

THE *Current*

February 17, 2026

[Sonia Fernandez](#)

Citizen science app tracks coastal erosion in the Bahamas

When Divina Cox was a child, the beaches in her home country of the Bahamas were typically postcard-perfect landscapes of fine white (and sometimes pink) sand at the edge of turquoise waters. But with the seas rising and storms intensifying due to the effects of a warming Earth, this idyllic scenery is changing.

“Having grown up there I’ve seen that the beaches have changed a lot,” said Cox, now a UC Santa Barbara Ph.D. student. The changes are particularly evident after big storms, where the sand is washed away, leaving rocky terrain. Cox, who is conducting her doctoral studies in geography under advisor Ian Walker, wanted to understand this phenomenon and other geomorphic effects of sea level rise. To do so would mean taking time in the Bahamas to monitor conditions throughout the year, time she didn’t have.

Fortunately, citizen science is poised to help.

With the smartphone application CoastSnap, Cox can now monitor conditions at Bahamian beaches year-round, with the help of locals and beach visitors who are handy with their smartphone cameras. The data from these photos will allow her to interpret what is happening at these beaches, and derive information that could help mitigate problems of, and find solutions for, coastal erosion.

An economic and existential threat

Monitoring the effects of sea level rise around the world is a gargantuan task. As climate change continues to heat up the oceans, the effects of this slow onset event are unevenly distributed and challenging to predict.

Among the front lines of sea level rise are small island developing countries like the Bahamas, an archipelago that has seen its coral reefs bleach, and that also faces land loss due to both thermal expansion of the water and the melting glaciers half a world away. Like other small island developing countries, the Bahamas contributes less than a percent of greenhouse gases that are fueling climate change, but are bearing the brunt of its effects.

“Tourism is the number one industry in the Bahamas,” Cox said. The country’s main economic engine, tourism accounts for 60-70% of its GDP and employs more than half the workforce. It is also highly dependent on sandy beaches that attract visitors from all over the world to its resorts.

“But if sea level rise and storms increase, there won’t be beaches to put resorts on,” Cox said.

Most of the coastal research being conducted in the Bahamas revolves around coral reefs and mangrove forests, both of which have a role to play in buffering the effects of rising seas. But Cox’s questions were about the physical properties of the coast and how they are standing up to sea level rise.

“There’s limited research on how the coastline changes in the Bahamas,” she said, which meant she would have to start from scratch or close to it in order to get a good sense of how the coast is evolving.

“I want to understand how the beach is eroding,” she continued. “And I want to understand the movement of sand on the beach.” Typically, beaches are part of littoral cells, self-enclosed regions with areas that collect and release sediment in a cyclical manner. “I want to understand how long it takes for sand to redeposit on the beach, and if that deposition takes a long time, then what would that mean for tourism and for the many people who live within a few kilometers of the coast?”

To gather baseline data would require her continuous presence on the main island of New Providence to have access to coastal study areas.

At least that's what Cox thought. With CoastSnap, she learned, it could be possible to monitor conditions at several study areas along the coast without having to be there at all times by having users of the app take photos of the coast and upload them to an online, publicly available database. The result is a time-stamped series of repeat photos of the same section of beach, which allows researchers and citizen-scientists to see how the coast changes over time. The app was initially developed in Australia to enable the monitoring of beach width, and has since expanded to coasts all over the globe.

To get the ball rolling, Cox, Walker, research scientist Kyle Emery and undergraduate student researcher Eric Morales Oyola traveled to the Bahamas over winter break. They established four research stations that consist of mounted metallic cradles upon which users can place their smartphones, so that their cameras face the same section of beach. The process involved working with public authorities to get permits, and dealing with consultants and the media to get the word out.

With the four stations waiting for citizen scientists to gather data, Cox is eager to see the images that should come rolling in. "Hopefully the stations are going to be there long-term so we can get more robust data for long periods of time," she said. Those images will become part of a dataset that includes drone imagery as the team will go there periodically to collect data.

"We're hoping to go back before hurricane season starts, to gather data of how the shoreline changes in that main island," she said, with hopes that they can implement monitoring stations on the other islands.

Tags

[Climate Change](#)

[Ocean and Beaches](#)

Media Contact

Sonia Fernandez

Senior Science Writer

(805) 893-4765

sonia.fernandez@ucsb.edu

About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.