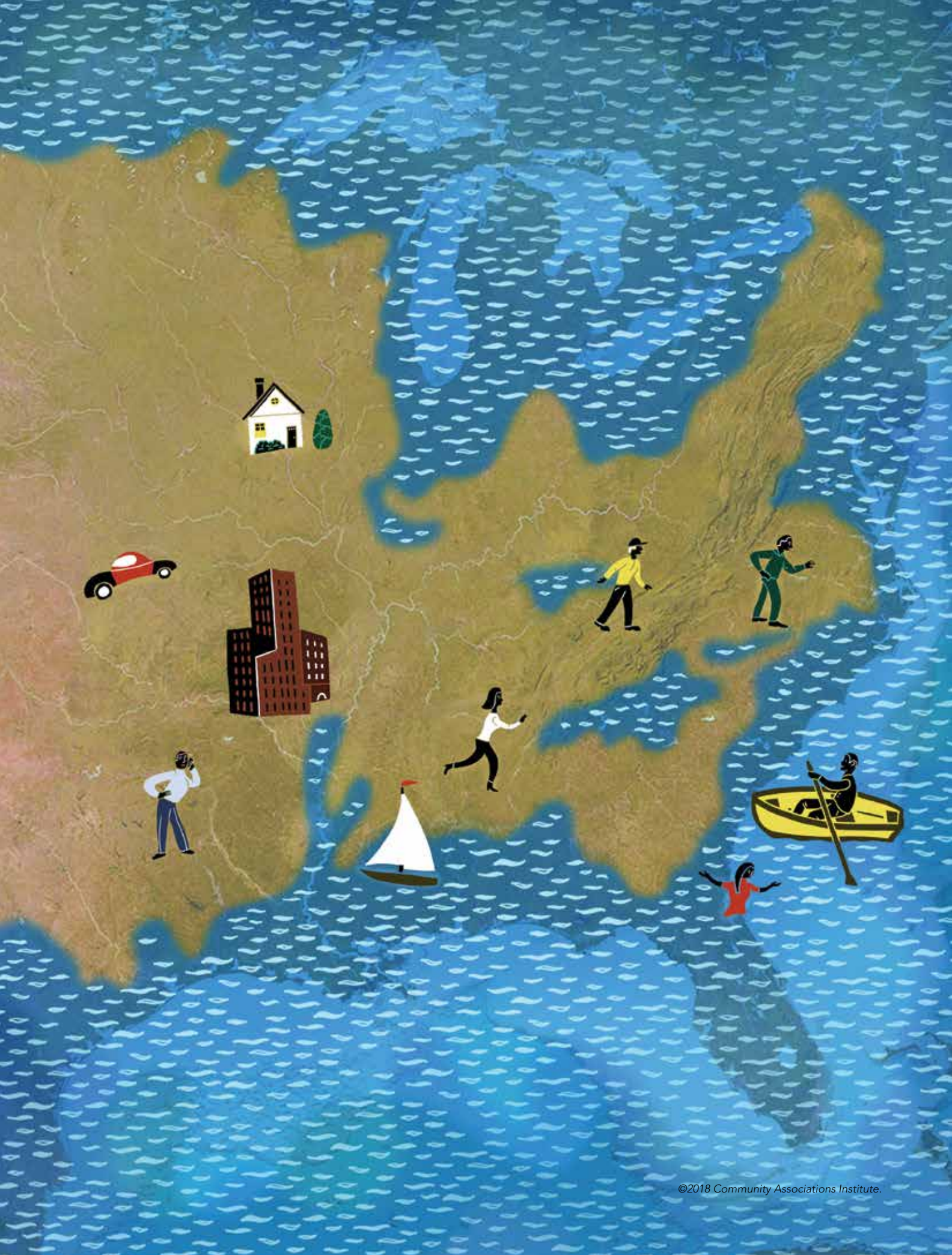


A SHORE THING

SLOWLY BUT SURELY, RISING SEA LEVELS WILL FORCE COASTAL COMMUNITIES TO ACT. IF YOUR ASSOCIATION ISN'T MONITORING ITS SHORELINE NOW, IT'S TIME TO START.

BY JULIE WARREN

ILLUSTRATION BY LEO ACADIA

HIGHER WATER LEVELS MEAN A GREATER LIKELIHOOD OF FLOODING DURING STORMS AS SEWERS AND LEVEES ARE RENDERED INEFFECTIVE BECAUSE THE WATER LEVEL IS TOO HIGH TO ACCEPT THE RUNOFF.

