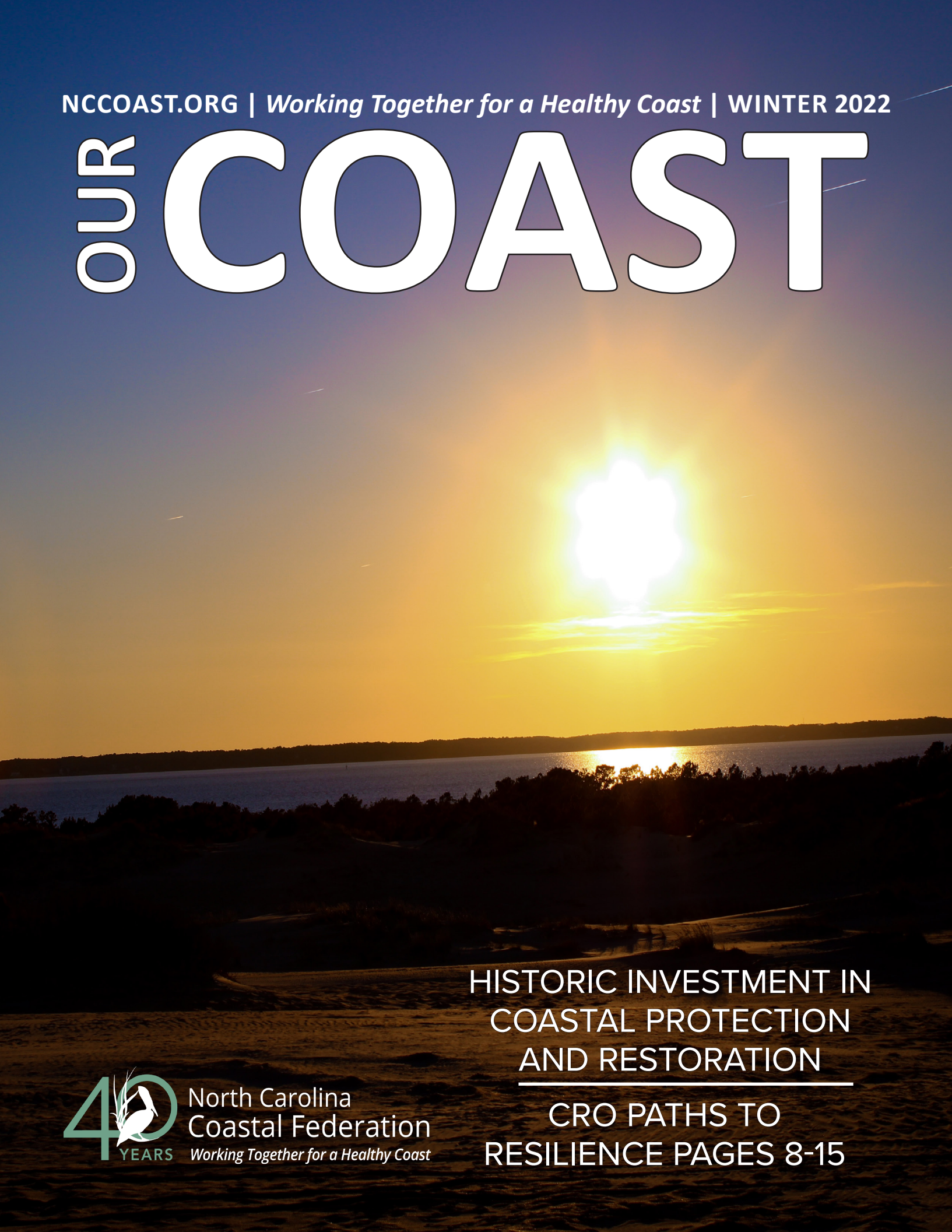
NCCOAST.ORG | *Working Together for a Healthy Coast* | WINTER 2022

OUR COAST



HISTORIC INVESTMENT IN COASTAL PROTECTION AND RESTORATION

CRO PATHS TO RESILIENCE PAGES 8-15

40 YEARS
North Carolina Coastal Federation
Working Together for a Healthy Coast

LETTER FROM THE DIRECTOR

Dear Friends of Our Coast,

Lots of things have changed in the past 40 years since the North Carolina Coastal Federation was formed.

For example, technology advanced in leaps in bounds. The Commodore 64 computer was released in 1982. One year later the Coastal Federation bought an Apple IIe with a 5-inch floppy disk drive and a dot matrix printer. This first computer is still one of the most expensive ones we ever purchased.

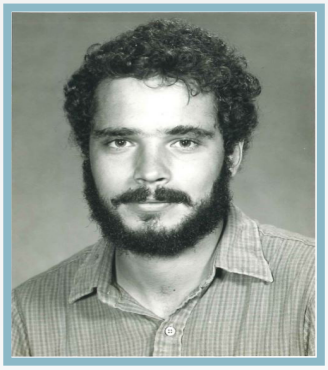
A sturdy manual Underwood office typewriter was how we prepared correspondences prior to personal computers. We typed two successful grant proposals to get the organization started: one to the Mary Reynolds Babcock Foundation and another to N.C. Humanities Council. These grants provided "seed" money to kick start our work. The letterhead used for those first proposals was homemade on that typewriter, fancied up by pasting a small pen and ink sketch (drawn by my sister Deede) of a flying brown pelican next to the address line.

Folks still ask why we picked the pelican as the logo of the Coastal Federation. I could say it was a strategic decision to use as our logo, a bird that had come back from the brink of extinction to symbolize that environmental protection works. However, in truth, the drawing was within easy reach when urgently needed to make proposals look good.

Raising funds in 1982 was a big challenge. We had no track record, and the economy was in recession. Yearly inflation was 6.16 percent, interest rates were 11.5 percent, and the Dow Jones closed the year at 1046. Of course, the cost of living was less: rent averaged $320 a month, the median price of houses was $67,800, gas cost 91 cents a gallon, and incomes averaged $21,050 a year.

More than half our existing staff members were not born when we were established. And dozens of our board members who served us faithfully over the years have passed away. All these changes make me think about the 1961 Broadway musical: "Stop the World – I Want to Get Off." Of course, change is inevitable. Having the agility to evolve and adapt is essential to remain effective in our work.

This astonishing and adventurous four-decade journey has been traveled along with thousands of nice, generous, and dedicated people. These many enduring relationships constantly stimulate creative and innovative solutions to many coastal management challenges. Forty years ago, we



Todd Miller - Aug 1985

were full of ideas and idealism about what our efforts might accomplish. Decades later past successes breed even more ideas and opportunities that invigorate our work.

This edition of Our Coast includes summaries of our five mission-related goals and samples of our award-winning journalism which is published every workday in Coastal Review. Our goals prioritize our daily work since it's impossible to pursue every worthy need or idea. That's not to say we don't seek to expand our capacity. This year we intend to finish our $6.5 million capital campaign so we can build our new Center for Coastal Protection and Restoration facilities and programs that better serve our coast.

Thank you for being part of the Coastal Federation's legacy. With your continued help, our efforts to protect and restore the coast are only just getting started.

North Carolina Coastal Federation
Working Together for a Healthy Coast

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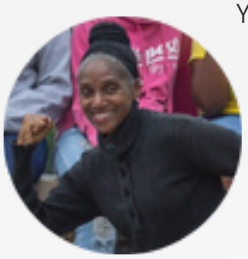
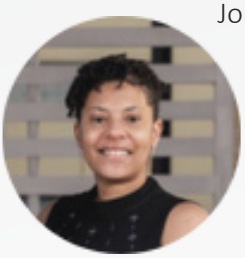
WORKING TOGETHER FOR A HEALTHY COAST

Celebrating 40 Years - This year marks our 40th anniversary and to honor this major milestone we'll be celebrating all year long with several social media giveaways. Aside from a chance to win 40th-anniversary Coastal Federation gear, we will also be offering special giveaways for members. Stay tuned to our website, **nccoast.org**, and social media, **@nccoastalfed**, throughout the year for anniversary updates, giveaways, and special event invites.

