

Towards More Inclusive and Equitable Risk Communication in Puerto Rico

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Abstract

In the last five years, people in Puerto Rico have been navigating multiple disaster cycles concurrently, including back-to-back hurricanes, an earthquake sequence, and the COVID-19 pandemic, among others. In this poster, we share research on risk communication in Puerto Rico. Building on that research, we also elaborate on how we are advancing an inclusive and equitable space where residents as knowledge holders, academics, citizen scientists, government officials, and non-governmental organizations co-produce convergence research to improve how disaster risk is framed and how communities are engaged to support mitigation, adaptation, and preparedness decision-making.

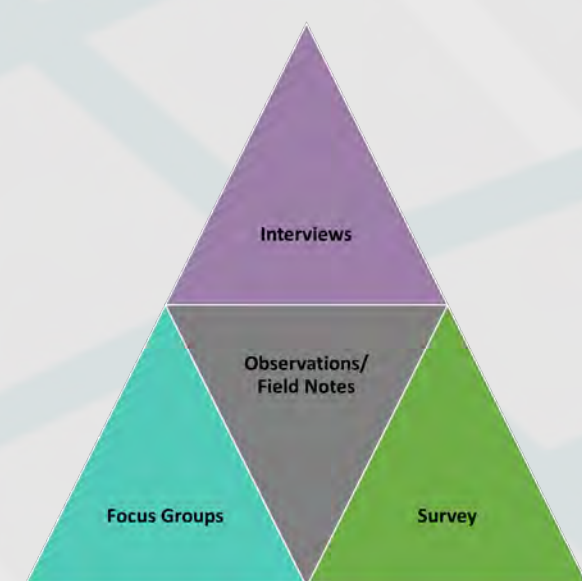
Objectives

1. identify the information sources used by different actors involved in the response process to a disaster or emergency in Puerto Rico,
2. better understand the perception of different risks,
3. examine how risk communication products available, experience with other extreme events, as well as individual characteristics and the familial/domestic situation, can inform decisions on protective actions and adjustments to reduce possible damage to life and property, and,
4. co-design visualizations that allow governmental and non-governmental organizations to effectively and efficiently transmit information on current and future risks.

Methods

Our project employed several techniques, including:

- In-depth interviews with responders (n=51) – approximately 90 minutes each, recorded and transcribed, approached and being analyzed applying the constant comparative method for grounded theory (Glaser and Strauss, 1967), using Dedoose.
- Door-to-door surveys (n=428)
- Focus groups to co-design risk communication products that convey multiple risks and possible adjustments (7 facilitated).
- Data collection (Launched on April 12, 2021, and closed on October 31, 2021)



Preliminary Findings

Responders and residents in southwest Puerto Rico perceive that people on the island think the earthquakes are a single event that “happened, ended, and left” and not a seismic sequence generating frequent seismic activity.

The beginning of the COVID-19 pandemic increased the demands placed on municipalities as they had to absorb the management of the makeshift camps previously assisted by emerging groups of citizens and public figures who brought aid to the camps. For example, the cost of services such as portable toilets increased exponentially as municipalities had to assume all the costs of maintaining the facilities.

Conflicting political transitions, frequent changes in the leadership of response agencies, particularly at the federal level, and delays in the bidding processes have prolonged the delivery of emergency services and the recovery process.

The increasing demands and beliefs around the earthquake aftershock forecast product mediated its dissemination. Most responders were unfamiliar with the earthquake aftershock forecast product and were overwhelmed by the increased activity and increased demands to examine the product and associated reports.

Several participants perceived earthquake risk as being attenuated or undermined by current preparedness programs, particularly those focused on individual preparedness while ignoring the need to promote structural assessments and support retrofitting.

No methodology was provided to local engineers volunteering to evaluate structures after the earthquakes in Puerto Rico. The Puerto Rico Engineering Association suggested using the Field Manual for Post Earthquake Safety Evaluation of Buildings developed by the Applied Technology Council (ATC-20). A member of the Engineering Association was familiar with Chicago's structure evaluation process and suggested using ATC-20.

