

Magnitude 7.2 HAITI

Saturday, August 14, 2021 at 12:29:08 UTC

At least 227 people have died and hundreds were injured or missing after a M 7.2 earthquake struck southwestern Haiti on Saturday, reducing churches, hotels, and homes to rubble.

This earthquake occurred 150 km west of the capital Port-au-Prince at a depth of 10 km. This earthquake was widely felt across the region including all of Hispaniola, the islands of Jamaica, Cuba and Puerto Rico.



The Cayimite Hotel is damaged after an earthquake in Les Cayes, Haiti, Saturday, Aug. 14, 2021. (AP Photo/Delot Jean)



@Frantzduval via Twitter

L'hôpital général aux Cayes est débordé.



Damage to the General
hospital in Les Cayes.



@JCOMHaiti via Twitter

Damage in Jérémie, Haiti.



@patrickgaspard via Twitter

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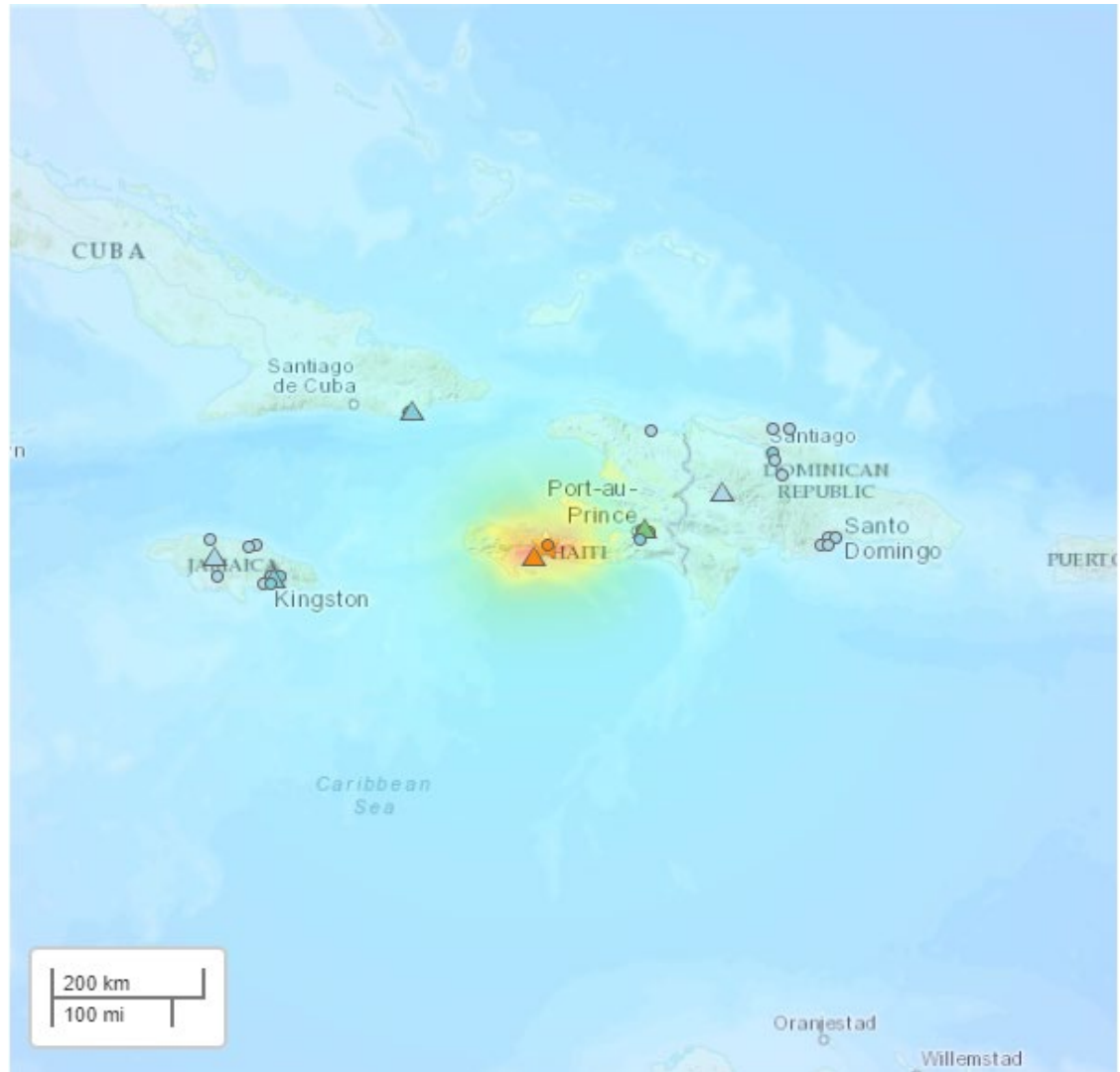
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The Modified-Mercalli Intensity scale is a ten-stage scale that indicates the severity of ground shaking. Intensity is dependent on the magnitude, depth, bedrock, and location.