Board of Directors Gains Four New Members



Yasmin Fozard received a Master in Landscape Architecture from the Harvard University School of Design (GSD), and a Bachelor of Art in Art and Psychology from Winston-Salem State University. Yasmin is the executive director of the Institute of Landscape, Art and Sustainable Spaces a 501c3. She has become more involved with the green economy and the revitalization of low-income local communities as well as creating an environmental summer camp for at-risk youth called the enviroKIDs Summer Camp. Yasmin is a native of Durham.



Jonelle Stovall, D.D.S. is from Goldsboro N.C., and splits her time between there and Ocean City at Topsail Beach. She received her B.S. degree in Computer Science from Duke University and her Doctor of Dental Surgery degree from the UNC-Chapel Hill School of Dentistry. She currently practices with her father at Stovall Dental in Goldsboro. In her spare time, you can find her fishing the Atlantic waters, keeping an eye on the dunes, or just enjoying the beauty of the coast.

Michael Serbousek has a business and technology background having spent over 30 years in the telecommunications and information technology industries. Michael graduated from the University of North Carolina at Chapel Hill and has an MBA from Old Dominion University. Michael has been an admirer of the Coastal Federation since he and his wife Janie moved to Kitty Hawk full time in 2012 and has been an active volunteer and NE Advisory Board member prior to joining the board. He loves to fish, play tennis, and is learning pickleball.

Annette Michelle (Shelli) Willis is a partner at the law firm Troutman Pepper practicing in the areas of finance, commercial real estate, and corporate governance. Shelli received her A.B. from Duke University and her J.D. from Emory University. Shelli currently serves on the Urban Land Institute- Atlanta District's Advisory Board. She also serves on the board of Ser Familia and the Trust for Public Land's Georgia Advisory Board. Shelli is originally from North Carolina and lives in Atlanta, Georgia, and Atlantic Beach, N.C., with her husband Robert Rodriguez and spends time with their three grown children whenever she can.

Federation Staff Grows by Two

Karyl Oglesby joined the staff as Administrative Office Assistant. Karyl holds a degree in Business Administration. Karyl is originally from South Carolina but has adopted eastern North Carolina as her home for almost 30 years.

Stacia Strong is our new Communications Director. Stacia has a bachelor's degree in Broadcast Journalism. Stacia spent the past seven and a half years as a news anchor and reporter. Originally from Florida, Stacia has called eastern North Carolina home for eight years.

OUR GOALS FOR 2022

Each year we update our program goals to set a course for our annual work and establish a collective agenda that engages our partners throughout the state and nation.

This ensures our work is on the leading edge of practice when it comes to maintaining clean and productive coastal estuaries, a healthy nature-based economy, reduced amounts of marine debris, and better coastal resiliency to extreme weather events.

Our goals stay focused and based on strategic plans that we developed with hundreds of stakeholders including the Nature-based Stormwater Strategies Action Plan, the N.C. Marine Debris Action Plan, the Oyster Restoration and Protection Plan: A Blueprint for Action, and most recently the updated Coastal Habitat Protection Plan. We have developed five key goals to guide our work in 2022 and advance our continued commitment to work together for a healthy coast. These include goals for clean water and reduced flooding, living shorelines, thriving oysters, and a coast that is free of marine debris all supported by our goal for sound coastal management.

GOAL: COASTAL MANAGEMENT THAT PROTECTS AND RESTORES.

Our Coastal Management Goal is deeply intertwined with, and supports our work for clean water, living shorelines, thriving oysters, and a coast that is free of marine debris. We work with a multitude of stakeholders to engage them in sound coastal management decisions based on the best science and technology. In addition, we partner to secure adequate funds so that decisions can be implemented and enforced, and support and strengthen the legal foundation that enables us to protect and restore our coast.

Coastal resiliency is at the foundation of this goals work, recognizing that now is the critical time to prepare for the future. This means ensuring natural defenses are sound, waters are safe for fishing and swimming and we are free of emerging contaminants and other threats like offshore oil and microplastics. In 2022, we will continue to unite communities, businesses, government agencies, and academia to work for effective coastal management decisions.

For 40 years, the Federation has increased the number, diversity, and commitment of stakeholders by identifying and linking common interests to forge partnerships. This allows us to maintain and improve the laws, policies, and funding needed to achieve our other goals. Our policy experts on the coast and in Raleigh are reaching out to and supporting federal and state lawmakers, government officials, regulatory commission members, academics, business and industry leaders, landowners, homeowners, fishers, farmers, media, and other key stakeholders, helping them to help us achieve our goals and benchmarks. But that's not all we do.

We also keep watch on important emerging issues that aren't fully encompassed within our existing goals. When needed, we adjust and adapt to address unanticipated problems or opportunities. Several issues that will likely be added to our policy work in the years ahead include influencing coastal energy and climate policies, better aligning of our existing water quality work with strategies to reduce nutrients and toxic algae in coastal waterways, increasing our capacity to reach out and engage with communities that are currently underserved by our work, and launching a comprehensive enrichment program to increase the capacity of local governments (elected and appointed officials, staff and consultants) to address environmental issues facing our coast.

WATER QUALITY & MARINE DEBRIS

GOAL: CLEANER & MORE PRODUCTIVE COASTAL WATERS BY FACILITATING THE USE OF NATURE-BASED STORMWATER STRATEGIES THAT IMPROVE WATER QUALITY AND REDUCE FLOODING.

Intense rainstorms cause flooding and water quality degradation as the runoff funnels pollutants to our coastal waters. Impacts are magnified by the altered landscape that channels rain instead of absorbing it.

The Nature-based Stormwater Strategies Action Plan released by the Coastal Federation in 2021 recommends specific policies and actions to reduce pollution and flooding caused by new land development; existing development and infrastructure; highways and streets; and working lands such as farms and commercial forests.

Throughout 2022 we will continue to recruit and cultivate diverse partners to provide effective leadership needed to implement this plan and achieve state and local government policies and commitment to promoting the use of nature-based stormwater strategies.

In addition, recently approved actions in the updated Coastal Habitat Protection Plan position us to further encourage nature-based stormwater strategies that concurrently improve water quality and reduce flooding, since they also protect and restore fish habitats. Working to implement these two key plans will advance nature-based strategies for managing rain storms mainstream.

We will also prepare watershed management plans in priority watersheds of Stump Sound and Newport River to serve as the foundation for replicating and restoring natural hydrology.

Urban stormwater reduction demonstration projects not only reduce critical volumes of runoff, but also help provide key examples and case studies that demonstrate success and facilitate new approaches to manage stormwater on future projects. In 2022 we will install stormwater reduction demonstration projects in Pine Knoll Shores, Swansboro, and Wilmington to substantially reduce the volume of runoff. Additional work will restore and replicate wetland hydrology on working lands and conserve natural lands to hold back billions of gallons of runoff.

GOAL: A COASTAL ENVIRONMENT THAT IS FREE OF MARINE DEBRIS.

Marine debris results from storm-damaged docks, houses, and yards; lost fishing gear; poorly managed construction sites; abandoned boats; plastics contained in wastewater and stormwater discharges; and careless littering. The Coastal Federation partnered with community groups, academia, and government agencies in 2020 to develop and adopt the N.C. Marine Debris Action Plan to both clean up and prevent debris large and small.

In 2022, the Coastal Federation will work for the reduced use of single-use plastics, advocate for more storm resilient building and maintenance practices for docks and piers, and promote improved treatment and disposal of wastewater and stormwater to reduce the number of microplastics being discharged to coastal waters.

We will also partner with state and local partners to continue to mobilize fishers and contractors to remove tons of debris, lost crab pots, and abandoned vessels. This work will be supported with a $500,000 appropriation from N.C. General Assembly adding to the over 2 million pounds of debris removed since 2019.

