2025

State of the Beach Report

Community-Driven Solutions from the Frontlines of the Climate Crisis

Nicole Holman Creative

SURFRIDER FOUNDATION

Contents

Overview

For more than four decades, the Surfrider Foundation's network of dedicated activists has worked tirelessly to protect our treasured beaches and coastal spaces — from California's revered surf breaks and coastal wetlands, to the kelp forests of Washington, to the shores of the Great Lakes, to the coastal dunes of the Atlantic seaboard, and the mangrove strands of Puerto Rico. Our network is dedicated to protecting these coastlines as well as our ability to enjoy them. We have a proven track record of fighting bad projects that threaten the health and future of our beaches, while implementing sound, science-driven policy that protects our ocean and coasts, and leading on-the-ground projects to restore the natural resilience of our shoreline ecosystems.

This work has become ever more challenging in recent years as the impacts of climate change have become unmistakable, extending far beyond our beaches. While our coasts have been threatened by encroaching development, eroding shorelines, and extreme weather, climate change has accelerated and exacerbated the destruction of the beaches and coastal areas we love at an alarming rate — underscoring the urgency of Surfrider's efforts to adapt to rapidly rising seas.

Aerial view of Cannon Beach in Oregon. (📷 Chanel Hason)

The Erosion Problem

Erosion of sandy beaches is a normal coastal process driven by local sea level rise, wave action, tidal or lake level fluctuations, wind, and coastal flooding. Climate change is ramping up the severity, intensity, and compounding impacts of many of these drivers along our coasts. Sea levels are rising more quickly, extreme weather events are becoming more frequent, and our beaches are disappearing faster than ever before. At the same time, rampant private development in idyllic coastal areas continues, encroaching on eroding beaches and contributing to what is known as "coastal squeeze." Where beaches would naturally migrate inland in response to rising seas, development is in the way, and the sandy beaches we know and love are in danger of being squeezed out of existence.

Greater rates of erosion have had catastrophic impacts on coastal areas and communities all over the U.S. In 2024, homes fell into the ocean along the North Shore of O'ahu and the Outer Banks of North Carolina, polluting nearshore waters with debris and wastewater. Access to the world-renowned surf breaks at San Onofre State Beach in Southern California has been severely restricted due to crumbling infrastructure from extreme weather and swells. The coastal places we live in, enjoy, and love most are vulnerable to escalating rates of erosion induced by climate change and its effects along our shores.

What is coastal squeeze?

Coastal squeeze happens when rising sea levels force beaches and coastal habitats to move inland, but development like buildings, roads, and seawalls block their path. Normally, these natural areas would shift to survive, but when trapped, they gradually narrow, erode, or disappear altogether.

Extreme weather threatens properties along the coast of Montauk, NY, demonstrating the negative effects of using short-term armoring as a long-term solution. (📷 James Katsipis)

Climate Change Impacts More than Our Beaches

Climate change is impacting more than just erosion rates. In 2025, extreme rainfall events alone inundated coastal and inland communities alike from the mid-Atlantic to the Great Lakes to Texas, polluting local waterways, destroying recreational areas and beaches, and in some cases, devastating communities — as the flash flood that impacted Kerr County, TX, and killed 138 people was the deadliest rainfall event in generations. Hurricane Erin skirted the Atlantic seaboard, severely eroding sandy beaches and threatening private property in the town of Buxton, in the Outer Banks of North Carolina. In 2024, Hurricane Helene demonstrated that so-called climate havens in mountain communities hundreds of miles away from the coast could be leveled by a hurricane that makes landfall on the Gulf Coast of Florida. Climate change-driven wildfires ravaged Los Angeles in early 2025, decimating neighborhoods and rendering nearby beaches unsafe to swim in for months. Extreme heat and sunny day flooding tested the limits of critical infrastructure in our coastal communities.

Every day, there are new stories detailing devastating losses to our beaches and coastal communities due to the impacts of climate change and erosion. To be clear, the predictions are grim: by 2100, it is estimated that more than 50% of our sandy beaches will be completely lost due to sea level rise driven by climate change alone. In states like California, the figure is as high as 70%. For all of us who love our beaches, the threat of losing them is urgent and imminent.

By 2100, it is estimated that more than 50% of our sandy beaches will be completely lost due to sea level rise driven by climate change alone. In states like California, the figure is as high as 70%.

Left: Aftermath of the Palisades fire that burned across the Westside of Los Angeles, California. **Top Right:** Floodwaters cover major routes in western North Carolina after Hurricane Helene passed through the state. (📷 NCDOT) **Botom Right:** Buxton Beach in North Carolina was among the most impacted by the extreme waves generated by Hurricane Erin. (📷 Jenni Koontz/Epic Shutter Photography)

Diminishing Federal Support

These growing losses also come at a time when federal leadership is withdrawing from efforts to protect our nation, and its shores, from the impacts of climate change. On the tail of the largest federal investment ever in climate resilience, with the passage of the Inflation Reduction Act in 2022 and the Infrastructure, Investment, and Jobs Act in 2021, there is now a sharp divergence from previous administrations in addressing climate change and its impacts along our coasts. Previously approved and allocated climate resilience funding to prepare and adapt to current and future climate change impacts is being yanked away from local communities. The President's budget request has proposed devastating cuts to bedrock coastal and ocean management funding and programs in the National Oceanic and Atmospheric Administration (NOAA). While Congress tries to protect NOAA funding, the threat remains of losing core programs that fund climate resilience work along our coastlines.

Meanwhile, there have been attacks, using all the tools available in the legislative and executive branches, on the Coastal Zone Management Act, a bedrock federal protection law. Lacking strong federal leadership in this space, the Surfrider Foundation is leaning into decades of experience by leveraging our grassroots network to lead change at the state and local levels and to continue making progress in protecting our coastlines in the face of a rapidly changing climate.

To ensure that future generations are able to enjoy our beaches, the Surfrider Foundation has identified several key strategies for our coasts to survive, and even thrive, in the face of growing climate challenges — drawn from our history of successful coastal resilience planning, projects, and campaigns throughout our network. This report aims to illustrate the successes and define the lessons learned through a series of case studies from coast to coast. While the beaches, communities, and political environments look vastly different in each of these places, the framework for success is largely the same: work with nature, rather than against it, and let communities lead.


Kilby Photo

Surfrider's Nature-Based Approach to Resilient Coastlines

Traditional approaches to coastal planning and management have proven to be no match for climate change and rising seas, as indicated by the growing number of disappearing beaches and crumbling critical infrastructure along our shores. For too long, coastal communities and managers have relied on hard infrastructure and sand nourishment to protect beaches with the intent to shore up defenses for private property and development nearby. Unfortunately, these costly approaches have proven to diminish or destroy the exact resources they aim to protect, and decisions are often made behind closed doors without adequate input from the public, if any at all. Seawalls, riprap, and beach renourishment have become the de facto choices for protecting many of our beaches and shores, and our coastlines are vanishing as a result.

Rather than hard defenses like seawalls or riprap, the Surfrider Foundation advocates for nature-based solutions to enhance coastal resilience — working with the natural environment to protect against growing hazards along our shores. These solutions can also include moving people and infrastructure out of harm's way.

What are nature-based solutions?

Strategies that protect, restore, sustainably manage, or support the naturally occurring dynamics of coastal and aquatic habitats and ecosystems. They enhance resilience and natural adaptive capacity to climate change impacts, such as sea-level rise, storm surges, erosion, biodiversity loss, and disaster risk.

Examples of nature-based solutions include strategies like coastal restoration, living shorelines, and marine protected areas.

Surfrider's approach to protecting our coasts in light of a changing climate is three-pronged:

1. **Stewardship:** Restoring hundreds of miles of U.S. coastline to bolster natural defenses against rising seas through our Climate Action Program.
2. **Community:** Facilitating community-led coastal planning to adapt to current and future projected changes to our coasts due to climate change.
3. **Policy:** Leading winning campaigns to change laws and regulations to better protect our beaches from the impacts of climate change.

Our Work

The stories we tell in this year's State of the Beach Report are stories that demonstrate what successful climate resilience on local beaches can look like. They are stories of partnership and community engagement to restore rapidly developing coastlines in Queens, New York; retreating from the sea and restoring dunes in Ventura, California; restoring wetlands in the Great Lakes; and rebuilding mangrove forests and beaches ravaged by Hurricane Maria in Puerto Rico. The Surfrider Foundation's network of more than 200 volunteer-powered chapters and student clubs is working along nearly every stretch of coast in the United States to defend our beaches against climate change impacts, working with nature and fostering a greater sense of community every step of the way. With so much at stake, this network is working to protect our most cherished and vulnerable stretches of coastline with tenacity and joy.

The Surfrider Foundation's network of more than 200 volunteer-powered chapters and student clubs is working along nearly every stretch of coast in the United States to defend our beaches against climate change impacts, working with nature and fostering a greater sense of community every step of the way.

Alexandra Fisher

VENTURA, CALIFORNIA

Surfers' Point Managed Retreat Project

Surfers' Point in Ventura, California, is one of the most iconic coastal stretches in the state and one that has been a critical resource to people for millennia. The Chumash have used the dynamic space where the Ventura River meets the Pacific Ocean for time immemorial, utilizing the natural crossroads of river and sea as a trading hub, fishing and hunting ground, and spiritual center. Today, surfers and other recreationists enjoy Surfers' Point for its incredible waves and natural beauty. It is also the leading global example of the potential for nature-based coastal adaptation solutions driven by the community, as climate change directly impacts beaches around the world.