Violent shaking was felt from this earthquake.

MMI Perceived Shaking

X	Extreme
IX	Violent
VIII	Severe
VII	Very Strong
VI	Strong
V	Moderate
IV	Light
II-III	Weak
I	Not Felt



USGS Estimated shaking intensity from M 7.2 Earthquake

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The USGS PAGER map shows the population exposed to different Modified Mercalli Intensity (MMI) levels.

The USGS estimates that 27,000 people felt violent shaking from this earthquake.

I	Not Felt	0 k*
II-III	Weak	11,843 k*
IV	Light	13,203 k
V	Moderate	5,215 k
VI	Strong	1,038 k
VII	Very Strong	405 k
VIII	Severe	619 k
IX	Violent	27 k
X	Extreme	0 k



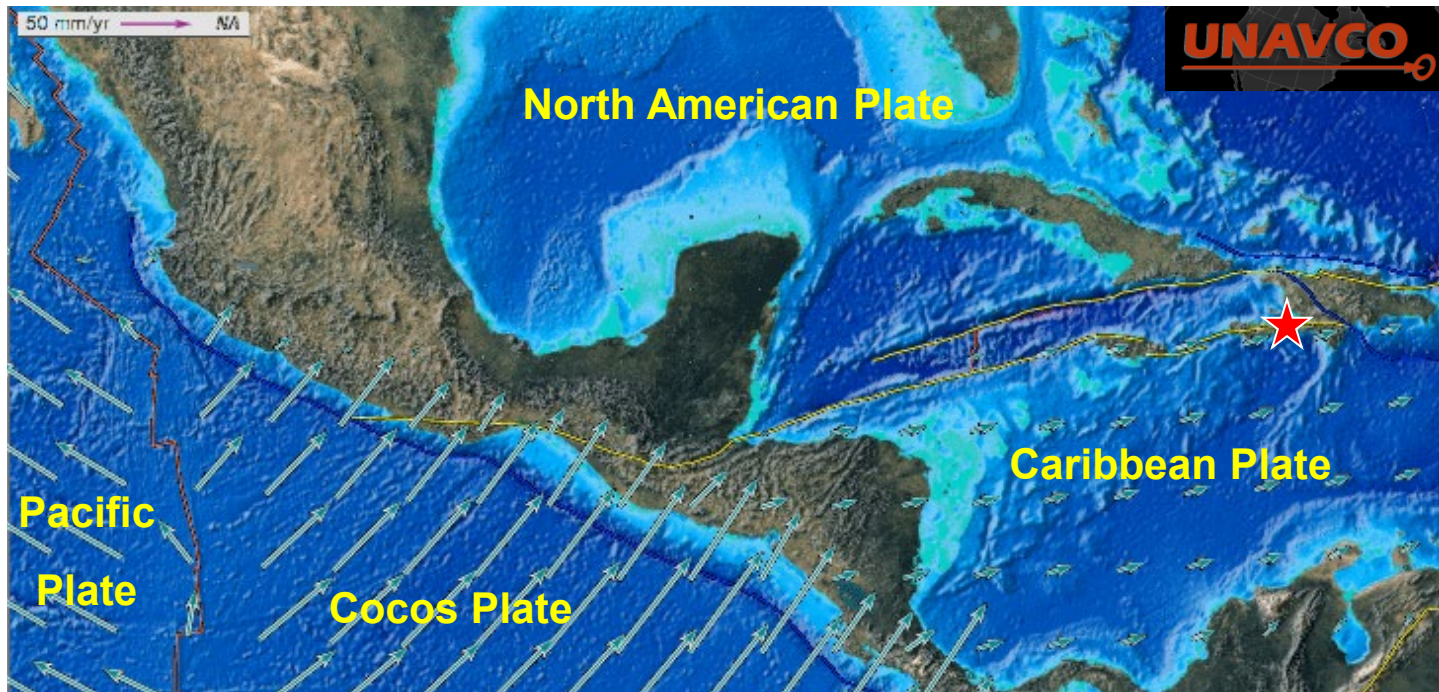
The color-coded contour lines outline regions of MMI intensity. The total population exposure to a given MMI value is obtained by summing the population between the contour lines. The estimated population exposure to each MMI Intensity is shown in the table.