Emergent Themes

Information-seeking – Regarding COVID-19 updates, “The number of cases, I don't follow it. I want to know how to protect me as a sensitive [immunocompromised] person.”

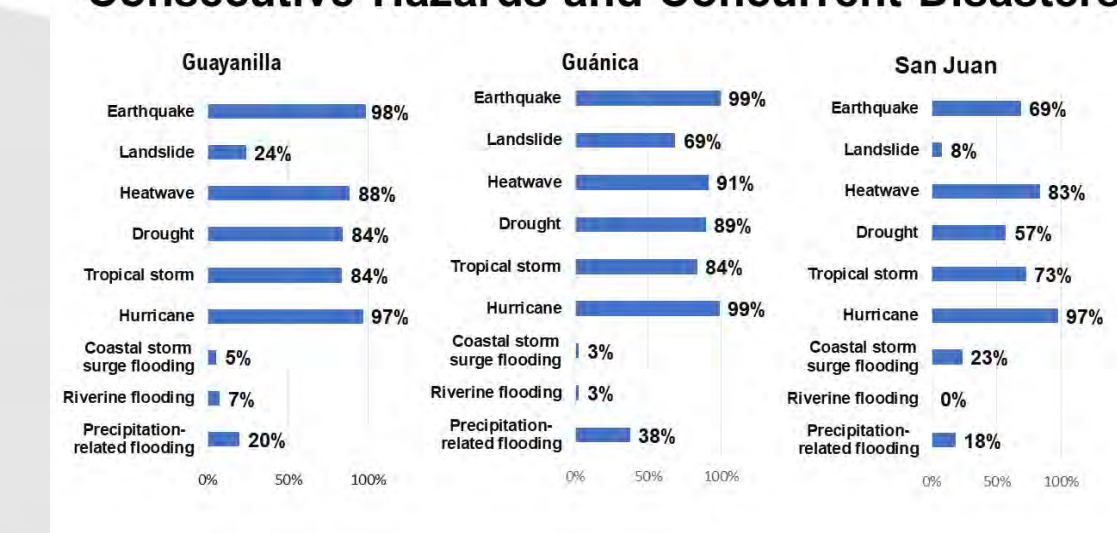
Elder access to assistance and recovery support, “On top of that, a lot of retired people in the community built their home when they were working and had a higher income. Their income now, we are talking about \$400, \$500. Guánica is the second poorest municipality of all Puerto Rico.” Another participant explained, “The main shelter was in the running track, administered by the National Guard, and once the shelters were closed, the FEMA Center was practically closed. People here, if they are elders and do not understand the process or have anyone to help them or guide them through the service (until they receive some form of assistance)... it's extremely difficult.”

Emergent response challenges – “One of the challenges was that there was no system through which all these providers could share information online. There was a system for communication between hospitals and the Department of Health, but it was not really active or ready to manage a pandemic. Staff had to be hired with the funding received.” Sense-making of the earthquake hazard by the scientific community and the public –

