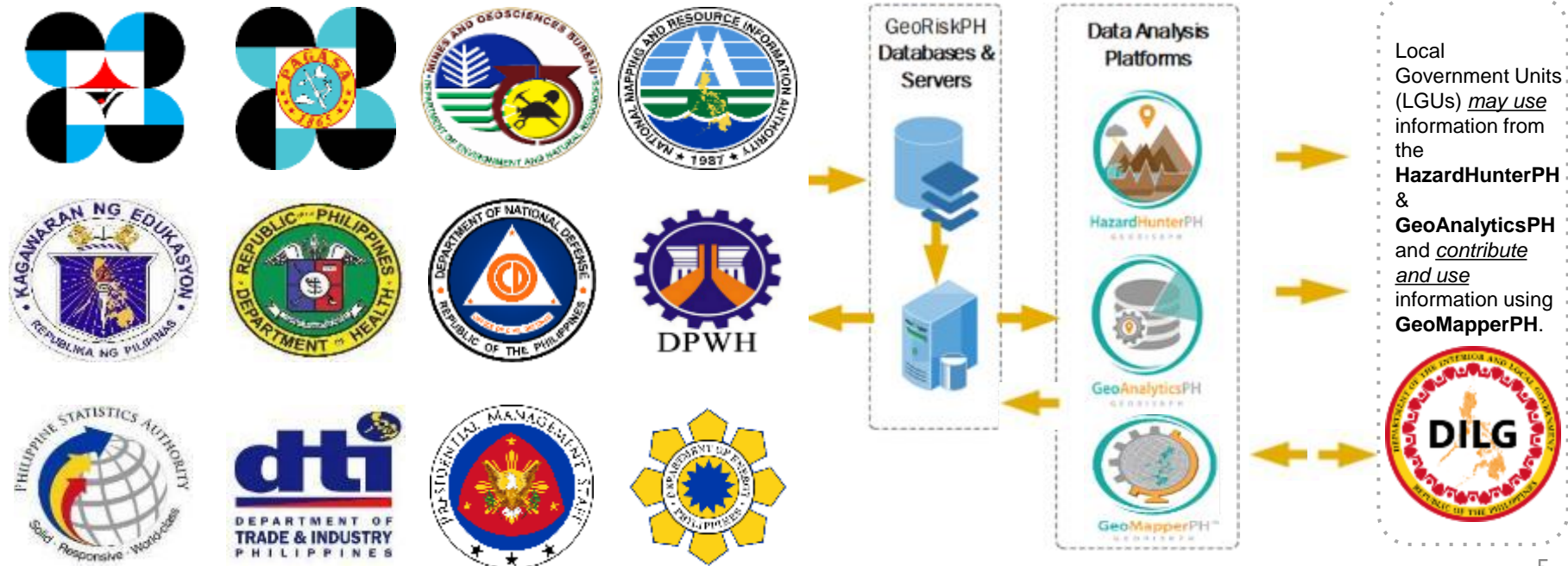
Funded and Monitored by:



# GeoRiskPH Integrated Platform (GRIP)

## Information follow standards

- data protocols
- geographic projections
- 16-digit numeric codes



# Web and Mobile Application



**HazardHunterPH**  
HAZARD ASSESSMENT AT YOUR FINGERTIPS



[hazardhunter.georisk.gov.ph](https://hazardhunter.georisk.gov.ph)

**HazardHunterPH Mobile**  
HAZARD ASSESSMENT AT YOUR FINGERTIPS



GET IT ON  
**Google Play**



# Multi-Hazard Assessment (Senate Building)



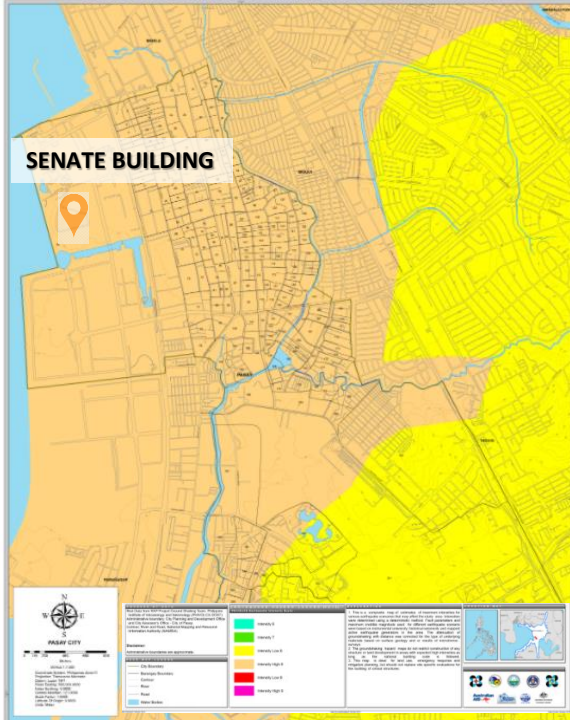
Assessment Results	
<b>SEISMIC HAZARD ASSESSMENT</b>	
Nearest Active Fault	Valley Fault System: West Valley Fault (8.0 km)
Ground Rupture	Safe
Ground Shaking	Prono; Intensity VIII
Earthquake-induced Landslide	Safe
Liquefaction	High Potential
Tsunami	Prono; Inundation depth: 2 to 2.99 meters
<b>VOLCANIC HAZARD ASSESSMENT</b>	
Nearest Active Volcano	Taal (59.3 km)
Nearest Potentially Active Volcano	Corregidor (47.7 km); No immediate volcanic hazard threat
Kilometer Radius	Outside
Ballistic Projectiles	Safe
Base Surge	Safe
Volcanic Tsunami	Safe
Nearest Inactive Volcano	Talim (part of laguna caldera) (36.7 km); No immediate volcanic hazard threat
<b>HYDRO-METEOROLOGICAL HAZARD ASSESSMENT</b>	
Flood (MGB)	Low Susceptibility; less than 0.5 meters flood height and/or less than 1 day flooding
Storm Surge (PAGASA)	Safe
Severe Wind (PAGASA)	117.1 - 220 kph (20-year return period); 117.1 -
<a href="#">View Report with Recommendations</a>	

14.5475, 120.98739

# Multi-Hazard Assessment (Senate Building)

## Ground Shaking (PHIVOLCS)

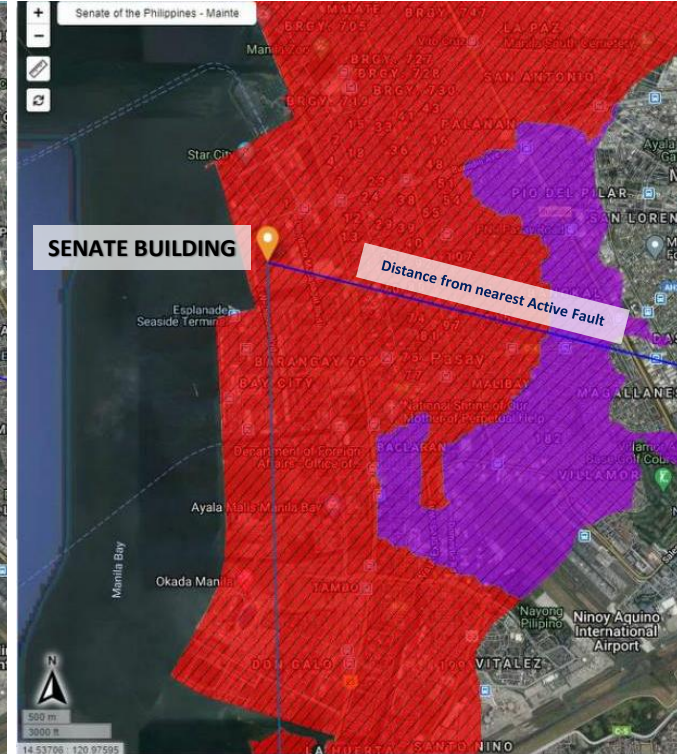
RISK ANALYSIS PROJEC: GROUND SHAKING HAZARD MAP OF PASAY CITY  
EVENT SCENARIO: MAGNITUDE 7.2 EARTHQUAKE ALONG THE WEST VALLEY FAULT.



## Tsunami (PHIVOLCS)



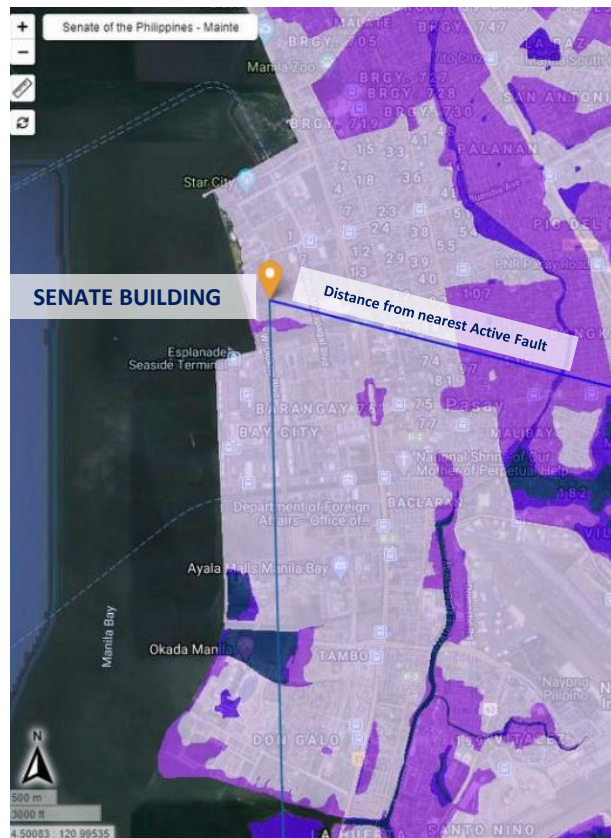
## Liquefaction (PHIVOLCS)