A Bit of History

In the mid-1980s, a bike path and parking lot were built on the shoreline at Surfers' Point, despite strong local opposition and outcry. The Surfrider Foundation's Ventura County Chapter was formed in 1991, largely in response to the construction of this ill-fated project and subsequent erosion damage to the shoreline. In order to protect the point at that time, the City of Ventura decided to armor the beach, which exacerbated erosion further down the coast and impacted the prized surf break. In some places, more than 60 feet of shoreline was lost, leaving an indelible mark on the shape of Ventura's coastline and surf breaks. When the city applied for a permanent permit for the rock revetment, the California Coastal Commission denied its request and recommended that the parties involved work together to resolve the issue. A working group was established comprising key community stakeholders, including: Ventura County Fairgrounds/31st Agricultural District, City of Ventura, California State Parks, California Coastal Commission, California Coastal Conservancy, state legislators, Full Sail Windsurfing Club, Ventura County Bicycle Coalition, and the Surfrider Foundation Ventura County Chapter.

Hence, the chapter and the working group began a decades-long effort to protect the point. Surfrider Foundation's Ventura County Chapter was a strong and early advocate for a planned retreat and nature-based strategy for Surfers' Point. After several years of study, discussion, and review, in 2001, the working group reached a consensus for a "managed retreat" strategy to protect Shoreline Drive and the bike path from future erosion that included four main components: replacing lost parking, stabilizing the shoreline, relocating the bike path, and restoring the area to a more natural environment.

Damaged bike path at Surfers' Point.

Phase I Begins

In 2005, the initial planning, design, and environmental documentation for the project were completed. The plan included relocating the parking lot and bike path inland, excavating the site, filling it with imported cobble, placing sand in and above the cobble, and installing native plants to facilitate the creation of dunes. In 1998, $4.45 million was earmarked in grants for the project, which, unfortunately, could only finance the first phase of construction. Nonetheless, the city and project partners moved forward with Phase 1 of the Surfers' Point Managed Retreat project, which was completed in 2011 and successfully restored three acres of beach.

After Phase I was completed, Surfrider's Ventura County Chapter helped lead volunteer dune management days to remove invasive plants and keep the beach free of trash. Meanwhile, the point's resilience continued to be tested by nature each winter. The restored portion of the point withstood the impacts of significant swells and storms, whereas the remaining parking lot and bike path continued to erode.

Top: Volunteers install native plants to restore dunes. **Left:** Coastal erosion at its worst. **Right:** A restored coastline, featuring native plants, at Surfers' Point.

The Next Phase

The working group and Surfrider remained committed to the complete vision and Phase II of the project. In 2018 and 2019, BEACON and the City of Ventura conducted final planning, design, and engineering work with funding from California's Ocean Protection Council. A final plan was completed the following year, which then began three more years of approvals, including for securing the $16.2 million in funding needed for construction. In 2023, California's State Coastal Conservancy awarded a grant to the city for the construction of Phase II of the Surfers' Point Managed Retreat Project, and construction began in 2024.

This gold standard, nature-based, coastal adaptation project will be completed in early 2026. Surfers' Point is now equipped with a relocated bike path and parking lot, and a restored shoreline, adding decades of resilience to erosion and climate change impacts. Meanwhile, to achieve long-term resilience, the Surfrider Foundation and the Matilija Dam Coalition are working upstream to remove the Matilija Dam, a defunct reservoir built in 1947, to permanently restore sediment flows in the Ventura River. If successful, dam removal will help naturally replenish sand lost to erosion as sea levels rise and hazards increase along this stretch of California coastline.

Success at Surfers' Point

The managed retreat strategy at Surfer's Point was successful because it began at a grassroots level and benefited from the leadership of a local coastal champion, Surfrider's Ventura Campaign Coordinator, Paul Jenkin. Surfrider's Ventura County Chapter tirelessly championed the approach for two decades, sharing the benefits and demonstrating the efficacy of a nature-based solution to the city council, state agencies, and local stakeholders. The project involved all major stakeholders throughout the planning process, as arduous as it was, and a consensus was reached that managed retreat was the best alternative for Surfers' Point.

The success at Surfers' Point is an incredible case study in community collaboration, leadership, and nature-based solutions. It's an example now being shared with cities around the world as they confront their own coastal resilience challenges. While these challenges are increasingly complex, successful adaptation is possible when solutions are led by local communities with nature at the forefront.

To learn more and stay up-to-date on the completion of Phase II of the Surfers' Point Managed Retreat Project, visit **surferspoint.org** and **ventura.surfrider.org**.

Surfers' Point is now equipped with a relocated bike path and parking lot, and a restored shoreline, adding decades of resilience to erosion and climate change impacts.

Aerial image showing the scope of the restoration project, including the newly opened bike and pedestrian path.

MIAMI BEACH, FLORIDA

Planting Seeds of Resilience in America's Most Vulnerable Coastal City

White sandy beaches, vibrant blue waters, and tropical temperatures make Miami a year-round paradise for Floridians and visitors to the state. South Florida's coasts are home to vital mangrove forests, sweeping seagrass beds, diverse coastal dunes, and the only tropical coral reef system in the continental United States, enticing sightseers from around the globe. In 2024 alone, Miami welcomed over 28 million visitors, contributing $22 billion to the local economy and supporting over 200,000 local jobs. With significant environmental, economic, and cultural importance, Miami's coasts are true Florida treasures. And yet, this region is at the forefront of the challenges and destruction brought on by climate change.

Rising sea levels, flooding, and increasing frequency and intensity of extreme weather events are just a few of the climate consequences threatening South Florida. While Miami has been spared from major hurricanes that have wrought havoc in other regions of Florida in recent years, extreme precipitation events and sunny-day flooding frequently render roadways impassable and significantly tax public infrastructure. As these impacts are compounded by expansive development and exploding population growth, Miami's beautiful beaches and coasts are in real jeopardy of being lost forever. In recognition of the urgent necessity for sustained, effective resilience action to safeguard the region's vital economic and ecological resources, Surfrider's Miami Chapter has prioritized and led nature-based coastal restoration efforts in collaboration with the local municipality on vulnerable beaches for over a decade.

Planting Seeds with the City of Miami Beach

In partnership with the City of Miami Beach, the Surfrider Foundation Miami Chapter has restored over ten acres of coastal dune habitat and installed more than 3,000 native plants in the region since 2006. Chapter volunteers remove invasive species that degrade the health of the dune ecosystems while planting native sea oats and dune grasses that provide critical storm surge, flooding, and erosion protection benefits along Miami's fragile shores. This on-the-ground restoration action also contributes to educational awareness for the local community and decision makers about the efficacy of nature-based solutions for coastal resilience. Recent efforts by state lawmakers to incentivize mangrove restoration and promote green infrastructure highlight the value of long-term restoration projects paired with education to advance sound, nature-based coastal resilience policy.

The Miami Chapter has been a leading voice advocating for stronger laws and regulations to support scaling and replicating nature-based solutions for coastal protection across the state, while advancing on-the-ground projects along Miami's sunny shores. Facing rising seas at ground zero for the effects of climate change, Surfrider activists in Miami are planting the seeds for a more resilient future in South Florida while modeling strong partnership and collaboration for coastal restoration.

As urban coastal areas throughout the U.S. face similar impacts, the Surfrider Foundation Miami Beach Chapter is a leading example of how the power of community and nature can be leveraged to enhance the adaptive capacity of some of our most vulnerable coastlines.

In partnership with the City of Miami Beach, the Surfrider Foundation Miami Chapter has restored over ten acres of coastal dune habitat and installed more than 3,000 native plants in the region since 2006.

Volunteers remove invasive species that degrade the health of the dune ecosystems while planting native sea oats and dune grasses that provide critical storm surge, flooding, and erosion protection benefits along Miami's shores. (📷 Alexandra Fisher)

ISABELA, PUERTO RICO

Community-Led Restoration at the Mabodamaca Community Nature Reserve

The Surfrider Foundation's Puerto Rico network is leading a transformative campaign centered on nature-based solutions and community-led ecological restoration to address the impacts of climate change and decades of environmental degradation at the Mabodamaca Community Nature Reserve. The campaign has grown over the years with strong involvement from student chapters, local volunteers, nonprofit organizations, and the Municipality of Isabela, exemplifying the power of community to enhance coastal resilience in Puerto Rico.

The Mabodamaca Community Nature Reserve, located on the northwestern coast of Isabela, Puerto Rico, is an invaluable coastal ecosystem that has been protected and restored by the local community for more than twenty years. This area was once home to the largest system of sand dunes in Puerto Rico, featuring towering sand mountains that reached heights of over 100 feet. To the north, these dunes bordered the Atlantic Ocean, where more than ten world-class surf breaks are still enjoyed today. To the south, the dunes gave way to a sprawling mangrove forest that included all four species of Caribbean mangroves.

