

APPENDIX

Joint Legislative Hearing
Before the Committee on Environment and Solid Waste and the
Special Committee on Infrastructure and Natural Resources
Dan Kelly, Exec. Director, Governor's Disaster Recovery Office
October 6, 2022

Chairs Kennedy and Karabinchak
Vice-Chair Stanley

INTRO AND SANDY DAMAGE OVERVIEW:

October 29, 2012. For New Jerseyans, that is a date none of us will ever forget.

- 300,000+ homes were severely damaged or completely destroyed.
- 2.7 million were without power as our electric grid failed in numerous regions.
- Not a single water treatment or wastewater treatment plant was fully operational, leading to an estimated 3-5 billion gallons of untreated wastewater being discharged into New Jersey's waterways.
- 8 million cubic yards of storm debris was strewn throughout the State, with no easy way to remove it.
- Transportation and transit systems were in disarray in every corner of the State.
- Tens of thousands of people were wet, tired, cold, and scared.

Superstorm Sandy changed New Jersey forever.

It changed me too.

In the years following Sandy, I was appointed to lead what was previously the Governor's Office of Recovery & Rebuilding and, as part of my job, I witnessed first-hand the suffering and the raw emotion of our citizens in response to Sandy's devastation and in the response to and recovery from each major disaster since.

Seeing storm impacts on residents first hand has helped emphasize the need for even greater investments in resilience to avoid it ever happening again.

In terms of storm response, and initial recovery, the group you have before you today is unmatched in terms of knowledge and expertise in getting FEMA, SBA, HUD, and other federal funding to those impacted by storms.

But today, ten years post Sandy, the question isn't whether we can get aid to those impacted. We know we can.

Ask anyone who's been through that process though, and even in the best cases, they'll still tell you it was an experience they'd never want to go through again.

So the question is: how do we keep people from having to go through the disaster recovery process altogether?

And that's the focus of today's hearing, and a major focus of the Governor's Disaster Recovery Office, along with DEP, NJOEM, DCA, BPU, and EDA.

This Office didn't exist when Sandy hit.

But it now serves as a vital point of disaster response and recovery institutional knowledge, including coordination of State recovery activities across agencies, and connecting with our federal partners and congressional delegation to push for FEMA, HUD, SBA and other federal support for recovery and resilience activities.

Additionally, the Governor's Disaster Recovery Office, led by Director of Compliance Bob Bartolone, helps provide access to and oversight of recovery and resilience funding from a variety of federal agencies in compliance with complex and oftentimes rigid federal rules.

I'm proud to serve with my colleagues present here today. Together, we all play critical roles in the response to and recovery from disasters, along with virtually every other State agency not present today who played some significant role in Sandy recovery as well.

SANDY RECOVERY PROCESS OVERVIEW:

Sandy recovery was not perfect.

Disaster recovery itself never is, nor is there ever an exact roadmap to a full recovery.

Each event requires dynamic programs created on an ad hoc basis.

Each disaster recovery program is funded with various streams of federal money that have complex, sometimes arcane, rules to properly expend taxpayer funding.

A successful recovery requires years of effort by residents, non-profits, faith-based organizations, and government agencies.

What was perfect in Sandy recovery was the effort, the compassion, and the focus by each of the agencies represented here today over the past 10 years to address many of the weaknesses exposed by Sandy.

The State devised and operated 97 individual new programs, with programs focused on some of the most critical weaknesses laid bare by Sandy and which we'll elaborate upon today:

- Housing recovery and resilience;
- Flood protection projects;
- Transit resilience;
- Hardening of the energy grid; and
- Reviving our economy and supporting our hardest-hit businesses.

The scale of these programs is unprecedented in our State history.

Indeed, more work has been done and more funding has been spent on storm resilience projects in the past decade than at any other time in this State's history.

There is never a "mission accomplished" moment in Sandy recovery because, even today, there are still residents that haven't been made "whole" and are not yet back in their pre-Sandy homes.

But the amount of resilience work completed in the past decade to avoid the "next" superstorm, which we all know is coming, has been remarkable.

