ENVIRONMENT FEATURED

Mitigation plans for coastal municipalities exclude dealing with sargassum

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By Rafael R. Díaz-Torres | Center for Investigative Journalism

The awareness that the governments of coastal municipalities and the central government have about sargassum and the challenges that this marine species present to communities, ecosystems and businesses has not been enough to integrate how it will be managed in the mitigation plans prepared by the Puerto Rico Planning Board, and the 78 municipalities.

After hurricanes Irma and María in September 2017, the Central Office of Recovery, Reconstruction and Resiliency, known as COR3, asked the Planning Board to update each municipality's mitigation plans.

For that task, the Federal Emergency Management Agency approved an allocation to the Planning Board of $3.2 million which was increased in July 2019 to more than $5.4 million. With hose funds the Planning Board contracted Atkins Caribe, LLC as an external

consultant to update the municipal mitigation plans. The contract is for more than $1.7 million.

Mitigation plans are necessary to request FEMA recovery funds. They include eight criteria that endanger life and property. According to the Planning Board, the hazards considered in the risk analysis for updating mitigation plans are climate change, earthquakes, tsunamis, landslides, drought, floods, strong winds and erosion.

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This, despite the fact that in the last decade, several beaches around Puerto Rico have experienced the events of large quantities of algae reaching the shores, causing a strong stench, losses in tourism, navigation challenges for fishermen, and possible public health problems resulting from hydrogen sulfide emissions from the decomposing sargassum. Those events in which the algae arrive in massive quantities to the beaches, coastal or estuarine areas, are known as surges.

"As part of the updates within the risks that are being considered right now, no municipality has identified it as a risk, but it could be considered (the sargassum)," said Planner Rebecca Rivera-Torres from the Planning Board.

"On the Board's behalf, if the municipality expresses the interest of considering sargassum as one of the

risks, the Planning Board has no objection to added. The mitigation plan is a municipal plan. So, the priorities of the municipality will be reflected," the official said during an interview with the Center for Investigative Journalism (CPI for its initials in Spanish).

Of the eight hazard criteria weighted in mitigation plans, two have been scientifically investigated for their possible link to the phenomenon of massive sargassum arrivals that began earlier this decade: climate change and erosion.

On the one hand, the climate crisis continues to show a trend of rising sea temperatures, which has been pointed out as an element that, coupled with the accumulation of nutrients and sediments that float toward the sea surface west of the African continent, facilitate the development of massive quantities of sargassum that subsequently reach the coasts of Caribbean territories.

On the other hand, scientists at Texas A&M University have been working for several years on experiments on the potential use of sargassum to help mitigate coastal erosion by inserting the algae in the sand and dunes. In other instances, its accumulation on the shores is associated with temporary coastal erosion events.

One of the eight coastal municipalities that already delivered its final draft of the mitigation plan to FEMA was Humacao. As in other municipalities of the eastern coast, some beaches in this town have seen limited recreational and tourist activity due to the accumulation and decomposition of sargassum on the

shore during the summer. One of the areas affected this year has been the Palmas del Mar private housing complex.

Although the Humacao municipal government acknowledges the problem that may arise from accumulated sargassum on its beaches, the issue was not included in the mitigation plan.

The director of the Humacao Municipal Planning Office, Anilda Fernández-Vega, said she complied with sending the information required by Atkins for the municipal mitigation plan, and that information did not include sargassum.

Nor was it mentioned by Department of Natural and Environmental Resources personnel in its interventions as part of the work groups in which agency representatives consulted different sectors as part of the process prior to developing the mitigation plan.

"Sargassum is a maritime phenomenon and the municipality has no jurisdiction over it. In fact, any intervention on the coast by both the municipality and the citizens requires authorization from the DNER," Fernández-Vega said in written statements.

"The reduction or elimination of the sargassum from the waters and coastal areas corresponds to the DNER. The mitigation plan does not show that during the workshops activities, the DNER requested that a strategy to manage sargassum events be included as a mitigation project," added the geographer and

planner, who clarified that her office has not received citizen complaints about the sargassum situation.

The municipal official also said she has no communication with the DNER to coordinate sargassum cleaning actions on the beaches of Humacao.

The DNER, says it cannot act if the municipalities and citizens do not request it.