A History of Destruction and Renewal

Between the late 1970s and the early 2000s, this unprotected site suffered severe degradation due to extensive sand mining. Mining devastated much of the northern coastline, with the dunes in Isabela among the most heavily impacted. After the sand extraction, the area became an illegal dump plagued by vandalism. Recognizing the ecological and protective value of healthy coastal ecosystems as a first line of defense against the impacts of climate change, in 2006, local groups began major cleanup and restoration efforts, removing thousands of tons of waste and advocating for the creation of the Mabodamaca Community Nature Reserve. Restoration efforts were led by local residents, including environmental activist Héctor Varela-Vélez, who played a central role in the reserve's revival for years before becoming Surfrider's Puerto Rico Program Manager in 2022. The Surfrider Foundation Rincón Chapter has long supported efforts in the area, including early restoration and advocacy initiatives. These grassroots efforts helped initially revive key habitats and reconnect the community to a place that had been both inaccessible and heavily degraded for years.

Mabodamaca supports a rich array of coastal habitats and vegetation, making it an essential refuge for migratory and local bird species, as well as threatened wildlife. The existing dunes play a critical role as nesting sites for endangered marine turtles like the leatherback sea turtle (Dermochelys coriacea). Beach dunes act as natural buffers against wind and storm surge, also contributing to the formation of high-quality waves valued by the international surfing community. Over the years, this ecosystem has become a key resource for recreation — particularly surfing, biking, hiking, and birdwatching — and is a regional economic driver through ecotourism.

Hurricane Maria Hits Mabodamaca

The coast of Isabela, and specifically the Mabodamaca Community Nature Reserve, has also undergone significant changes due to climate change — particularly from the increase in the frequency, intensity, and duration of hurricanes and associated storm surges. In 2017, Hurricane Maria struck Puerto Rico with catastrophic force, destroying 95% of the mangroves in Isabela. This represented a significant ecological loss given mangroves' critical role in buffering storms, improving water quality, supporting biodiversity, and reducing coastal flooding.

Although the site was not yet fully restored by the local community when Maria hit, earlier dune and mangrove restoration efforts helped minimize the storm's impact on the reserve. The partially restored ecosystems at Mabodamaca played a vital role in absorbing floodwaters and buffering winds from the storm. As a result, major infrastructure like PR-4466, the coastal road bordering the reserve, was spared from serious damage, and excess stormwater safely drained back to the ocean. This event underscored the protective power of natural, healthy ecosystems and the importance of continued investment in ecological restoration.

The impacts of climate change have also presented larger social challenges to the community of Isabela, including the risk of losing access to key recreational areas and transportation routes due to flooding and coastal erosion. However, the case of Mabodamaca demonstrates that community-led ecological restoration efforts, supported by organizations like the Surfrider Foundation, can significantly reduce these risks, strengthening both human-nature connections and the functionality and safety of coastal infrastructure.

In the aftermath of Hurricane Maria, the community mobilized to restore what had been lost and prepare for future storms. The Rincón Chapter continued supporting these efforts, and the Surfrider Foundation solidified its support in 2022 by hiring local staff to lead a formal long-term project focused on ecological recovery and the relocation of critical infrastructure away from rising seas. Working alongside a dedicated group of youth and local volunteers, the effort has continued to grow through strong community collaboration.

The campaign to restore Mabodamaca is deeply rooted in the principles of justice, equity, diversity, and inclusion, with strong involvement from student chapters, local volunteers and residents, fishermen, nonprofit organizations, and the Municipality of Isabela — fostering inclusive and active participation from historically marginalized communities on the island. This community-driven approach has been central to environmental education efforts and local empowerment, allowing knowledge and care for the ecosystem to be shared across generations. Ultimately, the Surfrider Foundation is working to transform the reserve into a self-sustaining model for nature-based climate adaptation and restoration, and to become a hub for environmental education on the island.

Left: Volunteers in Puerto Rico plant mangroves to improve coastal resilience on the island. **Right:** Mangroves are a powerful source of blue carbon, which is the carbon stored in coastal ecosystems. (📷 Nicole Holman Creative)

Climate Action in Action

As part of Surfrider's Climate Action Program, a large-scale mangrove restoration effort has been undertaken at Mabodamaca — one of the most effective nature-based strategies for boosting coastal resilience. Between 2024 and 2025, Surfrider Foundation staff and volunteers have planted over 18,000 mangrove plants and seeds, covering all four native Caribbean mangrove species. This work is helping to restore 40 acres of mangroves decimated by Hurricane Maria and reestablish a vital ecosystem for water retention and flood mitigation, ensuring the Isabela community is protected from the next major storm event.

The program also centers student and volunteer-led dune restoration projects, including an annual Christmas tree dune restoration event. After the holidays, the Rincón Chapter and community volunteers recycle Christmas trees to help stabilize and expand dunes, and promote native vegetation growth. Surfrider volunteers also plant native species in an effort to restore one mile of degraded coastal dunes. These restoration activities not only rehabilitate critical habitats but also educate and empower youth as climate action leaders in their community.

Building on the success of past restoration events, Surfrider has expanded mangrove and dune restoration efforts to other vulnerable coastal areas in Isabela, establishing community-led ecological monitoring for existing restoration sites, and strengthening alliances with community partners, government agencies, and local schools and universities to ensure long-term project viability. Building on the foundation of existing restoration activities, Surfrider's Puerto Rico network has plans to expand restoration areas, install interpretive signage, and collaborate with the municipality to integrate coastal restoration into their climate resilience and adaptation plans.

Between 2024 and 2025, Surfrider Foundation staff and volunteers have planted over 18,000 mangrove plants and seeds, covering all four native Caribbean mangrove species.

Left: Youth leaders and community volunteers in Puerto Rico plant mangroves. (📷 Nicole Holman Creative) **Right:** Christmas trees are collected and placed on the beach to help form sand dunes over a long period of time.

Relocating Public Infrastructure at the Golondrina Bike Path

Unfortunately, there are some areas within the reserve where climate change has already left a mark on coastal ecosystems. In 2017, a bike path collapsed at Playa Golondrina. The failure of this structure left concrete and asphalt debris on the beach, posing a hazard to beachgoers and degrading the natural environment. Rather than defaulting to traditional fixes like large rock placements or building a seawall — which would have disrupted wave dynamics, sand retention, and a major surfing spot — the Surfrider Foundation proposed an innovative alternative with the support of the Isabela community: relocating the bike path out of the way of rising seas.

Thanks to active collaboration with the Municipality of Isabela and support from the Surfrider Foundation's network of expert volunteers, a proposal was developed to relocate the affected section of the bike path inland. This approach not only avoids direct impacts to the beach but also sets an important precedent for responsible planning by coastal municipalities in Puerto Rico to adapt to changing coastal conditions due to climate change, moving infrastructure out of harm's way to protect the beach.

This project is currently underway and is expected to serve as a replicable model for other coastal communities across the island. From an area once deemed too degraded by development and vandalism for the public to enjoy, to a model for coastal resilience, the Mabodamaca Community Nature Reserve is ushering in a new era of community-led coastal planning focused on resilience and ecological adaptation in Puerto Rico.

Help protect our coasts! Join the restoration of the Mabodamaca Reserve and support nature-based climate solutions.

Visit puertorico.surfrider.org to subscribe to the Puerto Rico Chapter newsletter or volunteer for our mangrove planting, beach cleanup, and environmental education events.

Take action today and sign our petition to help preserve Mabodamaca's beaches forever!

Moving this bike path in Isabela, Puerto Rico out of harms way is a local priority for Surfrider Puerto Rico. (📷 Nicole Holman Creative)

RODANTHE, NORTH CAROLINA

Shifting Sands, and Communities, Out of Harm's Way

Rodanthe, North Carolina, sits on the northern end of the island villages of Salvo and Waves on the Outer Banks, a barrier island between the Atlantic Ocean and the Pamlico Sound. This quaint island village, located within Cape Hatteras National Seashore just south of the Pea Island National Wildlife Refuge, is surrounded by sand dunes, remnants of maritime forests, and some of the most beloved coastal recreation areas in the Outer Banks. It also experiences one of the highest erosion rates on the U.S. East Coast — at times exceeding 20 feet per year. Rising seas and intensifying storms have accelerated shoreline loss, causing eleven oceanfront homes to collapse into the sea since 2020. While Hurricane Erin never made landfall in August of 2025, the swells from the storm battered the Outer Banks and flooded communities like Buxton and Rodanthe, leaving several more homes vulnerable to collapse and underscoring the fragility of these barrier island communities in the wake of increasing coastal erosion and hazards.

These collapses have led to dangerous debris, impaired public beach access, and damage to delicate coastal ecosystems, making ocean recreation and surfing Hatteras' renowned waves an ever more treacherous activity. While Dare County has historically relied on beach renourishment to counter chronic erosion in Rodanthe, it cannot keep up with the mounting costs and exponential escalation of beach losses in recent years. Recent projects have failed to protect coastal habitats or private property, and with current renourishment costs projected at more than $120 million over the next 15 years, it's clear that more sustainable solutions are urgently needed to save the cherished beaches of North Carolina's Outer Banks.

Two houses have collapsed into the ocean in Rodanthe, North Carolina, following days of high surf and king tides, posing a significant risk to human health and safety. (📷 Cape Hatteras National Seashore)

Despite the compounding impacts of climate change, Rodanthe and the surrounding villages and communities remain economically and culturally significant. In 2023, Dare County ranked fourth in North Carolina for tourism, generating $2.15 billion in visitor spending and supporting over 12,000 jobs — nearly half the county's employment. Cape Hatteras National Seashore drew more than 2.7 million recreational visits in 2024. Surfing, fishing, kiteboarding, and other water sports and recreational activities are central to the area's identity and economy. The region is also home to the descendants of the Indigenous Croatan people, who called this area Chicamacomico and continue to preserve their heritage through the Roanoke-Hatteras Indian Tribe. It is also a refuge for endangered nesting sea turtles.

