



By **Drew Kann, CNN**

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Half of the world's beaches could disappear by the end of the century, study finds



Photos: Climate crisis threatens favorite beaches worldwide

Photos: Climate cri

Ocean City, Maryland. Ocean City's beach is an important economic driver for the local economy, but the city has had to spend millions of dollars in recent years to dredge up sand to keep up with the quickening pace of erosion.

Barceloneta Beach visitors each year, k

1 of 8

2 of 8

Hide Caption

(CNN) — Climate change poses an [existential threat to the world's sandy beaches](#), and that as many as half of them could disappear by the end of the century, a new study has found.

Even by 2050 some coastlines could be unrecognizable from what we see today, with 14% to 15% facing severe erosion.

While the amount of beach lost will vary by location, the study found that many densely populated areas -- including those along the US East Coast, South Asia and Central Europe -- could see some shorelines retreat inland by nearly 330 feet (100 meters) by 2100.

"We considered the threshold of 100 meters because if erosion exceeds 100 meters, then this means that most likely, the beach is going to disappear because most of the world's beaches are even narrower than 100 meters," said Michalis Vousdoukas, a coastal oceanographer and scientific officer at the European Commission who was a lead author of the study. "In a way, we consider this to be a conservative assessment."

The [study was published Monday in the scientific Journal Nature Climate Change](#) and was conducted by scientists from the European Commission's Joint Research Center, as well as universities in Spain, Portugal and the Netherlands.



Royal Palms Beach in the San Pedro area of Los Angeles is shown in 2017 studded with boulders placed to stop erosion.

Using updated sea level rise projections, the researchers analyzed how beaches around the world would fare in a future with higher seas and more damaging storms.

They also considered natural processes like wave erosion and a beach's underlying geology, as well as human factors -- like coastal building developments, dams and beach nourishment efforts -- all of which can affect a beach's health.

The study found that sea level rise is expected to outweigh these other variables, and that the more heat-trapping gases humans put into the atmosphere, the worse the impacts on the world's beaches are likely to be.

It's hard to overstate just how important the world's beaches are.

They cover more than one third of the world's coastlines, and serve as a critical buffer to protect coastal areas from storm surge.

Beaches are also important economic engines, supporting recreation, tourism and other activities.

And in some regions, the beach is more than just a vacation destination.

In places like [Brazil](#) and [Australia](#), life near the coast revolves around the beach for much of the year.

"There are large parts of the world where sandy beaches have value that cannot be directly monetized," Vousdoukas said.

Some of the world's most popular stretches of sand are already [waging a war against physics](#).

Normally, beaches are dynamic environments. Shorelines are supposed to naturally shift and change with the tide and respond to changes in sea level.

"The coast that we see today is just a snapshot in time," said Robert Young, the director of the Program for the Study of Developed Shorelines at Western Carolina University and a coastal geologist who was not involved in this study. "Our beaches, our wetlands and estuaries, they move back and forth in response to the changing sea level and they have since time began."

However, scientists say that when we develop near the water, we disrupt a beach's ability to move and halt the natural processes that allow sand to replenish on its own.

Related Article: Beaches around the world could disappear because of the climate crisis, development

Today, many of the beaches facing the worst erosion problems are located in urbanized areas, where high-rises and roads butt right up against the shoreline.

But the [financial and environmental costs of these projects are enormous](#), and scientists say rising seas and more powerful storms, supercharged by a warmer climate, will make this a losing battle.

Truckloads of sand are dumped on a beach near Miami to fight erosion.

"Right now, what we're trying to do everywhere is hold the shoreline in place. But over the next few decades, we are not going to be able to do that, even if we want to," Young said.

The new study found that as sea levels continue to rise, more and more beaches will face erosion problems.

The study found that Australia will likely see the most shoreline impacted, with at least 7,100 miles of coastline -- roughly 50% of the country's entire sandy coastline -- that could be threatened by 2100.

Other countries that could see huge lengths of shoreline eroded are Chile, China, the United States, Russia, Mexico and Argentina.