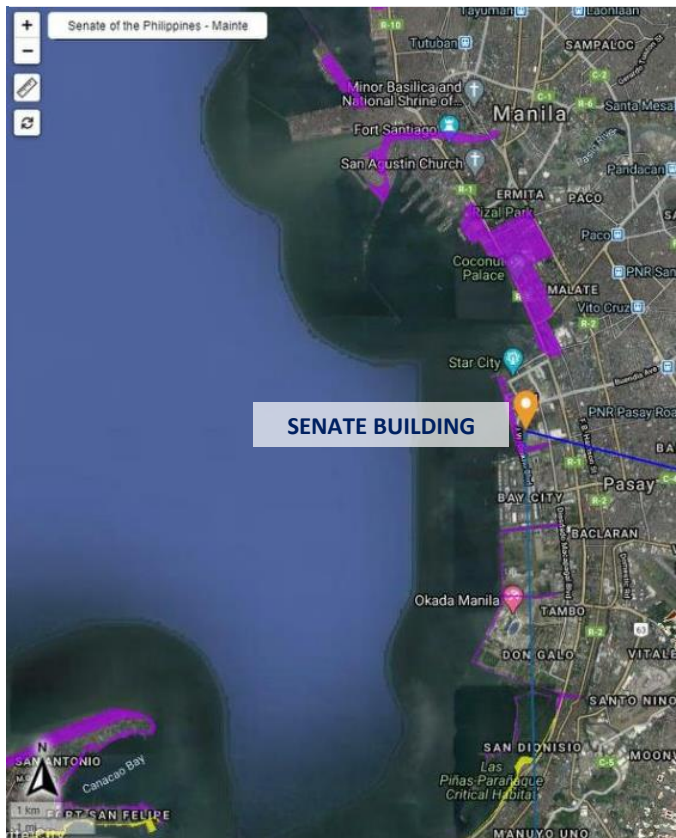


# Multi-Hazard Assessment (Senate Building)

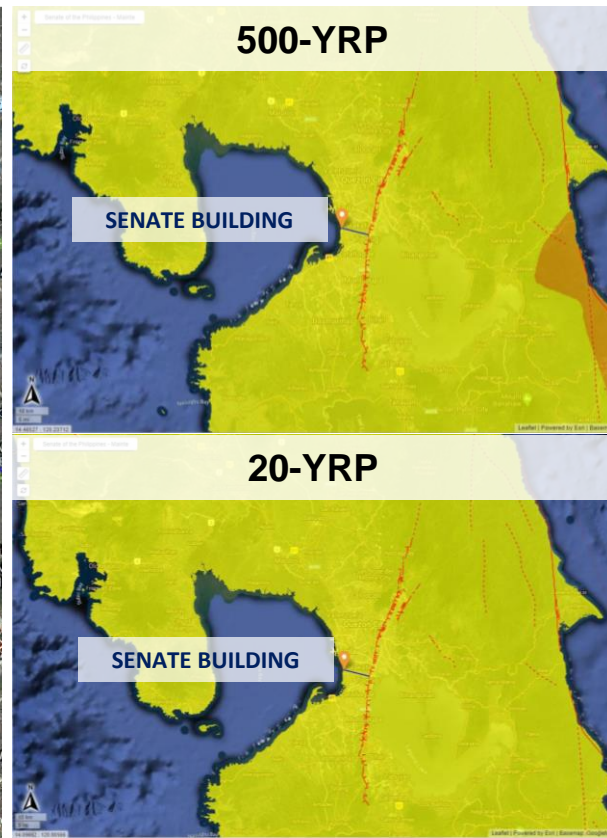
## Flood (DENR-MGB)



## Storm Surge (PAGASA)



## Severe Wind (PAGASA)





Scan to view location

**DATE** 16 March 2021, 9:04 am  
**LOCATION** Pasay City, Fourth District  
**COORDINATES** 14.54652 , 120.98345

*Note: When scanning the QR code, the assessment results in the website might vary from the results stated in this report due to updates in the data in the GeoRiskPH database. You may refer to the report available upon scanning the QR code for the updated assessment results*

#### SEISMIC HAZARDS ASSESSMENT

HAZARD	ASSESSMENT	EXPLANATION AND RECOMMENDATION
Ground Rupture	<b>Safe;</b> <b>Approximately 8.0 km from the West Valley Fault</b>	Active faults are those that have moved within the last 10,000 years. It shows evidence or has documented history of its recent movement. Ground rupture is a displacement along an active fault trace that reaches the surface.
Ground Shaking	<b>Prone; Intensity VIII</b>	All sites may be affected by ground shaking in the event of an earthquake and can be mitigated by following the provisions of the National Building code and the Structural code of the Philippines.
Liquefaction	<b>High Potential</b>	Liquefaction is a phenomenon wherein the ground, especially near the river, lake and coasts, behaves like liquid similar to quicksand due to very strong shaking.  Liquefaction hazards can be mitigated by following the provisions of the National Building Code and the Structural Code of the Philippines.
Earthquake-Induced Landslide	<b>Safe</b>	Earthquake-induced landslides are the downward slope movement of rocks, solid and other debris commonly triggered by strong shaking.
Tsunami	<b>Prone; Inundation depth: 2 to 2.99 meters</b>	Tsunami threat to people's lives can be addressed by community preparedness and a tsunami evacuation plan. Advice for tsunami evacuation comes from public agencies and the local government. More importantly, coastal communities must learn to evacuate themselves when they recognize the three natural signs of tsunami, which are 1) strong ground shaking, 2) unusual rise or fall of sea level, and 3) strong or unusual sound coming from the sea.  A tsunami is a series of sea waves commonly generated by under-the-sea earthquakes and whose heights could be greater than 5 meters.

**Note:**

- All hazard assessments are based on the available susceptibility maps and the coordinates of the user's selected location.
- Depending on the basemaps used and methods employed during mapping, discrepancies may be observed between location of hazards or exposure information and actual ground observations.

# Seismic /Earthquake Hazard Assessment (PHIVOLCS)



**DATE** 16 March 2021, 9:04 am  
**LOCATION** Pasay City, Fourth District  
**COORDINATES** 14.54652 , 120.98345

*Note: When scanning the QR code, the assessment results in the website might vary from the results stated in this report due to updates in the data in the GeoRiskPH database. You may refer to the report available upon scanning the QR code for the updated assessment results.*

[Scan to view location](#)

#### VOLCANIC HAZARDS ASSESSMENT

HAZARD	ASSESSMENT	EXPLANATION AND RECOMMENDATION
Nearest Active Volcano	<b>Taal (59.3 km)</b>	Active volcanoes are those that erupted within historical times (within the last 600 years). Accounts of these eruptions were documented by man within the last 10,000 years based on the analyses of material from young volcanic deposits.
Kilometer Radius	<b>Outside</b>	The kilometer radius is calculated from the volcano's main crater or eruptive center.
Ballistic Projectiles	<b>Safe</b>	Ballistic projectiles are large particle tephra ejected straight out of the volcanic vents.
Base Surge	<b>Safe</b>	Base surge is a special class of pyroclastic density current that are mobile and water-vapor-rich pyroclastic surges. They are generated by explosive phreatomagmatic eruptions.
Volcanic Tsunami	<b>Safe</b>	Volcanic tsunami occur in caldera lakes when water is displaced by deformation of the lake floor caused by rising magma or the entry of pyroclastic density currents (PDCs) or landslides into the lake, or in seas when water is displaced by PDCs or debris avalanches from volcanoes. Such tsunamis are unlike those generated by large magnitude offshore earthquakes, which are long-period waves generated by fault displacement or deformation of the seafloor.

**Note:**

- All hazard assessments are based on the available susceptibility maps and the coordinates of the user's selected location.
- Depending on the basemaps used and methods employed during mapping, discrepancies may be observed between location of hazards or exposure information and actual ground observations.

# Volcanic Hazard Assessment (PHIVOLCS)



**DATE** 16 March 2021, 9:04 am  
**LOCATION** Pasay City, Fourth District  
**COORDINATES** 14.54652 , 120.98345

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Scan to view location

**HYDRO-METEOROLOGICAL HAZARDS ASSESSMENT**

HAZARD	ASSESSMENT	EXPLANATION AND RECOMMENDATION
Flood	<b>Low Susceptibility; less than 0.5 meters flood height and/or less than 1 day flooding</b>	<p>Areas with low susceptibility to floods are likely to experience flood heights of less than 0.5 meters and/or flood duration of less than 1 day. These include low hills and gentle slopes that have sparse to moderate drainage density.</p> <p>The implementation of appropriate mitigation measures as deemed necessary by project engineers and LGU building officials is recommended for areas that are susceptible to various flood depths. Site-specific studies including the assessment for other types of hazards should also be conducted to address potential foundation problems.</p>

**Note:**

- All hazard assessments are based on the available susceptibility maps and the coordinates of the user's selected location.
- Depending on the basemaps used and methods employed during mapping, discrepancies may be observed between location of hazards or exposure information and actual ground observations.
- The possibility of both rain-induced landslide and flooding occurring is not disregarded. Because of the composite nature of MGB's 1:10,000-scale Rain-induced Landslide and Flood Susceptibility Maps, it spatially prioritizes the more frequently occurring and most damaging hazards in an area. Continuous updating is being done.

# Hydro-met Hazard Assessment (MGB)



**DATE** 16 March 2021, 9:04 am  
**LOCATION** Pasay City, Fourth District  
**COORDINATES** 14.54652 , 120.98345

*Note: When scanning the QR code, the assessment results in the website might vary from the results stated in this report due to updates in the data in the GeoRiskPH database. You may refer to the report available upon scanning the QR code for the updated assessment results*

Scan to view location

#### HYDRO-METEOROLOGICAL HAZARDS ASSESSMENT

HAZARD	ASSESSMENT	EXPLANATION AND RECOMMENDATION
Storm Surge	Safe	<p>A storm surge ("daluyong ng bagyo") is the abnormal rise in sea level that occurs during tropical cyclones or "bagyo". It happens when a very strong tropical cyclone blows-off excessive amounts of seawater toward low-lying coastal communities.</p> <p>It is catastrophic and life-threatening because a storm surge can cause massive inland flooding, sometimes in unimaginable heights. It is even more dangerous when the storm surge coincides with a high tide.</p> <p>For storm surge-prone communities, the most important considerations are 1) the strength of the tropical cyclone, 2) the height of the surge, and 3) if the community is located in a low-lying areas.</p>
Severe Wind	117.1 - 220 kph (20-year return period); 117.1 - 220 kph (500-year return period)	<p>The Regional Severe Wind Hazard Map represents the 3-second peak gust wind speed measured at 10-meter height (above ground) over open and flat terrain. This does not take into account the local factors such as topography, terrain roughness and shielding from neighbouring structures.</p> <p>The Regional Severe Wind Hazard is expressed in terms of Return Periods (RPs) of Tropical Cyclone winds. Return period means the repeat interval, or the estimate of likelihood and severity of severe wind event. Return periods are then translated into Annual Exceedance Probabilities (AEPs) which are the chance that a given severe wind hazard level will be equalled or exceeded in any year.</p> <p>At higher return periods, the wind speeds are stronger but are less frequent.</p> <p>At lower return periods, the wind speeds are less intense but are more frequent.</p> <p>The Regional severe wind hazard maps are used to update the wind zoning map of the Philippines and as reference in designing building structures.</p> <p>For those areas identified as high risk to wind damage, building codes/regulations must be strictly implemented to mitigate severe wind risks. For already developed areas, retrofitting is encouraged – the methods applied in this study can be used to set out a cost-benefit study for retrofitting older, more vulnerable building types to increase their resilience to severe winds.</p>

**Note:**

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# Hydro-met Hazard Assessment (PAGASA)



# Earthquake Hazards and Earthquake Safe Open Spaces

**DISPLAY OPTIONS**

- Basemaps
- Hazards
- Exposure
- Coping Capacity
- Safe Open Spaces (NCR)**
- Advanced Layers

**RESOURCES**

- Earthquake/Volcano Monitoring
- Hazard Assessment Overview
- Download Maps
- Glossary of Terms

**GeoRiskPH**

- HazardHunterPH
- GeoAnalyticsPH
- GeoMapperPH



**Legend**

- Active Fault
- Volcano
- Safe Open Spaces (NAMRIA)**
  - Small (200 - 500 sqm)
  - Medium (> 500 - 5,000 sqm)
  - Large (> 5,000 sqm)
- Boundary (PSA)



# Earthquake Hazards and Earthquake Safe Open Spaces

The screenshot displays the HazardHunterPH web application interface. On the left is a sidebar with navigation and tool options. The main area shows a map of Manila with various overlays: brown shaded regions representing seismic hazards and blue shaded regions representing safe open spaces. A blue line on the map indicates the distance from a specific location to the nearest active fault. On the right, an 'Assessment Results' panel provides detailed data on seismic and volcanic hazards.