Finally, we will partner with federal, state, and local agencies to refine programs to reduce the number of abandoned boats and debris along our coast and conduct extensive education and outreach about the importance of marine debris prevention and improved understanding through research.

LIVING SHORELINES & OYSTERS

GOAL: INCREASED USE OF LIVING SHORELINES SO OUR COASTAL WATERS ARE CLEAN AND PRODUCTIVE AND SOUND FRONT PROPERTIES ARE BETTER PROTECTED FROM EROSION.

North Carolina's 12,000 miles of estuarine shoreline provide some of the most productive habitats in the world for fish and shellfish. Unfortunately, the erosion of these shorelines is increasing because of rising sea levels, concentrated waves from boats, more extreme storms, and poorly planned development practices. Erosion control structures like bulkheads are not as effective as living shorelines in protecting shorelines. By installing buffers using salt marsh, oyster reefs, and other natural materials, living shorelines control erosion while protecting the natural beauty and productivity of our estuaries.

The Coastal Federation remains committed to making living shorelines the go-to approach for managing shoreline erosion. We have secured public and private funding that will help us provide increased financial incentives to landowners for living shorelines.

In 2022, our work to promote living shorelines is being advanced with $2 million appropriation from N.C. General Assembly as well as other state and federal grants. With public and private funds, we will build over 3,000 feet of living shorelines on private properties. By working with contractors, students, and community volunteers we'll enhance at least 400 feet of existing living shoreline at Jockey's Ridge State Park; build an additional 200 feet of living shoreline at Carteret County's future boat ramp location in Ocean; construct 800 feet and design and permit another 845 feet of living shorelines along NC Hwy 24 in Cedar Point and Swansboro. We'll also design, permit and begin the construction of 1,667 feet of living shoreline at MCAS Cherry Point and 2,408 feet of living shoreline at Fort Macon State Park. We plan to build 60 feet of living shoreline at Topsail Beach and begin construction of five acres of oyster, living shoreline and salt marsh; and 13 acres of tidal creek and marsh at Carolina Beach State Park. In addition, we will secure funding and permits for 150 feet of demonstration living shoreline using oyster castles and OysterCatcherTM materials, and maintain 1,860 feet of existing living shoreline at Morris Landing.

We will also test more environmentally acceptable materials for living shoreline construction, provide continuing education for public officials, contractors, and real estate professionals and work with researchers to increase public understanding of the value of living shorelines.

GOAL: ABUNDANT OYSTERS THAT SUPPORT THE ENVIRONMENT AND ECONOMY.

Our native eastern oyster is one of the most important species in our estuaries. Oysters benefit North Carolina's coastal ecology and economy by providing critical habitat for fish, filtering water, and their harvest infuses millions of dollars into the economy. When oysters thrive, so does the health and productivity of our coastal waters. For nearly two decades, a group of diverse stakeholders has worked together with the help of the Coastal Federation to protect and restore oysters. This work has resulted in a solid foundation of public engagement that has secured funding and enabled projects and policies to build more oyster habitats for fish as well as commercial and recreational harvest.

In 2021, the Federation worked with its partners to update the fourth edition of the Oyster Restoration and Protection Plan for North Carolina that now guides work on oysters until 2026.

In 2022, we will lead the Oyster Steering Committee and engage workgroups to implement actions in the Oyster Blueprint. This work is being assisted with over $2 million dollars in appropriations to N.C. Division of Marine Fisheries, as well as federal, state, and private grants. This will allow us to construct at least ten acres of new oyster habitat; grow shellfish farming to a $100 million statewide industry by 2030 with a goal of $7-8.6 million in farmed oyster sales in 2022. We will collect at least 5,000 bushels of recycled oyster shells, expand the recycling program coastwide, advance key oyster communication and education efforts that includes the N.C. Oyster Trail, shell recycling, and an interactive oyster display at the Roanoke Island Aquarium.

Historic State Budget Invests in Coastal Protection and Restoration

To protect the North Carolina Coast, it's important to have a strong voice inland – in the state capital – as well as back home, where the waves hit the shoreline.

That's why the Coastal Federation has a year-round presence in Raleigh. Every year, we make a list of policy and budget priorities for state policymakers that will best advance our work for clean water, livings shorelines, thriving oysters, sound coastal management, and a coast that is free of marine debris. Then, we walk the halls of the General Assembly and state agencies to ensure they prioritize coastal protection in their laws, budgets, and policies.

This year, the Coastal Federation's advocacy work paid big dividends. Indeed, the just-approved state budget for the 2021-2023 biennium includes a breathtaking number of investments in nearly all of our coastal protection, restoration, and economic development priorities. Some of these investments include direct appropriations, including:

- $2 million for the Coastal Federation to boost construction of living shorelines along the coast. Our staff is already making plans to utilize these funds to create miles of living shoreline projects to reduce erosion and provide habitat.

- $500,000 for the Coastal Federation's new Coastal Debris Clean-Up Fund to support programs like its annual crab pot clean-up program and large-scale marine debris removal.

- $750,000 in each year of the biennium to match federal funds for our work to build more oyster sanctuaries in the Pamlico Sound and expand the Senator Jean Preston Oyster Sanctuary Network.

- $500,000 to help the Coastal Federation and community partners restore prime shellfish growing areas in the Newport River that have been degraded by stormwater pollution. This funding will support planning and engineering efforts to apply nature-based strategies throughout the watershed to improve water quality and reduce localized flooding.

- $500,000 in each year of the biennium for a small business, low-interest loan program to help future shellfish growers. The "North Carolina Strategic Plan for Shellfish Mariculture" identified access to capital as a key need for the state's fledgling shellfish industry.

In addition to these appropriations, the new budget includes historic new investments in coastal resilience and restoration. The largest of these investments include close to $300 million in statewide funding to reduce the danger to life and property from storm-related flooding. In addition to supporting this investment, the Coastal Federation played an important role in shaping how these funds will be used. Lawmakers agreed with our advice that nature-based stormwater strategies be considered with the investment of these funds. Lawmakers also prioritized these nature-based strategies in the creation of the flood control "blueprint" that will guide how much of the $300 million is invested in the next few years. Special thank you to Rep. John Bell who represents Greene, Johnston, and Wayne counties as well as Sen. Jim Perry (Wayne and Lenoir) for leading this effort.

We'd like to thank all the lawmakers for their strong, bipartisan support for the coast this year. A special thank you to Rep. Pat McElraft of Carteret County, Sen. Norman Sanderson (Carteret, Craven, Pamlico), Sen. Bill Rabon (Bladen, Brunswick, New Hanover, Pender), Rep. Bobby Hanig (Currituck, Dare, Hyde, Pamlico), and Rep. Edward Goodwin.

With these investments, 2022 is shaping up to be a historic year for the coast. The Coastal Federation will work with federal, state, and local partners to leverage new state funds to better protect and restore our coast.

Finally, and most importantly, we extend a big thank you to our members and donors. Your support makes our efforts in Raleigh and the investments we were able to win this year possible.

CoastalReview.org
A Daily News Service of the North Carolina Coastal Federation

Paths to Resilience

Special report in partnership with Pulitzer Center's Nationwide Connected Coastlines

Underserved, Underwater: Mapping a Future

Volunteer Amber Hersel from the Civilian Crisis Response Team helps rescue 7-year-old Keiyana Cromartie and her family from their flooded home Sept. 14, 2018, in James City. Photo: Chip Somodevilla/Getty Images

By Trista Talton

Originally published March 8, 2021

Craig Allen's memory is a little hazy on the finer details of the coastal storm that pushed the waters of Scotts Creek into his grandmother's backyard in James City.

He can't pinpoint the precise year and time the hurricane rolled in – sometime in the early 1970s when he was in elementary school.

He doesn't recall the storm's name. But he vividly remembers that it was the first time in his life water flowed over the banks of Scotts Creek and crept alarmingly close to his grandmother's house on Kennedy Drive.

"Every year since then it's getting worse," Allen said. "There's some trees in the water now that when I was a kid they weren't in the (Neuse) river."