Vousdoukas said that small island states are also likely to suffer, especially those in the Caribbean because of their flat terrain.

The researchers did find that humans have some control over what happens to the world's beaches.

If the world's governments are able to stick to modest cuts to heat-trapping gas pollution, the researchers found that 17% of projected beach losses by 2050 could be prevented, a number that grows to 40% by 2100 if greenhouse gases are limited.

"By trying to accomplish the Paris agreement goals, we can reduce 40% of the impacts that we project in our study," Vousdoukas said.

Correction: The Nature Research press site originally distributed an incorrect version of this study, and two of those inaccurate findings were included in the original version of this story. The story has been updated with the correct percentage of beaches that could see severe erosion by 2050 and the correct percentage of projected beach losses that could be prevented through modest efforts to limit greenhouse gases.



TOPICS ▾

Innovative infrastructure in face of sea-level rise

EXAMPLES FOUND IN MAINE, CALIFORNIA, AND EUROPE

*September 27,
2018*

BY

POSTED SEPTEMBER 27, 2018

LAST MODIFIED OCTOBER 1, 2018

By Susie Arnold, Kate Tagai, and Allison Carmen

Rising ocean levels and increasing storm frequency and intensity are already having an impact along the Maine coast. How we choose to adapt and improve our coastal infrastructure will determine how our communities succeed.

Traditional approaches to improving built infrastructure include increasing the diameter of culverts to allow for greater storm water runoff, raising road levels, docks, and coastal buildings to account for rising tides, and building retaining walls. But some communities are looking beyond these basic upgrades and are beginning to test new innovative solutions.

Businesses that rely on the waterfront can't simply relocate to higher ground—they must adapt to the flood plain. The Front Street Shipyard in Belfast took an innovative approach when building a new 22,500-square-foot boat shed.

Working with the city to get a variance to the flood zone, the business designed a building that would allow the higher tides to run right through it. The lower portion of the wall has swinging stainless-steel louvers, and all the construction materials used on the lower six feet of the wall can withstand getting wet without impacting the integrity of the building.

"People always wonder why the outlets are so high," jokes JB Turner, Front Street Shipyard's president. "All the light switches and power outlets in the building are at a minimum 6-foot height."

These upgrades allow the tides to rise and fall and work to continue without interruption, saving Front Street Shipyard money both in worker time and the cost of repairs. By adapting to its environment, the business is becoming economically resilient.

On the other side of the country, landscape architect Kristina Hill is reimagining the San Francisco Bay area using natural environments to work in collaboration with built infrastructure in a system she calls "hybrid edges." Using wetlands and beaches to provide buffers for houses that are built on piled foundations rather than dug foundations, her designs use living systems as a component of infrastructure. With 39 percent of the U.S. population living along the shore, it is becoming increasingly important to work with the environment rather than in spite of it.

The Dutch have long adapted to a watery landscape from dikes to dynamic floodgates, and are now developing strategies to make themselves climate proof. Much of the Netherlands is actually below the current sea level, making it especially vulnerable to its rise. Leaders there are changing how they think about hard surfaces, storm water runoff, and how to let water in strategically, like the Front Street Shipyard, rather than try to block it out altogether.

A 22-acre expanse of fields and canals, called the Eendragtspolder, recently hosted the World Rowing Championships. But its primary purpose is to absorb excess storm water in a place without built infrastructure that can be undermined, damaged, or washed away.

The Dutch realized that building higher levees to contain the water would effectively wall off the city. Though they are increasing the height of floodgates, they also are creating strategic places where the river can flood. By creating wells for excess storm water run-off to be absorbed, they don't have to depend entirely on the integrity and maintenance of built infrastructure like dikes or levees.

The Floating Farm in Rotterdam is a bold design concept that addresses decreasing availability of arable land. In fact, the farm isn't located on land at all, but is built on three floats above the water with space for 40 dairy cows. The designers are creating a farm with closed loops, so the fertilizer the cows produce goes into growing grass for them to eat. It also can be fermented to create electricity to power the farm.