**LOCATION TOOLS**

- Current Location
- Long-Lat Coordinates

**DISPLAY OPTIONS**

- Basemaps
- Hazards
- Exposure
- Coping Capacity**
- Safe Open Spaces (NCR)**
- Impact
- Advanced Layers

**RESOURCES**

- Earthquake/Volcano Monitoring
- Hazard Assessment Overview
- Download Maps
- Glossary of Terms

**GeoRiskPH**

- HazardHunterPH
- GeoAnalyticsPH
- GeoMapperPH
- GeoRiskPH

**Assessment Results**

**SEISMIC HAZARD ASSESSMENT**

Nearest Active Fault	Valley Fault System; West Valley Fault (8.0 km)
Ground Rupture	Safe
Ground Shaking	Prono; Intensity VIII
Earthquake-induced Landslide	Safe
Liquefaction	High Potential
Tsunami	Prono; Inundation depth: 2 to 2.89 meters

**VOLCANIC HAZARD ASSESSMENT**

Nearest Active Volcano	Taal (59.3 km)
Nearest Potentially Active Volcano	Corregidor (47.7 km); No immediate volcanic hazard threat
Kilometer Radius	Outside
Ballistic Projectiles	Safe
Base Surge	Safe
Volcanic Tsunami	Safe
Nearest Inactive Volcano	Talim (part of Laguna caldera) (36.7 km); No immediate volcanic hazard threat

**HYDRO-METEOROLOGICAL HAZARD ASSESSMENT**

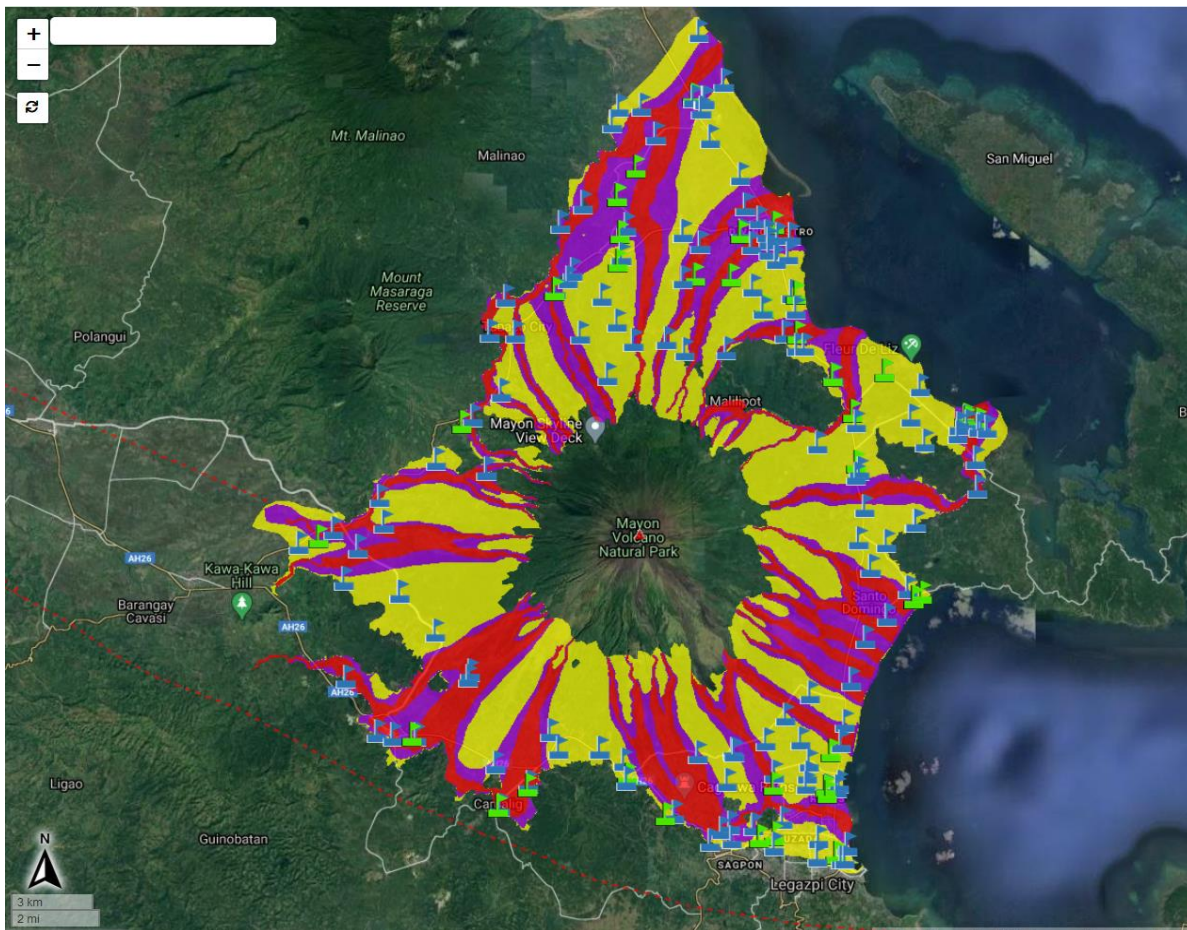
Flood (MGB)	Low Susceptibility; less than 0.5 meters flood height and/or less than 1 day flooding
Storm Surge (PAGASA)	Safe

**Map Labels:**

- Senate of the Philippines - Main
- Distance from nearest Active Fault
- Safe Open Spaces

**Map Coordinates:** 14.49967, 121.01654

# Hazard Assessment Overview



## Hazard Assessment Overview

Choose hazard

Volcanic

### VOLCANO ANALYTICS

Volcano

Mayon

Hazard

Lahar

### Elements Prone to Lahar from Mayon

Population	407,000	
Barangay	248	↓
Elementary Schools	148	↓
Secondary Schools	38	↓
Government Health Facilities	68	↓
Private Health Facilities	11	↓

Hazards and Danger Zones (PHIVOLCS); Administrative Boundaries (PSA, 2016); Population (PSA, 2015); Schools (DepEd, 2015); Health Facilities (DOH, 2016)

[Click here to see Methods and Limitations](#)

[View Full Report](#)





# Lahar Hazard Assessment Auto-generated Report for **Mayon Volcano** (PDF Version)



Republic of the Philippines  
Department of Science and Technology  
**PHILIPPINE INSTITUTE OF VOLCANOLOGY AND SEISMOLOGY**



**DATE** 20 July, 2020, 11:55 AM  
**LOCATION** MAYON  
**HAZARD** LAHAR

Note: When scanning the QR code in this report, the assessment results in the website might vary from the results stated in this report due to updates in the data in the GeoRiskPH database. You may refer to the report available upon scanning the QR code for the updated assessment results.

Scan to view location

## ASSESSMENT OVERVIEW OF AREAS AND FACILITIES SUSCEPTIBLE TO LAHAR OF MAYON

DATA	DATA SOURCE	SUSCEPTIBLE TO HAZARD
Population	Philippine Statistics Authority, 2016	~407,000
Barangays *	Philippine Statistics Authority, 2016	248
Elementary Schools *	Department of Education, 2015	148
Secondary Schools *	Department of Education, 2015	38
Government Health Facilities *	Department of Health, 2016	68
Private Health Facilities *	Department of Health, 2016	11

\* List of barangays, schools, and hospitals on next pages

### Data Disclaimer and Terms of Use

HazardHunterPH consumes existing information as provided by agencies to the GeoRiskPH Integrated System. Since some data used for calculations may be outdated, GeoRiskPH will not be liable for results that may differ from actual data. Also, hazards information may be refined and updated as new data become available to the system.

For point data for schools and health facilities, they may not represent the actual location of the facility and may need further verification. Similarly, administrative boundaries and the scope of the hazard may not fit well when calculating for their intersection. Hence, users are advised to view the hazard map overlain with the administrative boundary layer to visually verify how much of the area is within the scope of the hazard. Lastly, it should be noted that administrative boundaries used are only an approximate and are not considered authoritative.

### Calculation Method

Calculation for the level of exposure or proneness of barangays to hazards incorporates the slightest intersection between the barangay boundary and hazard layers. Values for prone population, schools, and health facilities per barangay, and prone barangays per municipality were summed up to obtain the values shown on the table. In the absence of data for built-up areas, population density figures per barangay were obtained by evenly distributing population across each barangay.