Allen also recalls that during Hurricane Florence in September 2018, residents had to be rescued by boat when Scotts Creek flooded the neighborhood.

James City, a community on the peninsula at the confluence of the Trent and Neuse rivers in Craven County, is in a floodplain.

That designation is part of why this community, which has a storied Black history, is one of several throughout the state that has been identified as a "potential" environmental justice community.

The North Carolina Department of Environmental Quality, or NCDEQ, has created maps that identify potentially underserved populations, ones that meet certain racial and economic criteria.

The state's June 2020 Climate Risk Assessment and Resilience Plan identifies these communities as either having a population that consists of more than 50% nonwhites, or a population of nonwhites of at least 10% higher than the county or state share.

Those with a population that experiences a poverty rate over 20% and households with poverty at least 5% higher than the county or state share.

The maps are designed to be a tool for local governments and organizations to use, if they choose, as a means in helping for the future, explained Renee Kramer, NCDEQ's Title VI and environmental justice coordinator.

"Of course, there's not one right or wrong way to use the mapping system," Kramer said.

"We really felt like we could help communities to provide a tool that has this data so that community members and, or local governments can see what is in their community right now and help plan and envision what they want

Underserved continued page 9

About this special section

We're all picking up the tab for the effects of climate change.

North Carolina's 20 coastal counties are each surrounded by water, with people living and working right there on the rivers, creeks, sounds, bays, estuaries, as well as the ocean. Each year, the rising water has made life harder and more expensive.

Brunswick, Dare and Hyde counties each had 10 hurricane-based federal disasters between 2010 and 2019, and Hurricane Dorian in 2019 and Hurricane Isaias in 2020 were added to the list for those and about a dozen other North Carolina counties.

Losses from Hurricane Florence in 2018 totaled $22 billion in North Carolina and 15 people died here. Dorian inflicted more than $1 billion in damage in the state, with about two dozen homes destroyed and hundreds with major damage. Preliminary damage estimates for Isaias were about $29 million, primarily for debris removal.

Maintaining N.C. 12 on the Outer Banks has cost the state about $75 million in the last 10 years. The total does not include the $252 million Bonner Bridge replacement project.

The costs are staggering, yet little seems to change, year after year. As a state, we have continued to pay to rebuild, rather than invest ahead of storms in sustainability. But there is new thinking. The state now has a plan that local governments can use as a template to address their own challenges. There are paths to resilience.

These paths include identifying and addressing the needs of communities that are the most vulnerable to the effects of climate change: those already economically challenged.

A state program launched in the fall of 2020 provides technical and financial help to governments in the state's 20 coastal counties to develop resilience efforts.

Some communities have already begun following their own paths, finding opportunity in the unique challenges they each face.

This publication is a condensed version of CoastalReview.org's in-depth, two-year examination of the changing minds on climate science in North Carolina and the efforts on behalf of state and local officials and nonprofit groups to make coastal communities more resilient to the effects of climate change, including sea level rise.

This reporting from two special series in 2020 and 2021 was supported in part by the Pulitzer Center for Crisis Reporting's Connected Coastlines initiative, and of course, our publisher, the North Carolina Coastal Federation, and is available in its entirety at CoastalReview.org.

Thank you also to our sponsors and donors for also making possible the quality local journalism we strive to deliver each day and projects such as the reporting included here.

It's the work of Coastal Review's longtime beat reporters, Catherine Kozak, Kirk Ross, Trista Talton, with contributions by Assistant Editor Jennifer Allen and yours truly,

Mark Hibbs, editor

Underserved continued from page 8

their community to be in the future. This is a screening tool. It's not the end-all, be-all."

The maps were created through a culmination of information pulled from various government agencies then layered to illustrate a community's compounding vulnerabilities.

The first layer is collected from across NCDEQ's divisions identifying where and which type of government-issued permits, such as air quality and wastewater permits, exist.

The second layer establishes socioeconomic and demographic characteristics collected from the Census Bureau.

The third piece includes a community's health characteristics gathered from the state Department of Health and Human Services and county health departments.

"You can't really plan for these real-life scenarios without taking into consideration the reality of the folks living on the ground," Kramer said.

What is the transportation availability in that community? What is the average income? Are there a high number of nonEnglish speaking residents in the population?

"One thing that we have added from our data version 1.0 that is currently out is the flood layer," Kramer said. "I think that would be a very powerful layer to consider to turn on if you're talking about climate change and resiliency."

James City is a prime example of a community with compounding vulnerabilities in our changing climate.

It is a historically Black settlement that lies within a floodplain.

A section entitled "Climate and Environmental Justice" in the Climate Risk Assessment and Resilience Plan states, "Barriers to property ownership have resulted in a number of climate resilience concerns specific to African American homeowners and historic African American communities.

A disproportionate share of African Americans live in low-lying areas in the Southeast, which are more susceptible to drainage and flooding problems."

Across the Trent River from New Bern, U.S. 70 now divides this unincorporated community named in honor of the Rev. Horace James, a Union Army chaplain who was charged with managing the Trent River Settlement, a haven for former slaves and their families during the Civil War in 1863.

"In 1863 if any African American could make it to that camp they were considered free," Allen said. "As long as we stayed there, we had a right to stay there."

By 1865, nearly 3,000 Black men, women and children lived in the settlement. During Reconstruction, James City transformed into an independent community of free Black people.

Roughly 10 years after the settlement was created, the land's white owners began hiking the rent of Black residents in an effort to evict them from the property. The owners turned down an offer of $2,000 to buy the land.

In 1892, the state Supreme Court ruled in favor of the property owners in a lawsuit brought on by Black residents.

The ruling prompted some Black families to move. Others were determined to stay.

For Allen, James City embodies a sense of place, pride and resilience in the face of overwhelming.

Community leaders are in talks to incorporate.

"To go back, it's home," said Allen, who lives in New Bern. "Home is home regardless of what people say. It's funny that it's called a flood zone and other neighborhoods are called waterfront. If all the Black people moved out right now then it would be a resort community because it's surrounded by water."

Chapter 4 of the Climate Risk Assessment and Resilience Plan pointedly discusses the connection Black property owners have to historically Black communities.

"Given the barriers to property ownership among African Americans, land often holds particularly high historical and cultural value for Black households. In some cases, land has been in the same family for many generations. The decision to consider a buyout, if offered one by a state or local program, is particularly fraught for these homeowners."

Naeema Muhammad is organizing director of the North Carolina Environmental Justice Network and a member of the NCDEQ Secretary's Environmental Justice and Equity Board.

She knows firsthand the challenges environmental justice communities face.

"It's about the sentimental and emotional ties and values that people are connected to in their homes and why should I have to give up my home and my family connection to my land to satisfy somebody else," Muhammad said.

"You will hear people around the state say, 'Well why don't they just move?' If it was that easy then maybe people would. You hear their stories and you hear the passion that they're speaking from," she continued.

"You see and hear their connection to the places they're at. You know, everything is not always about money. It's about the emotional ties that they have."

NC CHARTS NEW COURSE ON CLIMATE CHANGE

By Kirk Ross

Originally published Feb. 26, 2021

The relentlessness of tropical storms and severe weather over the past half-decade changed the dialogue on climate change statewide. State policy has shifted, too, but slowly and unevenly.

While there's consensus about some actions to further protect communities and make them more resilient, leaders are still divided when it comes to other climate-related initiatives such as greenhouse gas reduction.

In 2020, Gov. Roy Cooper released the North Carolina Climate Risk Assessment and Resilience Plan, a 372-page report on the state's present and future, the state's many vulnerabilities and an extensive set of strategies to address climate-related hazards.

The report followed through with a strategy Cooper launched early in his term to combine the effort to build resiliency with an emissions-reduction strategy organized around green energy.

In the wake of destructive hurricanes in recent years, record rainfall in 2018, and sporadic, prolonged droughts, there was broad consensus around the need for resilience, a catch-all term that now seems to encompass every strategy aimed at weathering future storms.