Image courtesy of the US Geological Survey

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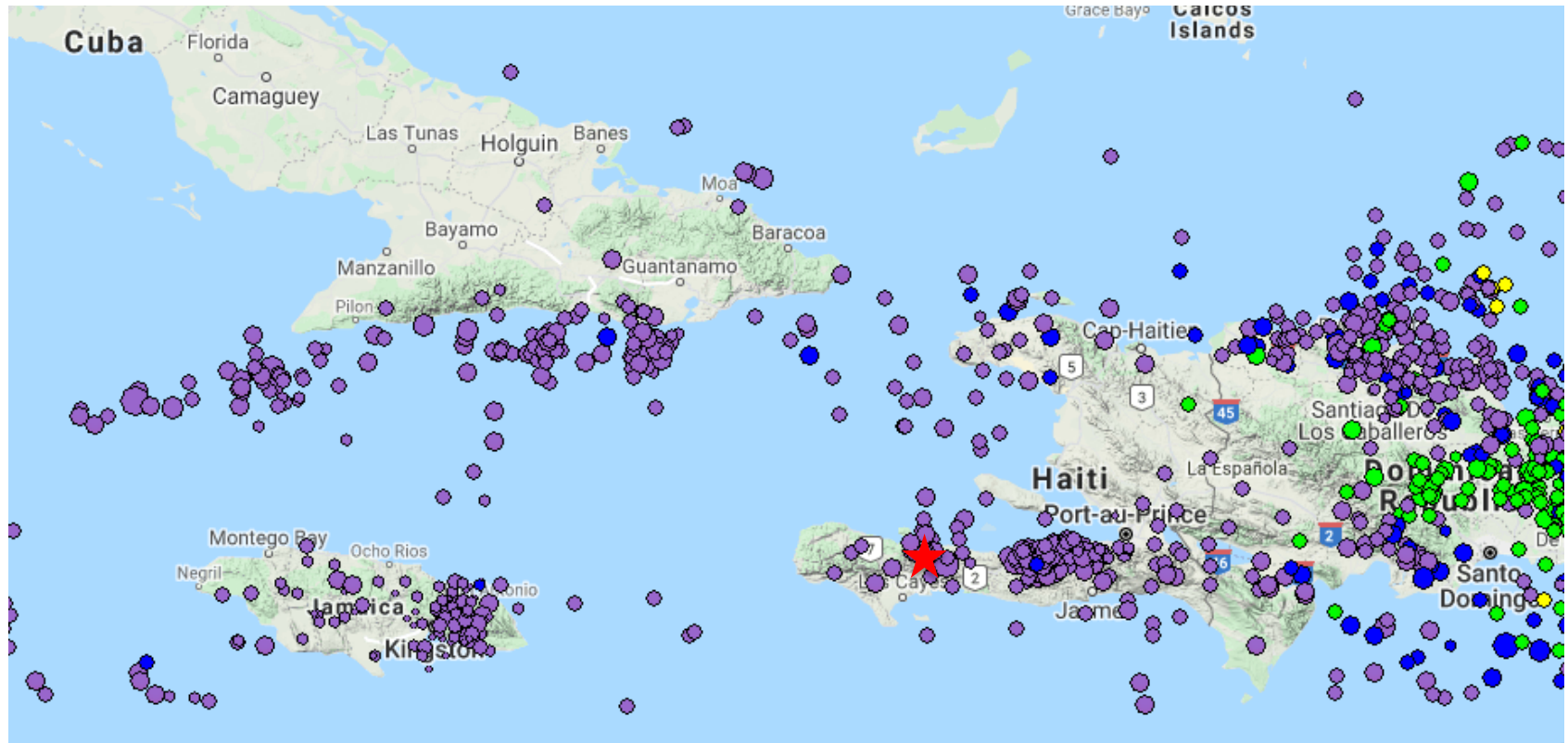
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This map shows the rates and directions of motion of the Cocos, Pacific, and Caribbean plates with respect to the North American Plate. Divergent plate boundaries are red lines, transform plate boundaries are yellow lines. The small arrows on the Caribbean Plate show that it moves eastward at a rate of about 20 mm/yr (2 cm/year) with respect to the North American Plate. This is a fairly slow rate of transform motion between the Caribbean and North American Plates. For comparison, the rate of transform motion across the San Andreas transform fault between the North American and Pacific plates is about 50 mm/yr (5 cm/yr).