The Surfrider Foundation is working to protect Rodanthe's coast and community by advocating for adaptations to climate change beyond traditional beach renourishment strategies. The newly re-energized Outer Banks Chapter, founded in 1993 and revitalized in 2025, is working alongside local groups and partners such as the North Carolina Coastal Federation to safeguard public beach access, water quality, and coastal resilience in the region. The Outer Banks Chapter is supporting solutions at the local level to move vulnerable homes and infrastructure out of harm's way, and legislative solutions at the federal level to fund the demolition or relocation of homes threatened by chronic erosion — before they collapse and pollute the ocean. By empowering local voices and advancing proactive adaptation planning, the Surfrider Foundation is committed to ensuring that Rodanthe and other vulnerable coastal communities and treasured waves along the Outer Banks of North Carolina are protected for generations to come.

Join the growing Outer Banks Chapter today to help advance proactive coastal solutions in Rodanthe and the surrounding barrier island communities!

Surfrider Foundation is committed to ensuring that Rodanthe and other vulnerable coastal communities and treasured waves along the Outer Banks of North Carolina are protected for generations to come.

Families enjoy a beach day in Rodanthe, NC.

ROCKAWAY BEACH, NEW YORK

Recovery, Restoration, and Climate Resilience in Queens

Just a one-hour subway ride from Manhattan, Rockaway Beach is a unique urban coastal area in Queens, New York. Home to some of the only rideable waves in New York City, Rockaway is popular with surfers and ocean recreationists alike, attracting approximately five million beachgoers annually. The area has long been the focus of coastal protection efforts by the Surfrider Foundation's New York City Chapter, whose volunteers have stewarded its shores and hosted beach cleanups in the community since the chapter's inception in 2000. Since then, the New York City Chapter has established strong, long-term relationships with the surrounding community and partnerships with local organizations focused on implementing nature-based solutions to erosion, sea level rise, and storm events along the nearly seven-mile stretch of sandy beaches.

Superstorm Sandy Hits the Rockaways

Rockaway Beach is situated near the mouth of the New York/New Jersey Harbor, and as a result, it naturally experiences significant beach erosion due to the coastal dynamics of the harbor. The area was also one of the hardest hit by Hurricane Sandy in 2012 — a harbinger for future climate change-fueled storm events along the Eastern Seaboard. Atlantic hurricanes are driven by warm waters, originating, and making landfall hundreds of miles south of New York state — Hurricane Sandy was no exception. However, after the storm wrought havoc in the Caribbean, it tracked toward the Mid-Atlantic and made landfall as a post-tropical cyclone near Atlantic City in late October 2012. Over ten feet of storm surge breached the dunes in the Rockaways, flooding homes and businesses, pouring into the subway system, overwhelming aging infrastructure, and tearing apart sections of the iconic beach boardwalk. For over a decade, this area has been in a prolonged state of recovery, while remaining vulnerable to the next major storm event.

The adjacent community directly impacted by Sandy, synonymously named Rockaway Beach, is culturally and economically diverse, and has seen strong gentrification pressure in the aftermath of the storm. While residents want to see their community protected from future storms and made more livable, they are wary of any development projects that might push them out.

Destroyed beach houses in the aftermath of Hurricane Sandy on November 4, 2012 in Far Rockaway, NY

Partnering for Restoration With RISE

The Rockaway Initiative for Sustainability and Equity (RISE), a local civic engagement and environmental justice organization, has worked to protect and restore this vibrant coastal area and community since the early 2000s. While the state and federal government have leaned into hard armoring, including seawalls, new rock jetties, and sand renourishment as recovery strategies for Rockaway Beach, RISE has been working to implement nature-based approaches to rebuild resilient coastlines in the region through the *Greater Rockaway Coastal Enhancement Plan*. This comprehensive effort, launched in 2020, aims to restore coastal habitat, increase civic and youth engagement, and protect the community from flooding and coastal impacts driven by climate change.

Surfrider's New York City Chapter forged a partnership with RISE in 2023 for a dune planting event as Surfrider began to formalize its own Climate Action Program. Since then, the New York City Chapter has partnered with RISE to host seven restoration events focused on strengthening coastal resilience in the Rockaways. Through this collaboration, the chapter has helped restore over an acre of dune habitat, engaged over 200 volunteers, and planted more than 5,700 native plants. Included among the over 20 species of mid-Atlantic coastal native plants installed for these events are bayberry, pitch pine, winged sumac, little bluestem, seaside goldenrod, common milkweed, and Carolina rose.

Dune restoration directly contributes to healthier shores in the Rockaways by bolstering coastal resilience against sea level rise, storm surge, and erosion, thereby protecting communities and critical habitats, all while sequestering carbon and enhancing native biodiversity. The regenerative effects of nature-based restoration efforts can be viewed in stark contrast to more traditional approaches to coastal management, using gray infrastructure like shoreline armoring, which has proven to increase erosion adjacent to the structures and eventually destroy the coastline they are intended to protect.

Building on the success of our existing partnership, and as part of New York City Climate Week in 2024 and 2025, RISE and Surfrider hosted restoration events that drew over 100 volunteers, planting some 3,350 native plants across more than an acre of secondary dunes. It continues to be the only hands-on restoration event out of the hundreds hosted during New York City Climate Week, fostering greater coastal resilience using nature while also building community in the Rockaways.

Through this collaboration, the chapter has helped restore over an acre of dune habitat, engaged over 200 volunteers, and planted more than 5,700 native plants.

Advocating for Climate Action Policy in New York

In tandem with on-the-ground Climate Action Program projects, the New York City Chapter has worked tirelessly to influence resilience policy at the state level to support restoration activities and adaptation to the growing impacts of climate change in New York State. In 2024, Surfrider helped pass the NY Climate Change Superfund Act, which provides funding from fossil fuel companies to support infrastructure projects that prepare the state for climate change impacts — just like the work RISE and Surfrider are leading in the Rockaways.

In 2025, the New York City Chapter is now advocating for the Climate Resilient NY Act, which will prepare the state for the negative impacts of climate change through better organized state governance, and a coordinated and strategic plan for tackling climate and adaptation issues thoroughly and justly. While the state has managed several strong vulnerability assessment tools and programs for climate risks like sea level rise, this legislation would establish the first statewide vulnerability assessment to inform long-term adaptation planning. If passed, these two bills will work together to protect New York's treasured coastal communities and habitats from the increasing impacts of climate change by supporting the deployment of nature-based solutions in New York's coastal areas, like the Rockaways.

For the Surfrider Foundation New York City Chapter, strong partnerships with organizations like RISE are key to ensuring the long-term resilience of Rockaway Beach. This favorite spot for New Yorkers looking to escape the hustle and bustle of the city, and even catch a wave, has undergone significant changes since it was devastated by Hurricane Sandy in 2012, with greater coastal impacts expected as climate change continues to contribute to more intense severe weather in the region. Storm events like the extreme rains that overwhelmed subway systems and local infrastructure in New York City over the summer of 2025 are a reminder of the vulnerability of the region, and the urgency with which state and local governments and organizations need to act to better protect coastal communities from further damage through strong policy and future-focused solutions. The New York City Chapter has demonstrated how to leverage partnerships, work with nature, and pass policies that will help protect the treasured shores and waves of Rockaway Beach for generations to come.

Help restore the Rockaways and pass strong climate resilience policy by joining the New York City Chapter today. Learn more at **nyc.surfrider.org**.