Each agency will get far more into detail on their individual projects in their presentations, but I'd like to offer an overview of each sector now.

HOUSING RECOVERY OVERVIEW:

The State didn't just help homeowners rebuild what previously stood; rather, we focused on rebuilding in a smarter, more flood-resilient way. To date:

- DCA's Disaster Recovery & Mitigation Division and NJOEM have combined to help elevate 6,955 (6,372 for DCA and 583 for NJOEM) homes above base flood elevations, ensuring that they can better withstand the "next" Sandy.
- Just as impressively, DEP's Blue Acre's program used more than \$200M to buy out and eventually demolish 802 "worst of the worst" flood-prone homes Since Sandy, with hundreds of more buyouts planned to avoid the cycle of storm-damage-rebuild-repeat for these residents.
- The 802 Blue Acres buyouts are in addition to the hundreds more funded by NJOEM and local entities through FEMA funding.

FLOOD RESILIENCE PROJECTS OVERVIEW:

We have invested to make sure the next storm that comes will not devastate us again like Sandy did.

Led by DEP in partnership with the US Army Corps of Engineers, we have engaged in well over \$2 billion in 19 coastal restoration project to build dunes and other protections to ensure that another Sandy type event does not devastate our Jersey shore.

From Cape May to Union Beach, and further inland, and in the north along the Hudson River and in the Meadowlands, DEP has built and is building protections that our citizens will be able to count on for decades to come.

TRANSIT RESILIENCE:

NJ Transit has several lessons learned in terms of operational issues and impacts to assets that simply were not resilient when Sandy struck.

NJ was awarded \$1.25 billion for NJ Transit resilience projects—the highest award given to any of the thirteen states competing for those grants.

Key investments by NJ Transit in operational and infrastructure projects will directly avoid the types of disruptions that we saw after Sandy.

ENERGY RESILIENCE:

Perhaps the most glaring weakness exposed by Sandy was the fragility of our electric grid.

Millions were without power, and many critical facilities either ceased operations or were extremely limited.

However, in the years since Sandy, BPU has worked with public utilities to invest more than \$2 billion in electric and gas infrastructure hardening activities.

Likewise, the EDA created the Energy Resilience Bank, which used \$200M+ in HUD CDBG-DR to create the first public infrastructure bank in the nation.

Led by EDA with support from BPU, the ERB addresses the energy resilience weaknesses exposed by Sandy at the State's hospitals and water/wastewater treatment plants by helping fund the development of microgrid technologies at these critical facilities to enable them to remain operational in the event of future power outages

MAKING DISASTER RECOVERY RESOURCES AVAILABLE AND EASIER TO UNDERSTAND:

Outside the tangible resilience investments, we've also realized that we need to make disaster recovery program resources, which come in through a variety of federal and state agencies at a time when residents' lives have been thrown into chaos, easier to understand and navigate.

Until recently, individuals, business, and government entities were left to navigate the complex web of federal and state programs with somewhat limited guidance.

Now, we have one location with all resources available and filtered by specific need at disasterhelp.nj.gov, a one-stop shop with resources organized for homeowners, businesses, and local governments. For Tropical Storm Ida recovery, and for all storms going forward, New Jerseyans can rely on disasterhelp.nj.gov as the place to find all available disaster resources for their specific needs.

It's a small step, but an important one, in helping our residents understand the process and access any resources that are available.

CONCLUSION:

While we've done much, we also recognize that recovering from Superstorm Sandy and fully adapting to the impacts of climate change is not solved in one decade, or through any one funding source.

Instead, it requires year-over-year, decade-over-decade commitment by the State to investing billions in projects that hold the water back in some places, while recognizing that some homes and towns require more targeted solutions like elevations and buyouts in cases where the land just isn't suited for homes.

It also requires continued support to an "action" mentality moving forward to get ahead of the next storm.

Indeed, we've seen the public mentality shift from pre- and post-Sandy.

Prior to Sandy, the idea of the government paying to elevate your home or to acquire and demolish it was somewhat of a foreign concept.