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This earthquake (star), plotted with the most recent 1000 regional historical earthquakes, occurred on the transform plate boundary between the Caribbean and North American Plates.

The depth and proximity to the population center contributed to the destruction.

The animation below explains the plate tectonic setting for the August 14, 2021, magnitude 7.2 earthquake in southwestern Haiti.



Haiti occupies the western part of the island of Hispaniola. At the longitude of the earthquake, motion between the Caribbean and North American plates is partitioned between two major east-west trending, strike-slip fault systems -- the Septentrional fault system in northern Haiti and the Enriquillo fault system in southern Haiti.

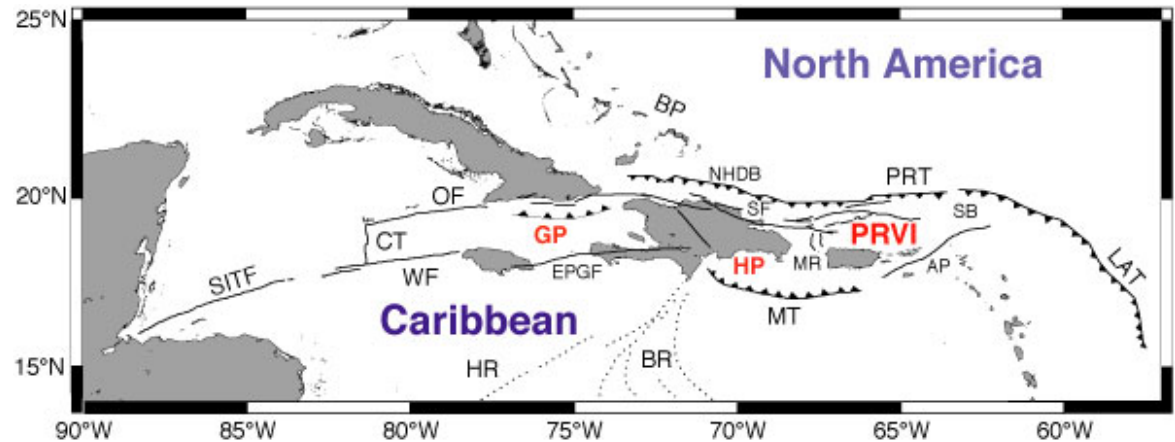
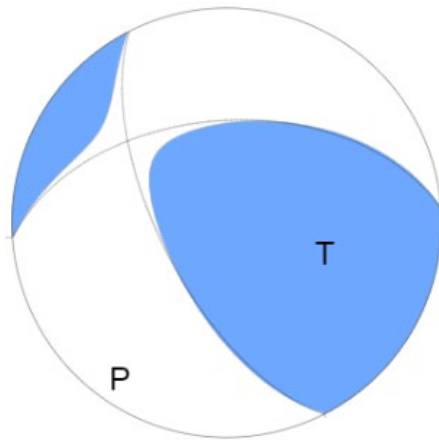


Figure 1. Map of northern Caribbean plate boundary showing microplates and structures. AP: Anegada Passage. BP: Bahamas Platform. BR: Beata Ridge. CT: Cayman Trough Spreading Center. EPGF: Enriquillo-Plantain Garden Fault. GP: Gonvave Platelet. HP: Hispaniola Platelet. HR: Hess Rise. LAT: Lesser Antilles Trench. MR: Mona Rift. MT: Muerdos Trough. PRVI: Puerto Rico-Virgin Islands block. SB: Sombrero Basin. SITF: Swan Islands Transform Fault. SF: Septentrional Fault. WF: Walton Fault.