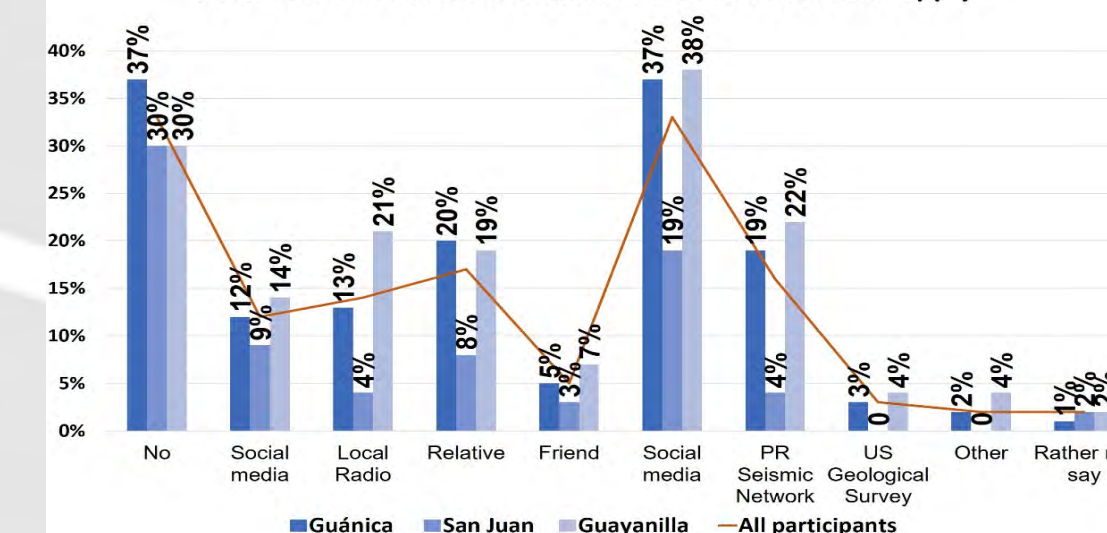
Scientists have found a network of faults moving. “It is not a single fault event but a fault system in its early development, which explains why earthquakes are expected to continue. “We are not talking one fault, we are not talking two faults, we are talking like a dozen small faults, the short, small faults, and this is what happens when you have a very young fault system - is kind of like having micro-fractures - trying to find the best place to break. That is what the Earth is doing right now in that area.”

Concurrent disasters in aging communities – COVID-19 affected the response process. Long-term research to understand in more depth disaster impacts – “The disasters have brought such serious consequences that perhaps from the outside, we don't see them like that, but if we go inside and see how it is, what is the situation of the day to day of what's happening, the isolation and the impact on people, you find that the impact is much more than what can be superficially observed.”

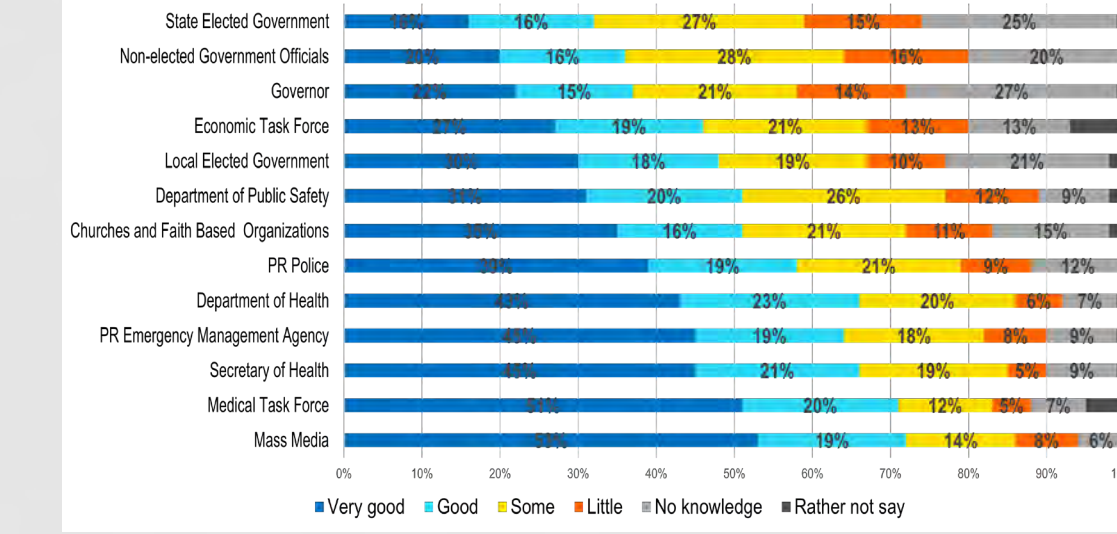
Consecutive Hazards and Concurrent Disasters