Now, we've made these housing mitigation projects much more commonplace, in no small part due to the urgency created by Sandy.

We just need to keep that urgency moving forward because there is still much work to be done all over the State.

I'll end by noting that FEMA recently issued notices of funding availability for its BRIC and FMA programs, which will make more than \$3B available nationally for resilience projects.

NJOEM's Mitigation Unit coordinates those applications for the State, which are open to local, county and State gov'ts for projects like flood infrastructure, elevations, and buyouts.

But having Legislative awareness and urgency expressed to local governments is the key to taking advantage of this federal money.

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These funds emphasize the need to proactively address flood risk, instead of waiting for the next event to hit.

We appreciate the Legislature's support in recognizing the need for continued resilience going forward.

And thank you for the opportunity to speak today.

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Joint Legislative Hearing
Before the Committee on Environment and Solid Waste and the
Special Committee on Infrastructure and Natural Resources
Justin Davis, NJ TRANSIT SVP, Government & Regulatory Affairs
and Chief of Staff
October 6, 2022

- Good morning, **Chairs Kennedy and Karabinchak** and members of the Joint Committee.
- Thank you for providing NJ TRANSIT with the opportunity to speak today, as we approach the 10th anniversary of Superstorm Sandy – one of the worst natural disasters to hit our region, with devastating damage to our transit system’s infrastructure, facilities, and vehicles – shutting down segments for several weeks.
- Sandy made two things perfectly clear:
- The storm reinforced how vital our transit system is to the hundreds of thousands of New Jerseyans who depend on our services every day and to the State’s economy, quality of life, and mobility.
- And also how vulnerable our transit system is to extreme weather events.

(PAUSE)

- To give you a sense of the challenges NJ TRANSIT contended with in the aftermath of Superstorm Sandy:
 - Tens of millions of gallons of corrosive seawater inundated our transit yards and vehicular tunnels.
 - Track beds were completely washed out and thrown out of alignment.
 - Uprooted trees destroyed overhead wires systemwide.

9x

- Bridges were battered and badly damaged. You may remember the images of the storm-tossed boats on the North Jersey Coast Line's Morgan Drawbridge in Middlesex County.
- Bus Garages and other NJ TRANSIT facilities flooded, damaging equipment and vehicles.
- Hindsight is always 20/20; the impacts of Sandy exposed the vulnerabilities of our transit system and taught us valuable lessons.

(PAUSE)

- To that end, NJ TRANSIT has fundamentally transformed the way it thinks about resiliency and how it prepares for severe weather events.
- We've done so with the understanding that every storm is different.
- With some storms bringing significant surges and flooding, others primarily wind events, and others, ice and snow during winter, grinding service to a halt.
- Though storms may be different, our general approach to them is not. It is strategic, thoughtful, and always "all hands-on deck."
- We have developed comprehensive plans and procedures that are triggered well before the weather event makes landfall and continues until we have fully resumed service.

(PAUSE)

- Following Superstorm Sandy, NJ TRANSIT developed its own Comprehensive Emergency Management Plan or CEMP.

- This plan includes storm preparation, mitigation, and restoration actions across every organizational business line and includes coordinating with external partners such as the New Jersey Office of Emergency Management, the State Police, counties, and municipalities.
- We are constantly learning. We review and update the CEMP annually, ensuring its evolution and comprehensiveness.

(PAUSE)

- To assist our weather event planning, we have incorporated an Inclusive predictive weather service to remain up to date with the best weather information available.
- Using a coastal storm surge warning system developed for us by Stevens Institute of Technology, we maximize the advance notice of storm surge timing, location, and magnitude.
- And partnering with Rutgers University, we're testing an additional and enhanced surge warning system to supplement the information we currently receive.
- We built a state-of-the-art Emergency Operations Center (EOC) in Maplewood, staffed with representatives from every organizational business line in an emergency, to ensure a coordinated response – enhancing internal and external communications with customers and key stakeholders.

(PAUSE)

- Importantly, NJ TRANSIT's response to all emergencies is informed by the National Incident Management System – a standardized approach to incident management developed by the U.S. Department of Homeland Security.