Barangays prone to hazard = barangays  $\cap$  hazard

Population prone to hazard = population density  $\times$  (barangay area  $\cap$  hazard area)

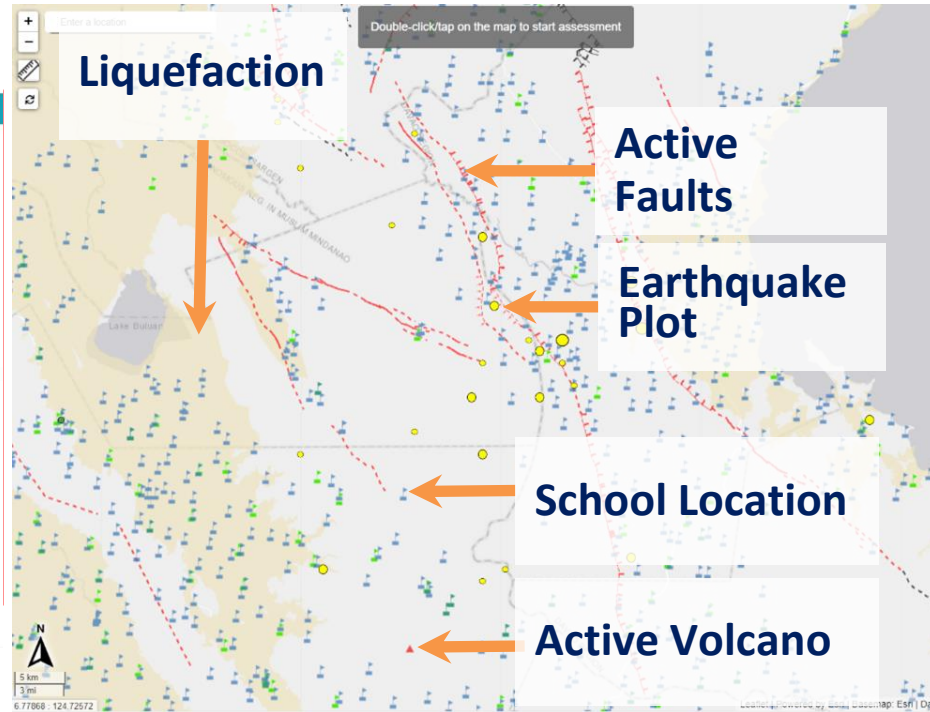
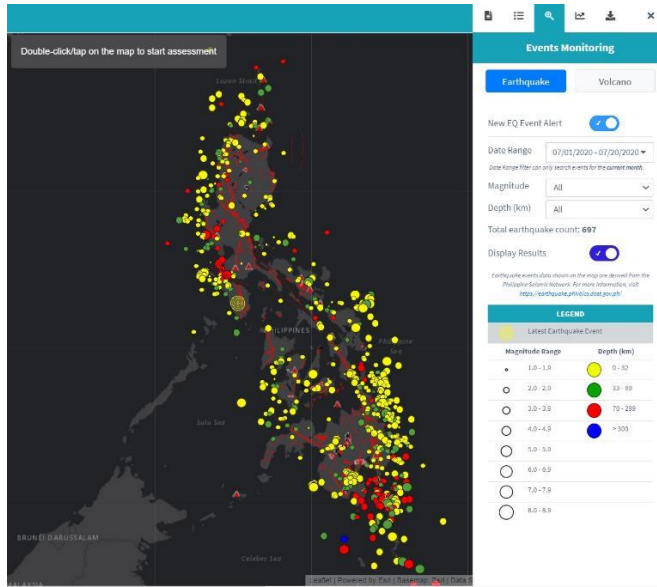
Facilities prone to hazard = barangays  $\cap$  hazard  $\cap$  facilities (Note: Facilities may be schools or health facilities)

# Base Surge Hazard Assessment Auto-generated Report for **Taal Volcano** (Excel Version)

1	<b>Barangays Prone to Base Surge from Taal Volcano</b>	
2	<b>Date of report:</b>	2021-02-18
3	<b>Location:</b>	Taal Volcano
4	<b>Hazard:</b>	Base Surge
5		
6	<i>Note: Administrative boundaries are approximate and not authoritative.</i>	
7	<i>This report was auto-generated.</i>	
8		
9	<b>PROVINCE</b>	<b>MUNICIPALITY/CITY</b>
10	Batangas	Agoncillo
11	Batangas	Agoncillo
12	Batangas	Agoncillo
13	Batangas	Agoncillo
14	Batangas	Agoncillo
15	Batangas	Agoncillo
16	Batangas	Agoncillo
17	Batangas	Agoncillo
18	Batangas	Agoncillo
19	Batangas	Agoncillo
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25	Batangas	Agoncillo
26	Batangas	Agoncillo
27	Batangas	Agoncillo
28	Batangas	Agoncillo
		<b>BARANGAY</b>
		Adia
		Bagong Sikat
		Balangan
		Bangin
		Banyaga
		Barigon
		Bilibinwang
		Coral Na Munti
		Guitna
		Mabini
		Pamiga
		Panhulan
		Pansipit
		Poblacion
		Pook
		San Jacinto
		Santa Cruz
		San Teodoro
		Santo Tomas



# Hazard Sources and Hazard and Exposure Information



- Displays earthquake plots with reference to natural hazard sources, multi-hazard layers and critical facilities

- User-defined basemaps based on available map options



**GeoMapperPH**  
MAP ANYWHERE, ANYTIME

# Empowering LGUs & NGAs in Data Collection (Exposure, Vulnerability, Coping Capacity etc.)



**DOST**



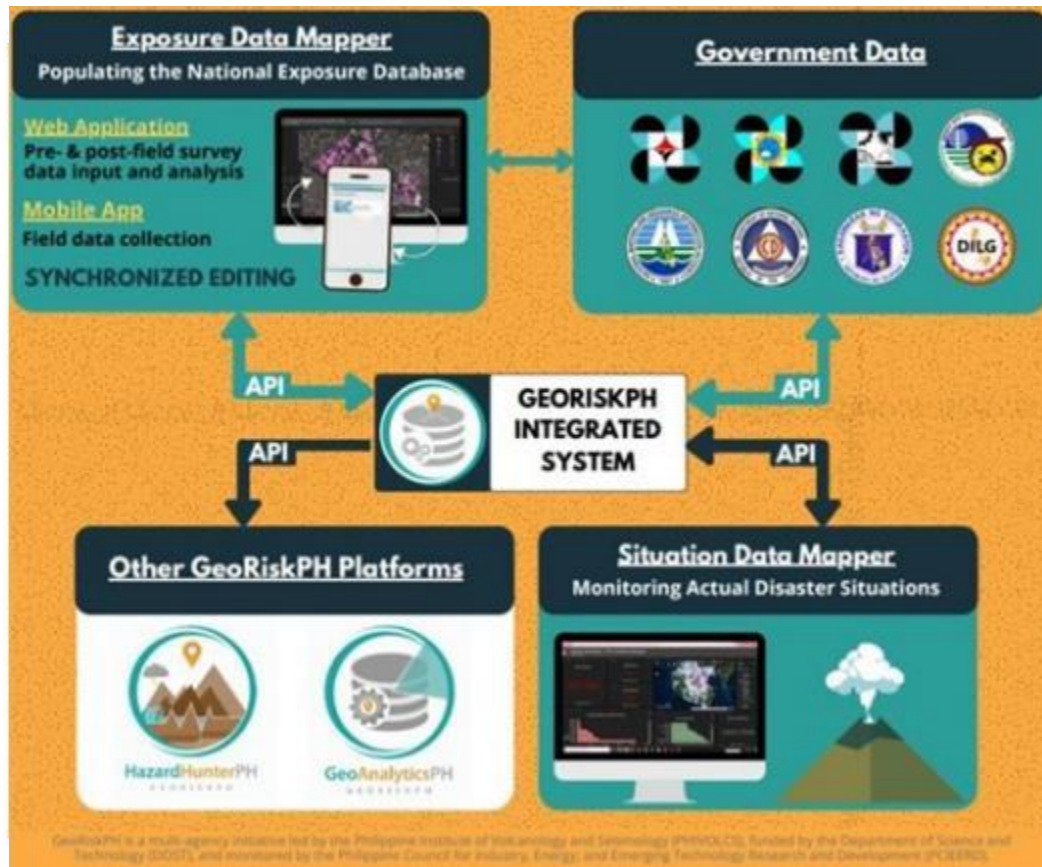
**DOST-PHIVOLCS**



# GeoMapperPH

MAP ANYWHERE, ANYTIME

## WORK IN A NUTSHELL

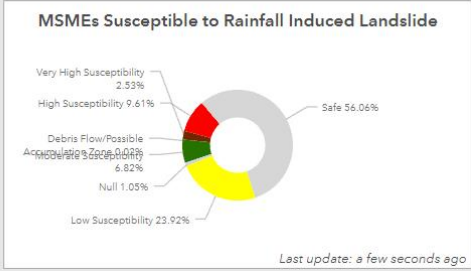
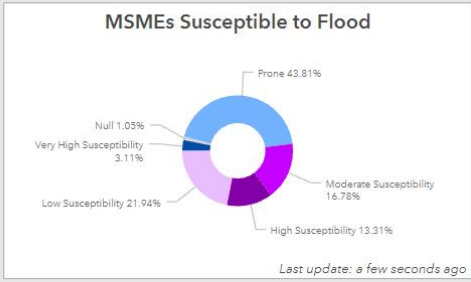
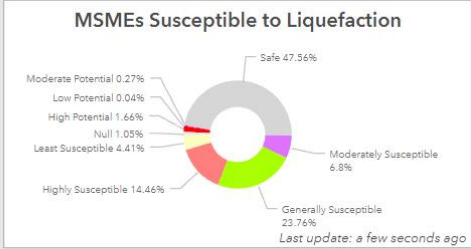
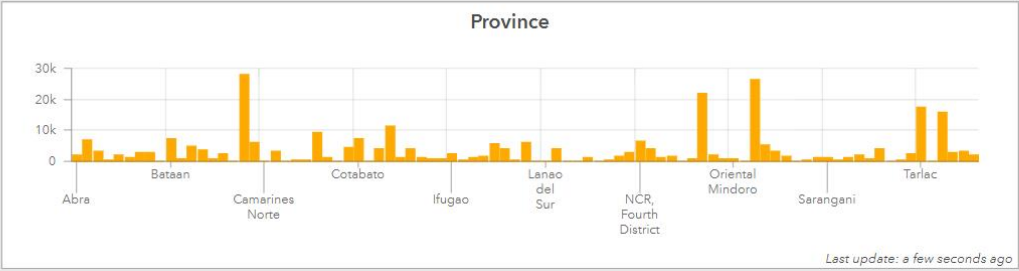
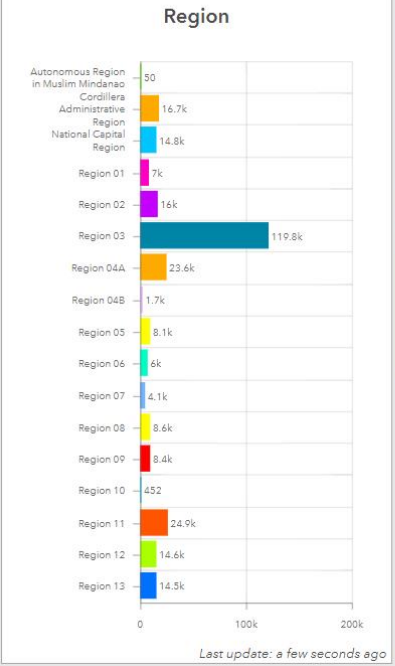
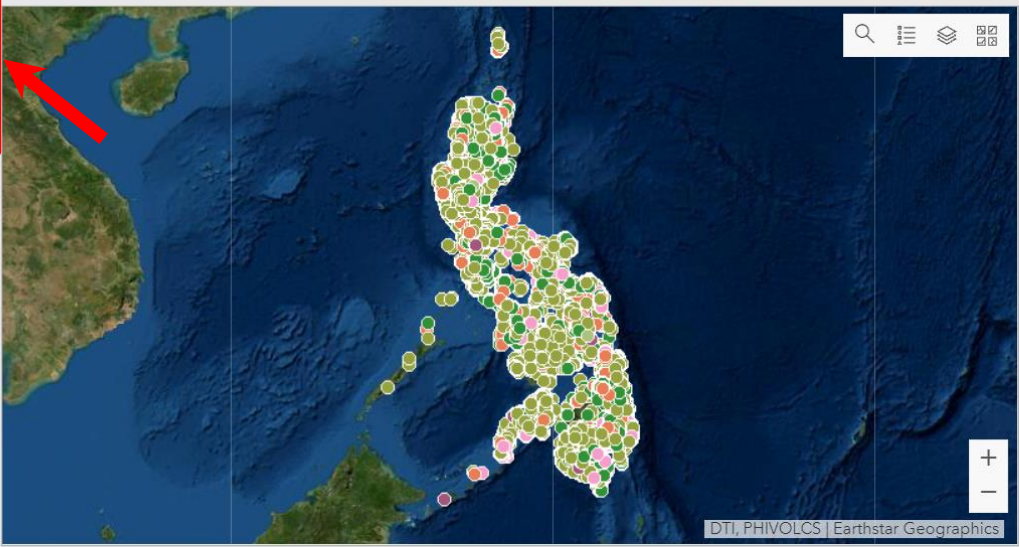