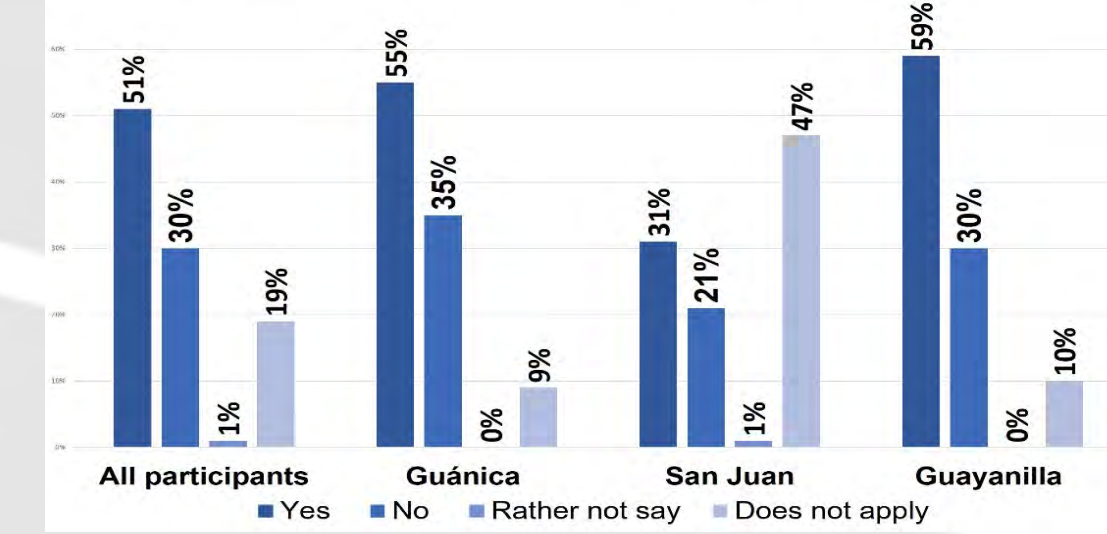
Did you try to find more information about the earthquake as soon as the movement ended? Please check all that apply.



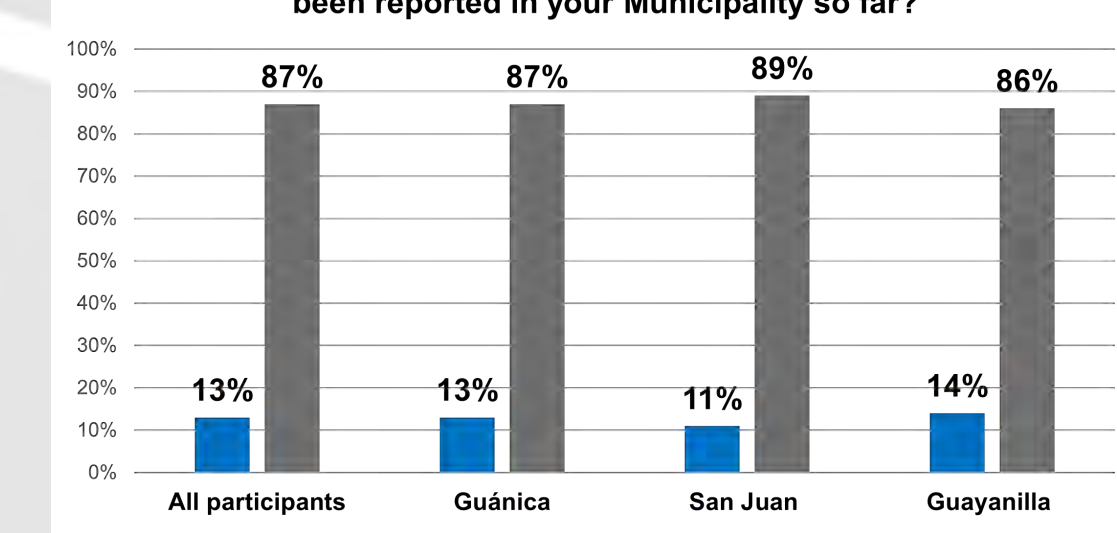
To what extent each of the following is knowledgeable about COVID-19?