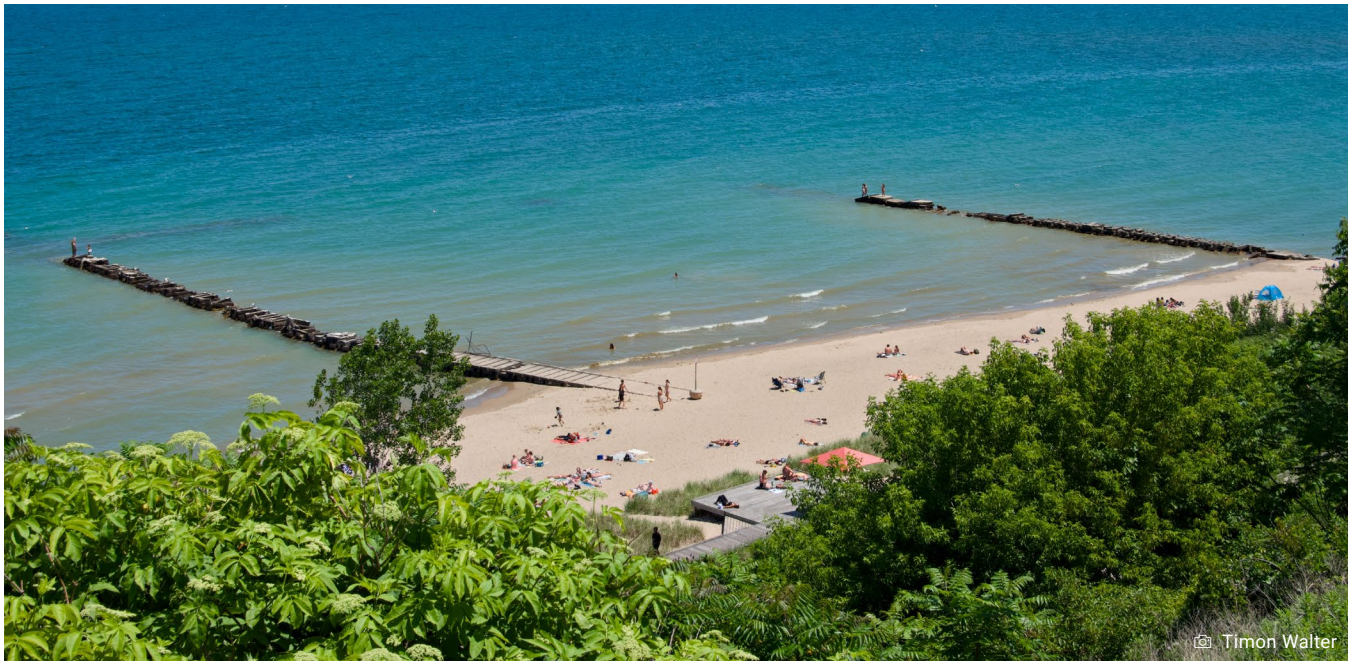
SHOREWOOD, WISCONSIN

Atwater Beach: Coastal Resilience on the Great Lakes

Atwater Beach sits on the west side of Lake Michigan just north of downtown Milwaukee, Wisconsin. It has been a favorite local break for surfers, swimmers, divers, and beachgoers alike in the Great Lakes for decades, with some of the few rideable waves in the region. Atwater Beach boasts approximately 800 feet of naturalized shoreline, featuring a diverse dune plant ecosystem, and is backed by a 100-foot clay bluff. The robust population of hundreds of species of native dune plants makes Atwater Beach an important migratory stopover point, helping to fuel insect, bird, and mammal migrations across the Great Lakes. Close to Milwaukee's vibrant downtown, Atwater provides beach access to tens of thousands of diverse visitors year-round who enjoy this popular and picturesque local break.

Climate Change Impacts on the Great Lakes

Despite being far from the ocean impacts of climate change, the Great Lakes region has experienced a number of extreme weather events over the past decade that have significantly impacted the lakeshore and its coastal resources. Several intense storms severely degraded the bluff and access road in two back-to-back 100-year storm events in the summer of 2010. Hundreds of tons of sediment were displaced, the access road was damaged beyond repair, and facilities and stairs to Atwater Beach needed significant repairs to restore public access. Local water quality on Lake Michigan was also seriously impacted, with siltation and turbidity persisting for months after the storms. The road repair, bluff stabilization, and water quality improvements have taken years and close to $1.5 million to save the beach, protect public access, and restore coastal habitat in the aftermath of these extreme weather events. The Village of Shorewood continues to maintain the vegetation and enhance the health of the dune in partnership with organizations such as the Surfrider Foundation, bolstering the resilience of the shoreline against the impacts of future storms. This work is critical as the frequency of severe weather events increases in the Great Lakes region, including the summer of 2025, when one extreme precipitation event inundated southeast Wisconsin with more than 10 inches of rain.



Timon Walter

A History of Stewardship on Lake Michigan

The Surfrider Foundation Milwaukee Chapter has led beach cleanups and community events at Atwater Beach for many years. More recently, as part of the Climate Action Program, the chapter hosted a major community volunteer event that restored 0.2 acres of dunes and included native plantings and invasive species removal on the beach. Guided by chapter volunteer and landscape ecologist Mike Marek, the Milwaukee Chapter took the lead in planning and implementing the restoration event, where volunteers worked tirelessly to remove woody invasive plants and reintroduce a variety of native plant species, revitalizing the local dune ecosystem in the process.

Their efforts to restore the dunes to their natural conditions received overwhelming community support, marking the chapter's largest volunteer turnout in years.

Over 40 volunteers planted 3,000 dune grass plugs and 15 woody dune species, including jack pine, juniper, quaking aspen, and white pine, and removed the equivalent of 100 cubic yards of invasive brush, in partnership with the Village of Shorewood and a local landscaping team. The chapter also led long-term maintenance at the project site, watering the newly installed plants to ensure their survival.

Over 40 volunteers planted 3,000 dune grass plugs and 15 woody dune species, and removed the equivalent of 100 cubic yards of invasive brush, in partnership with the Village of Shorewood and a local landscaping team.

With the support of dedicated volunteers and generous donations, the Surfrider Foundation Milwaukee Chapter has been hard at work restoring native dune habitats along the beautiful shores of Lake Michigan at Atwater Beach.

Leveraging Volunteer Events for Long-Term Resiliency Projects

Building on the success of the restoration events at Atwater Beach, and to foster long-term resilience of this treasured surf break, the Surfrider Foundation Milwaukee Chapter is now working to advance a comprehensive restoration project at the nearby Shorewood Nature Preserve, a 6.5-acre natural area along Lake Michigan. This effort will include invasive species removal, habitat restoration, trail improvements, and erosion control to enhance ecological health, protect water quality, and ensure safe public access. The Milwaukee Chapter is demonstrating how small-scale grassroots dune planting events can be leveraged into large-scale restoration projects, growing the impact and footprint of community-led restoration work from 0.2 to 6.5 acres in coastal regions.

While the consequences of climate change present different challenges in the Great Lakes region, Surfrider Foundation Milwaukee Chapter is committed to protecting Atwater Beach from the next major storm event by using nature-based solutions, big and small, implemented by the local surf and conservation community.

Nick Hade, Milwaukee Chapter Chair, waters newly installed plants to ensure their long-term survival.

O‘AHU, HAWAI‘I

Renewed Resilience: North Shore Coastal Resilience Working Group 2.0

The North Shore of O‘ahu is one of Hawai‘i’s most iconic and valuable coastlines — culturally, ecologically, and economically. Stretching from the moku (district) of Waialua through the northern reaches of Ko‘olauloa, this coastline holds deep cultural significance, is home to threatened and endangered species, world-renowned surf breaks, and multi-generational communities. Yet today, it faces mounting threats from erosion, flooding, and accelerating sea level rise.

The region includes sacred and historical sites, such as Pu‘u Mahuka Heiau and Waimea Valley, as well as some of the last remaining intact coastal dune ecosystems on O‘ahu, which are critical habitat for threatened native plants and animals. The North Shore is also internationally celebrated for its legendary surf breaks: Pipeline (‘Ehukai Beach Park), Waimea Bay, and Sunset Beach (Paumalū), which anchor Hawai‘i’s robust surf industry and drive regional tourism. In 2023, more than half of O‘ahu’s 5.6 million visitors spent time on the North Shore. Visitor spending in the area exceeded $1.1 billion, supporting nearly 10,000 local jobs, equivalent to 12% of O‘ahu’s visitor economy and nearly 5% statewide. While this vigorous tourism economy brings financial benefits to the island, it also increases pressure on long-time residents, infrastructure, and ecosystems, including the area’s prized beaches.

The North Shore is home to deeply rooted local families who have deep ancestral, cultural, and practical ties to the land and ocean, many of whom rely on continued access to the beach for traditional and customary practices, gathering, recreation, and livelihood. But rising housing costs, luxury vacation homes, and absentee landownership have transformed the shoreline. These tensions — between public access and private interests, cultural values and economic drivers — are intensifying as climate change impacts continue to drive coastal erosion in O‘ahu.

An Erosion Hotspot

The coastline's exposure to large winter surf that makes it an iconic surfing destination, also creates powerful wave energy that drives both episodic and long-term erosion, making it an erosion hotspot on the island. Today, 73% of North Shore beaches are chronically eroding, with more than 90% of beaches projected to be in a chronic state of erosion by 2050. Nearly one-third of all residential properties are located within 20 feet of the shoreline and designated as imminently threatened by the state. The increasing impacts of climate change, compounded by rising sea levels and flooding from more powerful storm events, have further ramped up erosion rates. Because of the dense coastal development and infrastructure along the North Shore, this is resulting in the destruction of multiple private and public structures. Two homes have already collapsed into the ocean in recent years, most recently at Kammies in 2024. Collapses such as these can release hazardous debris, wastewater, and other pollutants into the nearshore ecosystem, endangering marine life, beachgoers, and neighbors.

Private property interests aside, erosion also threatens critical public infrastructure. Much of Kamehameha Highway, the main route around the island, lies dangerously close to the shoreline. An estimated 2.9 miles of state highway and 5.8 miles of city roads on the North Shore could be lost by 2100, threatening access to homes and basic services around the island. The Laniakea Realignment Project, launched in 2024, aims to address this risk by retreating 1,000 feet of the highway 90 feet inland, demonstrating what proactive adaptation to move vulnerable infrastructure out of harm's way can look like.

One of the most severely impacted neighborhoods is Ke-Nui Road, facing the Kammieland surfbreak, adjacent to Sunset Beach. These homes, many of which are on small lots perched atop eroding dunes, face direct wave impacts during strong winter swells. With no space to retreat inland, homeowners have taken protection measures into their own hands, turning to short-term and occasionally unpermitted fixes like laying geotextile burritos, erosion skirts, and even unauthorized concrete. Meant to shield their property, these temporary measures worsen long-term erosion, disrupt sediment flow, and accelerate beach loss for neighbors and the public. Many of these homes are just one strong swell away from collapse.

Today, 73% of North Shore beaches are chronically eroding, with more than 90% of beaches projected to be in a chronic state of erosion by 2050.

