

The Big Island: Solutions for the long and unique coasts of Hawai'i County

The coastline of Hawai'i Island is long and diverse, with mostly basalt rock shoreline interrupted by pockets of sandy beach. This geology lends itself to coastal hazards that differ from other islands where beach erosion, for instance, is more prevalent. Instead, low-lying areas of Hawai'i Island are susceptible to other impacts associated with sea level rise, such as flooding of inland areas at high tides and episodic events, such as storm surge and tsunamis, which pose a less frequent but more severe concern.

"Many of our low-lying areas were developed before our zoning code. So there are many non-conforming – for the most part – structures," said Bethany Morrison from the Hawai'i County Planning Department. The county is working to protect and manage their coastal development through a number of avenues on multiple geographic scales.

On a community-based scale, Hawai'i Island is becoming more resilient to sea level rise through individual community plans, such as Envision Downtown Hilo, the vision that Hilo residents created for how their town will look and feel in 2025. This effort was largely driven from the ground up by community members who sought to protect Hilo's natural resources, manage the town's growth and keep the community safe, among other goals. "Because the project area of that plan, Downtown Hilo, has experienced tsunami inundation, the community is a little bit more aware and concerned about changes to the sea that could impact them," said Morrison.

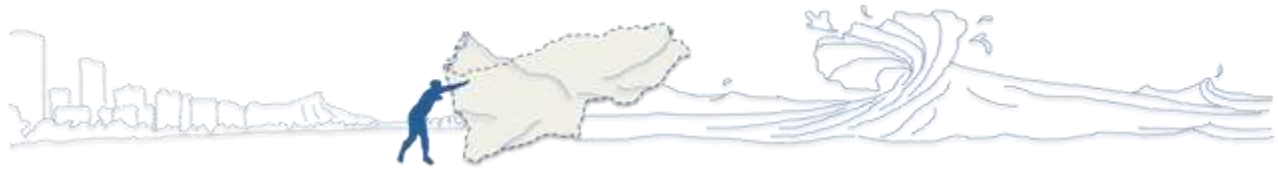
Similarly, Puako in South Kohala is low-lying and therefore vulnerable to coastal hazards. The South Kohala Community Development Plan states that "future coastal development



Figure 1 Inland flooding in Puna at high tide.



Figure 2 Hilo Bay and Downtown Hilo.



should take into consideration global sea level rise and plan accordingly.” Though the community has not yet specified what actions might be taken to adapt to sea level rise, one of Puako’s main concerns is the amount of untreated effluent entering the ocean. “Many of the structures were built with cesspools. Many of those still exist today and as inundation happens, there are concerns as to whether or not their individual waste water systems will function properly. So that’s an environmental concern,” said Morrison. At the moment, the use of cesspools is still allowed by the Department of Health (DOH), however DOH has proposed a rule revision which may prohibit the installation of new cesspools.



Figure 3 Low lying areas in South Kohala.

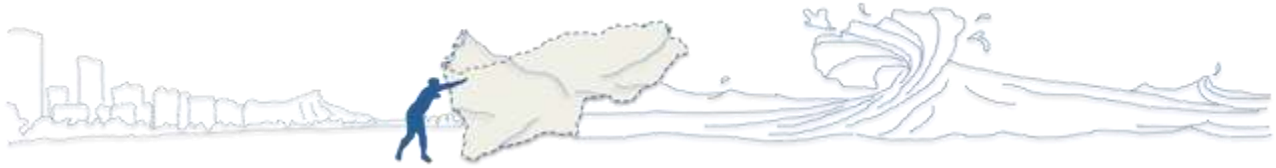
On a county-wide scale, the Planning Department is updating their County General Plan in 2018 for which they are considering sea level rise scenarios to guide long-term planning. They are still in the process of gathering data and results from the ICAC’s Sea Level Rise Vulnerability Assessment and Adaptation Report could help inform how Hawai’i County addresses sea level rise impacts in their long range strategies for the development of the island.

On a statewide scale, Hawai’i County Planning Department is an active member of the Ocean Resources Management Plan (ORMP) partnership of state and county agencies and a member of the Council on Ocean Resources. The ORMP aims to collaboratively manage and protect the state’s coastal zone from the shoreline seaward. “It really stands out because it is a plan that encourages all the agencies to get together and talk about common ocean-related issues,” said Morrison.

Key Message: Collaboration across agencies can facilitate innovative ideas and data sharing.

One of the challenges Hawai’i County discusses at ORMP and faces in adaptation is identifying and quantifying the impacts of sea level rise. Hawai’i Island’s coastline is expansive and unique among the state – mostly basalt rock as opposed to sandy beach – which give it unique hazards. “Other counties use erosion rates for their shoreline setbacks but we don’t have any erosion rates so our shoreline setback does not account for physical shoreline changes on the property,” said Morrison.

To address this dearth of data, the Planning Department collaborated with University of Hawai’i Hilo to collect available Geographic Information System (GIS) data on coastal hazards and apply it to the shoreline to see which areas are vulnerable to which hazards. “It didn’t really give us any new information but it confirmed that low lying areas are the most vulnerable, which is something we have seen from working on the ground in



these communities. We still need to understand how vulnerable they are and what measures might need to be taken to protect them.

Having studies to inform action, Morrison explained, is crucial to implementing good policy. For example, a study was conducted in Kapoho, in the district of Puna, on the eastern tip of Hawai'i Island, to determine the rate of subsidence – a geologic phenomenon where the land gradually sinks in elevation. “We have been able to successfully use that subsidence rate to increase the base flood elevation requirements for some structures being built in the Special Management Area (SMA).

The lesson from this, Morrison explained, is that sea level rise can be treated much in the same way that subsidence in coastal areas within Special Management Areas (SMA), which are areas near the coast containing valuable natural resources that are protected by additional regulations and permits. Established in 1975 under the Coastal Zone Management (CZM) Program, SMAs include all areas within 500 feet of the shoreline statewide, with additional natural resource areas farther from the coast as outlined by individual counties. SMA Permits are issued by counties to regulate appropriate land use.

“The SMA has been a good tool. It allows for a little more dialogue,” said Bethany of using SMA permits to require coastal development to consider coastal hazards in their plan. “Because otherwise if [landowners] meet the code requirements, they can develop, but in the SMA we can mitigate for any impacts.”

Key Message: Sea level rise impacts can be addressed within existing planning frameworks to manage growth and new development in a changing climate.

“Sea level rise as a coastal hazard is one of many,” Morrison said, which means that it can be treated as other coastal hazards such as subsidence. By using existing regulatory frameworks such as the SMA, Hawai'i County could require coastal development to factor in sea level rise alongside other coastal hazards. In order to employ this useful tool, Hawai'i County's next step will need to be acquiring island-specific data on how sea level rise will impact the coastline.