# Total Number of MSMEs:

**Number of MSMEs**

**289,374**

*Last update: a few seconds ago*



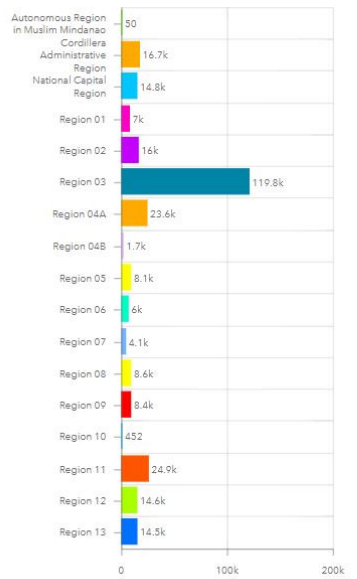
# MSMEs per Region:

## Number of MSMEs

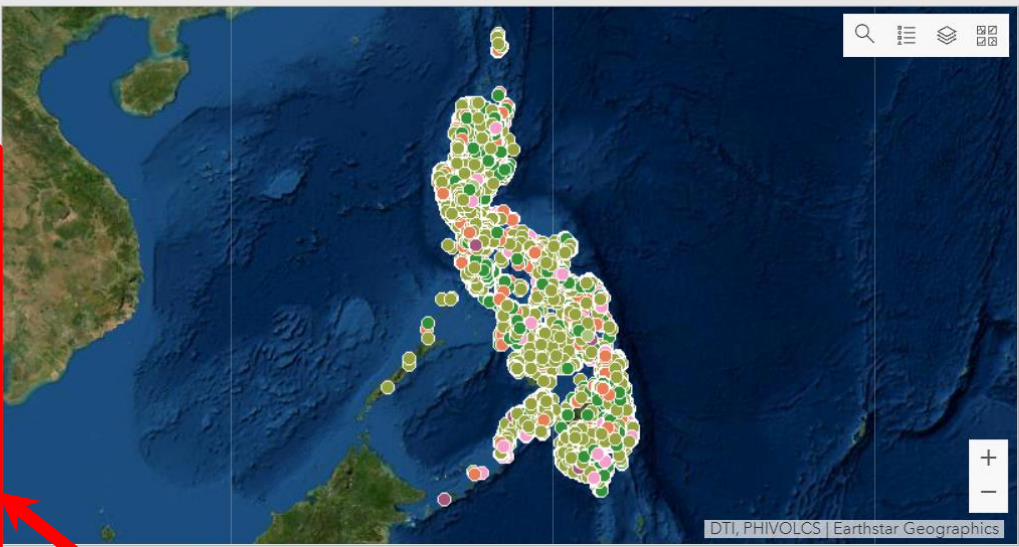

289,374

*Last update: a few seconds ago*

### Region

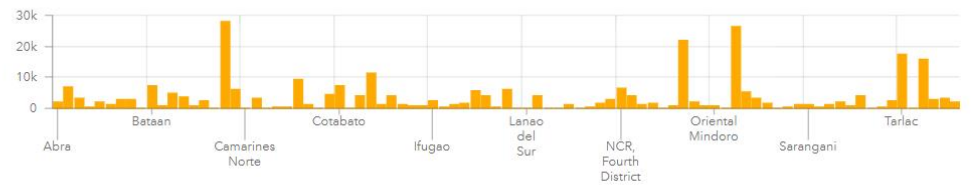


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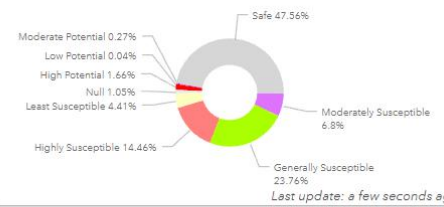
DTI, PHIVOLCS | Earthstar Geographics

### Province

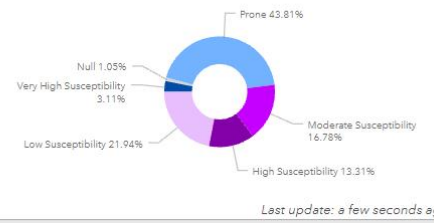


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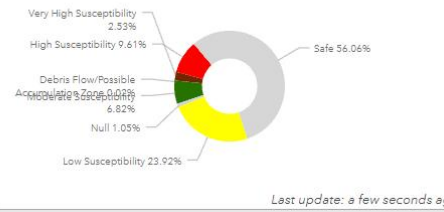
## MSMEs Susceptible to Liquefaction



## MSMEs Susceptible to Flood



## MSMEs Susceptible to Rainfall Induced Landslide



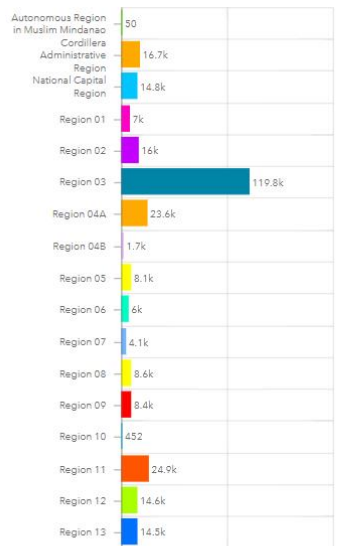
# MSMEs per Province:

## Number of MSMEs

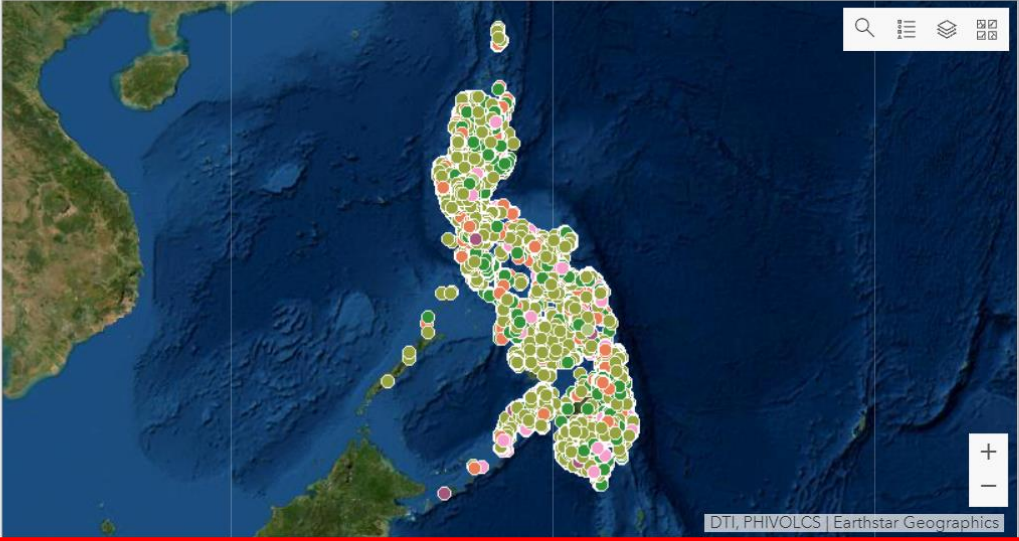

289,374

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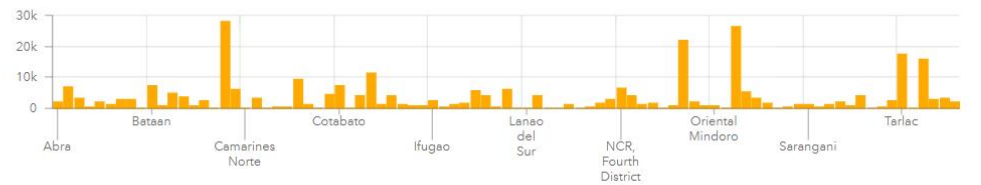
## Region