"What they have to do is notify. That is what the protocol says," said the director of the office that runs the DNER's coastal zone and climate change management program, Ernesto Díaz, in reference to the document that his agency published in 2015 to handle the sargassum that reaches the coasts.

However, the absence of initiatives of the central government and some coastal municipalities to determine the uses that can be given to the sargassum collected on the coasts, leaves communities and the tourism sector devoid of strategies to deal with the situation.

Oceanographer Jorge Bauzá stresses that including sargassum management in mitigation plans is indispensable. The inclusion of sargassum in mitigation policies can contribute to the development of recovery strategies and different positive uses that result from the use of the algae.

"When we talk about mitigation it's about how we can reduce our vulnerability, and in the case of sargassum, studies show that it is a situation of climate change, a

situation of balance, the product of human activity, and that it reaches the shore and is creating an ecological impact, an impact on public health and an impact on the economy," Bauzá said.

Among the best-known value-proposition strategies is turning the species into biogas, its use as plant fertilizer, and its conversion to develop products such as construction materials and notebooks, among others.

"As we prepare for the hurricane season, there are coastal municipalities that must prepare for sargassum surges. They have to integrate it into their mitigation plans by region, by coast and by community," Bauzá further noted.

Bauzá advocates the use of sargassum that reaches the coasts of Puerto Rico. According to the scientist, the seaweed can be used for the development of fertilizer, food for farm animals, biofuel, bricks, biomedical products, handicrafts, among other valuation proposals.

Although sargassum has always been present on the high seas and on the Caribbean coast, its accumulation in large quantities during some seasons is a recent phenomenon. For this reason, marine scientists are immersed in research projects on the causes of the surge in parts of the Caribbean and the Atlantic as of 2011.

Also, territories of the region continue to devise strategies to deal with sargassum. One of the initiatives with an emphasis on the Caribbean

emerged in late June 2019, when the Mexican state of Quintana Roo hosted a sargassum summit. A total of 12 countries and the French island of Guadeloupe participated and signed a 26-point collaboration agreement. Mitigation was one of the aspects highlighted in the regional cooperation document.

Puerto Rico did not participate in that summit.

When Díaz was asked if the government of Puerto Rico treats the issue of sargassum as a minor issue, the DNER official denied that this was the case.

"I believe that the 44 coastal municipalities, the Puerto Rico Hotels and Tourism Association, everyone is very aware of the situation and how, sporadically, a hurricane or floods will bring these tremendous problems, because it not only affects the business owner, it affects employees, and those who serve hotel operations and businesses in that area. Nobody is going to sit on a shore or on a terrace to have a drink or eat with this situation," said the DNER scientist.

Despite the importance that Díaz has given to sargassum for years from his post at the DNER, the

researcher admitted that it is necessary to develop planning and detection strategies prior to the arrival of the algae to the coasts.

Besides a guide presented in 2015 by the DNER for sargassum collection on the beaches, there is no public mitigation policy that integrates the management of this marine species.

Also, the federal government has no plans to inquire about the effects of this algae. "Currently, ERDC is not carrying out research on sargassum," said Víctor González, who spoke on behalf of the Engineering Research and Development Center of the United States Armed Forces, assigned to the U.S. Corps of Engineers, told the CPI.

Some municipalities consider including sargassum in their mitigation plans

The eight coastal municipalities that have already delivered their final draft of the mitigation plan to FEMA are Santa Isabel, Vega Alta, Arecibo, Dorado, Aguada, Mayagüez, Patillas and Humacao, according to the information provided by the Planning Board. The drafts "Natural Hazards Mitigation Plan" are available on the agency's page.

The municipal governments that are still working on their mitigation plans could include the management of sargassum, but it is not clear whether it should be an initiative of the Planning Board or the municipalities.

At least that's what several municipal officials told the CPI.

"In the case of the mitigation plan, we do have to consider it because citizens don't know what sargassum is used for and they always go to the municipality to look for a way to dispose of it because they see it as waste," said Luis Rivera, special assistant to the mayor of Yabucoa.
Rivera believes the Planning Board should consider the issue of sargassum management in the guidelines related to working on the updated mitigation plans.