The U.S. spends billions on disaster recovery every year, only to watch the infrastructure get inundated and rebuilt again a few years later. We need to start adapting rather than replacing. Municipalities, businesses, and private home owners must choose to prioritize investing some of the billions up front to create more resilient roads, houses, businesses, and cities.

Ultimately, spending a little more now may prove to be more cost effective in the long run. We will be looking to countries like the Netherlands, businesses like Front Street Shipyard, and professionals like Kristina Hill to continue to lead the way with new ideas.

Susie Arnold is a marine scientist, Kate Tagai is a senior community development officer, and Allison Carmen is an infrastructure finance specialist with the Island Institute.

The Maui News

BREAKING NEWS

Two new COVID-19 cases reported; none in Maui County

Maalaea coastal erosion considered above average

Official: Mitigation may take 55 months and a quarter-million dollars



A seawall fronting the Kanai A Nalu condominium in Maalaea that is crumbling and being undermined shows its wear in this photo taken Friday. Government officials say that Maalaea's shoreline is facing higher-than-average rates of erosion, and that it could take 55 months and a quarter million dollars to address. The Maui News / MATTHEW THAYER photos

MAALAEA — Maalaea Bay's high shoreline erosion rate is forcing area residents to act soon, but mitigation efforts are often riddled with time, permitting and funding issues, government officials said recently.

Meanwhile Maalaea community members are appealing for county help with coastal erosion problems that seem too big for any one group.

"My biggest takeaway was seeing how overworked and understaffed the Planning Department is," Peter Cannon, Ma'alaea Village Association board member, said Tuesday. *"It's demoralizing to try and do the right thing for the community when you know how the county is struggling to respond to it themselves."*

About 140 people, mostly Maalaea residents, attended a Feb. 27 community meeting with state and county officials, along with coastal experts, to discuss shoreline erosion and mitigation measures.

Maalaea Bay Beach has eight condominiums and two-single family properties that are facing higher-than-average shoreline erosion rates.



A sign warning about the dangers of a crumbling Maalaea seawall rocks in the wind as its supports are also being eroded.

Also, much of the infrastructure was built in the 1970s, before coastal oversight and regulation, according to Tara Owens, coastal processes and hazards specialist for the University of Hawaii Sea Grant College Program.

Maui has the highest rate of erosion in the state, Owens said, citing a U.S. Geological Survey report.

For some areas in Maalaea, the rate is up to 2 feet per year over long-term ranges that span the early 1900s to the early 2000s; the islandwide average is less than a foot per year.

“That’s a pretty high erosion rate,” Owens said.

Also steep are the time and cost challenges for shoreline mitigation efforts, officials said.



A pair of long-topped palm trees cling to life Friday in Maalaea

Jim Buika, county Department of Planning coastal resource planner, presented a step-by-step planning process that could take 55 months — four years, seven months — and a quarter million dollars to complete based on Kahana Bay’s erosion mitigation efforts over the last five years. Kahana Bay is similar in size to Maalaea Bay; the area has 1,000 condo units and 20 buildings, some 12 stories high.

Not to mention, another major hurdle involves navigating the multijurisdictional shoreline permit process. The shoreline is managed by the county (onshore), the state (seaward of shoreline) and the federal government (into the water). Anticipated permits include three at federal, seven at state and eight at county levels, he added, saying that *“it gets very complicated very fast.”*

“That’s the reality,” Buika said. *“I don’t mean to scare you, but that’s the process we’re going through in Kahana Bay. So you need to get organized.”*

Although Maalaea's erosion is not as bad as West Maui's Kahana Bay "*war zone*," or Oahu's "*horrific*" North Shore, the South Maui area needs a customized solution, said Sam Lemmo, state Department of Land and Natural Resources Office of Conservation and Coastal Lands administrator.

"People always want to know what they can do to address the erosion problem, you'd like to know from government officials like myself, what you can and cannot do," he said. *"Each situation has to have a unique solution, and it's based on the circumstances of the site."*

For example, Lemmo said the state considers the existing, onsite beach resources; what the backshore area looks like; how close the structures are to the ocean; surrounding land use; and the conservation and resource values of the area.