The consensus on resilience has been strong enough to draw state funding and lead to policy changes, despite the backdrop of long-running political disagreements and budget standoffs between Cooper and General Assembly leaders.

The most concrete result of the resiliency consensus is a new state agency, the Office of Recovery and Resiliency, which was formed in late 2018 to manage the massive flow of federal funds coming in the wake of the storms.

In contrast to at least a general agreement on the need to build resilience, the difference between the governor and legislative leaders on climate change mitigation, particularly limits on fossil fuels, could not be starker.

The General Assembly began the 21st century with an eye on a less carbon-reliant energy policy, passing requirements for renewable energy generation and forming a commission on global climate change to develop a state action plan.

After a series of delays and over industry objections, the commission released a 117-page report in 2010 calling for a major statewide effort to reduce emissions.

The year the report came out, Republicans won majorities in the state House and Senate and the leadership of key committees shifted to legislators openly skeptical about the science around climate change.

At the same time, lawmakers and administration officials were being courted by oil and gas exploration companies who saw potential for renewing offshore exploration as well as hydraulic fracturing, or fracking, for natural gas in Piedmont shale deposits.

Within a year, the legislature embraced both onshore fracking and offshore drilling. An energy policy bill passed in 2011 declared that both industries would bring jobs and oil and gas royalties. In 2012, the legislature launched its effort to limit the science used to determine the rate of sea level rise, and the legislature eventually codified skepticism of any science based on models showing an accelerated rate of sea level rise.

The legislature had a willing partner from 2013 to 2016 in then-Gov. Pat McCrory, who supported fracking and offshore drilling.

But McCrory's defeat in 2016 by Cooper led to a change in the executive branch every bit as striking as the legislature's shift in 2011, starting with unvarnished opposition to a Trump administration plan to reopen the leasing program for oil and gas exploration along the Atlantic Coast.

In October 2018, Cooper followed through on a campaign promise to reduce the state's carbon emissions through Executive Order 80, which signed on to the 2015 Paris Agreement on climate change, and mandated a full review of state government policies and operations to reduce greenhouse gas output.

Roads and canals crisscross a marsh with homesites in Down East Carteret County, where connections to the water that surrounds are engrained in the culture. Photo: Mark Hibbs/SouthWings

The order was significant because in addition to calling for numerous concrete steps across state government, it also knit together the concepts of climate change resilience and mitigation.

The last "whereas" reads: "Whereas to maintain economic growth and development and to provide responsible environmental stewardship we must build resilient communities and develop strategies to mitigate and prepare for climate-related impacts in North Carolina."

Coastal Review met with Cassie Gavin, government affairs director with North Carolina Sierra Club, who said combining resiliency and climate change mitigation into the strategy is a step forward to address both cause and effect.

"They have to go together. I'm glad that they are and that the state is doing both things at the same time," she said. "The plan is a good start in that it sets a path for state agencies and local governments to follow and lays out resiliency priorities that the legislature should fund."

The plan also gives governments a template to develop plans, and includes a scoring system for qualifying risk and other strategies.

"It's not just the state that needs a resiliency plan," Gavin said, "every community, especially at the coast or any community near water, needs a resiliency plan of their own."

Bill Holman, state director of The Conservation Fund and a former state environmental secretary, said North Carolina has suffered from the lack of a long-term resiliency plan.

"Unfortunately, we have a lot of experience dealing with major floods going back more than 20 years," Holman said. "I think what we've lacked is that while we've responded to the storms, we really haven't done much to make ourselves more resilient for the next storm."

Many communities would like to take action but need technical and financial support from the state to move forward, he said. Success in those communities would likely spur change in other places.

"I'm an optimist about the long haul here, because it's an imperative and we really don't have a choice, in particular in eastern North Carolina, where becoming more resilient is going to be critical to its long-term environmental and economic health."

The choice for many places, he said, will be to become more resilient or wither away.

Will McDow, Environmental Defense Fund resilient landscapes director, said he agrees that the report could provide a pathway for communities looking to be proactive.

"It does a good job of providing that North Star, providing those guiding principles for where the state should go," he said.

Attitudes among once-skeptical farmers and residents in rural, eastern North Carolina are changing, he said, and elected officials are beginning to get the message.

"There's a shift in how people are thinking. They may not believe the science, but they believe their eyes. They're seeing longer droughts and they are seeing higher flood waters, and that's beginning to trickle up."

Seeds of resilience may be in forests, farms

By Kirk Ross

Originally published April 13, 2021

There's a growing body of evidence on what a warmer, wetter climate holds in store for our generation and future residents.

Among the effects already being felt and already baked in for decades ahead are more frequent heavy rains and, with them, repeated flooding in vulnerable areas.

Even though climate science is not universally embraced in North Carolina, a changing climate is evident. Strategies for dealing with it are changing, too.

Although most of the state's cities and towns have been expanding their stormwater requirements and capabilities over the past few decades, none are engineered to deal with a deluge.

After Hurricane Florence in 2018 churned through many of the same places Matthew did in 2016, taking on disasters one at a time no longer made sense. Resiliency went from buzzword to watchword.

Gov. Roy Cooper and legislative leaders agreed to form a new agency, the state Office of Recovery and Resiliency, to handle both the massive inflow of federal disaster and housing aid, but also to find ways to best fit that aid into a resilience framework.

Getting proactive about flooding in the same way has not been so straightforward, in part because the impacts vary with every turn of the waterways, but mostly because of the enormous expense of raising roads, reconfiguring bridges and culverts, and moving people and key infrastructure out of the floodplain.

The General Assembly and the governor began early in 2021 on another attempt to reach a deal on a comprehensive state budget and there's agreement on the need for a major effort on flooding resilience.

Although there are differences among approaches and strategies between policymakers and stakeholders, one key theme that's emerging in resilience and any likely legislation is an emphasis on leveraging the state's land resources, particularly the natural and working lands in eastern North Carolina.

This comes at a time when climate researchers say it is even more essential to preserve and enhance those lands because of a growing understanding of how essential they are to carbon sequestration and mitigating the state's contribution to greenhouse gasses.

Flooded state Department of Agriculture and Consumer Services crop and pasture lands following Hurricane Matthew in 2016. Photo: NCDEQ

Both approaches envision converting some cropland back to forests and using farmlands, wetlands and other natural systems to reduce the severity of flooding.

As the state grapples with what to do about storms and floods, the nexus of resilience and sequestration found in its natural and working lands could become the cornerstone of climate policy.

In June 2020 a working group of dozens of scientists, state and local officials and representatives, businesses and nonprofits published an appendix to the state's 2020 Climate Risk Assessment and Resiliency Plan on working and natural lands.

Misty Buchanan, director of the state's Natural Heritage Program and part of the working group that wrote the 124-page report, said the push for putting natural solutions to work were findings in the state's 2017 greenhouse gas emissions study, which revealed the scale of sequestration potential in natural and working lands.

"What drew me in, and what I think resonates with people, is when we got our greenhouse gas inventory and first started to understand where our emissions are coming from and how much our emissions are," she said. "We determined that the land use sector, including natural areas and forest and farms and even things like oyster farms, have a huge potential to offset the emissions that are coming from the state."

The study found that natural and working lands offset 25% of the state's current greenhouse gas emissions, she said, more than twice the average rate of other states.

"We're already in a great position," Buchanan said. "We can do more. We also need to think about how we're just going to hold on to that percentage as our state develops around us. We need to think about how we can restore land and manage our land in a way that we can continue to offset those gas emissions and sequester and store more carbon each year."

To jumpstart the ideas and build support, the group looked at options that provided multiple benefits, keying in on those that benefited both carbon sequestration and resiliency, water quality and biodiversity.

They fall under three main categories: protecting land through conservation easements or acquisition and incentives for protection; restoring lands to increase sequestration and resilience; and improving management of existing natural and working lands.

Proposals include programs for farmers to conserve and enhance lands, tools for local governments, changes to forest policies, tax incentives for landowners, floodplain buyouts, preserving forests, restoring pocosin and coastal habitats, and improving urban land management.

