

## IOOS® in Action: The Caribbean

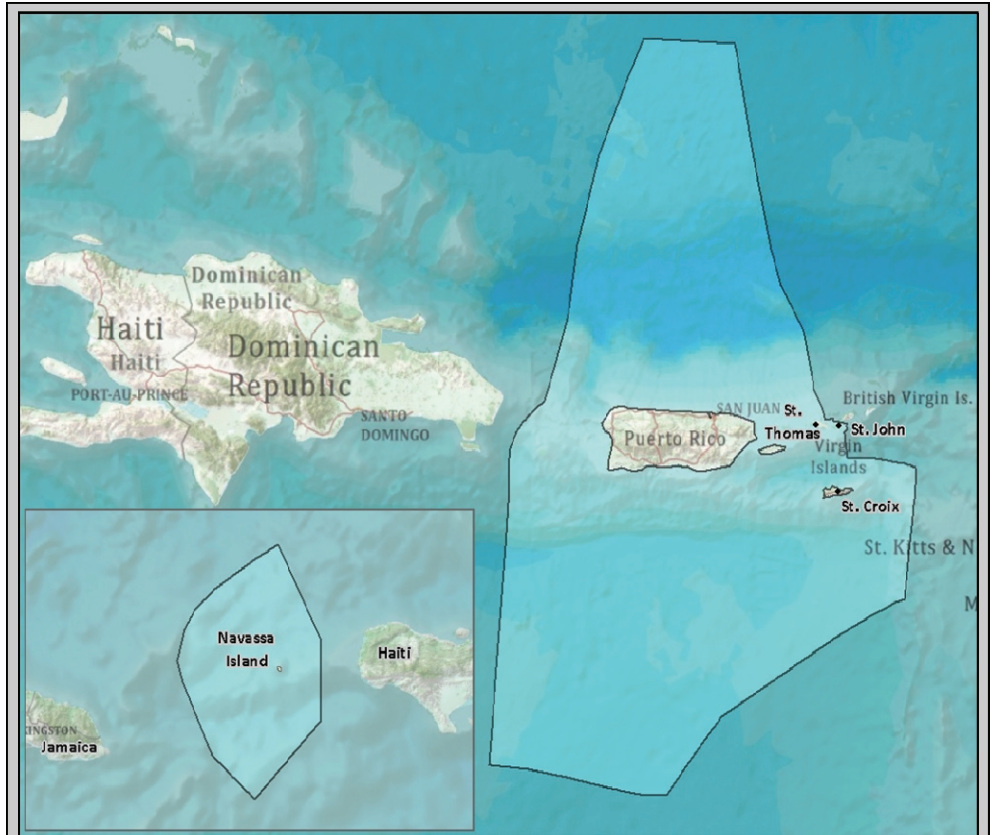
### Improving Lives and Livelihoods in the Caribbean

**Overview:**

Thousands of tools – from satellites above Earth to sensors below the water – continuously collect ocean and coastal data. The Integrated Ocean Observing System (IOOS) is expanding this network of data and making it easier to access and use.

The Caribbean Regional Association (CaRA) and the Caribbean Coastal Ocean Observing System (CariCOOS) include Puerto Rico and the U.S. Virgin Islands. Regional partners collect, integrate, and disseminate data from multiple sensors and numerical models. This supports safe and efficient maritime operations, provides safer experiences to recreational beachgoers and mariners, and assists government missions.

Scientists consult stakeholders to keep system design and data content pertinent and responsive to stakeholder needs. The system is designed for cost-efficiency by maintaining a minimal number of observing platforms in places they are needed most. The region also complements these with models that support prime requirements: coastal winds, waves, currents, and coastal inundation.



The Caribbean Region includes the Exclusive Economic Zone for Puerto Rico and the U.S. Virgin Islands, as well as that surrounding the small, uninhabited island of Navassa.

**Expanding Data Delivery:**

A recent focus on enhancing the availability of IOOS data in the Caribbean is providing new capability to the National Weather Service and improving regional forecasts.

The number of sensors collecting ocean and meteorological information substantially increased with the deployment of two buoys delivering hourly data such as wave height and direction, current velocity, salinity, and temperature. Caribbean partners also installed one high frequency radar system

that collects surface current data in Puerto Rico, as well as a network of a dozen shore-based meteorological stations at key locations throughout the region.

Scientists recently deployed a third buoy southeast of St. Thomas, on the U.S. Virgin Islands insular shelf, to better plan scheduled ship approaches to the port of Charlotte Amalie and ease inter-island ferry operations.

**Aiding Port Operations:**

Northern coasts of the Caribbean are particularly vulnerable to the

impact of large ocean swells generated by extra-tropical storms in the North Atlantic and all regional coasts are vulnerable to hurricane-generated swells. Regional port procedures require port closure when wave forecasts exceed a certain threshold, but deciding when to re-open is also important.