"We crunch these numbers and figure out how to move forward," he said.

Owens said erosion occurs for various reasons, including long-term or chronic erosion from steady narrowing of beaches and land movement due to sea level rise; episodic erosion from event-based incidents, such as big storms; sea conditions like swells that change how sand behaves on the beach; and even human interventions, such as taking natural shoreline and exacerbating it by armoring or building walls.

Coastal management options range from doing nothing; managed retreat though setbacks or relocation; adaptation by elevating or reconfiguring; beach nourishment and/or dune restoration; temporary erosion control through sand pushing, natural or geotextile bags or erosion blankets; and armoring with a permanent rock revetment or seawall, she added.

The preferred strategies for coastal management are typically in the middle, Owens said, highlighting beach nourishment and dune restoration.

Looking ahead, Cannon, a Maalaea community member, said he's most concerned with the lack of resources available for the county and the Planning Department.

“I’m appealing for help — I’m not criticizing,” he said Tuesday. “I’m asking for help from council and the mayor. It’s their Planning Department and their staff. The people of Maui are hurting, and they could be helping us.”

* Kehaulani Cerizo can be reached at kcerizo@mauinews.com.

SHORELINE MANAGEMENT

Jim Buika, county Department of Planning coastal resource planner, said the shoreline erosion conversation should move from *“what to do”* to *“how to do it.”* During a meeting last Thursday in Maalaea on the topic, he outlined the following five key points:

- Reactive to proactive. *“We need to change our paradigm of what we’re doing from a reactive, emergency situation to proactive planning.”*
- Shoreline now managed by parcel. *“Our shorelines are now managed one property at a time. We need to move away from that. We’re parceling our shoreline to death. One protective measure causes a problem for the next, etc.”*
- Shift to regional beach cell approach. *“We need to shift to a regional beach cell approach. We need to look at the Maalaea beach cell and create a hui, organizing and figuring out a common solution.”*
- Establish public-private partnerships.
- Proactively restore beaches where feasible.

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HAWAII NEWS

Officials, lawmakers grapple with eroding Kamehameha Highway in Windward Oahu

By [Timothy Hurley](#) · March 1, 2020

Eugene Kaneshiro lives by the ocean near Kaaawa with a gorgeous view of the Koolauloa coast and a commute that will take your breath away.

But life isn't quite so idyllic right now for Kaneshiro and his Windward Coast neighbors as emergency repairs continue on the area's lifeline Kamehameha Highway, causing daily traffic jams and rush-hour delays that can stretch for more than an hour.

"It's a pain in the butt," he said of the contraflow lane closings. "I can't go anywhere. Just going to the post office is hard."

It's a growing problem for Kaneshiro and his neighbors. Emergency repairs are becoming increasingly necessary as climate change-driven sea level rise and erosion plague the 10-mile shoreline from Hauula to Kaaawa and undermine a highway that is now precariously close to the ocean's edge.

Residents say the situation has been a problem for at least 15 years. More recently, the state Department of Transportation has been forced into making emergency repairs two years in a row.

The current repair job near Kaaawa is expected to last another week, and officials said it's possible additional emergency repairs may be necessary if any other sections of the highway are found to be especially vulnerable.

The price tag for this year's emergency repairs so far: between \$3 million and \$4 million.

Ed Sniffen, DOT deputy director for the Highways Division, said he knows area residents and commuters are frustrated but the department is working on the problem.

A resiliency study, he said, is in the works to look at the highway's weak points, its vulnerabilities and its stressors, including sea level rise, shoreline erosion and rock falls. The \$250,000 study, expected to be completed by July, also will examine how to address the problems going forward.

Sniffen said current trends in sea level rise mean that 20% of Hawaii's roads will be inundated by the end of the century, which means those roads will either have to be relocated or elevated if continuity is to be maintained. The estimated cost for all of that is \$15 billion, he said.

"Even if we had the \$15 billion, we don't know if we should put all of our resources into moving things right away because it all depends on where people are going to live and work in the future," he said.