A few years ago, Ralph Burchfield offered to help a fellow Fripp Island homeowner who was concerned about "poor drainage from the road" that was leaving water in her yard.

Burchfield, who is vice president of the Fripp Island Property Owners Association in coastal South Carolina, monitors the island community's roads, bridges, and drainage. He investigated the homeowner's concern and found the water wasn't runoff from the road. It was coming up through the storm drain in the homeowner's front yard from the marsh behind her home.

Burchfield helped install a valve on the storm drain and asked the homeowner where the other end of the drain was located. She pointed to the portion of her lawn adjacent to the marsh, which is Fripp Island's western border.

When Burchfield couldn't locate the second drain visually, he referenced the home's plat, measured, and waded out into the marsh at low tide to find it. The drain was under water and well into the marsh. Over about five or six years, the marsh had claimed 15 feet of the homeowner's back lawn—without her ever noticing.

"It's probably one of the least talked about things on the whole East Coast," Burchfield says of rising sea levels in coastal communities. And he is adamant that every coastal community eventually will have this problem.

"We're not talking about drainage," Burchfield says. "Drainage is the control of rainfall or wastewater management. What we're talking about is—in most cases—non-freshwater and its ability to come on your association property."

SLOW AND PERVASIVE

The National Ocean Service, a division of the National Oceanic and Atmospheric Administration, reports that "global sea levels have been rising over the past century, and the rate has increased in recent decades."

The Ocean Service estimates that in most areas, the rise is about one-eighth inch annually—a rate that's barely noticeable from year to year, even for long-term coastal residents.

Over time, though, that slow encroachment is claiming residents' land as well as associations' common areas. Higher water levels also contribute to higher tides, king tides—which occur in conjunction with the solstice and full moon—and storm surges that erode beaches and redeposit sand where it can alter currents and affect shipping channels.

Higher water levels mean a greater likelihood of flooding during storms as sewers and levees are rendered ineffective because the water level is too high to accept the runoff.

Rising water levels also can corrode manmade structures, like roads and seawalls, that are on ground that's no longer high enough.

Miami regularly experiences flooded streets, even on sunny days, from sea water bubbling up through storm drains, and there's concern that salt water eventually will seep into Florida's fresh water aquafers.

But this isn't just an East Coast phenomenon. Based on NASA mapping, New Orleans is sinking by 2 to 3 inches annually. And a 2013 *Houston Chronicle* article reported that 18 coastal Texas towns, including Galveston, will lose 25 percent of their land to rising sea levels in the next decade or two.

A *Scientific American* article, "Rising Sea Levels Will Hit California Harder Than Other Places," in 2017 suggests that melting Antarctic ice will have a direct impact on the California coast. "For every foot of global sea-level rise caused by the loss of ice on West Antarctica, sea levels will rise approximately 1.25 feet along the California coast," the article states. Rising sea levels will contribute to tidal flooding and mudslides on the West Coast, and by the turn of the century, according to the article, sea levels out West could rise as much as 5 or 6 feet.

A report by the National Academy of Sciences, Engineering, and Medicine illustrates that, because of tectonic plate action, while sea levels are rising along the California coast, they're actually dropping slightly along the Oregon and Washington State coasts. However, this trend could change quickly and dramatically.

NOAA's Office of Coastal Management provides a comprehensive tool for tracking rising sea levels by region or even by city at coast.noaa.gov.

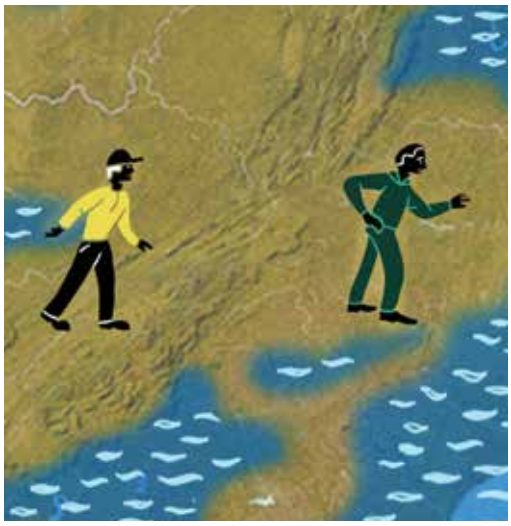
THE CALL OF THE SEA

Yet even as the seas creep onto land, robust development continues and population booms in many low-lying coastal areas.

