

TSUNAMI MONITORING IN PUERTO RICO

The PRSN operates a system of tide gauges that continuously monitor changes in sea level. This equipment helps detect and confirm the generation of tsunamis and subsequently assess their impact. The components of the tide gauges include temperature sensors, pressure sensors, wind sensors, radars, and digitizers.

The PRSN receives data from local tide gauge stations as well as stations located along the coasts of the Caribbean Sea and the Atlantic Ocean. In addition, it receives data from Dart Buoys (NOAA) and GPS stations.



Tide gauge station in Guayanilla, Puerto Rico

TSUNAMIS SOURCES

LOCAL



The wave travel time is less than **1 hour**. A tsunami could reach the coast in a matter of minutes. The source is located approximately **100 km** or less from our coast.

REGIONAL



The wave travel time is **1 to 3 hours**. The source is located at a distance of **100 km to 1,000 km** from our coast.

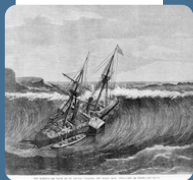
TELE- TSUNAMIS



Waves with a travel time exceeding **3 hours**. The source is located at a distance greater than **1000 km** from our coast.

HISTORY OF TSUNAMIS IN PUERTO RICO

1867



November 18, 1867

- Occurred 20 days after Hurricane San Narciso.
- Magnitude: 7.3
- Epicenter: Anegada Passage
- Felt in the Virgin Islands and the eastern part of Puerto Rico.
- In Yabucoa, the sea receded from the coast and then surged around 450 feet inland.

October 11, 1918

- Friday, October 11, around 10:14 am, the day of San Fermin.
- Magnitude: 7.3
- Epicenter: Mona Canyon
- Felt across the entire island, with greater intensities in the west.
- Generated a tsunami with waves up to 6 meters high in Aguadilla.
- 116 people lost their lives, 40 of them due to the tsunami.

1918



2020



January 7, 2020:

- Tuesday, January 7, around 4:24 am
- Magnitude: 6.4
- Maximum intensity of VIII in Guánica, felt across the entire island.
- A local, small non-apreciable tsunami was recorded.

TSUNAMIS



Puerto Rico Seismic Network

University of Puerto Rico
Mayagüez Campus
Geology Department

For more information, please visit:

<http://redsismica.uprm.edu/787-833-8433>

<http://tsunami.gov>



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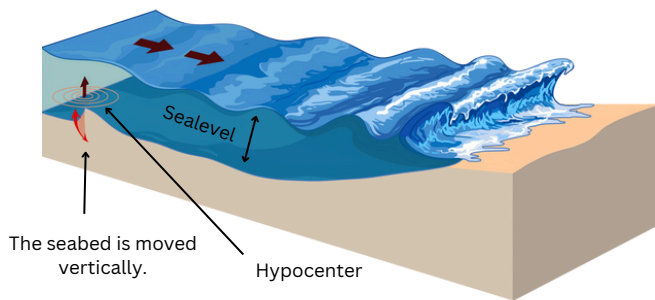
Tsunami – A Japanese word from a double root: tsu, meaning port or harbour, and nami, meaning wave. A tsunami is a series of waves generated by an underwater disturbance or violent activity in the ocean or near the coast, which produces vertical displacement. These can be caused by earthquakes, volcanic eruptions, submarine landslides, collapses, or meteorite impacts.

STAGES OF TSUNAMI EVOLUTION

Generation: Release of energy in a submarine fault, causing vertical displacement of water, resulting in abrupt disturbance of the sea surface. The height reached by the waves will depend on the magnitude, speed, and duration of the displacement, as well as the depth of the water column.

Propagation: During this stage, energy moves from the generation zone towards the coast. Changes in sea depth can alter the direction and height of the waves. As the waves approach the coast and the sea becomes more shallow, higher waves and faster currents are generated.

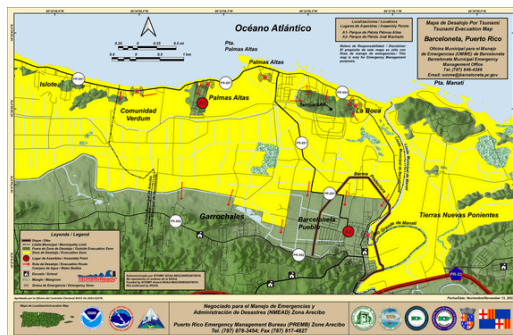
Inundation: Tsunamis can be a wall of water or a flood, with waves that can reach tens of feet in height, with five feet being enough to cause disasters. Without cliffs or steep topography, waters can flood hundreds of feet inland. Sometimes, before the flood, there is a retreat of the sea.



Stages of Tsunami Evolution (Credit: NOAA/NWS)

EVACUATION MAPS FOR TSUNAMIS

Flood and evacuation maps are designed to assist communities in coastal areas to identify and reduce their vulnerability to flooding caused by tsunamis. Access the following QR code to find the tsunami evacuation zones, evacuation routes, and assembly points.

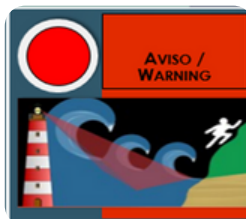


Example of Barceloneta Evacuation Map



Scan to download evacuation maps.

TSUNAMI MESSAGE LEVELS



Imminent danger of coastal flooding due to a tsunami.

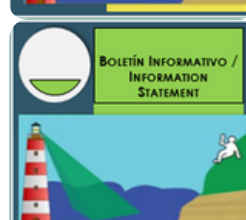


Move to higher ground immediately.



Potential tsunami danger, strong currents or dangerous waves may occur.

Leave beaches, ports, and marinas.



The expected impact of a tsunami is unknown.

Stay alert for further official information.

Seismic event with no potential to generate a tsunami.

No action required.

SAFETY RULES FOR TSUNAMIS



Pay attention to natural signs:

- Strong and prolonged earthquake (20 seconds or more)
- Sudden change in sea level
- Loud noise coming from the sea



Follow the established routes to your assembly point by walking inland to a high location (horizontal evacuation)



If the tsunami is so close that it prevents you from moving inland, climb a structure with 4 floors or more (vertical evacuation).



In the vehicle:
If you are within the evacuation zone, abandon your vehicle and seek higher ground, inland, assembly point, or perform vertical evacuation.



On a boat:
If you are at the docks, consider abandoning the vessel immediately; otherwise, stay 600 feet or more deep.



Scan for Maritime and port community guide for tsunami preparation