*Last update: a few seconds ago*

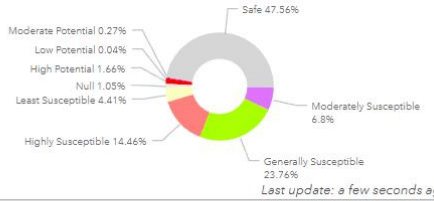


## Province

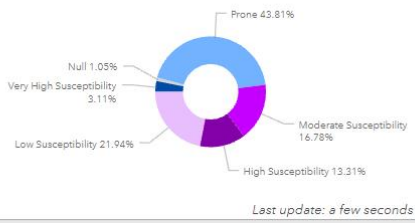


*Last update: a few seconds ago*

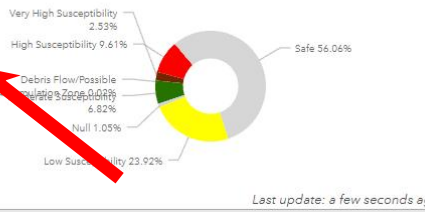
## MSMEs Susceptible to Liquefaction



## MSMEs Susceptible to Flood



## MSMEs Susceptible to Rainfall Induced Landslide



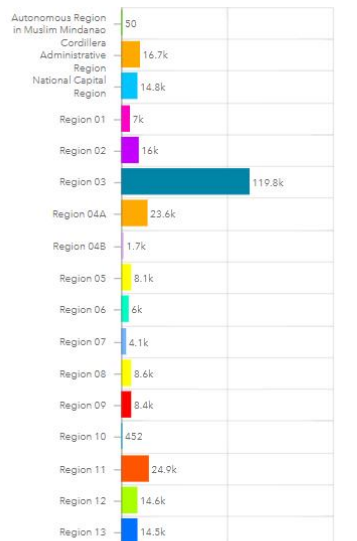
# MSMEs susceptible to Liquefaction:

## Number of MSMEs

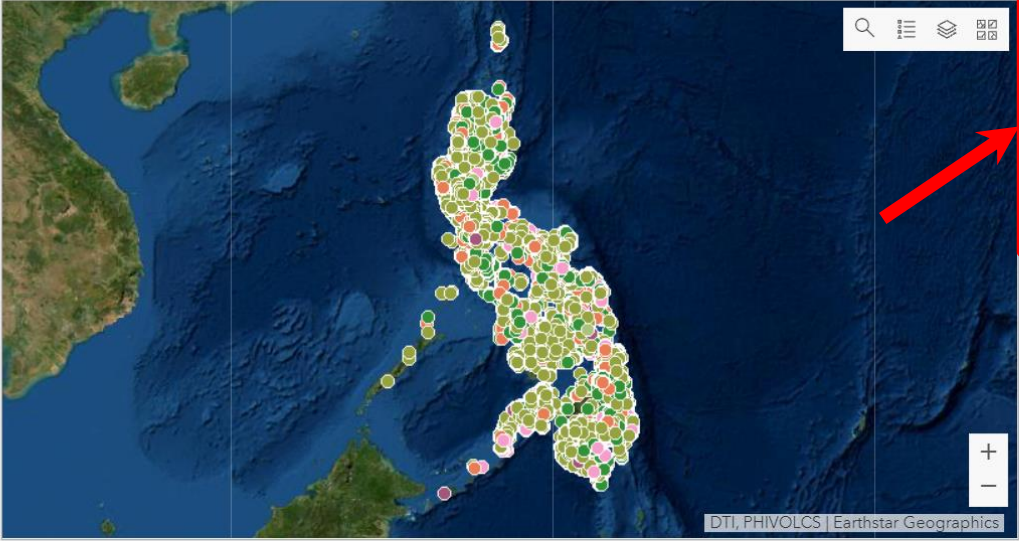

**289,374**

Last update: a few seconds ago

## Region

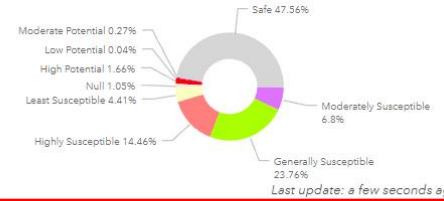


Last update: a few seconds ago



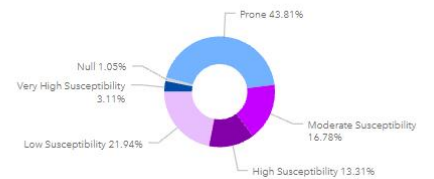
DTI, PHIVOLCS | Earthstar Geographics

## MSMEs Susceptible to Liquefaction



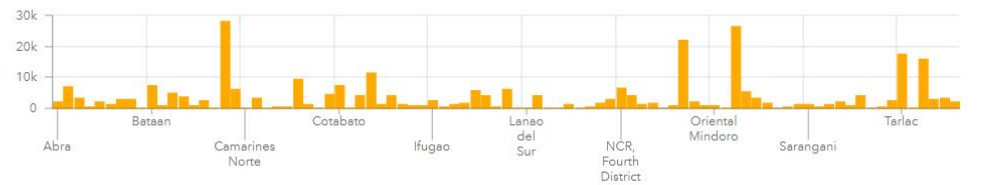
Last update: a few seconds ago

## MSMEs Susceptible to Flood



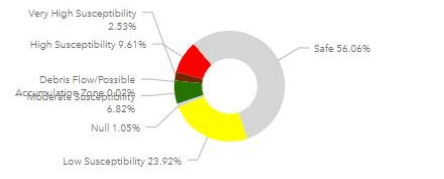
Last update: a few seconds ago

## Province



Last update: a few seconds ago

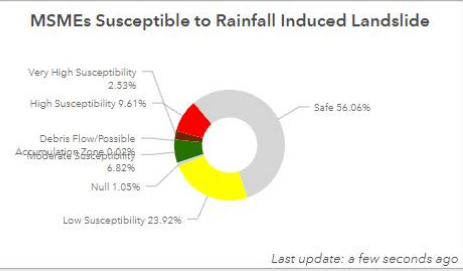
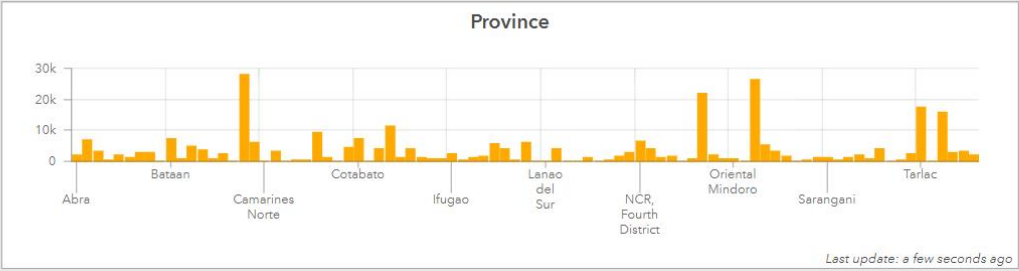
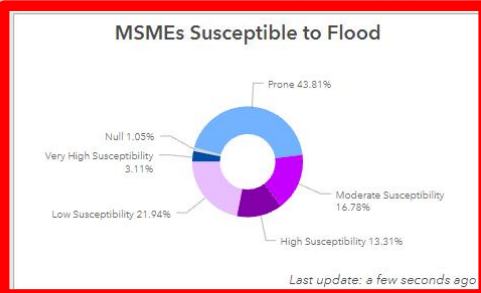
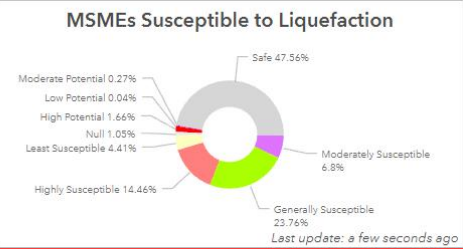
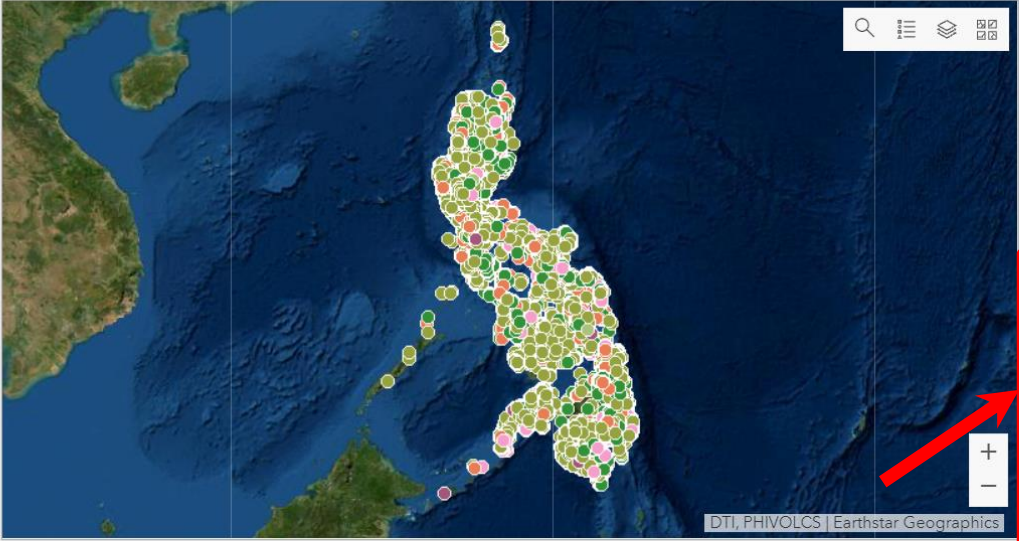
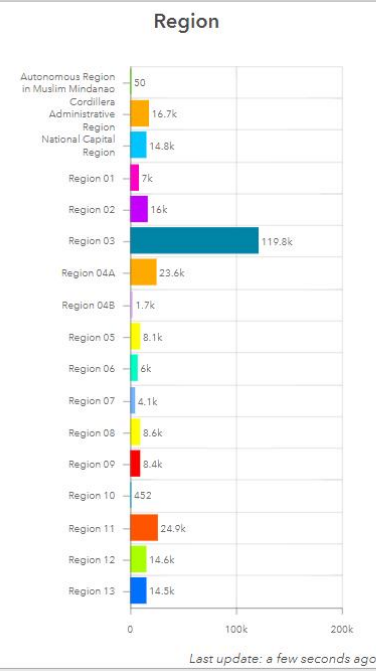
## MSMEs Susceptible to Rainfall Induced Landslide



Last update: a few seconds ago



# MSMEs susceptible to Flood:



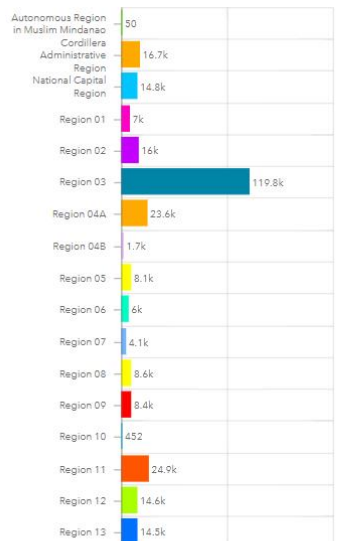
# MSMEs susceptible to Rainfall Induced Landslide:

## Number of MSMEs

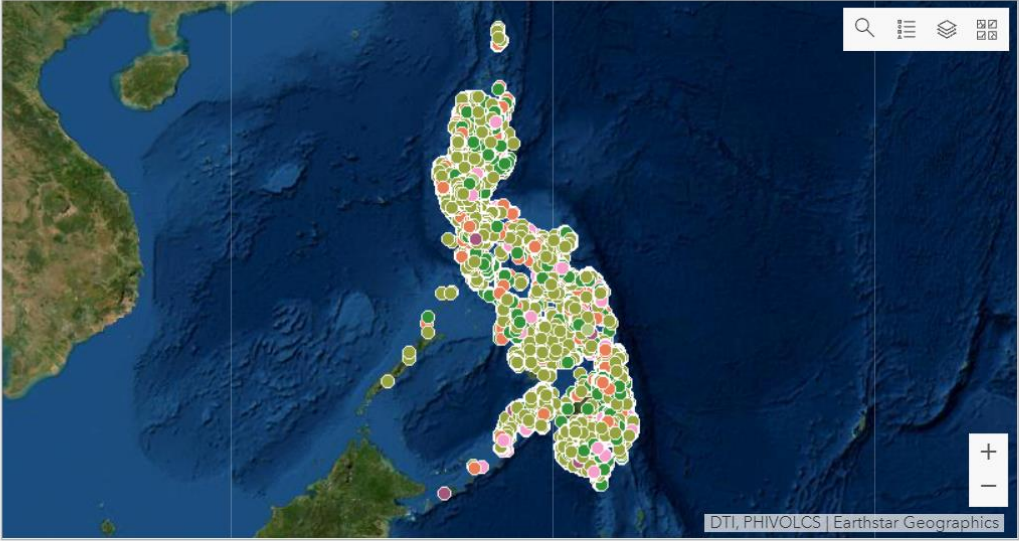

**289,374**

Last update: a few seconds ago

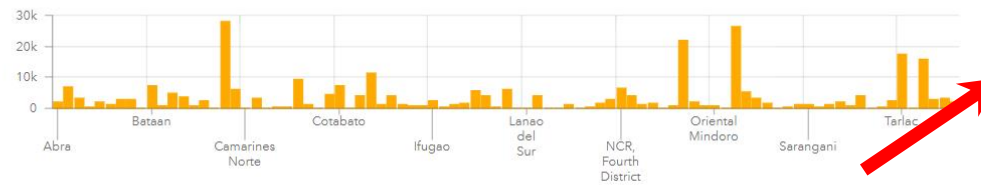
## Region



Last update: a few seconds ago

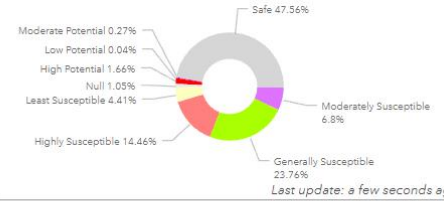


## Province

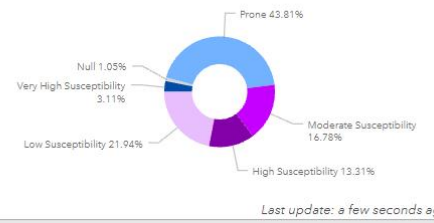


Last update: a few seconds ago

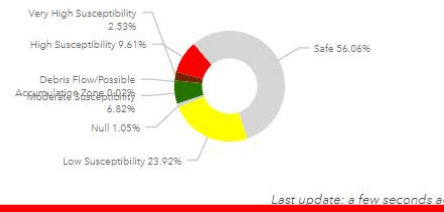
## MSMEs Susceptible to Liquefaction



## MSMEs Susceptible to Flood



## MSMEs Susceptible to Rainfall Induced Landslide



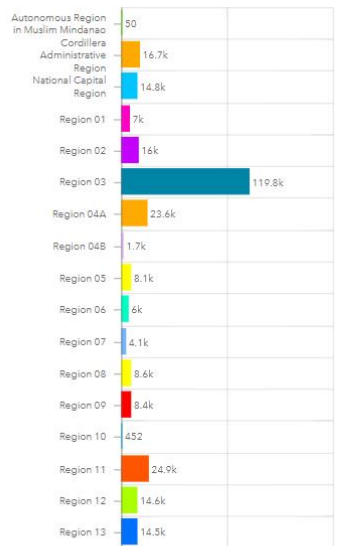
# Location of MSMEs on Map:

## Number of MSMEs


289,374

*Last update: a few seconds ago*

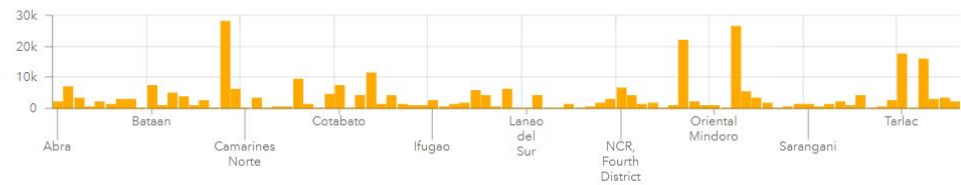
## Region



*Last update: a few seconds ago*

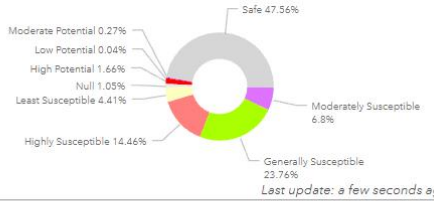


## Province

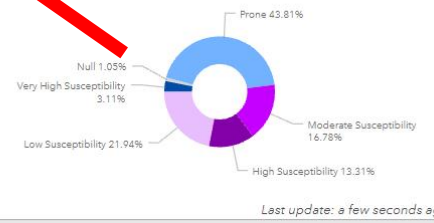


*Last update: a few seconds ago*

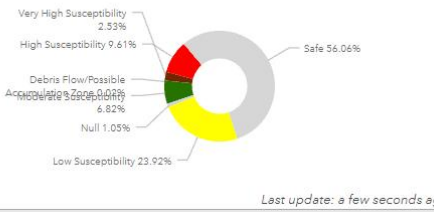
## MSMEs Susceptible to Liquefaction



## MSMEs Susceptible to Flood



## MSMEs Susceptible to Rainfall Induced Landslide

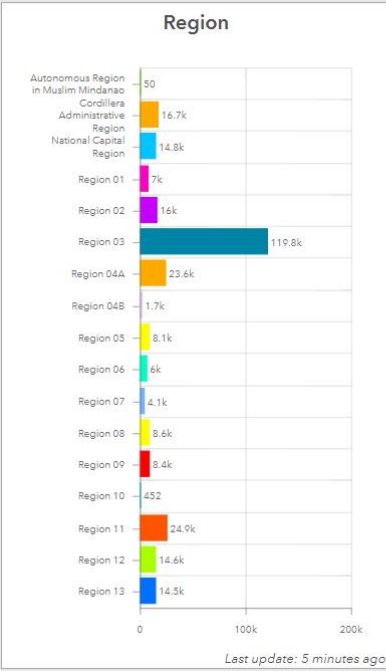


# MSMEs detailed information:

**Number of MSMEs**

**289,374**

*Last update: 5 minutes ago*



1 of 2

BusinessName

BusinessRegion National Capital Region (NCR)

BusinessProvince NCR, Second District

BusinessMunicipality

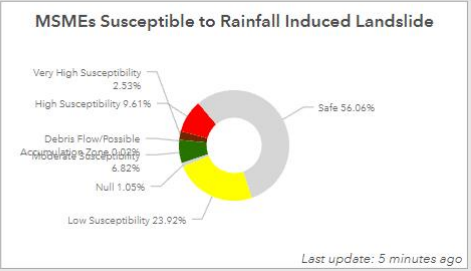
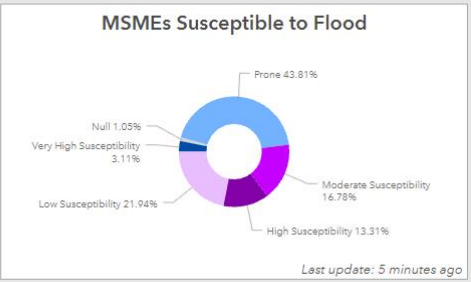
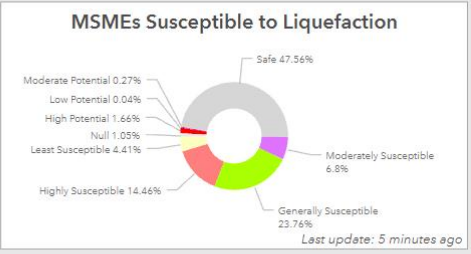
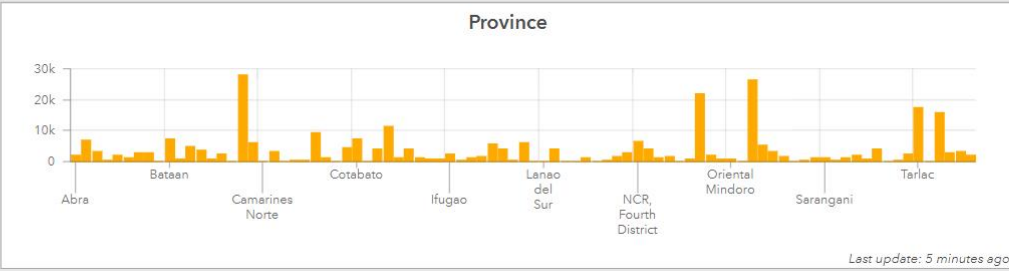
BusinessDistrict Lone