11x

- This process – performed under a formal Incident Command Structure, or ICS – is supported by NJ TRANSIT Police Department's Office of Emergency Management (OEM), which works with all internal and external partners.
- As of today, thousands of NJ TRANSIT employees, including community and partner agencies, have received ICS training through the Texas A&M Engineering Service, or TEEEX, a recognized leader in emergency response training.

(PAUSE)

- Since Superstorm Sandy, NJ TRANSIT's operational thinking has evolved significantly.
- When severe impacts to the system are predicted, we no longer run service until the last possible moment.
 - Instead, we begin an orderly shutdown of service when conditions are predicted to restrict us from safely operating. This allows us to:
 - Communicate to customers, with a goal of providing four hours of advance notice, so they can get to stations and terminals in plenty of time to return home before service is suspended;
 - Safely and strategically position equipment in garages, terminals, and yards, so we can resume service as quickly as possible after the weather event subsides.

(PAUSE)

- As part of New Jersey's overall state emergency plan, NJ TRANSIT serves as an evacuation partner when local resources have been exhausted.

12x

- For example, NJ TRANSIT provided extensive evacuation assistance for Atlantic City residents during Superstorm Sandy.

(PAUSE)

- These initiatives highlight how NJ TRANSIT's has transformed its preparation and response protocols internally.
- Externally, NJ TRANSIT has several billion dollars in Sandy resiliency projects currently in construction or the procurement process.
- They include:
 - Completing the first phase of our \$284 million-dollar **Long Slip Project in Hoboken** with the entire length of the canal filled, protecting Hoboken Terminal and the City of Hoboken from flood water intrusion.
 - Beginning construction on the \$421 million-dollar **Delco Lead Storage and Inspection Facility** in New Brunswick, to provide a critical safe haven for rail vehicles during extreme storms and allow rail cars to be quickly inspected and returned to service once a weather event has passed.

(PAUSE)

- Our **Signals & Communications Resilience** program that is hardening vital signals and communications systems against extreme weather events. This has been completed on our Raritan Valley Line and on two of three sections of our Hudson Bergen Light Rail System, and it continues on NJ TRANSIT's other commuter lines.
- I'd like the Committee to know that we've exceeded Federal Emergency Management Agency (FEMA) guidance by a foot-and-a-half above the recommended base flood elevation levels

for inland areas and two-and-a-half feet above for coastal locations.

- We also now are 62 percent complete for phase one of the **Raritan River Bridge Replacement Project**, the sole rail link for 17 of the 20 stations on the North Jersey Coast Line.

(PAUSE)

- NJ TRANSIT's focus on resiliency extends well beyond our Sandy Resilience projects.
- I can only speak to my experience at the agency over the last four-and-a-half years, but there's been a transformative shift in the culture at NJ TRANSIT when it comes to how we think about resiliency.
- In 2017, NJ TRANSIT had just \$60 million dollars in hard money construction contracts out on the street.
- Since 2018, we've advanced more than \$4 billion dollars in projects – with \$8 billion more projected to be in procurement or construction over the next three years.
- Resiliency is the key element and consideration in all of these projects.
- We simply do not design infrastructure today without first asking, "would this withstand a weather event similar or greater than Superstorm Sandy?"
- NJ TRANSIT has made great strides over the past 10 years to better prepare for, mitigate against, respond to, and recover from disasters, but there is still much more to do.
- With your continued support, NJ TRANSIT will meet this challenge as we continue to shore up our system to protect our customers, our

mobility, and our very way of life.

- Chairs Kennedy and Karabinchak, members of the Committee, thank you for your time today and for the opportunity to speak on NJ TRANSIT's behalf.