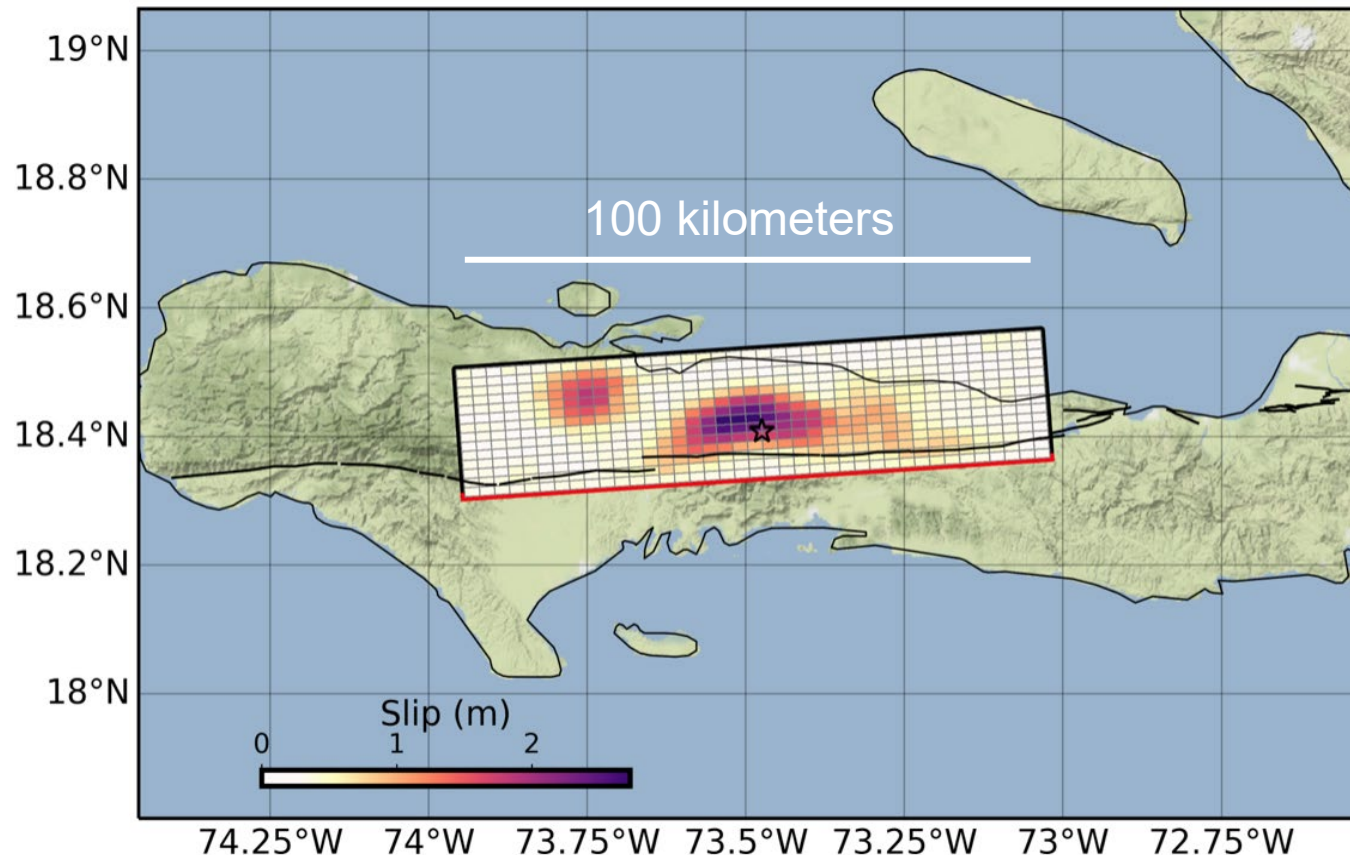
The location and focal mechanism of the earthquake are consistent with the event having occurred as the result of oblique reverse motion along the Enriquillo fault zone.

This fault system accommodates about 11 mm/yr, nearly half the overall motion between the Caribbean plate and North America plate.