The new IOOS buoys provide the Port Captain with an objective tool for deciding when to re-open ports, thus saving maritime operators from substantial losses due to forced ship idleness.

**Servicing Tourism:**

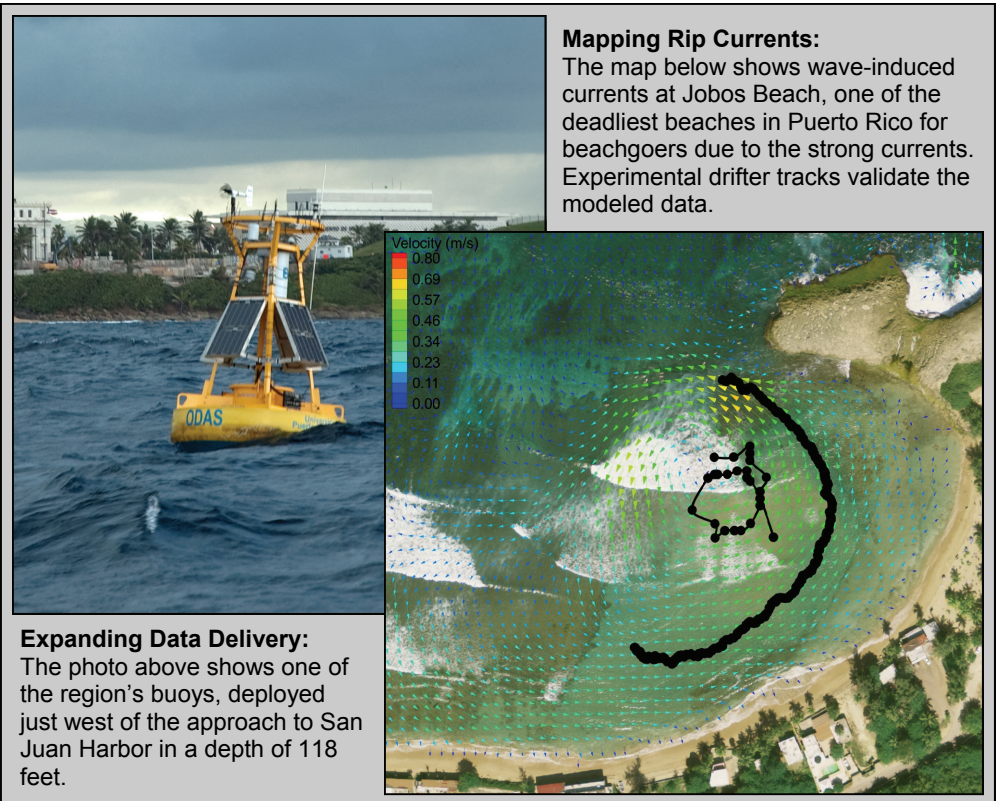
Caribbean economies depend heavily on tourism. Regional IOOS partners respond with products tailored to specific ocean sports events and recreational operations.

For example, scientists developed wind and wave models to aid decisions for the regattas of the Central American and Caribbean Games held on the west coast of Puerto Rico in 2010. The region also did this for the Rip Curl Pro Search 2010, one of the largest surfing events in the world, held on the north coast of Puerto Rico.

**Improving Safety:**

Studies show 20-30 beachgoers each year lose their lives in the region, succumbing to hard-to-predict rip currents. To address this problem, IOOS partners in the Caribbean are developing rip current and beach safety data products.

Scientists will provide the National Weather Service and municipal emergency management officers with current patterns at selected beaches identified through research and local stakeholder knowledge. Preliminary results for Jobos Beach are shown in the figure in the upper right corner.



**Mapping Rip Currents:**  
The map below shows wave-induced currents at Jobos Beach, one of the deadliest beaches in Puerto Rico for beachgoers due to the strong currents. Experimental drifter tracks validate the modeled data.

**Expanding Data Delivery:**

The photo above shows one of the region's buoys, deployed just west of the approach to San Juan Harbor in a depth of 118 feet.

**Enhancing Weather Prediction:**

IOOS partners in the Caribbean and WeatherFlow Inc., a private firm delivering tailored weather products, established a network of hurricane-hardened weather stations throughout the islands.

This network provides continuous real-time data to stakeholders in various marine sectors so they can make critical safety decisions, as well as those that save time and money. The network also serves to validate and refine input to regional weather forecasts.

**Future Outlook:**

As IOOS begins a new five-year funding cycle, the Caribbean is focusing on several initiatives. These include: support to navigation safety and rapid response recovery in key regional ports; minimization of hazards; long-term climate change and ocean acidification observation; remediation, mitigation and adaption to coastal hazards; and data support for marine spatial

planning and marine protected areas.

This IOOS region also focuses on ocean literacy outreach and education. In addition, the region assures continued stakeholder engagement and representation and maintains partner alliances.

**For More Information:**

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