Buchanan said that in assessing opportunities, there were obvious win-wins. One that gives an idea of the scale of possibilities is that about 5% of unprotected forests in the state are in the floodplain of watersheds with significant sources of pollution.

"If we just protected those forests, that would be a million acres," she said. "So, there are some large opportunities still in North Carolina for land protection."

The goal is 1 million acres of floodplain protection and another million acres of wetland and floodplain restoration. If that sounds like too much to shoot for, Buchanan said, consider that the Biden administration recently set far higher goals for land protection than that.

Near the end of last year's session, the General Assembly approved legislation to create an inventory of natural and working lands that could be used in flood control and potential incentives for private landowners to do stream restoration and wetlands enhancement and build flood-stage capacity. The bill set the stage for this year's likely follow on.

The Senate Select Committee on Storm Related River Debris and Damage in North Carolina met in April to review preliminary results from last year's bill.

The committee is co-chaired by Sens. Danny Britt, R-Robeson, and Jim Perry, R-Lenoir, who represent eastern North Carolina counties hard hit by prolonged flooding during Matthew and Florence.

Sen. Jim Perry said he and Britt believe that the state's approach right now is too scattered and their primary goal is to focus it by establishing a sole, central agency in charge of enacting a statewide plan. In effect, Perry said in a recent interview, the state needs a flood czar.

"We think at the end of the day, somebody in the state of North Carolina needs to go to bed thinking about flooding mitigation and resiliency and needs to wake up thinking about it," he said. The state can't settle for a patchwork approach or sweeping problems under the rug.

Perry is among those advocating for large-scale debris removal as part of the plan as well.

He said he'll listen to the scientists in terms of best practices, but he doesn't want a here-and-there approach.

"We don't need to clean out the spots of river, close to the bridge because people can see it. We need to start somewhere around Raleigh and clean it out all the way down to the coast," he said.

Bertie County Manager Juan Vaughan II and retired county manager Scott Sauer take to the water during Bertie Beach grand opening in June 2019 in Bertie County. Photo: Sarah Tinkham/TGOW

NC PROJECT SHOWS OPPORTUNITY IN RESILIENCE

By Cate Kozak

Originally published March 15, 2021

At the confluence of the Albemarle Sound and the Chowan River, Bertie County residents celebrated in June 2019 the grand opening of their first public beach.

Amid the joyous splashing and squeals of laughter, Ron Wesson spied a young girl trying to coax her little brother into the water. The boy would not budge, so the older man gently offered to help.

"We kind of sat there, with our toes in the water," Wesson recounted in an interview. "He held my hand, and I walked out there with him. We took it real slow."

Within a short time, the little guy found his nerve and was soon playing carefree in the water with the other kids.

Bertie Beach is the community's first cool gulp of the "Tall Glass of Water," the working name for the county's outdoor recreational project.

"It's weird, though, because I can kind of relate," Wesson said, referring to the boy's hesitation and that he and the boy are both Black.

In 2019, Bertie County was ranked by Wall St. 24/7 analysis as the poorest county in North Carolina. Of its population of 19,000 people, about 68% are Black. Wesson said that, historically, the county has the highest percentage of Black residents in the state.

The celebration was part of a strategic regional approach to community resilience: Bring the environment to the people and stimulate economic growth through sustainable ecotourism.

After devoting much of his career to study of North Carolina's barrier islands and sea level rise impacts, Stanley Riggs, a professor emeritus at East Carolina University, has in recent years focused on the inland communities of the Albemarle-Pamlico estuarine system, which comprises sounds and rivers and is threatened by sea level rise and other climate change impacts.

Those waterways and surrounding lands offer great opportunity but are considered vastly underutilized.

"That's one of the world's great water systems and it's hardly used," Riggs said.

"There's nobody on Alligator River and the whole Albemarle Sound system. There's precious few people out there.We've lost several generations of people. Kids have never learned to swim. You take people out on boats and they're scared to death."

Riggs is chairman of the North Carolina Land of Water initiative, or NC LOW, and Tall Glass of Water is one of its first success stories.

To Wesson, a county commissioner and Bertie native, the project's multiyear effort shines new light on the county's wealth of natural resources.

"It's about broadening the opportunities and possibilities in a community," he said. "You have to look at the resources available in a community. This is economic development. This is our brick and mortar."

Perhaps more than any promotion or lecture could ever do, Tall Glass of Water is showing that climate resilience springs not only from a community's shared investment in its environment, but also from its shared access to and benefits of that environment.

Its success demonstrates to the entire region that resilience and adaptation to changing climate conditions can enrich communities and open up new economic possibilities, while protecting their environments.

People from all over northeastern North Carolina attended the grand opening of Bertie Beach, said Steve Biggs, Bertie County's director of economic development. About 250 people were coming on summer weekends, he said. Swimming, kayaking, canoeing and paddleboarding are all allowed. Eventually, he envisions families traveling to the Outer Banks stopping by for a respite in Bertie.

Biggs explained that the genesis of Tall Glass of Water, or TGOW, was in about 2014, when he was on the lookout for a piece of land for the county to build a boat ramp on the Chowan River. As he was heading into work one day, he said he noticed a "For Sale" sign on some waterfront property.

"I came in and jokingly told the commissioner who happened to be here that morning, 'So I found your 2 acres for your boat ramp, but it comes with an additional 135 acres,'" Biggs said. As it ended up, the county purchased the 137 acres, he said, and added 10 more later.

Even though Phase I of the TGOW project was stalled by COVID-19 shutdowns, the public outdoor recreation plan has already injected a bolt of energy in talk of ecotourism collaboratives among Albemarle communities.

"We wanted to create a place where folks can spend the day," now-retired Bertie County manager Scott Sauer said in an interview shortly before the June 29, 2019, opening day.

"We think this will be a place that will draw people regionally."

Not only does the project boast a 3/4-mile stretch of shoreline, 350 feet of which is sandy beach, and shallow, calm water bordered by soundside cliffs where the Chowan River begins, TGOW also includes opportunities for kayaking and canoeing, and will eventually offer a music pavilion, picnic shelters, hiking trails, ramps and walkways, primitive campsites and environmental educational field experiences for students and adults, according to plans.

There will also be restoration of the former agricultural land and woodlands, which will help restore the wetlands.

Gov. Roy Cooper announced last fall that the project would receive $500,000 through the North Carolina Parks and Recreation Trust Fund. Bertie County's local match for Phase 1 is $529,591, for a total of $1,029,591.

The county-owned land encompasses Site Y, where archaeologists with the First Colony Foundation recently discovered artifacts that indicate some members of the 1587 Lost Colony relocated there after leaving Roanoke Island.

As luck would have it, a large area of adjacent wilderness was protected around the same time as TGOW was hatched.

The new, more than 1,200-acre Salmon Creek State Natural Area was purchased for conservation by the nonprofit Coastal Land Trust, which turned it over to the state in 2019. Altogether, a total of 1,432 acres of undeveloped soundfront land is now protected.

Robin Payne, a project consultant for Tall Glass of Water, said that the citizens provided input into the master plan, which was released in March 2020. The project is being built and funded in phases.

"You know, it really all has to be sustainable, and it has to tie together community, environment and economic development," she told Coastal Review last year. "And so, as we move forward, we're making sure that we connect those three points."

Until now, unless a family could go to a private pool or beach, it wasn't a realistic option to enjoy a refreshing dip, especially for African Americans.

There are still plenty of kids from Bertie who have never been to the ocean, Wesson said, the Outer Banks is about a 90-minute drive.

Coastal resilience goal of new program

By Jennifer Allen

Originally published March 29, 2021

More than two dozen coastal communities have been awarded funding from the state to better prepare for natural hazards.

The state Department of Environmental Quality's Division of Coastal Management announced March 17, 2021, that $675,000 would be granted to 25 coastal communities through the new Resilient Coastal Communities Program, launched in 2020 to provide technical and financial help to governments in the state's 20 coastal counties to develop resilience efforts.