U.S. Census data indicates that more than half of Americans live within 50 miles of the coast. That's an increase of 45 percent since 1970.

In the last decade, according to *The Washington Post,* more than 2.5 million new residents have moved to Florida, which has more community associations than any other U.S. state.

And *The Post and Courier* in Charleston, S.C., reported last year that Myrtle Beach, Hilton Head, and Charleston were among the top 20 U.S. metro areas for growth. Combined, the number of residents in these cities has increased by more than 10 percent since 2010.



Harris County, Texas, which was devastated by flooding after Hurricane Harvey, has 4.4 million residents and is one of the fastest-growing counties—and the third largest—in the U.S. A suburb of Houston, the area includes nearly 110,000 units in almost 4,000 community associations.

FLOODED WITH DEBT

Flooding along the coast—and inland—has been a concern for decades.

Roughly 90 percent of all natural disasters involve flooding, and all 50 U.S. states have experienced some kind of flooding disaster in the past five years, according to the National Flood Insurance Program.

Before 1968, flooding was considered an uninsurable risk, so the NFIP was created to provide flood insurance, improve floodplain management, and develop maps of flood hazard zones. Now homeowners in coastal or flood-prone communities are required to have flood insurance; without it, they're considered in default on their mortgages. While some private companies offer the coverage, most flood insurance is provided by the federal government.

Managed by the Federal Emergency Management Administration, the NFIP—which is about $25 billion in debt—was reauthorized for 90 days in early September, just days after torrential rain caused by Hurricane Harvey flooded large portions of the Houston area.

Communities throughout Florida also suffered severe flooding when Hurricane Irma tore through the state less than a week later. Meanwhile, despite the devastation suffered in Puerto Rico and the U.S. Virgin Islands just days after those storms, Hurricane Maria is not expected to have a significant impact on the NFIP due to a limited number of policyholders.

Congress reauthorizes the NFIP at regular intervals, otherwise the buying and selling of homes in flood-prone areas, including the coasts, would be suspended. Both the Senate and the House of Representatives have proposed a variety of alterations to the program. Some bills propose limiting the value of replacement costs or restricting new construction in flood-prone areas—a concept the National Association of Homebuilders vehemently dislikes. The National Association of Realtors opposed another House bill because it eliminated rate grandfathering for base flood elevation. In that situation, if someone has owned a home for many years and regularly pays flood insurance premiums, the home could remain in compliance—technically but certainly not realistically—with outdated requirements.

Brock Long, the new FEMA administrator, supports mitigation.

In his testimony to the Senate Committee on Homeland Security and Government Affairs in October, Long affirmed that "flooding is the most frequent and costly disaster we face" and emphasized the importance of investing in mitigation before a disaster strikes. "Developing resilient capacity ahead of an incident reduces loss of life and economic disruption," he said.

Scott Canady, principal at Tambala Strategy and CAI's legislative consultant, wasn't surprised when both the Senate and the House quickly passed temporary legislation reauthorizing the NFIP in the fall. "There's a lot going on about this," he says.

Between 2001 and 2015, the U.S. paid out more than $200 billion for flood-related disaster recovery, says Canady, who would rather see the federal government invest in community-wide efforts to reduce flooding. "But the few programs focused on mitigation—reducing flood risk, buying out flood-prone properties, or helping people raise their homes to safe levels—have been starved of cash," he says.

COMMON SOLUTIONS

Flood insurance, which benefits individual homeowners, is only part of the answer.

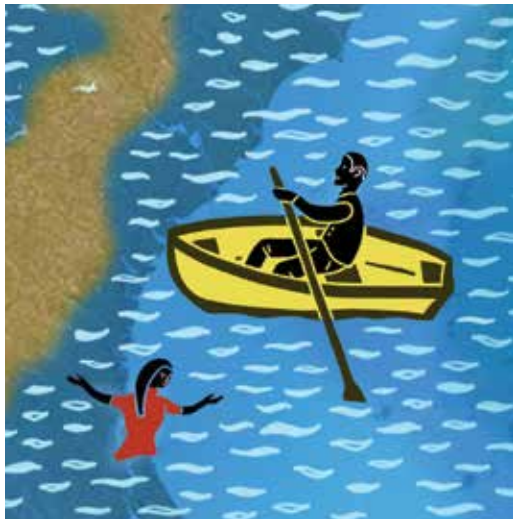
"You can charge individual homeowners all you want in terms of higher premiums, and it's not going to make a difference to the overall safety and productivity of that community," says Canady. "You'd be much better off investing that money in community-wide efforts to reduce flooding."