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"I've said this before, Kamehameha Highway was built so that we connect all the communities. But if that roadway is going to be inundated, what makes us think the communities right off the road won't be? We need to know, from the highway's perspective, first, will the community still be there? And if it is, we've got to find ways to connect it," he said.

Options for the Koolauloa coast, he said, might range from moving the road further mauka to perhaps offering a ferry service along the coast.

Sniffen said the resiliency study is only the first step in what has to be a more comprehensive process to examine related issues beyond the transportation infrastructure.

The state Legislature is now looking at a proposed Office of Planning study of the Hauula area that would look at mid-term and long-term solutions requiring land use planning to address economic, social, public health and environmental considerations.

House Bill 2207, which would underwrite an estimated \$250,000 study, so far has been approved by three House committees and awaits further scrutiny by lawmakers this year.

“Our resiliency study is DOT-centric but our improvements as we go forward have to be state-centric. It has to be good for the state, not just for transportation,” Sniffen said.

Climate scientists are projecting more than 3 feet of sea level rise over the next 80 years. But they say rising oceans are already causing periodic flooding and other impacts on coastal properties.

And while the highway from Hauula to Kaaawa isn't the only stretch of Hawaii roadway under attack by the sea, it's probably the most vulnerable.

The Statewide Coastal Highway Program Report, prepared by University of Hawaii engineers for DOT in 2018 and updated in August, noted that five of the top 10 most critical road priorities are sections of the Kamehameha Highway on the Koolauloa coast.

State Rep. Sean Quinlan, a Democrat who represents Hauula and Kaaawa, submitted a bill this session calling on DOT to create a strategic plan by 2021, replenish the beaches next to the highway by 2022 and reinforce the highway by 2024.

“This has been an ongoing problem for the past decade,” Quinlan wrote on his Facebook page in January. “It's about time that long term solutions need to be created rather than emergency repairs at this point.”

State Sen. Gil Riviere (D, Heeia-Laie-Waialua) agreed.

“I don't think we should be paralyzed by analysis and future planning efforts. Rather than try to get consensus for a 50- or 100-year plan, maybe we should start talking about a 10- or 20-year plan to reduce the cost of emergency repairs and ensure continuing viability of the existing highway,” he said.

Riviere said it is easy to talk about managed retreat from the shore and highway relocation.

“But it is much more difficult to define what that means when we look at actual costs, actions and societal consequences,” he said. “So, all we ever see are reactionary repairs.”

Sniffen said he's confident the repairs being made right now will last for five years and even 10 with proper maintenance.

They are essential for now but going forward officials have much to consider in the next few years.

“We've got to look at it from an entire state perspective,” he said.

Toward that end, Sniffen said he was planning to meet with Land Board Chairwoman Suzanne Case to inspect the shore along the highway. He said he's hoping the two agencies can align behind common goals and partner to save both beaches and highways, whether it involves constructing groins or replenishing sand or whatever else might work to preserve both resources.

“If I went to protect our road but forgot about the beaches, forgot about the resources that make Hawaii Hawaii, in the end we might have connectivity, but who would want to come to Hawaii anymore, to visit as a tourist, if we don't have any beaches?” Sniffen said.

Waikane Store is on Kamehameha Highway six miles south of the ongoing road repairs. But the daily traffic jams are still having a negative affect on the family-run general store.

“Everyone is in a rush,” said the store's Alden Tokuzato. “There's no time to stop.”


Hawaii 2040

Six Feet Above: Where To Draw The Line On Sea Level Rise

Lawmakers are considering how far to set back new developments as well as specific strategies to deal with climate change.



By Blaze Lovell   / February 18, 2020

 Reading time: 11 minutes.



Lawmakers are trying to halt building in areas that could be prone to flooding and rising seas in the next century in an attempt to buy Hawaii time to protect itself from the worst immediate effects of climate change.

One bill would push any new development back to 2 meters (about 6.56 feet) above sea level. That could ban new building anywhere from more than 6 feet just off the coast to nearly half a mile from the nearest shore. Within that zone lies some of Hawaii's most iconic properties, and right on the edge of what could be Oahu's new south shore if seas rise, sits one of its most beloved shave ice stores.