To protect their homes from the encroaching sea, homeowners resort to short-term fixes like geotextile burritos, erosion skirts, and unauthorized concrete.

Failing Infrastructure, Disappearing Beaches

Historically, coastal erosion on beachfront properties led to shoreline hardening to protect structures and coastal development along the North Shore. Today, over 10,000 feet of the North Shore is lined with seawalls and rock revetments. Homes, condos, resorts, businesses, and roads have infringed along most beach dunes, leaving very few natural dune systems intact. Unfortunately, the pressure to develop and protect existing development is likely to only increase with dense and growing populations living near the shoreline on the North Shore.

Despite strong state-level policy on the books aimed at protecting coastal resources, there is still a widespread failure to achieve the protection of public trust beaches and a reliance on emergency permits to protect encroaching structures. Furthermore, there is no proactive adaptation framework in place to effectively address coastal erosion and sea-level rise, including the very real need to explore managed retreat options.

The Surfrider Foundation O'ahu Chapter has a long history of advocacy on the North Shore since 1991, working with the community to protect the coastline from harmful developments, including working with the community to establish the North Shore Community Land Trust and "keep the country country" by purchasing and conserving a 1,130 acre parcel behind Pipeline, and protecting Sharks Cove from a proposed mall development. The chapter's Blue Water Task Force citizen science water quality monitoring program provides vitally important information to beachgoers on the North Shore regarding water quality and safe recreation. They have also been deeply involved in identifying possible solutions to the erosion emergency along the North Shore for years.

Top: Collapsed home, tarps and other temporary erosion control measures, and impaired beach access between Rocky Point and Sunset Beach Park, North Shore, 2022. (📷 Shellie Habel, Sea Grant/DLNR Dolan-Eversole) **Left:** Demolition of collapsed home. (📷 Denise Antolini) **Right:** Tim Tybuszewski talking to attendees about North Shore Community Land Trust restoration efforts.

The North Shore Coastal Resilience Working Group 1.0

Recognizing the urgency of erosion impacts along the beaches, the Surfrider Foundation, the University of Hawai'i Sea Grant, and SSFM International launched the North Shore Coastal Resilience Working Group (The Working Group) in 2021. This collaborative, community-based effort gathered together local residents, scientists, planners, and cultural practitioners with the goal of identifying critical concerns and recommendations for immediate action. The Working Group, recognized statewide with a Community-Based Planning Award from the American Planning Association, prompted important policy action and further scientific study by the state.

The Working Group's final report informed legislation allocating $1 million to Hawai'i Sea Grant to develop a North Shore Beach Management Plan from Sunset Beach to Sharks Cove (Kapo'o) — a key recommendation from the process. The Working Group designated three coastal erosion hot spots on the North Shore, including the Sunset Beach /Kammies area. In response to the working group, the Institute for Sustainability and Resilience at the University of Hawai'i at Mānoa published a scientific study in 2024 on managing retreat and sea level rise adaptation within the Sunset Beach area.

With new state funding for a regional beach management plan and heightened public awareness following the 2024 Kammies home collapse, Surfrider reactivated the North Shore Coastal Resilience Working Group in 2025. Like in 2021, the goal is to bring together local stakeholders and decision makers to identify shared priorities and advance proactive place and nature-based solutions to climate change-driven erosion. With potential solutions ranging from dune restoration and revegetation to engineered living shoreline demonstration projects to developing a managed retreat framework, this forum will serve as a critical vehicle for fostering public trust, supporting community stewardship, and protecting the North Shore's beaches and nearshore ecosystems.

The efforts of the North Shore Coastal Resilience Working Group and the Surfrider Foundation O'ahu Chapter serve as a national model for what true community collaboration for nature-based coastal resilience can look like in coastal areas across the nation, and how states can advance local resilience outcomes and initiatives through funding and policy support. It also demonstrates that there is no single solution for protecting our beaches from the impacts of climate change. Coastal resilience is iterative and requires short and long-term solutions that also adapt to reflect changing conditions and realities along our shores.

Surfrider Foundation staff touring the North Shore.

CANNON BEACH, OREGON

Oregon Beaches Forever

Cannon Beach, stretching four miles along Oregon's North Coast, is storied locally for its place in the historic fight for public beach access statewide, and widely known on the national stage for its stunning natural features. This world-famous beach is home to Haystack Rock, featured in films like "The Goonies" and "Twilight," which is one of the last remaining nesting sites of the Tufted Puffin in the state of Oregon, and is a recreational hotspot for surfers and ocean lovers alike. The area was also the site of the ancestral Nehalem Tillamook tribal village of NeCus', an important stopover for tribal communities as they migrated north and south along the coast. This legendary stretch of Oregon's coastline is also threatened by the increasing winter king tides, which have been made worse by climate change and rising sea levels. While devastating events like the 1964 tsunami — which ripped homes from their foundations, flooded the town, and destroyed the Ecola Creek Bridge — haunt the town's history, dangerous events like the king tide event in 2024, and landslides from extreme precipitation, are becoming more and more common, and are threatening to destroy the beach and the infrastructure of the nearby resort town.

Nestled between Cannon Beach and Ecola State Park lies Ecola Creek and its estuary. The area serves as a popular recreational site and access point at the north end of Cannon Beach, where the estuary and creek meet the beach and ocean. Over the years, development on both sides of the creek and estuary, with significant seawalls on the southern side, has interrupted the natural movements of sand and sediment that help feed and restore the public beach. Coupled with sea level rise, intensified storms, and king tides, the result has been increased beach erosion — threatening access and recreation, as well as creating hazards to development and public infrastructure. This coastal squeeze of beaches between development and the ocean represents the challenges facing Oregon's coastline under the current paradigm for shoreline management: growing losses to the beach, and the public's ability to access them, under outdated regulations that favor armoring over more novel, nature-based approaches like living shorelines or coastal restoration. The current management approach to these coastal resources in Oregon reflects a longer history of tension between coastal protection and public access in the state.

A History of Public Beach Access

The nearby resort town of Cannon Beach has been a popular site for coastal tourism and recreation since the late 1800s. Riprap and seawalls were erected early in the region's history as coastal protection measures to keep the ocean away from motels and private property. As a result, Cannon Beach remains one of the most heavily armored beaches along the Oregon coastline to this day. The early development and armoring of this stretch of beach by and for private interests led to a series of conflicts over public beach access, ultimately escalating to the passage of Oregon's Beach Bill. Cannon Beach is where then-Governor Tom McCall launched a highly publicized media campaign to establish public ownership of the beach up to sixteen vertical feet above the low tide mark in 1967. Since then, the site has been emblematic of the passion Oregonians have for protecting their beaches, and the challenges of safeguarding beach access when confronted with pervasive armoring and climate change impacts along our coasts.

Given the significance of Cannon Beach in the historic fight to protect public beach access in Oregon, community groups like the Surfrider Foundation, watershed councils, and various friends groups have played an active role in protecting Cannon Beach, as well as local estuary and watershed resources for decades. Passionate community members have conducted water quality monitoring in the area for over 20 years, and ultimately chartered the Surfrider North Coast Chapter in 2020. Activists in this region have led water quality, shoreline preservation, and land use campaigns throughout the years, fostering stewardship along Cannon Beach's shores. And the City itself is certainly no stranger to innovative solutions to local environmental challenges — from a stormwater discharge system which employs mycofiltration technology to their 16-acre wetland-based wastewater treatment plant to the purchase of the Ecola Creek watershed, which protected the town's drinking water along with salmon habitat and old-growth rainforest. The city operates the only municipal wildlife interpretation program in the state, which employs guides to educate visitors on the flora, fauna, and natural history of the Haystack Rock Marine Garden, one of the first Marine Protected Areas in the state of Oregon.

However, as the impacts of climate change have grown in the region, so too have the number of proposed coastal armoring projects and riprap applications, threatening the future of Cannon Beach and Ecola Creek. While the Oregon Parks and Recreation Department is the governing entity overseeing shoreline armoring permits at the state level, local regulations in the City of Cannon Beach have put the ultimate decision to armor in the hands of local government. Surfrider and local partners, such as Friends of Dunes, have been working to fight armoring in Cannon Beach on a project-by-project basis for years, recognizing the challenges of the local decision-making framework and advocating for a broader, statewide approach to coastal resilience and adaptation.

Left: Extensive riprap placed on the beach in Neskowin, OR, make stretches of beach impassible. (📷 Rena Olson) **Right:** Public beach access points are closed off due to failed riprap and rock armoring.

Oregon Beaches Forever is Born

In 2024, in collaboration with Friends of the Dunes, Crag Law Center, and Oregon Shores Conservation Coalition, Surfrider launched Oregon Beaches Forever, a comprehensive multi-year campaign to protect Oregon's beaches from future armoring, centered on Cannon Beach, and working to implement nature-based alternatives instead of armoring for beach erosion. At the local level, Surfrider is activating to halt individual riprap applications, advocating for changes to Clatsop County's comprehensive plan to better plan for future sea level rise and climate change impacts by prioritizing nature-based solutions, and educating the local community and decision makers about shoreline dynamics and alternatives to armoring. This also includes a pilot project led by the local community at Ecola Creek to illustrate the efficacy of nature-based solutions along Oregon's dynamic coasts. The project is a collaboration between the Surfrider Foundation, CREST, the City of Cannon Beach, and the homeowners' association of Breaker's Point condominiums to help resolve long-standing erosion and sand management issues through a nature-based alternative to more traditional hardened strategies like rock armoring (riprap) or seawalls.