BusinessBarangay West Kamias

BusinessStreet

BusinessEmail

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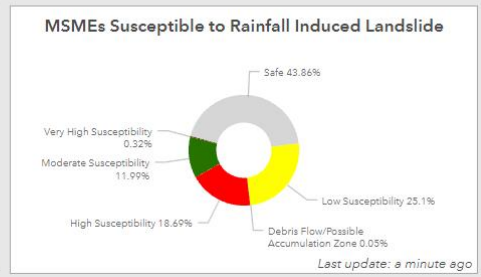
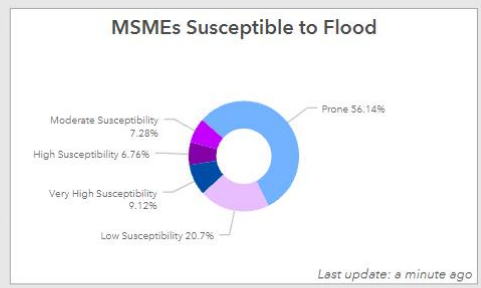
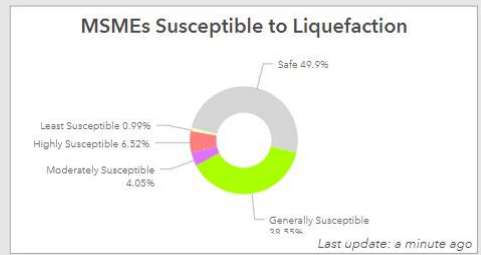
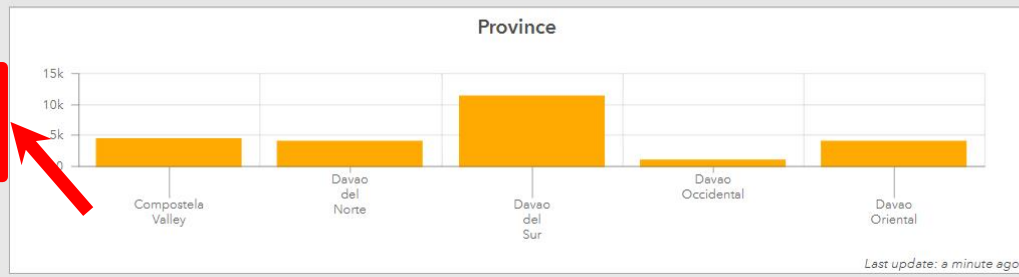
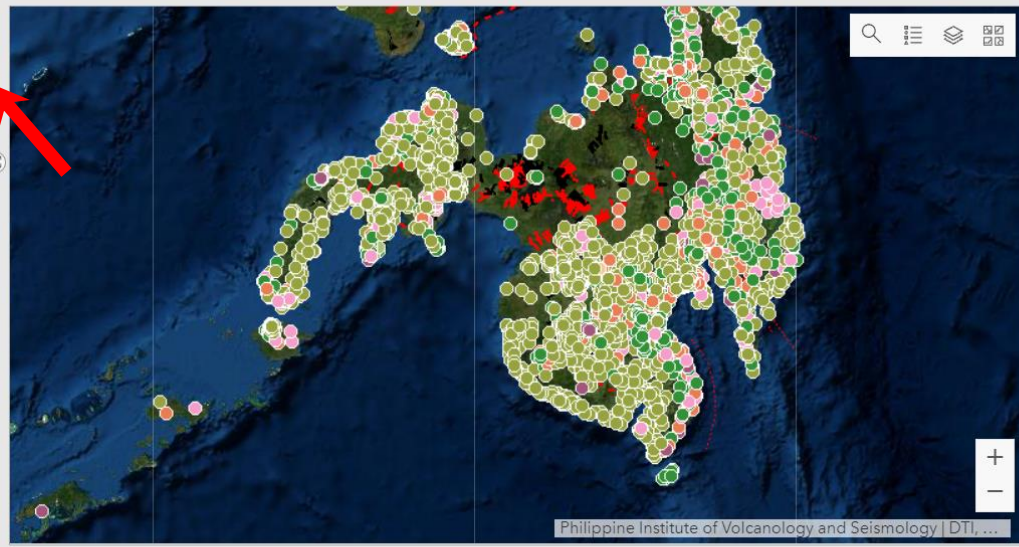
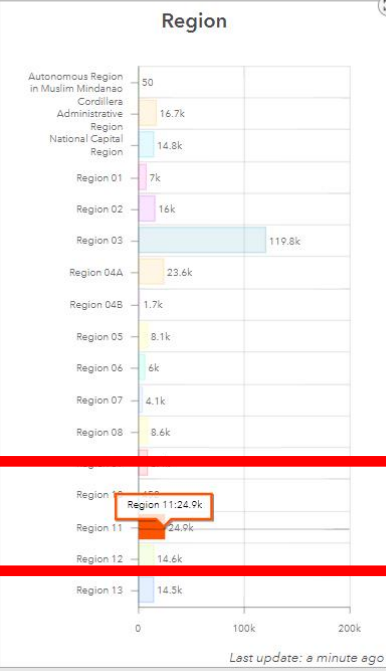


# Number of MSMEs in Region 11:

### Number of MSMEs

**24,913**

Last update: a minute ago



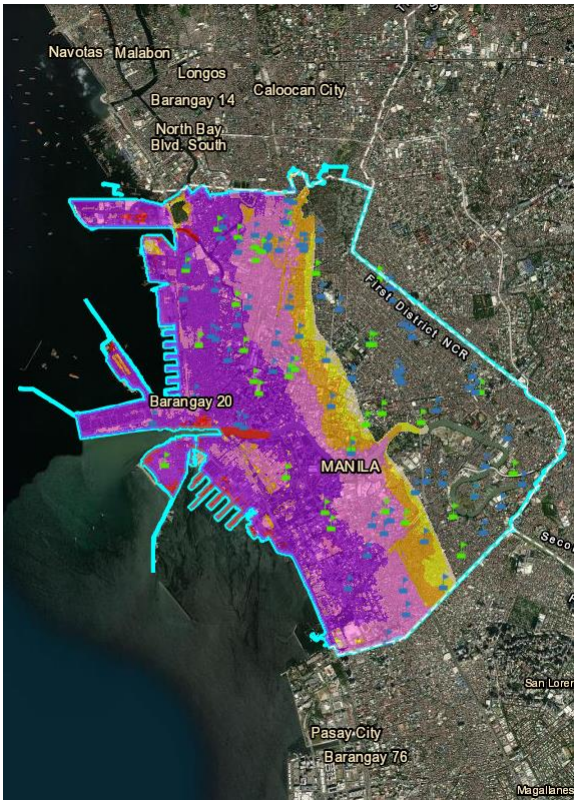


**GeoAnalyticsPH**  
RISK ANALYSIS MADE EASY

# From Data Collection to Analysis:

Generating Summary Hazard Assessments  
and Analytics Using GeoAnalyticsPH

# LGU-BASED HAZARDS ANALYSIS (Schools Prone to Tsunami)



**Schools (Elementary & Secondary)**

- ▲ Elementary School
- ▲ Secondary School

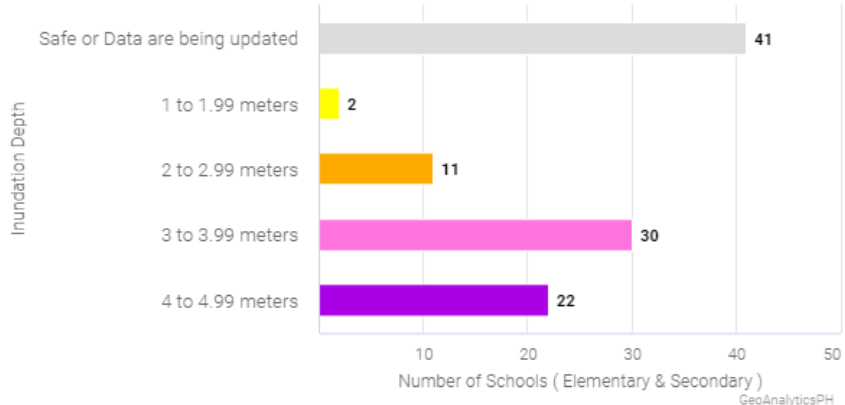
**Tsunami**

- General Inundation, Inundated
- Inundation depth, < 1 meter
- Inundation depth, 1 to 1.99 meters
- Inundation depth, 2 to 2.99 meters
- Inundation depth, 3 to 3.99 meters
- Inundation depth, 4 to 4.99 meters
- Inundation depth, 5 to 6 meters
- Inundation depth, > 6 meters

**Provincial Boundary**



Schools (Elementary & Secondary) Prone to Tsunami  
First District (City of Manila), NCR



Total Schools (Elementary & Secondary) Prone to Tsunami: 65 out of 106 (61.3%)

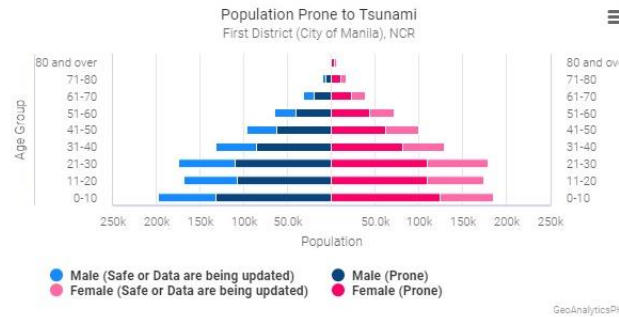
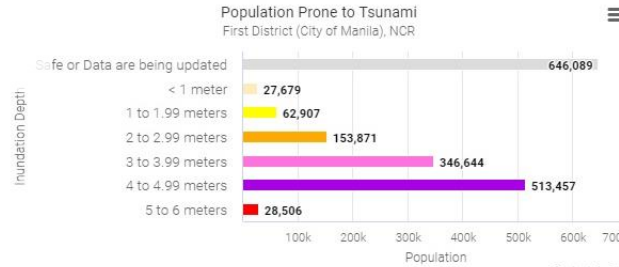
Note: Political boundaries (PSA, 2016) depicted on the map are not authoritative, and are only an approximate; Elementary and Secondary School Location Data (DepEd, 2015); Tsunami data (Please disregard assessment results for coastal areas that are marked as Safe. Consult DOST-PHIVOLCS for more information on Tsunami) is continually being improved and updated.

Data and Methods Used - Formulas, data sources, and how to cite results  
Official Hazard Maps - More information regarding hazard data

# LGU-BASED HAZARDS ANALYSIS

## (People Prone to Tsunami)

Population Prone to Tsunami  
First District (City of Manila), NCR



Assessment	Population
Safe or Data are being updated	646,089
< 1 meter	27,679
1 to 1.99 meters	62,907
2 to 2.99 meters	153,871
3 to 3.99 meters	346,644
4 to 4.99 meters	513,457
5 to 6 meters	28,506

Rows per page: 7 1-7 of 7

Total Population Prone to Tsunami: 1,133,064 out of 1,779,153 (64%)

Note: Political boundaries (PSA, 2016) depicted on the map are not authoritative, and are only an approximate; Census data is based on PSA data of 2015 and does not reflect real-time information; Population density was computed by evenly distributing population throughout the land area of the selected location.; Tsunami data (Please disregard assessment results for coastal areas that are marked as Safe. Consult DOST-PHIVOLCS for more information on Tsunami) is continually being improved and updated.

Data and Methods Used - Formulas, data sources, and how to cite results  
Official Hazard Maps - More information regarding hazard data



# GeoRisk Philippines

INNOVATIONS FOR RESILIENCE

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