But restricting construction in areas that could be inundated is a problem for the construction industry. In the case of urban Honolulu, that's where many new developments, including some affordable housing projects, are planned to be sited.

The Legislature this year is considering several bills to mitigate the effects of [rising seas](#). Lawmakers are putting forward these proposals after [failing last year](#) to take many meaningful steps to protect the state from a changing climate.



Anthony Quintano/Civil Beat

King tides in 2017 gave Oahu a preview of the quickly encroaching sea. Now, lawmakers are considering how far back to set new developments.

Among those measures, [Senate Bill 2381](#) could have the most immediate impact. The measure would double shoreline setbacks to 40 feet and set that 2 meter height limit for new developments. Sen. Karl Rhoads, who introduced the bill, hopes such a restriction could buy the state more time, at least 100 years in some cases, to plan for and mitigate against rising seas.

He said senators settled on the 2 meter mark based on projections that sea levels could rise that much if temperatures rise 2 degrees Celsius above pre-industrial levels.

If global warming is left unchecked, seas are expected to rise 3.2 feet, about 1 meter, by 2100. But those rising seas will impact islands in the state, and even parts of each island, differently. Oahu could be hardest hit, with over 9,400 acres of land flooded, more than 13,000 residents displaced, and \$12.9 billion in economic losses, according to the [Sea Level Rise Vulnerability and Adaptation report](#).

Many beachfront residents, especially on Oahu's Windward side, have nowhere to [run from rising seas](#). Compare that to some towns on the Kona side of the Big Island, which may not experience as much inundation.

Rhoads, who wrote the bill, said simply limiting building near the shore doesn't necessarily help low-lying areas.

"If you're 40 feet offshore, but you're in McCully, you'll still go underwater," Rhoads said.

One McCully store owner already deals with flooding several times a year.

Jerry Lee, owner of the iconic Waiola Shave Ice store on the corner of Waiola and Paani streets, worries over news of the polar ice caps melting, of seas rising around the world, of the planet getting hotter.

“I know for a fact it’s coming. It’s not superstition,” Lee said of climate change. “Probably not in my generation. But I have to care for my kids. What about their future? You have to think about their future, they’ll have to deal with our problems.”

[Maps from the National Oceanic and Atmospheric Administration](#) show Waiola Shave Ice right on what would be the new shoreline if seas were to rise about 2 meters. Lee recalls a scene several years ago when neighborhood children drew the new high water mark along the sidewalk with chalk. They drew in fish, waves and a reef too.

The sea rising to Waiola Street could be so far in the future it’s hard to plan. Lee jokes that he’ll have to move his shave ice window to the second floor if waters get too high. He already deals with flooding in the store, which happens about three to four times a year, he said.



Waiola Shave Ice owner Jerry Lee already has to deal with regular floods in his store.

Everything there — the counters, the racks of crack seed, the ice chests and iceboxes — are all jacked up a few feet off the ground. The water gets as high as 14 inches, Lee said, and has previously totaled his mother’s car and blew out several freezers.

“That’s our problem right now. Sandbags not going to help you when water comes in every direction,” Lee said.

Lee does what he can to help the environment. He's switched to paper cups and bowls to hold the shave ice and gives out wooden spoons instead of plastic. He tries not to give out straws unless customers ask, and when they do, he gives them paper straws he's been experimenting with.

Some businesses could also be struggling with Hawaii's high cost of living, Lee said.

"Paying high rent, property tax, hard to find people and put them to work — for businesses there's so much to consider," Lee said. "Climate change? Probably not on everyone's list, but it's happening."

Pushback From Building Industry

Measures putting restrictions on new buildings are facing pushback from the building industry.

The Building Industry Association of Hawaii says the state should work on relocating government infrastructure like roads and sewers first. That would force private developers to move their projects, Gladys Quinto-Marrone, the BIA CEO, said in [written testimony](#) on SB 2381.

"Mandating compliance on private property without government leadership is irresponsible," she said.