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Major earthquakes occur by displacement on a large area of a fault. The map below shows the amount of slip on the Enriquillo Fault Zone during the August 14 Haiti earthquake projected onto the Earth's surface. The fault is oriented East – West and dips toward the North. Displacement started at the hypocenter shown by the star then spread over a fault length of nearly 100 kilometers during a rupture interval of about 25 seconds. Maximum slip at the hypocenter is modeled at over 2 meters.

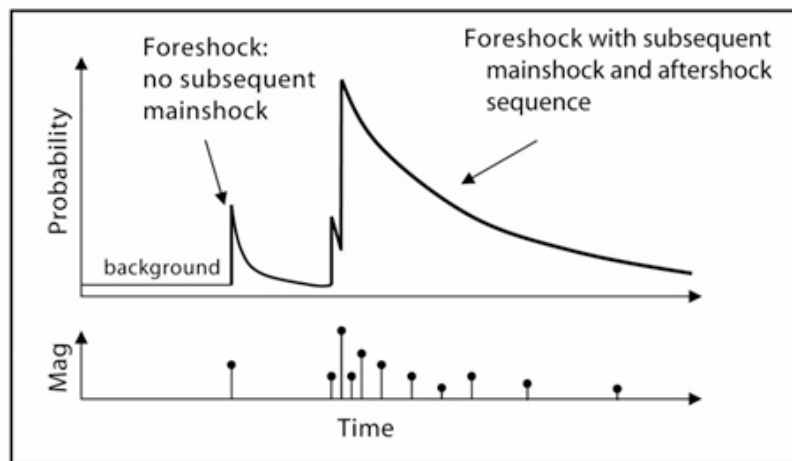
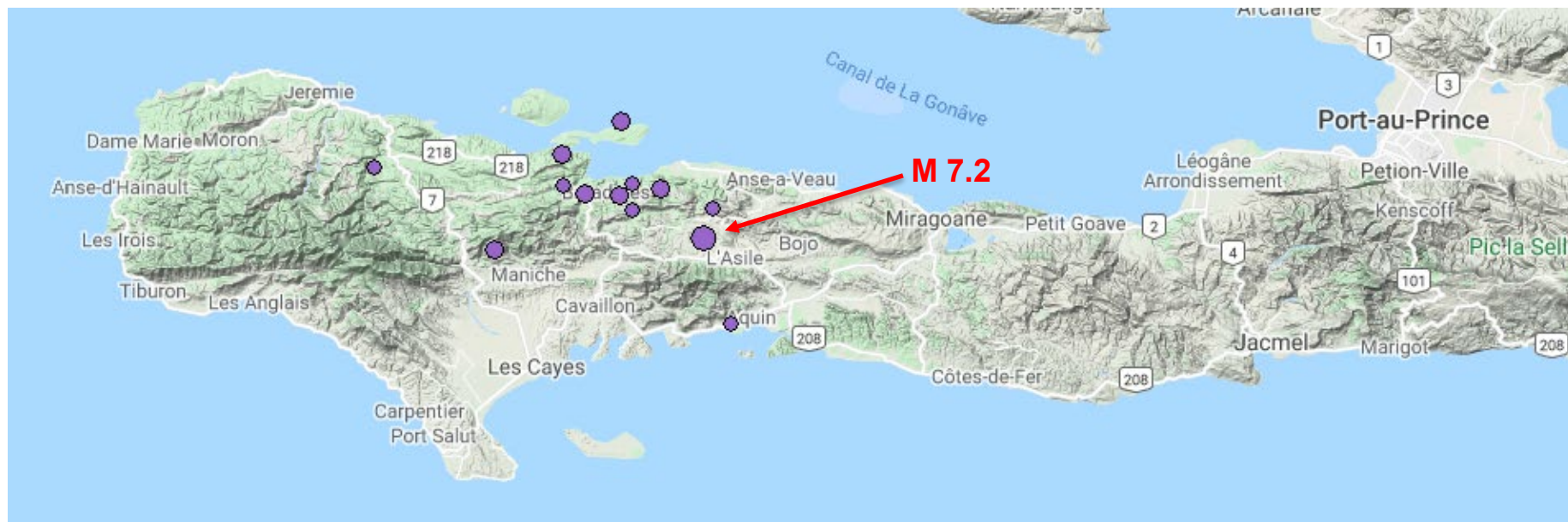


*Image courtesy
of the USGS*

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In the first ten hours after the earthquake there have been 12 aftershocks greater than magnitude 4.