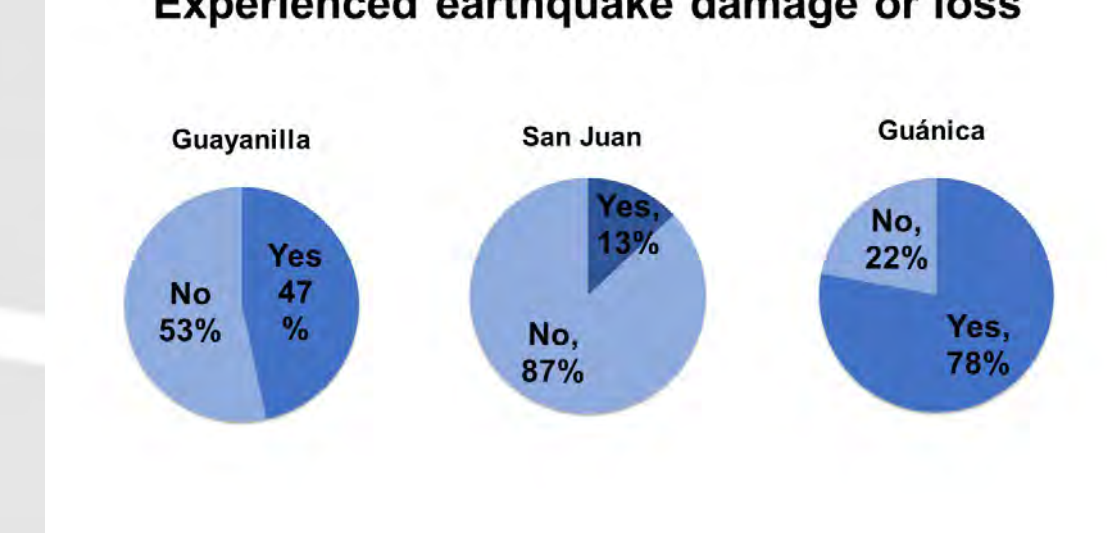
Did you manage to get information about the earthquake?



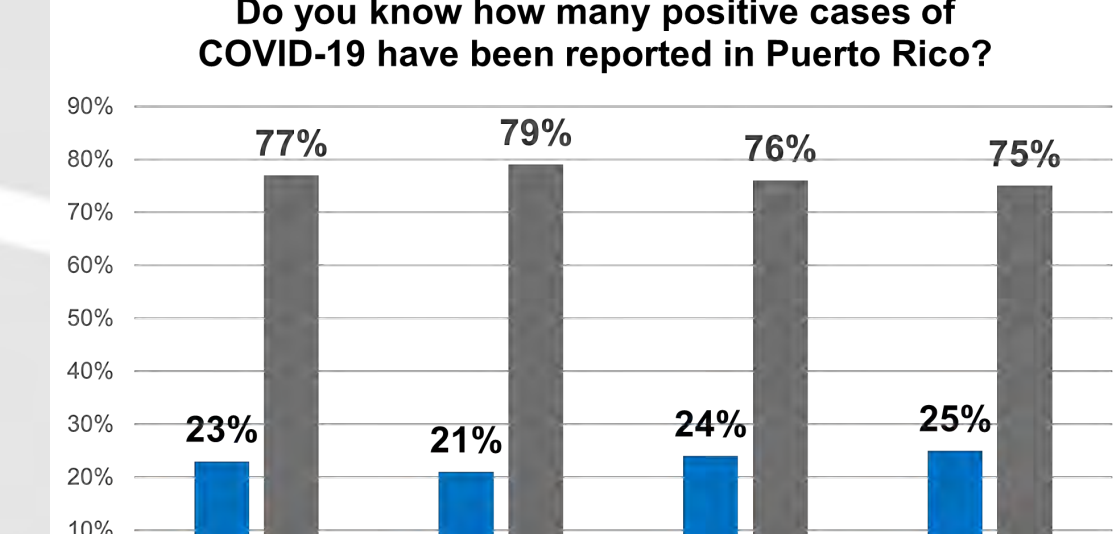
Do you know how many positive cases of COVID-19 have been reported in your Municipality so far?



