

Seismic Activity in Southern Puerto Rico

FIELD UPDATE: January 11, 2020

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Recent Seismic Activity

Although seismic activity in the Southern region of Puerto Rico gained public attention on January 7th, residents in the South-central/South-west part of the island have been dealing with the hazardous conditions since December 28th, 2019. When the events of Jan.7 happened, many had already evacuated their homes and were spending the night outside or in their cars.

There is a great deal of uncertainty, and, for instance, it is difficult to put in perspective the forecast offered by the USGS.

Three power plants were affected by the events on Jan.7: Costa Sur, Eco-eléctrica, and AES.

While there is a great deal of concern and stress among most residents, many areas throughout the island have power, water, and telecommunications reestablished. AEE (Power Authority) reported on Jan.11, 2020, at 9:58 pm that 97.24% of the customers have service. However, the system is unstable, and there are frequent outages in different areas.

An M 5.99 earthquake was felt on January 11, 2020, at 8:54 a.m.

Certified and Improvised Shelters

There were over 600 evacuees at each of the tent shelters we visited; numbers change and are updated throughout the day and increased after the event that took place yesterday at 6:28 pm. Overall, there are more evacuees at night time.

Staff at the different sites expressed that there is a need for services provided throughout the night because that is the most challenging time. During the day, some people go out to do things, and numerous groups come to visit and offer different services and activities. However, there is a higher demand at night, evacuees are not sleeping well, and barely anyone comes in to volunteer or support during night hours.

We also want to highlight that the conditions in which evacuees are staying since the 28th are tough. Those in shelters are sleeping in cots under open tents or outside. There are mosquitoes and other insects

in the shelter areas. The situation with mosquitoes was particularly the case at the improvised shelter by Barrio Indio in Guayanilla. Those who are not in shelters are sleeping in their cars. Others are staying at improvised 'tent' communities or outside of their homes in a tent or a mattress located in an open space. Some residents expressed that their legs were swollen and are in high distress (e.g., not sleeping well, experiencing circulation problems because they are sleeping sitting, not eating their usual diet, not having access to showers). Therefore, evacuees in shelters, and residents alike, are adapting to the hazardous environment in which they are living.

Guánica

Sites visited: Tent Shelter at Coliseo Mariano “Tito” Rodríguez

Population Profile:

Source: 2018 American Community Survey



Total Population	17,327
Occupancy Status Total	5,469 Occ /
Occupied Housing Units	9,340 Total
Median Age	41.4
Median Income	\$12,653
Under 5	5.5%
Percent 65+	21.2%
Percent Below Poverty	65.2%
Employment Rate	23.7%
Major	Santos “Papichy” Seda

We visited the tent shelter located by the Mariano Tito Rodriguez Coliseum in Guánica. This site was particularly crowded. Those who have cots are registered, but some families are sharing cots, and not everyone is registered. Some families are staying in camping tents outside the managed shelter. There is a need for services for evacuees with disabilities, particularly mobility limitations (e.g., wheelchairs), and eldercare assistance. Some elders receive home care assistance (e.g., Servicio de amas de llave) and are not receiving the service at the campsite. Personnel at the camp stressed that there is a need for better accommodations for those with special needs (e.g., air-conditioned tents, better sleeping arrangements, nursing personnel, etc.). The National Guard has established a camp next to the Coliseum. The camp has air-conditioned tents. The National Guard is staged to respond if a more significant event happens.

Affected areas mentioned: Barriada, Cantera, La Luna, La Esperanza, Centro Gubernamental, El Abra

Carr. 116 – Damaged bridge

Improvised shelters identified: Barrio Santa Juanita – Parque de Pelota Shelter

Yauco

Sites visited: Yauco Stadium

Population Profile:
 Source: 2018 American Community Survey



Total Population	37,585
Occupancy Status Total Occupied Housing Units	10,790 Occ / 17,427 Total
Median Age	42.1
Median Income	\$14,451
Under five-years	4.8%
Percent 65+	19.3%
Percent Below Poverty	50.4%
Employment Rate	29.1%
Major	Angel "Luigi" Torres Ortiz

Residents who had damage to their homes or who decided to evacuate as a protective action are staying under tarps or in their cars. The parking lot was full at the time of our visit. Municipal Police and Emergency Managers are responsible for coordination and security. As in other Municipalities, many residents leave during the day and return at night. The camp is administered by the Municipality and by J.A. Machuca, a public housing administrative agent.

World Central Kitchen is serving hot meals at the Yauco stadium and making deliveries. There is a call online for volunteers.

Areas affected mentioned: Sector La Palmita, Susua Alto

Improvised camps identified: Sector Lima

Guayanilla

Sites visited: Downtown Guayanilla, Barrio Indio



Total Population	19,578
Occupancy Status Total	6,485 Occ /
Occupied Housing Units	8,265 Total
Median Age	40.3
Median Income	\$14,988
Under 5	5.3%
Percent 65+	18.3%
Percent Below Poverty	55.8%
Employment Rate	28.8%
Major	Nelson Torres Yordán

In Guayanilla, we visited the downtown area and Barrio Indio.