At just a 1 meter rise in sea level, which scientists warn could happen by 2100, parts of Farrington Highway in the west and Kamehameha Highway in the east of Oahu would likely be flooded, cutting off sections of the island.

Maui Mayor Mike Victorino has lamented to legislators two years in a row on the state of Honoapiilani Highway, parts of which he says are quickly falling into the ocean. Projections show much of downtown Kahului flooded with a 2 meter rise in sea level.

Sen. J. Kalani English has said that parts of Molokai are in danger of being cut off. The Department of Transportation has already [identified vulnerable roads](#) in need of saving, which could cost a [total \\$15 billion](#).

At a 2 meter rise, Maili is underwater, and the beach in Ewa Beach would be pushing up against Campbell High School.

Mapunapuna, which already floods during king tides, would be permanently flooded. Moving further into town, the sea could reach King Street.

The effect is most pronounced in Kakaako and Waikiki, where Magic Island could really turn into an island and Waikiki would be lost.



A projected 2 meter rise in sea levels would swallow up much of urban Honolulu, as shown in this map of the area between downtown and University Avenue.

The problem is, that's where much of the new construction is already happening.

There are at least [five new](#) high rises in various stages of development around Ala Moana Shopping Center alone. One of those, [Sky Ala Moana](#), is planned to be a 400-foot tower with over 400 units.

Another 418-foot tower, [The Residences at the Mandarin Oriental Honolulu](#), is planned for the corner of Kapiolani Boulevard and Atkinson Drive, which could both be inundated with 1 meter of sea level rise.

Just a 1 meter rise could cause hundreds of millions of dollars worth of economic losses in the urban core of Oahu.

“It’s difficult, but they keep building down there,” Rhoads said.

He guesses builders are either hoping the state will put in measures to protect new buildings, or that they think they’ll make enough money before needing to deal with climate change.

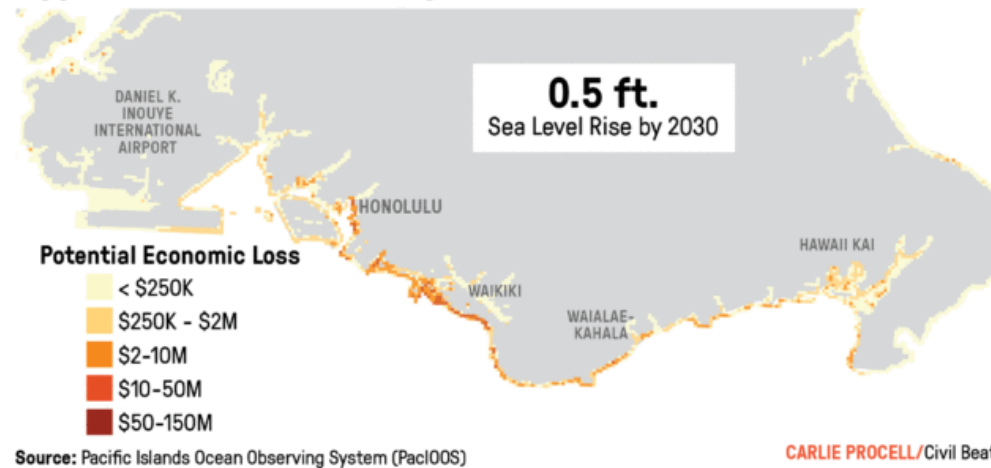
Honolulu Mayor Kirk Caldwell [said in 2018](#) that government should work to harden the urban and tourism centers on Oahu but that beachfront communities around the island may need to move or be cut off.

Rep. Nicole Lowen, who has introduced four sea level rise bills in the House, said the state must at least set the strategy for dealing with sea level rise.

“I think that government policy being in place is essential, or the private sector will make decisions on a completely different set of parameters,” Lowen said.

SEA LEVEL RISE IMPACT

Conservatively, sea level rise is estimated to cost Hawaii more than \$20 billion from lost structures and land alone by 2100, with the biggest financial loss in the greater Honolulu area.



The City and County of Honolulu’s Department of Planning and Permitting also had concerns with SB 2381. They felt that setback requirements should be left up to each county.