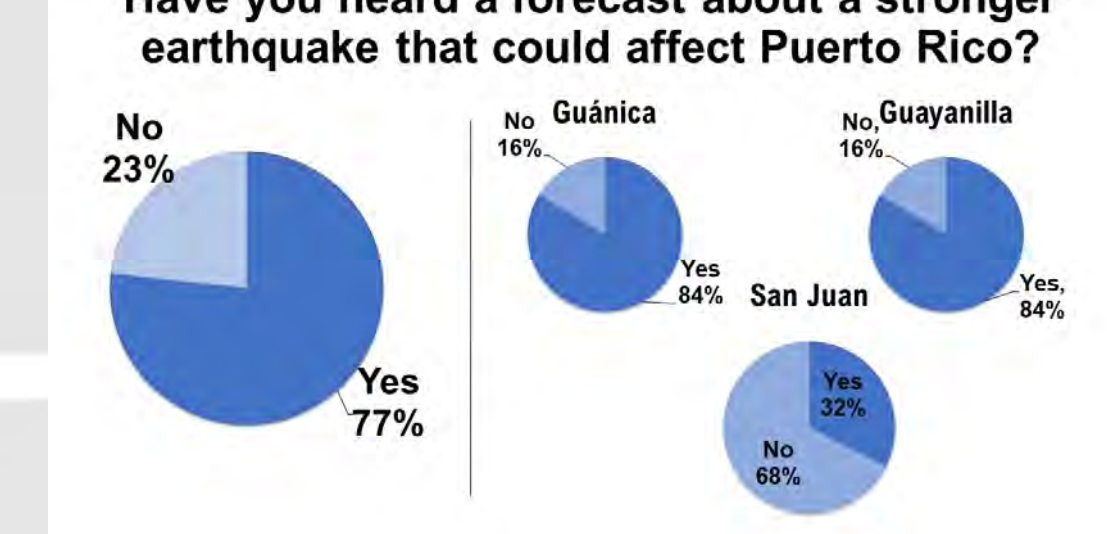
Experienced earthquake damage or loss



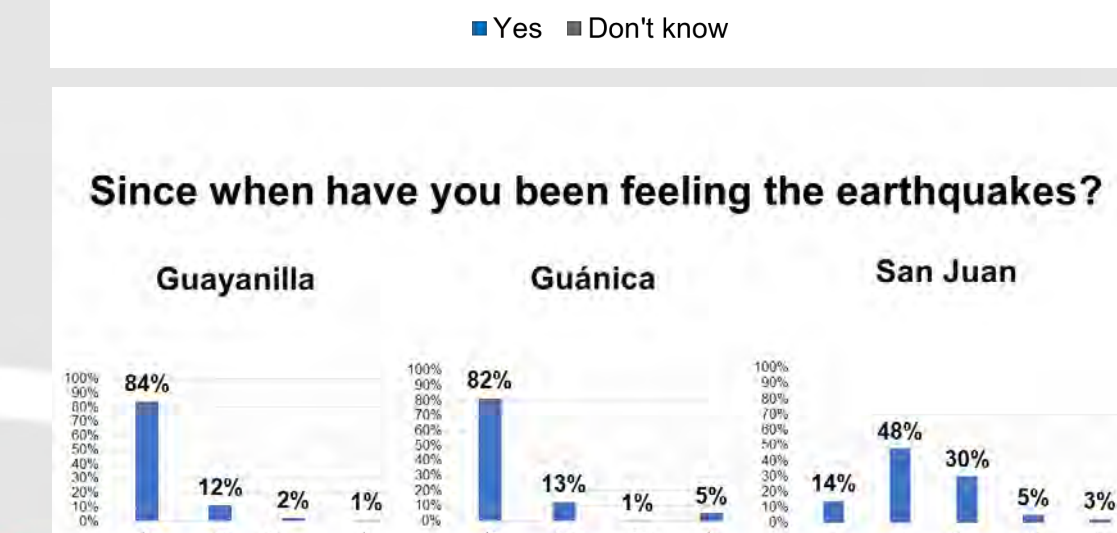
Do you know how many positive cases of COVID-19 have been reported in Puerto Rico?