We were at the improvised open shelter by the community of Indios in Guayanilla when the event at 6:28 pm happened. The "shelter" is at a private field next to the community, and residents of surrounding areas plan to stay there in preparation for a more significant event. There are also evacuees from other areas that heard of the place through friends and relatives; or through their church because a pastor coordinates the site.

They have an improvised kitchen, porta-potties, and improvised showers. They have a generator and large lamps for illumination. At the time of our visit, there was a group of healthcare professionals and volunteers (Iniciativa Comunitaria), but they do not have health services on-site.

The church in the downtown area of Guayanilla is destroyed. The Municipality of San Juan was working on debris management at the time of our visit. Bricks were stored, although we could not identify an official source to get more information about their plans.

Peñuelas

Sites visited: Pista Atlética Glidden Feliciano Santos – El Super Refugio



Total Population	21,661
Occupancy Status Total	6,987 Occ /
Occupied Housing Units	8,678 Total
Median Age	36.4
Median Income	\$16,868
Under-five years	6.1%
Percent 65+	14.6%
Percent Below Poverty	57.3%
Employment Rate	31.1%
Major	Gregory González Souchet
Emergency Contact	(787)836- 5260

Departamento de Vivienda is administering the camp established by the Municipality at Pista Atlética Glidden Feliciano Santos. The Municipal Emergency Management Office has an established command post on site. Of all the camps visited, this camp seemed the most organized.

MedCentro is offering health services at Pista Atlética Glidden Feliciano Santos. There is a mobile medical center available. There were also activities for children and representatives from various agencies (e.g., ASSMCA, Departamento de la Familia).

Although we observed, porta-potties, showers were not available.

As we drove from Peñuelas to Guayanilla, through Carr. 127, damage to many of the industrial facilities was observable, and there were several landslides.

Areas in need mentioned: Malpaso

Ponce

Sites visited: Escuela Vocacional Bernardino Cordero Bernard, Downtown Ponce, Emergency Operations Center



Population Profile

Source: 2018 American Community Survey

Total Population	148,863
Occupancy Status Total Occupied Housing Units	53,450 Occ / 65,299 Total
Median Age	39.5
Median Income	\$16,561
Under 5	5.4%
Per cent 65+	19.1%
Percent Below Poverty	51.6%
Employment Rate	32.1%
Major	María “Mayita” Meléndez
Emergency Contact	

We visited the Emergency Operations Center established at the Francisco Montaner Stadium. We spoke with Nino Correa, currently coordinating the USAR mission, on Jan. 10 at about 2:00 pm. His main concern at the time was the tall structures in Ponce that are compromised and may collapse (e.g., Condominio Ponciana, and others at Calle Marina – Condominio Darlington, Condominio Parque La Abolición). It is essential to highlight that the majority of the affected structures in this area were housing units occupied by seniors. Residents are not in the structures, but the team noticed people going into the compromised structures to get personal or office items (e.g., office personnel getting medical files out of the affected structures). Local capacity is very much focused on

evacuees and assistance coordinating this process, if rendered safe, would be beneficial. The buildings were taped-off with caution tape but no officers safeguarding the area were observed.

The logo for the Centro de Investigaciones Sociales (CIS) features the lowercase letters 'cis' in a red, cursive font.

Centro de Investigaciones Sociales

Facultad de Ciencias Sociales
Universidad de Puerto Rico, Recinto de Río Piedras



Dra. Jenniffer M. Santos Hernández

We also visited the Vocation School Bernardino Cordero Bernard, located across the street from the Emergency Operations Center. At the time of our visit, there were 613 evacuees. Of those, 109 were elders 65+. There 16 children from 0-2 years and 130 children. They had several services available for evacuees. The site is coordinated by Departamento de Vivienda. Residents expressed that they had difficulty with the coordination of services.

Metropolitan Area of San Juan

Sites visited: Río Piedras, Plaza Las Américas

Social and economic activity in the Metropolitan area of San Juan is also altered. Businesses are notably empty. The parking garage, as well as the food court, of Plaza Las Américas, the main commercial center in this area, had numerous empty spaces. Numerous aid drives and fund raising activities (e.g., concerts, flea markets) are being organized by churches, universities, businesses, and non-governmental organizations (e.g. El Boricua – Ayuda al Sur Concert and Collection Center, El Nido – Los de Aquí x Los de Aquí Initiative, Munchies PR Fund Raising, Movimiento Comunitario Julia de Burgos, Ocean Lab, Coca Cola – Dasani water, Del Oeste Cerveza Artesanal, La Chona Food Truck, Peko Peko Food Truck, La Queenie Food Truck, Javy’s Tacos – Utuado, PR, Pina Records, Crunch Fitness Ponce, Catedral de San Juan – Centro de Acopio, AMAR – Asociación de Médicos al Rescate, Nuestra Escuela de Caguas, Lazos de Amor).