While nature-based solutions for shoreline stabilization are emerging as a viable alternative to coastal armoring on beaches throughout the U.S., policy and legislative direction to support these projects is lacking at the state level in Oregon, as is the case in many states. Surfrider has been working to shape modernized rules and guidance that reflect and support the shift to prioritizing non-structural, nature-based solutions in Oregon through legislation and advocacy with state agencies. In 2025, Surfrider supported SB504, a bill directing the state's Land Conservation and Development Commission to define and develop rules and guidance for using nature-based solutions on Oregon's beaches and coastal lands. The passage of this state bill is a major victory for a more resilient coastline at Cannon Beach and for better planning guidance and a land use framework that will ultimately protect all of Oregon's coastal areas.

Oregonians are passionate about their beaches, and to ensure that future generations will have the opportunity to access and enjoy iconic recreational areas such as Haystack Rock, explore the incredible biodiversity of rocky tidal pools, or watch whales from the shores, the Surfrider Foundation's Oregon network and its robust coalition of local partners are working to break away from the status quo of shoreline armoring at Cannon Beach. By supporting dynamic, beach-friendly alternatives for erosion control with a demonstration project at Ecola Creek, and working to advance nature-first policies and solutions within city halls and the state legislature, Surfrider Oregon is engaging at every level to successfully advance nature-based coastal resilience on a highly dynamic stretch of coastline in the Pacific Northwest, demonstrating the comprehensive and multifaceted approaches needed to protect coastlines across the nation from the impacts of climate change.

You can receive updates and pledge your support to protect Oregon's coastlines forever by helping the Surfrider Foundation reach 10,000 voices for Oregon's beaches **here**.

Chapman Point, Oregon. (📷 Mylasia Miklas)

SAN CLEMENTE AND SAN ONOFRE STATE BEACH, CALIFORNIA

A Tale of Two Eroding Southern California Beaches

Southern California's coastline is a mosaic of sandy beaches, scenic bluffs, wetlands, and world-renowned surf breaks — serving as cultural, ecological, and recreational cornerstones of the region. Both San Onofre State Beach and San Clemente, in particular, split between San Diego and Orange Counties, are global surf destinations on a stretch of coast that is sacred for the Acjachemen Nation. These beaches are also home to Trestles, designated as the surfing venue for the 2028 Summer Olympics, and Old Man's, which has played a significant role in California's surf culture for 100 years. Trestles, and its series of cobblestone point breaks, was the beneficiary of the Surfrider Foundation's successful "Save Trestles" campaign that spanned two decades to stop a toll road from bisecting San Onofre State Beach and threatening the San Mateo watershed — one of California's last unaltered rivers.

The campaign, one of the most storied and impactful in the organization's history, ultimately secured state-level protected status for San Onofre's endangered habitat at Trestles.

Longstanding efforts to protect San Onofre and San Clemente's beaches have now shifted to the future as the coastline is experiencing the impacts of decades of diminishing sand supply due to developed watersheds and coastal armoring, including the construction of Dana Point Harbor in the 1960s. Coastal erosion and a changing climate pose significant challenges to this iconic coastline, which has led the Surfrider Foundation, its volunteer network, and coalitions of partners to spearhead innovative and locally tailored solutions through campaigns, nature-based projects, and community-driven planning.

Coastal erosion and a changing climate pose significant challenges to this iconic coastline, which has led the Surfrider Foundation, its volunteer network, and coalitions of partners to spearhead innovative and locally tailored solutions through campaigns, nature-based projects, and community-driven planning.

Protecting the Beach at San Clemente

San Clemente's beaches are not only a local treasure but also a regional economic engine and a vital space for equitable coastal access. The 2.6-mile San Clemente Beach Trail provides critical public access, drawing thousands of visitors annually to surf, swim, and enjoy local beaches. These beachgoers generate more than $132 million per year for the state of California. Surfrider's South Orange County Chapter has a long history of defending this stretch of coastline, working to ensure that coastal protection efforts respect both environmental values and principles of justice, equity, diversity, and inclusion.

In recent years, San Clemente has become a stark example of how poorly planned development and climate change exacerbate coastal erosion, storm impacts, and infrastructure vulnerability. Landslides during heavy rains in 2021, 2022, and 2024 repeatedly shut down the Pacific Surfliner rail line, which runs along San Clemente's shoreline, resulting in hundreds of millions in repair costs, significant economic disruption, and safety concerns for riders. At San Clemente State Beach, both the shoreline and nearby bluffs are rapidly receding, leading to the loss of sandy beach areas that once provided critical habitat and recreation space, as well as a natural buffer for the rail line. Local businesses have reported losses up to $1,000 per day due to access disruptions caused by repeated rail closures and beach degradation.

In response, in 2021, Surfrider's South Orange County chapter launched the Save South OC's Beaches from Railroad Armoring campaign, opposing shoreline armoring projects and advocating for long-term, nature-based solutions. The chapter's efforts have included science-based public education, ongoing policy engagement at the local and state levels, support for coastal adaptation strategies like dune restoration, and, ultimately, the relocation of at-risk infrastructure. By rejecting short-term emergency permits for riprap and calling for systemic, nature-based planning, Surfrider is working to ensure San Clemente's coastline — including the culturally and recreationally critical Trestles — remains a resilient and accessible public treasure for decades to come.

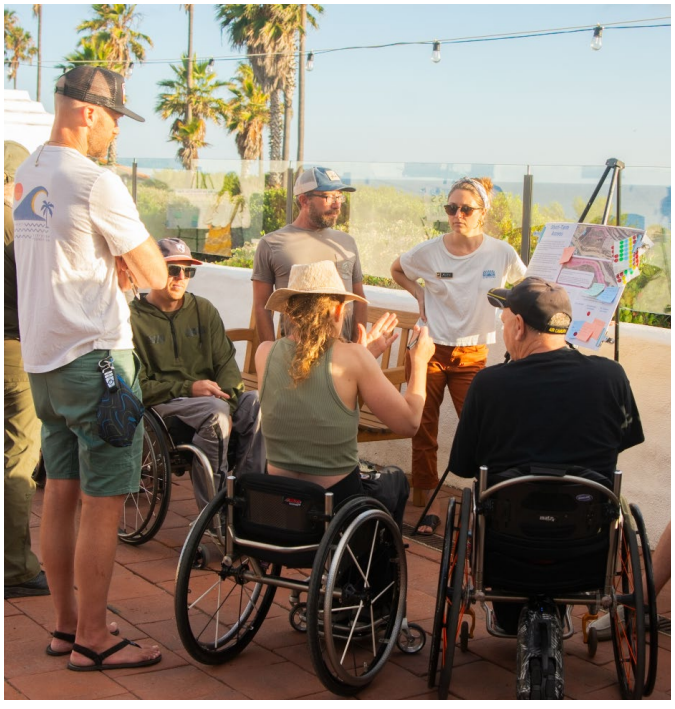
Left: Orange County Transit Authority's existing rock riprap at Cotton's Point has increased erosion and blocked lateral access to Trestles. **Right:** Community members came together to listen, learn, and share their vision for San Onofre's future.

Saving San O (Again)

San Onofre State Beach, or San O, located in north San Diego County, is the native sacred site of Panhe, an ancient Acjachemen village that remains a gathering place for the Tribe today. This fifth-most-visited California State Park sits on land leased from the U.S. Navy, adding a layer of management complexity. A 2012 study valued San O's annual recreational benefit to nearby communities at over $26 million — equal to $37 million today when adjusted for inflation, but not the estimated 35% increase in surfers in the water over the last decade. Despite its clear value, access and enjoyment of San Onofre face growing risks from erosion and our changing climate.

One of the characteristics that gives San O's well-loved "Surf Beach" its historic charm is the fish-camp-like natural dirt access road and drive-on sandy beach parking. However, those exact features also make its access incredibly vulnerable — with only one road in and out, an ever-dwindling parking lot pinned between the ocean and the bluff with few alternatives (the nearest outside parking is at least 2.5 miles away), options for accessing this beach are incredibly limited. In recent years, high tides and storm events have repeatedly damaged the access road and parking lot, resulting in months-long closures and a loss of more than half of the original 350 parking spaces. To complicate the landscape further, in 2017, a large rock revetment was installed under a temporary emergency permit to armor the access road. While protecting a segment of the road, the action has since contributed to a significant acceleration of erosion at both ends of the 800-foot rock wall and loss of recreational beach space. With no formal alternative plan in place, when beach access is lost, it could be lost forever.

Surfrider is actively working on advancing long-term, nature-based adaptation planning through the San Onofre Shoreline Resilience Project to address current and future erosion issues at San O. Surfrider is developing a nature-based adaptation plan that will work to restore the natural beach processes and buffer the shoreline from the larger, more powerful waves of the future. This effort is in partnership with the Juaneño Band of Mission Indians Acjachemen Nation, California State Parks, United States Marine Corps Base Camp Pendleton, and the San Onofre Foundation, and informed by important historic community groups like the San Onofre Surfing Club and important user groups, such as the members of the adaptive surfing community.



Left: High tides and storm events have repeatedly damaged the access road and parking lot at San O, resulting in months-long closures and a loss of more than half of the original 350 parking spaces. **Right:** Adaptive surfers share their perspectives to help shape a long-term vision for San O.