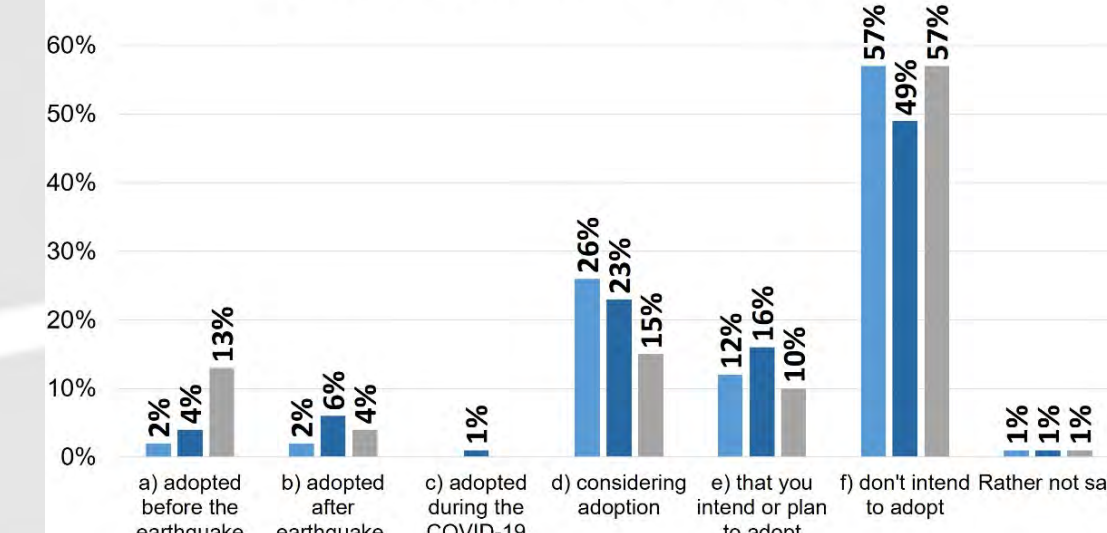
Have you heard a forecast about a stronger earthquake that could affect Puerto Rico?



Prepare a response plan with the community



Since when have you been feeling the earthquakes?



Next steps:

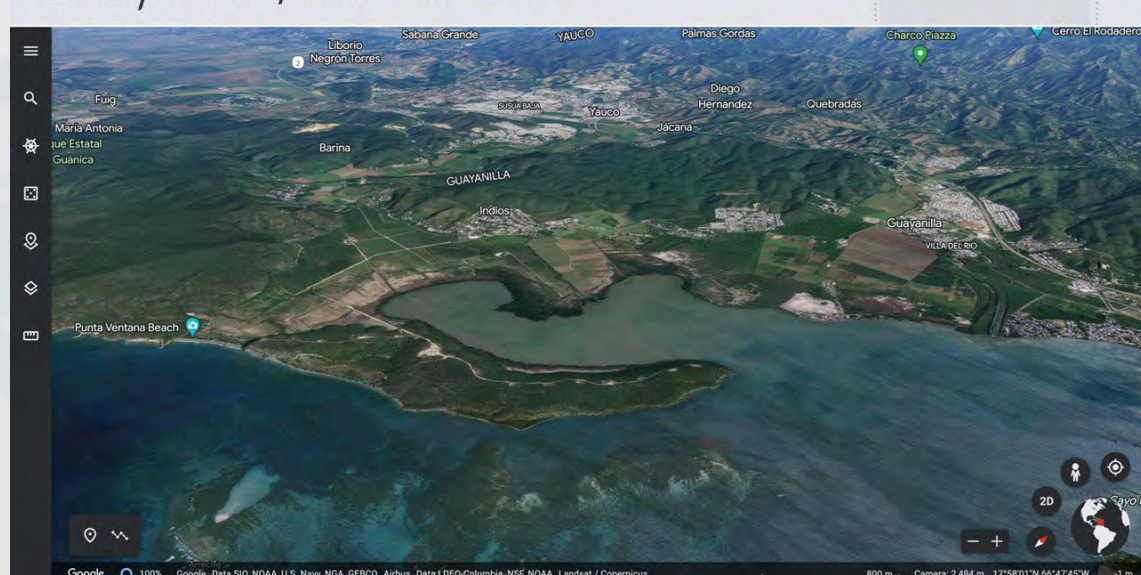
We are building on the data collected and the ongoing analysis to inform the development of activities to co-produce convergence research. To do so, we will continue collaborating with communities in Southwest Puerto Rico and San Juan to promote risk awareness and examine strategies to promote community engagement.