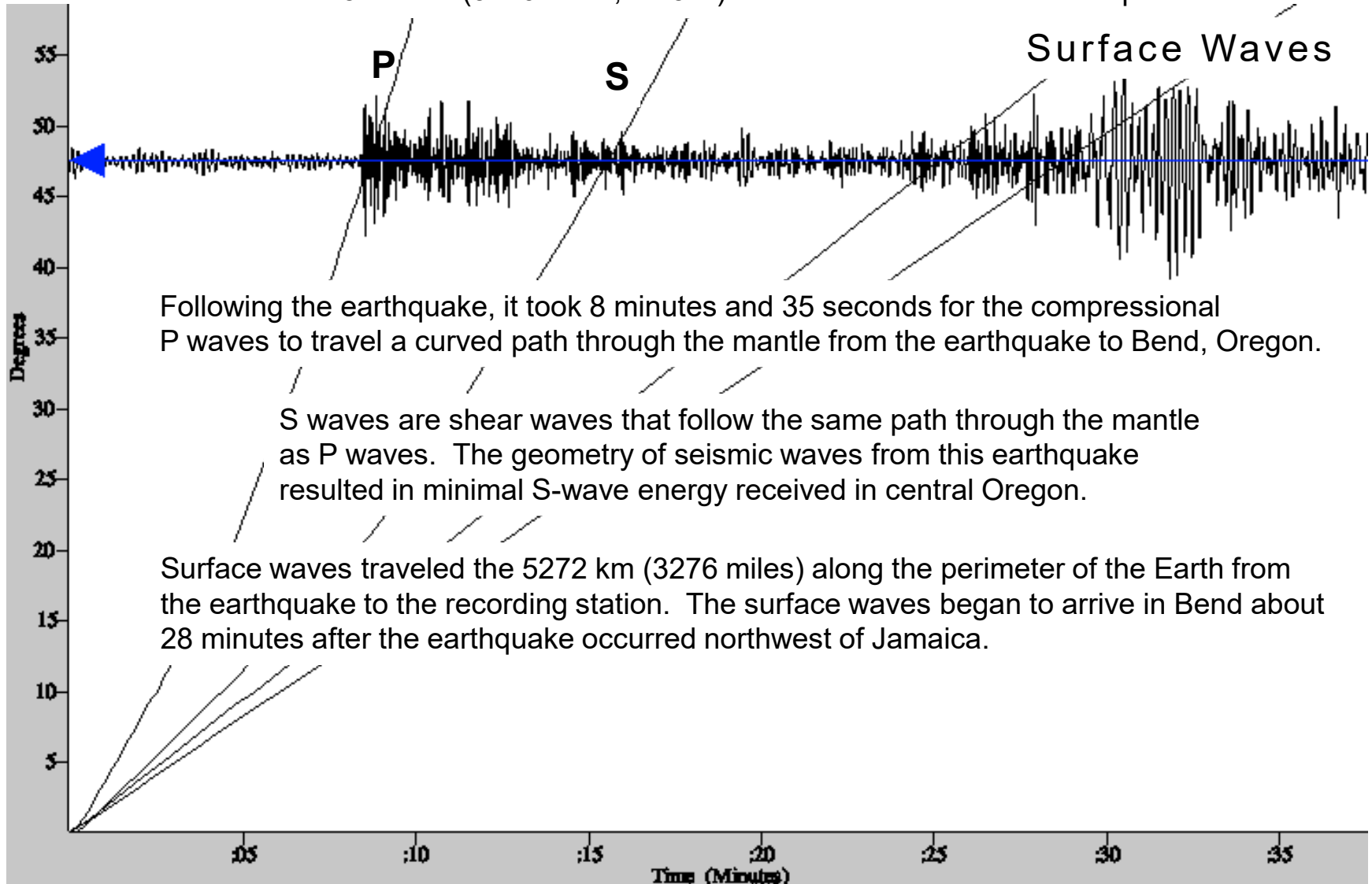
Map created with the IRIS Earthquake Browser

The graph shows how the number of aftershocks and the magnitude of aftershocks decay with increasing time since the main shock. The number of aftershocks also decreases with distance from the main shock.

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The record of the earthquake in Bend, Oregon (BNOR) is illustrated below. Bend is 5272 km (3276 miles, 47.5°) from the location of this earthquake.



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