How are some communities protecting their common areas and infrastructures over the long term?

Pump, rebuild, and hope for innovations. At barely 4 feet above sea level and home to about 90,000 residents, Miami Beach is essentially a 19-square-mile barrier island that is particularly vulnerable to rising sea levels. A recent University of Miami research project has determined that the rate of sea-level rise on the island has tripled in the last decade.

"THE FEW PROGRAMS FOCUSED ON MITIGATION—REDUCING FLOOD RISK, BUYING OUT FLOOD-PRONE PROPERTIES, OR HELPING PEOPLE RAISE THEIR HOMES TO SAFE LEVELS—HAVE BEEN STARVED OF CASH."

ASSESSMENTS IN COASTAL COMMUNITIES SHOULD REFLECT THE EXPECTATION THAT, OVER TIME, STRUCTURES NEAR THE COAST WILL NEED REGULAR MAINTENANCE … (AND) IN SOME CASES, STRUCTURES MAY NEED TO BE ELEVATED—A SIGNIFICANT EXPENSE.



Miami Beach is tackling that problem with a $400 million project to increase the number of pump stations and rebuild vulnerable roads and seawalls several feet above their current heights. Philip Levine, the city's mayor, expects these measures will buy the community several decades; during that time, the hope is that near-future innovations will provide more permanent remedies.

Repair and restore revetments. Peter Kristian, CMCA, LSM, PCAM, general manager of Hilton Head Plantation Property Owners Association in South Carolina and a CAI past president, reports his community spent close to $10 million over the past 12 years to make sure that a revetment wall on the Port Royal Sound (the north side of the island) was built properly. A revetment is a stone retaining wall built against a sloping bank below and above the water line to deflect waves and minimize erosion.

"During Hurricane Matthew in 2016, that revetment got the stuffing kicked out of it, but it protected the homes above it," says Kristian. "None of those homes were flooded."

The community spent $2 million to repair and restore the revetment after Matthew, raising the rocks by another foot or two. Hilton Head's budget includes a regular line item for maintaining and rebuilding revetments and for beach renourishment (replacing eroded sand).

Kristian adds that assessments in coastal communities should reflect the expectation that, over time, structures near the coast will need regular maintenance. He adds that, in some cases, structures may need to be elevated—a significant expense.

Build higher. Key Largo, a little more than 70 miles southwest of Miami Beach, took a direct hit from Irma in early September. David Ritz, president of the Ocean Reef Community Association in Key Largo, says none of the homes built on the island to codes enacted after Hurricane Andrew in 1992 endured serious damage. Built on stilts and above flood stage, these homes are very significant structures, he says.

Kristian has observed similar results from updated building codes in his community. The few Hilton Head homes that tend to flood during a storm usually are decades old and not built to the required higher levels.

When an older Hilton Head home in a prime location is sold, Kristian says the new owners often tear down the original structure and rebuild to the new codes. "Insurance companies look rather kindly on that," he says.

Stormwater management is likely to be another focus, according to Kristian.

"Stormwater is set at a certain elevation, and you have to have enough fall between where the water enters the system and where it exits the system," he says. "With rising sea levels, the stormwater exit points are going up."

Prepare and monitor. "The one thing you don't want to do … is to instill a mentality of fear," says Fripp Island's Burchfield, who recommends that managers and boards of coastal properties start by recognizing there's a problem.

Kate Hines, AMS, LSM, PCAM, general manager of Fripp Island Property Owners Association, credits the community's board with establishing a planning committee and initiating a new master plan that will address a range of issues—top among them is preparing the community's infrastructure to cope with rising sea levels. "We want to make sure that we're looking forward and preparing for what may come," Hines says.

To do just that, Fripp's board is in the process of hiring a consultant to help address the increase of high water on the island, and Beaufort County has provided the island with LIDAR mapping. Produced by NOAA, LIDAR—light detection and ranging—uses GPS, laser, and aerial imaging to produce very accurate shoreline maps.

"It shows us where the lowest areas are already, and from there, we can figure out where we'll need to build," Hines adds.

Burchfield urges association boards and managers to monitor several locations throughout their communities and investigate what options are available. He's currently working on a study to understand the community's exposure. He's been keeping track of five locations in the community.

"All five have been encroached," Burchfield says. **CG**

Julie Warren is editor of *Community Manager* and a contributing editor to *Common Ground*.