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Major Carmen Yulín launched the ‘Mirando al Sur’ initiative. There is an ongoing public discussion about the Calle San Sebastián festival (Fiestas de la Calle San Sebastián) to be held in Old San Juan from January 15-19, 2020.

Refugios (Shelters) – Departamento de Vivienda (1/11/2020)

Moca

-Coliseo Juan Sánchez Acevedo

Utuado

-Escuela Antonio Reyes Padilla

Lajas

-Coliseo Juan Lluch

Mayagüez

-Escuela Eugenio María de Hostos

San Germán

-Antigua Guardia Nacional

-Residencial El Recreo

Adjuntas

-Cancha Bajo Techo Fernando Belvis

(Improvised: Valle Verde Housing,

Guánica

-Coliseo Mariano Tito Rodríguez

-Alturas de Bélgica

-Parque Centenario

-Parque La Laguna

-Cancha Oasis

-Valle Taína

-La Luna

-Cancha Valle Taína

-Siberia (Isleta)

Guayanilla

-Escuela Gloria Borrero

-Parque de Pelota Luis Pegui Mercado

Juana Díaz

-Pista Atlética

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The logo for the University of Puerto Rico (UPRRP) consists of the letters 'UPRRP' in a bold, black, sans-serif font, with a red horizontal bar underneath.

Dra. Jenniffer M. Santos Hernández

Peñuelas

-Pista Atlética Municipal

Ponce

-Escuela Bernardino Cordero Bernard (Vocacional)

-Escuela Ramón Baldorioty de Castro

-Centro Comunal Clausel

-Escuela Ernesto Ramos Antonini

Yauco

-Estadio Municipal Mario Ñeto Ramírez (Parque de Pelota)

Maricao

-Escuela La Carmen

-Parcelas el 30

-Parque del Barrio Montoso

Jayuya

-Complejo Deportivo Filiberto García

USGS Forecast

Source: USGS

<https://earthquake.usgs.gov/earthquakes/eventpage/us70006vll/oaf/commentary?fbclid=IwAR34y6kbNU0JjVx1tkL2zkkXHNIw6vXYNEAWSy98r0Qpdudb6FrTOFVEe40>

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M 6.4 - 8km S of Indios, Puerto Rico

- 2020-01-07 08:24:26 (UTC)
- 17.916°N 66.813°W
- 10.0 km depth

Aftershock Forecast

Contributed by US⁵ last updated 2020-01-12 08:34:29 (UTC)

- The data below are the most preferred data available
- The data below have **NOT** been reviewed by a scientist.

CommentaryForecastModel

Be ready for more earthquakes

- More earthquakes than usual (called aftershocks) will continue to occur near the mainshock.
- When there are more earthquakes, the chance of a large earthquake is greater which means that the chance of damage is greater.
- The USGS advises everyone to be aware of the possibility of aftershocks, especially when in or around vulnerable structures such as unreinforced masonry buildings.
- This earthquake could be part of a sequence. An earthquake sequence may have larger and potentially damaging earthquakes in the future, so remember to: Drop, Cover, and Hold on.

What we think will happen next

According to our forecast, over the next 1 Week there is a 5 % chance of one or more aftershocks that are larger than magnitude 6.4. It is likely that there will be smaller earthquakes over the next 1 Week, with 79 to 160 magnitude 3 or higher aftershocks. Magnitude 3 and above are large enough to be felt near the epicenter. The number of aftershocks will drop off over time, but a large aftershock can increase the numbers again, temporarily.

More details about the earthquake forecast are provided in the section “Our detailed aftershock forecast” below.

About this earthquake and related aftershocks

So far in this sequence there have been 142 magnitude 3 or higher earthquakes, which are strong enough to be felt, and 6 magnitude 5 or higher earthquakes, which are large enough to do damage.

Our detailed aftershock forecast

The USGS estimates the chance of more aftershocks as follows: Within the next 1 Week until 2020-01-19 09:00:00 (UTC):

- The chance of an earthquake of magnitude 3 or higher is > 99 %, and it is most likely that as few as 79 or as many as 160 such earthquakes may occur in the case that the sequence is re-invigorated by a larger aftershock.
- The chance of an earthquake of magnitude 5 or higher is 68 %, and it is most likely that as few as 0 or as many as 4 such earthquakes may occur.
- The chance of an earthquake of magnitude 6 or higher is 11 %, and it is most likely that as few as 0 or as many as 2 such earthquakes may occur.
- The chance of an earthquake of magnitude 7 or higher is 1 %, such an earthquake is possible but with a low probability.

About our earthquake forecasts

No one can predict the exact time or place of any earthquake, including aftershocks. Our earthquake forecasts give us an understanding of the chances of having more earthquakes within a given time period in the affected area. We calculate this earthquake forecast using a statistical analysis based on past earthquakes.

Our forecast changes as time passes due to decline in the frequency of aftershocks, larger aftershocks that may trigger further earthquakes, and changes in forecast modeling based on the data collected for this earthquake sequence.

This forecast was issued: 2020-01-12 08:24:26 (UTC)

This forecast will be updated on or before 2020-01-19 08:24:26 (UTC)