The division received 30 applications representing 32 coastal communities, one application was submitted by three communities, for the first two phases of grant funding.

Sam Burdick, coastal resilience coordinator with the Division of Coastal Management, said that building resilience to natural hazards is vital for communities to help maintain quality of life, healthy growth, durable systems, and conservation of resources for present and future generations.

"However, a number of barriers to developing resilience to coastal risks exist, including economic and capacity constraints that have been exacerbated in recent times. Building more resilient communities requires careful, thorough planning efforts using sound, locally relevant data," she said.

The program is four phases: community engagement and risk and vulnerability assessment; planning, project selection and prioritization; project engineering and design; and implementation. The initial funds are to be used for the first two phases.

Applications were scored on the level of risk exposure to vulnerable populations and critical assets, economic status and need, and internal capacity and momentum, according to the state.

Aurora, Beaufort, Belhaven, Cape Carteret, Hertford, Leland, Navassa, Sunset Beach, Surf City, Topsail Beach, North Topsail Beach, Vandemere, Washington and Windsor were awarded.

Barnes Sutton, Navassa's town planner, explained that urban planning and design were once guided by the natural forces in a area, such as navigable waters or the direction of prevailing winds, allowing cities to optimize those natural resources and, by extension, protect those resources.

"This created unique places that balanced city centers and residential areas with communal space and fields for agriculture," he said. But at some point, urban planning moved away from these principles and began to emphasize consumption over conservation.

The division also selected Beaufort, Craven, Currituck, Dare, Hertford, Hyde and Pamlico counties for the program.

Dare County Manager Bobby Outten said that the county received a $30,000 grant to study all risks and vulnerabilities on Hatteras Island.

These include economic, storm and transportation vulnerabilities and any others that the consultant determines exist.

"Completion of this study would make Dare County eligible for additional grants to determine remedies to resolve or mitigate the vulnerabilities found," Outten said. "Once the remedies are determined, Dare County would be eligible for yet another grant to begin implementing those remedies."

Beaufort in Carteret County also received a grant.

Town Planner Kate Allen said that storm surge, heavy rainstorms and higher tides of recent years pose acute risks to life and property, particularly during hurricane season.

"In 2018, Hurricane Florence wreaked havoc on the town and surrounding areas. Heavy rains coupled with high tide results in frequent flooding of Front Street. Shoreline erosion, primarily caused by rising water levels and storms, increases the town's flooding risk. These stressors individually pose risk, but are most impactful when they occur together, and often they do," she said.

The view of water-surrounded downtown Swansboro in September 2019 reflects changes caused by Hurricane Florence a year earlier. Photo: Mark Hibbs/SouthWings

"As a small community, town staff lack the time necessary to conduct thorough vulnerability and risk assessments. This grant will allow the town to place more emphasis on the risk and vulnerability assessment included in the ongoing CAMA/Comprehensive Land Use Plan update."

Burdick explained big barriers for communities when it comes to planning are the lack of a dedicated resilience budget, an overall reduced budget related to the economic effects of the pandemic, and a lack of capacity to plan.

A more proactive, sustainable and equitable approach to risk planning focuses on mitigating or reducing vulnerability, rather than responding after storms or flooding, she said.

The resilience program is a priority in the state's Climate Risk Assessment and Resilience Plan and reflects Gov. Roy Cooper's commitment to building climate change resiliency statewide while promoting economic growth and stability, Burdick said.

It's the product of a series of resilience efforts and events the division led in recent years to address intensifying natural hazards on the coast.

After Hurricane Florence in 2018, Cooper signed Executive Order 80, calling for the development of the state Climate Risk Assessment and Resilience Plan.

The Climate Risk Assessment and Resilience Plan called for the development of the Resilient Communities Program, designed to boost resilience building at the local level with a three-pronged approach: local government funding, training and capacity building and an online resilience portal.

The Resilient Coastal Communities Program is under the umbrella of the statewide North Carolina Resilient Communities Program, Burdick explained.

Partnering with the state Office of Recovery and Resiliency, North Carolina Sea Grant and The Nature Conservancy, the division tailored resilience plans from other states to needs specific to North Carolina's coastal communities.

Division of Coastal Management Director Braxton Davis told Coastal Review that division partners and coastal communities have been working on various aspects of coastal resilience for a long time, but lacked a clear framework to help organize efforts.

"This new program will help all of us become more efficient and strategic in our investments, ensure that we are identifying and prioritizing the most important projects, and provide more targeted technical assistance that builds on previous planning efforts," Davis said.

"DCM is proud to lead this effort on behalf of our coastal communities and appreciates the ongoing partnerships we have with the N.C. Office of Recovery and Resiliency, The Nature Conservancy, and N.C. Sea Grant."

Signs of change are clear, if language is not

By Mark Hibbs

Originally published May 27, 2020

A series of record-breaking hurricanes over the past four years has led to changes in how coastal residents and state and elected officials talk about climate change and sea level rise.

While the above terms aren't always part of the discussion, the words "resilience" and "resiliency" have become used on both ends of the political spectrum, especially when talking about vulnerable infrastructure on the coast.

"Certainly, resiliency is something that is being talked about a lot more, and is factored into our conversations a lot more than it has in the past," said Jerry Jennings, the state Department of Transportation's engineer for the division that includes the Outer Banks.

On Ocracoke Island north of the village, along Hatteras Island and other parts of the Outer Banks, transportation infrastructure, most obviously roads and bridges, are nearly always affected by wind, rain and tides during nasty weather.

Low-pressure systems can be enough to kick up waves that wash over portions of N.C. 12, resulting in closures to vehicle traffic and multimillion-dollar repairs.

From 2002-2012, the state spent about $100 million maintaining 120 miles of N.C. 12 between Corolla and Ocracoke. Since then, the costs have continued to climb.

"Over the last 10 years, we spent $75 million on maintenance and repairs of N.C. 12 from Oregon Inlet to Ocracoke Village," Jennings said, referring to the most frequently storm-damaged stretch of the highway. The amount did not include the $252 million Bonner Bridge replacement project.

Geologist Stan Riggs said the economics of continuing to develop dynamic coastal islands and support and protect that development is anything but resilient.

"The reality is, 'resilience' is not the right word there, 'it's get the hell out of the way,'" Riggs said. "The human population may be becoming more resilient to this, which I don't agree with. We're learning a lot more about it, and we're learning how to be safer and we're learning how to build stronger structures, but we are not dealing with a fundamental long-term problem."

A message of hope greets all visitors to Ocracoke, which was severely flooded during Hurricane Dorian in 2019. Photo: Dylan Ray

Riggs, 83, said he's seen how the barrier islands have gone from mostly wilderness to a densely built -upon area as the population exploded.

"When I moved here, the Outer Banks was nothing but beach cottages. They were little, you know, one-, two-, three-room things, and we used beach buggies — the old cars, the old junkers that you fixed up," Riggs said.

He said that at the time, the population along the Outer Banks was limited to a few small villages.

"It's a different ballgame today," Riggs said.

"And rather than backing off the beach, we're building these mega-McMansions out there now and they essentially form a hardened shoreline. It's a wall of buildings that represents a bulkhead — it's a house bulkhead. And in order to keep the beach there, we're now pumping sand on over 125 miles of our beaches every two-three-four years at an incredible economic cost. That's not resiliency, in my opinion. That's foolishness."

The year-round population along the Outer Banks is somewhere around 67,000, but the number normally swells to the hundreds of thousands during the vacation season. All those people have places to go and many have property to protect.

Residents and visitors expect road crews to keep transportation passages clear and safe and drainage systems functioning. Mostly, there is public good will toward NCDOT here but less for the lawmakers in Raleigh who are blamed for underfunding its projects. Storm damage becomes more costly every year and now, with the agency's budget stretched to the breaking point by the COVID-19 pandemic, many wonder whether the constant rebuilding and repairing is sustainable.