“Senate Bill No. 2381 seems to reduce the flexibility appropriate to suit different situations. We have a variety of property types along the shoreline, necessitating a flexible approach,” DPP Director Kathy Sokugawa told lawmakers in [written testimony](#).

DPP also noted concerns with how the bill could restrict development in Kakaako.

Rhoads said both the government and the private sector must retreat at the same time. But he said builders should be wary of putting homes close to the shore.

“If you’re a private sector guy that builds out on the edge of the water and it falls into the water 15, 20 years from now ... I don’t even know if you can get insurance for that now,” Rhoads said.

After clearing a preliminary vote by the Senate Water and Land Committee Jan. 29, SB 2381 just needs to pass the Senate Judiciary Committee, which is chaired by Rhoads, before going to the full Senate for a vote. It would then need to win approval in the House.

Study It

There’s also some private sector pushback on several bills that would require home sellers to disclose if their properties are in areas vulnerable to sea level rise. Maps showing parcels impacted by sea level rise were already created by the Hawaii Climate Change Commission.

However, Ken Hiraki, director of government affairs for the Hawaii Association of Realtors, argued that the commission is not a government entity, and therefore, real estate agents should not disclose those maps.

English said in January that some real estate agents on his home island of Maui already use [maps](#) provided by the commission or [other applications](#) on the internet showing sea level rise to provide information to their clients.

English has sponsored a bill this year, [Senate Bill 3099](#), which would put into law recommendations found in the [Hawaii Sea Level Rise Vulnerability and Adaptation Report](#). While that report was released in late 2017, lawmakers [failed last year](#) to pass a similar measure.

Contact Key Lawmakers

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The building industry and business community were more supportive of measures that require the state to study climate change, rather than set any restrictions on building.

The BIA testified in support of [Senate Bill 3132](#), which would have asked the Department of Transportation to identify critical infrastructure like airports, harbors and highways and come up with a way to protect them from sea level rise. Senate committees killed that measure Feb. 10.

Measures proposing more aggressive studies are still alive, however.

Lowen introduced [House Bill 1856](#), which tasks the Hawaii Climate Change Commission with producing a more in depth strategy on how to handle sea level rise in Hawaii that's more granular than the 2017

report.

“The next step moving forward is to figure out what is the best plan to go with,” Lowen said. “We could look at managed retreat. We could look at adaptation. The key thing is to be thinking ahead on it.”

In addition to studying sea level rise and setbacks, lawmakers are also considering a slate of other environment-related bills.

[Senate Bill 3150](#) would create a [carbon tax](#) set at \$40 per metric ton of carbon dioxide per year. In Hawaii, each person on average is responsible for the emission of 16 to 17 metric tons of carbon annually.

[Senate Bill 2629](#) would require state agencies to participate in carbon offset programs if they use air travel to fly employees for work. Both SB 3150 and SB 2629 were introduced by Rhoads and are awaiting a hearing by the Senate Ways and Means Committee before going to the full Senate for a vote.

[House Bill 2657](#), introduced by House Speaker Scott Saiki, seeks to end coal burning in Hawaii. It would halt any power agreements made after June 30 of this year and would prohibit reissuing permits to burn coal after Dec. 31, 2022.

[House Bill 2699](#), introduced by Lowen with support from 32 other representatives, would require state agencies to have all of their light duty vehicles run on clean energy by 2045. [House Bill 1859](#), also introduced by Lowen with 24 others in the House, would create a program at UH to test new toilet and waste treatment technologies.

Those bills are all sitting in the House Finance Committee, chaired by Rep. Sylvia Luke, which they must clear before moving to the House for a vote by all 51 members.

All bills have until Feb. 28 to move past their last committee hearings.

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About the Author



Blaze Lovell ✉ 📧

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Comments

HEAD'S UP, CIVIL BEAT READERS --

Commenting will be unavailable starting Saturday morning (Feb. 29) while we make improvements to our commenting system. We should be back up by Monday morning (March 2). Watch for a short story Monday morning that explains some of the new functions you will see with the new system. Thanks for your patience!