Testimony of Rutgers, The State University of New Jersey
Hurricane Sandy 10th Anniversary Joint Special Hearing
New Jersey Assembly Solid Waste and Environment Committee
New Jersey Assembly Special Committee on Infrastructure and Natural Resources
October 6, 2022

Jeanne Herb
Director; Environmental Analysis & Communications Group
Rutgers University Bloustein School
Co-Director; New Jersey Climate Change Resource Center

Lisa Auermuller
Assistant Manager;
Jacques Cousteau National Estuarine Research Reserve
Administrative Director;
Megalopolitan Coastal Transformation Hub

Lisa Auermuller:

Thank you for the honor to be here today and for the opportunity to share the community resilience work that Rutgers has been undertaking for 10 years. My experience in this topic comes from working and living in a small coastal community in Southern Ocean County where I am the Assistant Manager of the Rutgers-managed Jacques Cousteau National Estuarine Research Reserve - and a coastal resident. As Rutgers staff embedded at the coast, we are trusted sources of science-based information and anchors in the community. It is through this shared, lived experience, and decades of relationship building with coastal decision-makers, that Rutgers staff and scientists provided over 65 coastal communities with direct technical assistance following Superstorm Sandy.

Jeanne will talk to you more about Rutgers's ongoing commitment to not only maintaining, but building that trusted relationship, but before she does, I would like to share what working directly with coastal communities over the past 10 years has taught me about community resilience.

I was on the front line of that work and here are three lessons I have learned:

1. We quickly forget.
2. Action requires sustained investment - and
3. We need to know where we are going.

On Lesson 1: It is easy to forget

Ten years later, homes are higher, and plans have been written,but people are forgetting. While there is now increased awareness of coastal hazards, it is much easier to go back to life along the coast as if Sandy didn't happen. In many cases, the higher and newly rebuilt homes mean not only a false sense of security but mean increased property values in areas that are now even more at risk with 10 years of additional sea level rise added to their previous flooding baseline. And it doesn't take a storm to have flooding - Sunny day flooding events are becoming more and more frequent. In the coastal community I live in, School buses commonly divert their routes to accommodate student drop off and pick up on flooded local roads.

- Higher homes (alone) do not make a community resilient.
- Municipal Planning (alone) does not make a community resilient.

Which leads me to my 2nd point...

- Planning Comes Easy. Taking action requires sustained investment:

All the planning for resilience now needs to be put into action. Additional technical assistance to municipalities, funded through Sandy disaster funding, needs to become part of permanent programs aimed at getting local governments the economic and educational resources they need to turn words into projects.

Capacity-limited municipalities need hands-on, sustained help to navigate the world of resilience grants, guidance, and continuously updated science.

New recognition of the mental toll that coastal disasters bring to residents and practitioners, alike, needs to become part of the conversation.

Our most vulnerable and historically underrepresented populations need help even getting by day to day before we can expect them to prepare for the future.

And finally, We need to know where we are going...

We need an inclusive vision for the future of coastal New Jersey. The "one-off" approach does not equal a resilient NJ. Evacuation routes and storm surges do not begin and end at municipal boundaries. To be resilient together, we need to vision together. It should not be a one size fits all vision— In fact, it should be unique in its regional approaches. This vision can honor the past, preserve the culture of the shore, and aim to create a future New Jersey Coast that continues to adapt to an ever-changing coastal environment.

In summary - Resilient New Jersey communities mean the whole community – it means homes, infrastructure, businesses, visitors, the natural environment, and the people. It means not just bouncing back from a future Sandy. It means bouncing forward and being prepared to embrace the ever-changing future.

And with those thoughts, I turn it back to you, Jeanne...

Jeanne Herb:

The work that Lisa and other Rutgers colleagues led following Hurricane Sandy provided a great foundation for a much more expansive effort at Rutgers. Our aim is to bring the research and skills of the university to advance resilience and preparedness efforts at the coast and statewide. A second goal is to prepare our students to lead preparedness and resilience efforts regardless of whether they are studying engineering, sciences, community planning, public policy, or other disciplines.

For today's hearing, I will highlight a few efforts underway, but I would be remiss in not acknowledging that Rutgers' efforts on these topics are wide and deep. Examples include:

- Using laser scanning technologies to collect more accurate building footprint data to inform disaster preparedness and recovery efforts;
- Developing guidance for restoring Blue Acres properties to maximize their ability to store floodwaters;
- Engaging small businesses to assess their preparedness efforts and needs for assistance;
- Better understanding the connection between extreme weather events and housing insecurity;
- Assessing impacts of changing climate conditions on municipal finance and property values; and
- Helping urban communities to use green infrastructure to capture stormwater with cost-effective practices before it enters combined sewer systems.