Ditches that run along state-maintained roads are also part of the department's responsibility and drainage is an ongoing concern, especially in low-lying areas.

Along with flooding, there is growing awareness that septic tanks and wastewater treatment plants have become more vulnerable. During Hurricane Dorian in September 2019, flooding caused untreated sewage from plants in Manteo and Columbia to spill into waterways.

But most of the homes and businesses in this part of the state use septic tanks, which are more at risk of leaking during storms because of higher water tables.

Intense storms and flooding will continue to affect coastal North Carolina residents for the foreseeable future, according to a report released in March by North Carolina State University's North Carolina Institute for Climate Studies.

The report finds that temperatures warmer than historic norms, disruptive flooding, increasingly intense and frequent rainstorms and hurricanes are "virtually certain" in the next 80 years.

The report also found that the past four years had the largest number of heavy precipitation events on record for the state. The study's authors said that increasing concentrations of carbon dioxide and other greenhouse gases were most likely causing much, if not all, of the observed changes.

On Ocracoke Island, residents continue to rebuild after Hurricane Dorian's 7-foot surge flooded the village. Mickey Baker, co-owner of Mermaid's Folly, a clothing shop on Ocracoke Island, said there's little question what's going on.

"Climate change is apparent. The icecaps from both poles are in our yard," Baker said. "I've been here for 18 storms in 36 years, not counting nor'easters. We all survived. We all swam through front doors. We all lost pets in front of our eyes. The hard part was that we couldn't stop what we were doing to help our friends. We were totally frustrated and worried. I got a text from a friend that read 'in attic.'"

Other coastal residents say the problem is something else.

Christine Voss, an ecosystems ecologist and research associate at the University of North Carolina Institute of Marine Sciences in Morehead City, noted that when real estate and other business interests along the coast became concerned that climate science might lead to regulatory change, that's when the pushback began that led the General Assembly to restrict the use of sea level rise forecasting in planning and policy.

"I think people acknowledged what was going on but wouldn't always admit it," Voss said.

Voss noted that hurricanes have happened throughout history and are not unique to climate change, but the frequency of flooding in areas along the coast is increasing.

Voss said it's also up to young people to bring the change.

"I hope they realize that they do have the power to affect change in the way we do things, the way we look at things," she said. "For their sake, I hope that all of us, young and old, will be considerate, be less greedy and be open to what we need to do to adapt to our changing climate.

"Yes, I hope the younger generation comes through. We're counting on them."

Where storms are lore, folks see change

By Jennifer Allen

Originally published May 28, 2020

While hurricanes are woven through the history of Down East Carteret County, a remote string of communities on the central North Carolina coast known for its fishing and boatbuilding traditions, Hurricane Florence was a turning point.

Before Florence hit in September 2018, no one ever talked about sea level rise or climate change, but "Florence is the dividing line. Florence caused everybody to look at things differently," Karen Willis Amspacher explained in an interview.

Amspacher, who has always called Down East home, is executive director of the Core Sound Waterfowl Museum and Heritage Center on Harkers Island.

"Down East starts at the North River Bridge," she said, which connects Beaufort to the about a dozen communities.

"I say that North River is not only the geographic divide, but it's the cultural divide," she continued, adding there are traits shared with other fishing communities but, "Down East, to me, is one of the last vestiges of the values of those old fishing communities that still exist."

The heritage of many of these communities began more than a century ago on Diamond City, which encompasses all the barrier island communities of Shackleford Banks.

A series of devestating storms forced families to move from their barrier island homes, many landing in the Down East communities of Harkers Island and Marshallberg, as well as Salter Path on Bogue Banks and the Promise Land community near the downtown area of Morehead City.

Each of the Down East communities has its own personality, its own strengths and its own characteristics, Amspacher said, "But there's a common thread among Core Sounders and Down East about place. And I think that's the tie that binds us to that land."

The center works to preserve this heritage of Carteret County, particularly Down East and the lives lived in the remote area.

A few months before the 2018 hurricane, the museum installed the "Harm's Way: How Storms Have Shaped Our Communities, Our History and Us," exhibit and launched the storms archive.

After Florence hit, the museum closed for nearly two years while $3.4 million in repairs were made to the facility.

The exhibit expanded when the museum reopened to include Florence and Dorian that hit in 2019 and added RISING, a North Carolina Sea Grant-funded, photography-oral history project by Ryan Stancil and Baxter Miller that illustrates sea level rise.

"Both of these exhibitions were hanging in the museum when Florence came. Now they are hanging together with a more long-term theme of 'Living on the Edge' and how storms are not the only force changing our landscape."

With the exhibits featuring the landscape changing and hurricane history, "We hoped that somewhere in the process with programming and conversation, people would connect the two, and they did," she said.

Down East folks often see the science community as a threat because many times, fisheries hasn't always helped and has been equated with increased regulation that's unfair, Amspacher said. That being the mindset, they're skeptical. "The politics around climate change and sea level rise are very real."

Amspacher said 10 years ago, climate change and sea level rise weren't even on the radar.

"Isabel (in 2003) came and it tore up Down East more than Florence, I think, in some ways, and nobody equated that with sea level rise, really. It was just a bad storm, like the storm of '33 or Hazel (in 1954). so there's 1899, '33, Hazel, and then Isabel and now Florence," Amspacher said. "But now, especially with Dorian coming right behind it, I think all the conversation over the past five, six, seven, 10 years, paid off in that when Florence hit, people realized, well, maybe they were right. it had a name. it had a reason."

Since Florence, everybody talks about the impacts. "They don't call it climate change. They're not talking about the ice caps melting. They're talking about the next storm," she said. Florence was a signal more storms are coming and there's very little question about it, something is changing. "The question is, how am I going to respond to it?"

Near Harkers Island Bridge shortly after Hurricane Florence hit in 2018. Photo: Lillie Chadwick Miller

She said one response was action. Homeowners raised their houses, put on metal roofs and cut down trees.

When asked why not leave, she responded, "Where in the hell are you going to go? I'm not leaving. it's home.

"A lot of people left after Isabel and moved to Morehead City. That's still a move, that's still changing your life. But people don't have the money to move, they don't want to move, they've got families here. This is everything they know and anybody who wanted to leave has already left."

Michele Nolin stayed in her Marshallberg home for Florence, deciding at the last minute to stay, Nolin explained in an interview recorded at the museum during a community event on the year anniversary. The museum worked with Duke University Marine Lab students to collect oral histories.

Nolin said she was concerned about the storm surge. Her 1920s craftsman-style cottage is by water on three sides. So, she checked the tide chart and knew to expect high tide.

At about 2:30 a.m., "the winds were howling and limbs were hitting the house. The storm was really rocking at that point," and she started watching the tide. Every 15 minutes she would climb on a stepstool to shine a spotlight out of the small windows of her front door, the only ones not boarded up, to see if water was rising. The first few times she checked, she saw green grass but around 3:30 a.m., around the time of high tide, she didn't.

"I saw black and I was looking and shining the light and I could see water lapping," Nolin said. She wasn't sure the direction the water was coming but knew she had tide in her yard and didn't know how high the water would reach.

"I had no frame of reference for that. I had been told since 1920, including the 1933 storm, there had never been tide inside that house," she said. "But this is different, everything's different now. You know, storms are bigger and wetter and they stay a lot longer and they dump a lot of rain and a lot of wind and a lot of surge in the water seems to be higher and higher every year around us."

She said that this experience taught her how unpredictable storms are and the unknown. "If you do choose to stay, at some point you are on your own, it's going to be you and the tides going to do what it's going to do, and you may not have anywhere to go. And it is has changed me."

Louie Piner, who is in his mid-70s and a lifelong resident of Davis in Down East, like most interviewed for the project, stayed home.

He said that the experience with Florence changed how he prepared for Dorian.

"We had no idea that the tide would be what it was in Florence. Nobody expected that," he said. "Florence was the one of record and that's the one that my generation will make reference to. My mom's generation always reference to '33 storm. My generation will always reference Hurricane Florence."

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