"It would have to come from them (the Planning Board) because they don't include it in the guides. Maybe because it's not a year-round problem, but rather a seasonal issue of a little more than two months, then maybe for the Board's purposes, there isn't much awareness and given that it does not affect the northern area as much, but rather the southern and eastern areas, perhaps the situation goes unnoticed because it is not an island wide problem," said the Yabucoa official, adding that the final draft of the new mitigation plan for his municipality will be ready between November 2019 and January 2020.

The CPI asked the Planning Board of Puerto Rico if the guides for the mitigation plans changed by municipality or region, depending on whether they are coastal, of the mountainous or urban area. The agency explained in an email that the mitigation plans "work in the same format, which is in compliance with the requirements of the Federal Code of Regulation." However, "the plans address the risks according to the particularities of each municipality."

In the southern municipality of Lajas, its mayor, Marcos Irizarry, said he considers integrating the sargassum issue into the new plan he hopes to have

ready by the end of the year. For the past few years, Playita Rosada in Lajas has had to close several times due to high algae accumulations. Irizarry explained that the sargassum they collect from this beach is used as material to cover the municipal landfill, in addition to allowing farmers to use it as fertilizer.

Irizarry said he hopes the Planning Board recognizes the importance of including sargassum in the conversations and orientation sessions related to mitigation plans.

For planner and special assistant of the municipality of Luquillo, Jardany Díaz-Salgado, any sargassum mitigation strategy must be based on the premise that this marine plant brings benefits to other species and can represent a source of income, if properly used in economic and ecological projects.

"We believe that, from the scientific point of view, sargassum is a natural process that helps with beach recovery, which helps to mitigate erosion, that delivers organisms that bring nutrients. When the sargassum arrives at night, during high tide, it traps snails that serve as food for the coastal birds," Díaz-Salgado explained.

About the new mitigation plan, the planner said "the issue of sargassum is something to be included. After Hurricane María, there are many things that are being added to that plan. We are evaluating the plan we had when we met with the Planning Board to determine what the most pressing needs are."

"Now there are issues such as climate change and rising sea levels, which we knew were happening, but were not included in the risk plans," Díaz-Salgado said.

Lack of research on the relationship of sargassum with climate crisis and erosion

Given the rise in sea levels experienced in recent years, waves and erosion have a greater impact on the coasts.

Sargassum surges during the current decade occur on different types of beaches, including those that have been undergoing erosion for years.

Three scientists from the University of Texas A&M presented pilot projects in which they have used sargassum to restore dunes, to try to increase coastal protection against erosion. The work raised the potential of sargassum and other marine plants in creating the natural shields that protect the coasts.

On the other hand, the coincidence of the sargassum surges with the loss of beaches in some places has motivated some scientists to inquire about the possibility that the excessive accumulation of the algae can accelerate further the erosion that these areas have already been experiencing. The impact of sargassum in large quantities can inhibit oxygen in the water and affect other marine grass. Similarly, the collection of sargassum without proper training can lead to accidental removal of sand and other seagrass from the beaches.

According to coastal geologist Maritza Barreto, the continued presence of sargassum on the Caribbean

coast makes it essential to study the links between surges and coastal erosion.

"Sargassum could have two effects with respect to erosion. However, as a student of the coastlines, I have no information that it produces sand or erosion. It would be necessary to monitor the width and elevation of those beaches that are affected by the sargassum for a minimum of one year," the professor of the Graduate School of Planning at the University of Puerto Rico said.

The need to study the possible effects of sargassum for a period of at least one year responds to the fact that the beaches are dynamic and constantly changing in terms of width and elevation. A beach eroded during a season of sargassum accumulation could be restored and have the sand back in weeks or months. These scenarios will also depend on the type of sand, the behavior of the swell, as well as the general characteristics of the beach.

For Bauzá, it is important to study the link between sargassum and erosion, based on the impact of algae on corals.

"The stain of the sargassum has a shadow effect and prevents the light that corals need. Imagine having these sargassum for months, they will affect a community of corals, corals that are already threatened by high temperatures and bleaching. Corals are natural barriers. If that natural barrier that dissipates the wave is threatened, those waves are going to reach deeper into the beach given the rise in sea levels and the beach will erode," the oceanographer warned.

"If there's evidence that it affects the distribution or quality of coral, we have a big problem. If I lose the coral's capacity in distribution or quality, I have a serious problem because the coral has a function in protecting the beach," said Barreto, who also warned about the dangers of losing seagrasses that also fulfill a function of protecting the beaches.

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