Acknowledgments:

- Participants
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- RVCC Hub Collaborators: Isabel Rivera Collazo, Julie Maldonado, and others

Research Sites

Guayanilla, Puerto Rico



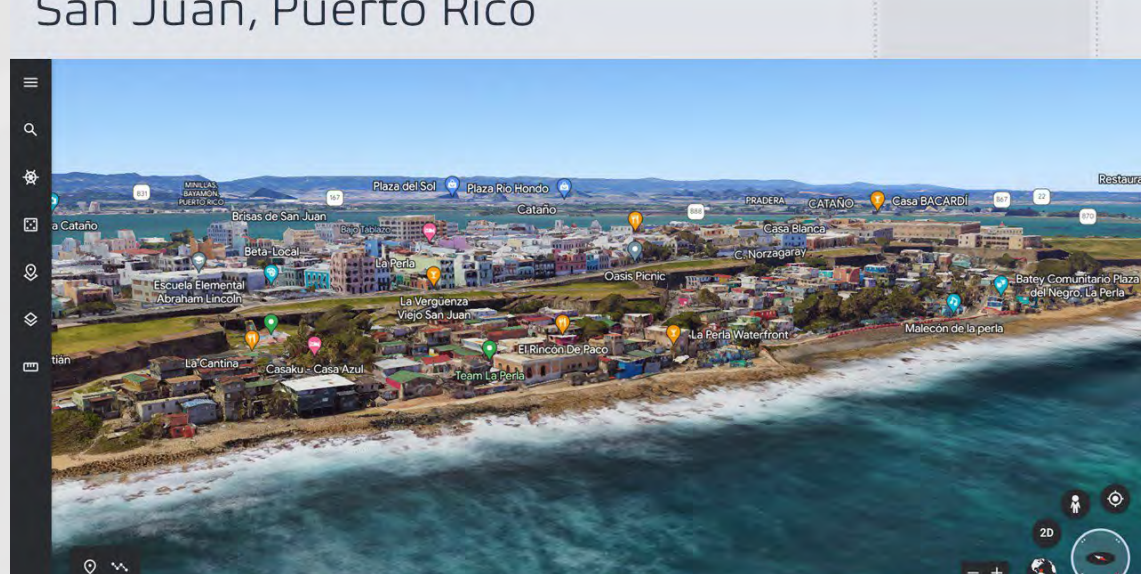
Over 50% of the population lives below poverty.
Costa Sur Energy Complex – produces over a quarter of the electricity for the island
Established in 1833. its name combines Guadianilla, a river in Spain, and Guaynia, the pre-Columbian name of the southern region governed by Taino Agueybana.

Guánica, Puerto Rico



One of six municipalities in Puerto Rico where over 60% of the population lives below the poverty level.
Historical records document that the pre-columbian name of this site was Guaynia – considered the capital of Puerto Rico and destroyed during an uprising in 1511.
In 1898, U.S. General Miles arrived in Guánica as part of the Puerto Rico campaign during the Spanish American War.

San Juan, Puerto Rico



Located on the outskirts of Old San Juan. Enslaved people were forced to live outside the city wall and began building homes around El Matadero, the slaughterhouse.
The hit ‘Despacito’ by Daddy Yankee and Luis Fonsi brought the community into the spotlight, locally known previously for its nightlife.
They see tourism as an opportunity for economic development, but one that should benefit its residents and assure the permanence of the community.

