

—Emily Bauernfeind

# Tracking the Pulse of a Caribbean Coral Reef

*While New Englanders were raking leaves and lugging winter clothes from storage, Aquarium researchers were in the tropics for a different kind of autumn experience—looking at the seasonal changes on the coral reefs of Belize.*



Loyal *blue* readers will know that Randi Rotjan, Ph.D., has been returning to the waters around the 0.74-acre Carrie Bow Cay for years. She conducted studies there as a graduate student, and returns periodically with other Aquarium scientists to monitor the health of these reefs and ocean animals. This means that she really has her finger on the pulse of these coral reefs.

“On top of the chaos of packing and organizing an expedition to the tropics, there’s always an exciting element of anticipation,” says Randi. “What am I going to find? How have my beloved reefs fared in my absence?” Sometimes she returns to find a formerly healthy coral stand now covered in algae, which suffocates the corals if not kept in check by plant-eating fish. On another patch of reef, she may find that some corals have overcome algal threats, and now teem with a diverse assemblage of fish. “It is an ever-changing landscape,” she says.





Above: Measuring new coral growth. At left, inset: Aquarist Pete Gawne.



The increasing prevalence of invasive lionfish is a common sight throughout the Caribbean.

There is always reason to rejoice tempered with some cause for concern upon return to Carrie Bow, which lies just inside a newly created marine protected area (MPA) that prohibits fishing. After all, life and death are part of the ecosystem on any coral reef, whether it is protected by an MPA or not. At the root of these expeditions to Carrie Bow Cay is the need to document, examine and understand these changes over time—season after season, year after year. This long-term understanding can help Randi and other researchers determine whether and how the reef can withstand various forces (both human and natural), and whether the MPA has a buffering influence.

Randi's colleague Pete Gawne, a Senior Aquarist at the Aquarium, was on the trip to record fish diversity and abundance. His eye was trained on some blue flecks darting among mature corals. These juvenile blue chromis can grow up

to eat plankton, which will keep the waters of the reef clear and healthy. Pete and Randi visited the reef several times every day with cameras, clipboards and measuring devices in hand. They revisited the familiar patches of reef to see what's happened since their last visit. Piecing together all their data—the good and the bad—creates a complete picture of life on the reef. But it is definitely a work in progress. It takes years for a tiny patch of coral to grow up to be a robust stand capable of providing habitat for fishes, just as it takes years for tree seedlings to grow and create a forest.

“The future of the reef is uncertain at this stage; all we know for sure is that the ride isn't over, and we're probably due for some more twists and turns, encouraging signs of life and some unfortunate changes,” Randi says. “But I take heart in the healthy stands of large corals that we see in some areas, and I hope that every trip brings more encouraging signs of new life.”

## You can help

We can protect coral reefs by using fewer resources and making changes in our day-to-day life that reduce the impact of climate change. These actions include reducing waste and pollution, conserving water and reducing the amount of fossil fuel we use by taking public transportation or carpooling whenever possible.

**Learn more about what you can do online. [www.neaq.org/climatechange](http://www.neaq.org/climatechange)**



## Dr. Mom

Randi is the type of scientist who really dives into her work. She's always taking her research and passion for the oceans home with her. Sometimes, it goes in the other direction, and she takes her home life with her on research trips.

During this very special expedition to Carrie Bow Cay, Randi was able to share the experience with her infant daughter and her husband, who was able to make the trip. Randi orchestrated research projects, surveyed coral reefs and blogged for loyal readers back home while also nursing a young infant. When she was diving, her family explored the shoreline of the tiny island and supported her research efforts as much as they could. As is the case for many Aquarium families, their passion for the oceans runs deep.

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