Surfrider and the coalition are working on a solution for San O that is rooted in science, utilizes nature-based solutions, and most importantly, is informed by the community — ensuring that this iconic beach is protected for all. Surfrider has started gathering user feedback, values, and insights to help design a solution that is informed by and best serves the diverse stakeholder community. In addition, Surfrider is working to facilitate conversations between land managers and the public to plan for realistic short-term alternatives to maintain access until a long-term solution is successfully implemented.

The summer of 2025 marked a turning point in the project. Now supported in part by the California Coastal Conservancy, Environmental Science Associates has been contracted to begin studying the beach and, along with the input and direct involvement of the public, develop a nature-based resilience design for the beach. People will have an opportunity to stay informed and engaged through community meetings, hands-on Climate Action Program restoration events, and through Surfrider's blogs and newsletters.

As Southern California's coastlines confront new challenges stemming from climate change, the solutions being implemented at San O and San Clemente demonstrate the necessity of community-driven planning and strategy to preserve our beaches for the future. While traditional coastal management and policy in the state have largely employed a top-down approach, Surfrider is proving that communities must be in the driver's seat and play an active role in the planning, stewardship, and restoration of vulnerable coastal areas to ensure that our beaches are resilient to future hazards and challenges. At San O and San Clemente, we are once again reminded that, as former California Coastal Commission executive director and conservation guru Peter Douglas said, "the coast is never saved, it is always being saved."

Want to stay in the loop on these projects and campaigns in Southern California?

Sign up for our San Onofre updates mailing list to hear about opportunities to get involved and help shape the future of this coastline for all.

To support these efforts, **follow the South OC chapter's updates** and join Surfrider today!

Volunteers participate in recurring monthly events within the state park, featuring Climate Action Program habitat restoration and beach cleanups. In the first four months, volunteers removed over 5,000 pounds of invasive plants and 400 pounds of trash, making space for beneficial native species to thrive.

Conclusion

Climate change has arrived along shorelines and beaches throughout the U.S. No matter what stretch of coast you enjoy, you have likely already experienced some of the losses fueled by climate change firsthand. Whether it's increasing "sunny day" flooding, hurricane intensity, drought, wildfires, infrastructure failures, or erosion at your favorite beach — the effects of climate change are evident and growing by the day. While the prospect of losing our favorite beaches and coastal areas forever could be catastrophic for coastal communities, there are real solutions accessible to all of us at the local level. Even at a time when we lack strong leadership in Congress or the White House to address the root causes of human-induced climate change, there are communities of leaders and activists across the country who are already working tirelessly to adapt and advance solutions that will protect our beaches for generations to come.

While these solutions look different along our coasts, the Surfrider Foundation has identified several key strategies for success and reasons for optimism through the stories of progress and accomplishment in this year's State of the Beach Report. We can prepare and adapt to current and future challenges posed by climate change by collaborating with each other, and with nature, to foster community-led, nature-based solutions and strong, science-driven resilience policy.

We can prepare and adapt to current and future challenges posed by climate change by collaborating with each other, and with nature, to foster community-led, nature-based solutions and strong, science-driven resilience policy.

Nicole Holman Creative

Nature Knows Best

Coastal habitats and plant communities have evolved to adapt to the dynamic conditions along our shores, even with the new challenges posed by climate change. Problems arise when we introduce hard infrastructure and development in the coastal zone, disrupting the natural processes that allow coastal habitats to migrate and adapt. Rather than trying to build our way out of growing issues with erosion and sea level rise, we need to look to nature for solutions through coastal restoration, green infrastructure, and living shorelines. Whether on the shores of Lake Michigan, the surf breaks of Southern California, or the mangrove forests of Puerto Rico, our coastlines and the communities that rely on them are most resilient when natural ecosystems are protected, healthy, and restored.

You Cannot Go It Alone

Climate change, and its impacts along our shores, is a monumental and complex challenge. Especially as federal support and funding for climate initiatives wanes, it is more important than ever that we lean into communities to lead and advance local, site-specific solutions. This can, and ideally should, include your local Surfrider chapter or student club, recreational groups, local or state governments, small businesses, tribes, and community organizations. Our collective power to protect our beaches is amplified with every new voice that joins the fight. Every successful campaign and project highlighted in this year's State of the Beach Report would not be possible without strong, collaborative partnerships, many of which have taken years to cultivate.


Aaron Lieber


Nicole Holman Creative

Locals Must Lead

Bad decisions are made for our beaches when locals are not leading. When decisions about projects or policies are made behind closed doors, with community consultation as a box to check rather than an integral part of the process, many projects intending to protect our coasts and beaches are doomed from the outset. That was certainly the case at Surfers' Point, where a bad project devised years ago is now finally fixed after decades of community-led project development. Frontline communities, local resource champions, and those most closely connected to our coastlines should be the trusted advisors and consultants in identifying and advancing site-specific solutions to coastal and climate hazards. They hold the unique local, cultural, and ecological knowledge needed to ensure long-term shoreline resilience in the wake of climate change.

Strong Policy Enables Successful Projects

Modernized state and local policy that accounts for future coastal hazards and incorporates nature-based techniques and methods for shoreline stabilization is urgently needed to advance proactive and protective solutions for our coasts and beaches. Traditional coastal management policy and approaches that rely on hard armoring and sand renourishment are no match for increasing erosion, flooding, and rising seas. In states and municipalities that have accepted the realities of climate change, through new or updated laws, rules, and regulations, and embraced nature as a partner in coastal protection, resilience projects and solutions are easier to deploy, and ultimately more successful. It's easier to protect beaches and coastal communities on the North Shore of O'ahu using local knowledge when there is state funding to support it. Oregonians can look to nature-based solutions for their most pressing erosion challenges when they have strong definitions and rules to guide them coming from the state. In order to meet the challenges of climate change along our shores, innovative policy change is mandatory for all coastal states and communities.

The time to act for our beaches is now. While there is reason for optimism, there are also very real and very urgent challenges facing our coasts, and hard decisions facing our coastal communities. Every day, there is a new climate-fueled catastrophe stealing our shores, dismantling local economies, and destroying what we love most as ocean recreationists. We must continue to deploy solutions for the current and future challenges wrought by climate change on our beaches.

As evidenced by this year's State of the Beach Report, Surfrider's network of more than 200 volunteer-led chapters and student clubs is leading the fight locally, and calling on you to join us in the battle against climate change and its impacts on our coasts.

Aaron Lieber

Five Things You Can Do (Today) to Protect Our Coasts

Go To the Beach

Sounds too good to be true, right? In order to protect what we love most, we must first understand the risks and what's at stake. Head out to your favorite beach and observe. What changes are you seeing along the coast? Is erosion increasing? Has the beach changed in the months and years since you first started visiting? What measures are being taken to protect the beach? Can you still surf or swim safely in the same areas? Take photos and document what you see. This information is invaluable to understanding the shifts and changes along our coasts as a result of climate change, and the types of impacts or interventions that might be necessary to address them.

Join Your Local Surfrider Chapter

You are not alone in the fight to protect your favorite beach from disappearing. There are already communities of coastal defenders on the frontlines of our beaches and Great Lakes that are actively engaged in the fight to protect our beaches. Attend a local chapter meeting and get connected with the folks looking to take action and implement solutions to climate change impacts at your beach.

Contact Your Representatives

Just because federal leadership is lacking on climate change does not mean they should not hear from all of us about the importance of protecting our beaches and prized coastal areas. Your representatives in Congress and your state elected officials need to hear from their constituents. Coastal advocates can speak to the impacts of the climate crisis along our shores and the solutions they can support, like funding for National Oceanic and Atmospheric Administration programs. Pick up the phone or send an email to your representatives today and make your voice heard.

Restore Your Favorite Beach

Prefer to get your hands dirty? Attend or lead a local restoration event at your favorite beach through Surfrider Foundation's Climate Action Program. You can help remove invasive species that make dunes less resilient, and restore the native plant species that help make coastal areas more resilient against flooding and rising seas. Check out local events near you, or work with your local Surfrider chapter to host an event of your own.

Attend a City Council Meeting

Most decisions around managing your local beach happen in town halls or city council chambers. Attending these meetings ensures you are aware of the vulnerable coastal areas that your local community is seeking to protect, including the types of management decisions being made and projects that are being implemented. They are also the appropriate venue to communicate your concerns about the impacts of climate change along nearby shores and advocate for proactive, inclusive nature-based planning.

SURFRIDER FOUNDATION

The State of the Beach Report is compiled and edited by Emma Haydocy, Surfrider's Coasts and Climate Senior Manager, with regional report contributions from:

Carla Avila-Martinez, Climate Action Program Manager
Katie Bauman, Florida Policy Manager
Sarah Damron, Great Lakes and Texas Senior Regional Manager
Alex Ferron Mignogna, Coastal Adaptation Manager
Matt Gove, Mid-Atlantic Policy Manager
Kaia Hazard, Oregon Regional Manager
Kayla Huff, Southeast Regional Manager
Paul Jenkin, Ventura Campaign Coordinator
Hanna Lilley, Hawai'i Regional Manager
Mike Marek, Milwaukee Chapter
Evan Orellana, Florida + Puerto Rico Regional Manager
Zach Plopper, Senior Environmental Director
Charlie Plybon, Oregon Senior Policy Manager
Jennifer Savage, California Associate Director of Policy
Héctor Varela-Vélez, Puerto Rico Programs Manager

Alexandra Fisher