FEMA Offers Workshop to Counteract the Effects of Climate Change

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Guaynabo, Puerto Rico – Landslides and coastal erosion were two of the most frequent impacts suffered by Puerto Rico's municipalities because of Hurricane María in 2017. These and other threats may worsen and increase as the effects of climate change continue to intensify across the Island.

To address this challenge, the Federal Emergency Management Agency (FEMA), through its Community Assistance - Recovery Support Function (CA-RSF) unit, organized a workshop to advise municipal staff on new tools and strategies that can increase the resilience of their recovery projects by considering climate change variables in their jurisdictions. Emergency planners and managers, among other local officials from the municipalities of Bayamón, Cataño, Ciales, Dorado, Florida, Guaynabo, Manatí, Morovis, Orocovis, San Juan, Toa Alta, Toa Baja, Vega Alta and Vega Baja participated in the event.

“Puerto Rico's recovery encompasses many complex and far-reaching issues. Being well educated about climate change will ensure that we are all informed and take timely action to prevent or reverse damage to the extent possible,” said FEMA Federal Disaster Recovery Coordinator José G. Baquero.

The workshop brought together experts from the University of Puerto Rico Mayagüez Campus (UPRM) Geology Department, the Caribbean Coastal Ocean Observing System (CARICOOS) office, and the National Oceanic and Atmospheric Administration (NOAA) Climate Adaptation Partnerships Program (CAP). Staff from FEMA's Public Assistance and Hazard Mitigation programs provided information on opportunities available to fund projects that address current challenges.

Held in early December, this workshop is one of several that the federal agency organizes as part of the CA-RSF's Regional Recovery Focus Workshop, a recovery planning initiative that is carried out in all areas of the Bureau of Emergency Management and Disaster Administration (NMEAD) on the island.

These workshops seek to provide information, answers and possible alternatives to specific problems identified by the municipalities in the event of a disaster. The workshop that took place recently in the municipality of Dorado addressed land use planning and management strategies to address landslides, coastal erosion and other threats associated with climate change.

Topics included how to update land use plans according to climate change and nature-based mitigation measures, an aspect that FEMA works on with applicant recovery projects.

Kenneth S. Hughes, a professor in the UPRM Department of Geology and coordinator of the Storm-induced Landslide Impact Dynamics on the Environment and Society (SLIDES-PR) project, said that “while most landslides are caused by gravity, they can also be caused by rainfall, earthquakes, volcanic eruptions, groundwater pressure, erosion, destabilization of hillsides as a result of deforestation, cultivation, and construction, among others.” According to Hughes, this can be dangerous when they occur in areas where there are roads and even structures and residences, because of the speed and volume with which they occur.

“Hurricane María was an event that taught us what nature is capable of because all the areas in Puerto Rico that were already facing initial landslide problems became even more complicated. After that, around 70,000 landslides were recorded island wide. This opened a path to learn and prepare for future situations that are often unavoidable,” said the geology expert.

For Hughes, the first step to establish risk mitigation measures is to identify where the vulnerable points and areas are: to know the drainage at the site, the conditions of the infrastructure, where and how the road is built and the state of its drainage system, among other aspects. Mitigation measures will depend on the nature of the site or the construction of the structure or road.

He indicated that “in order to know in real time the possibility of a landslide occurring, the SLIDES project has so far installed 17 monitoring stations throughout the island to measure soil moisture, among other parameters that could help alert about imminent landslide conditions before the event occurs.”

For her part, Patricia Chardón Maldonado, deputy director and technical director of CARICOOS, pointed out that coastal erosion was already affecting the width of our beaches before the ravages left by Hurricane María in Puerto Rico. The hurricane's intense winds and strong waves caused what little sand there was on the beaches to be lost in deep water. Chardón, who is a civil engineer and expert in coastal erosion, explained that several scientific investigations on the island estimate that about one to three miles of beach width has been lost.

“This loss on our beaches is significant because our beaches are not very wide. However, there have been some that have recovered, but others have not because of the significant loss of sand, landslides, collapse of structures near the maritime-terrestrial area and poor planning in construction,” said the expert.

As for mitigation measures, Chardon said that it will depend on the area being worked on. More natural design measures can be used, such as coral barriers, dunes and measures to rehabilitate certain beaches through sand suction, among other options presented at the workshop.

“It is important to keep the economic aspect of the project in mind, but especially to keep the social aspect in mind when implementing any risk mitigation measures,” stressed the environmental expert.

Wanda Crespo, a climate adaptation specialist with NOAA's Regional Integrated Science and Assessment Program, urged local governments to incorporate climate change adaptation and mitigation measures when updating or revising existing plans, “to avoid the investment and time needed to develop new planning initiatives and thus shorten the implementation of recommended actions.” He indicated that it is better to plan “so as not to have to react later”.

At the conclusion of the event, invited directors and staff from the different units shared concerns and sought possible solutions to counteract the situation in their respective regions.

Some of the recovery challenges discussed in previous workshops include recommendations on how to manage deteriorated structures and encumbrances, bank erosion management through nature-based solutions, and storm runoff.

In 2024, FEMA's CA-RSF will continue to coordinate participatory mapping exercises and related efforts with those municipalities within NMEAD's Ceiba and Caguas Emergency Operational Zones.

Six years after Hurricane María, Puerto Rico has over $31.3 billion in FEMA allocations for nearly 10,900 projects that will help spur rebuilding.

For more information about Puerto Rico’s recovery, visit fema.gov/disaster/4339, fema.gov/disaster/4473 and recovery.pr. Follow us on our social media at Facebook.com/FEMAPuertoRico, Facebook.com/COR3pr and Twitter @COR3pr.