In 2020 the legislature passed a law creating the New Jersey Climate Change Resource Center and housed it at Rutgers. The mission of the Resource Center is to act as a "service center" to provide support to state and local policymakers, community leaders, hazard and community planners, educators, and others to integrate the latest science, data, and best practices into their preparedness efforts.

We do this in four ways:

1. **We bring the latest science and evidence to bear in support of state agencies as they work to advance internally consistent policies and programs.** Examples include collaborations with:
 - The Office of Emergency Management to develop and maintain free-web based data tools that county and municipal hazard planners can use to help them identify projects that may benefit from federal grants. Our work with OEM will continue into the future with us providing support to its update to the State Hazard Mitigation Plan and its development of tools and guidance for local hazard planners. This work will help New Jersey to advance more informed mitigation strategies as well as to prepare applications for federal funds.
 - The Office of Planning Advocacy in the Department of State to provide support to towns going through the State Planning Commission's Plan Endorsement process;
 - The Department of Transportation to develop guidance its staff can use internally to assess vulnerabilities that may be associated with proposed activities in flood prone areas;
 - The Department of Environmental Protection on many efforts, including:
 - developing guidance for considering of environmental justice as part of local natural hazard planning;
 - assessing scientific consensus on future sea level rise in New Jersey;

- developing a training for local hazard and resilience planners on how to engage underrepresented populations in their efforts;
- assessing options for monitoring ocean acidification impacts that has the potential to affect our fisheries industries; and
- research on exemplar practices outside New Jersey to contribute to DEP's development of what Commissioner LaTourette refers to Blue Acres 3.0.

2. We develop practical guidance and tools for use by many end users including county and municipal hazard planners, public health agencies, local officials, nonprofit and community-based organizations, flood plain managers, and agencies that make decisions about large infrastructure investments, among others.

I need to take a quick pause here to highlight an aspect of our work that is widely used every day. Over the past several years, we have developed a portal of key data that is needed by state and local decision-makers, planners, and communities to better understand threats and vulnerabilities caused by natural hazards and changing climate conditions. This portal, called NJADAPT (<https://njclimateresourcecenter.rutgers.edu/nj-adapt/>) allows end users to have FREE and VERY easy access to state and local data on climate impacts and natural hazards. We have heard loud and clear from our end users that it is too much to expect them to negotiate complex technical and scientific data and to translate it into actionable products. Our job is to make their job easier by identifying and assembling complex data about climate futures and natural hazards and to make them easy to use.

NJADAPT includes scientific data on climate change trends and futures as well as data on critical assets, built infrastructure, natural resources and people and communities. What is important for me to stress, however, is that NJADAPT is not just a massive data clearinghouse. Yes, it hosts a ton of authoritative data, but it does much more than that. We work closely with end users to develop tailored applications on our website. Examples include:

- An application called 'municipal snapshot' that puts municipal level data on climate impacts in one automated report which provides support needed for county and municipal local officials;
- An application called New Jersey Floodmapper that assembles all critical data related to flooding in our coastal areas in one mapping tool;
- An application we will be releasing over the next two weeks called HazAdapt that presents key sets of data that county and municipal hazard planners need to comply with state and federal hazard mitigation planning requirements;
- An application we will be releasing in about a month called HealthAdapt that integrates data on municipal level health outcomes with climate data and data on social determinants of health with end users being state and local health officials and community leaders.

We know that these tools are well used. In 2021, they had more than 52,000 hits with almost 34,000 unique users and, to date in 2022, we have had almost 42,00 hits with almost 26,000 unique users.

We recently finished a breakneck schedule of tailored, virtual trainings on use of these various tools. For example, training sessions were tailored for public health officers, reporters, county planners, green team and environmental commission members, and flood plain managers.

In addition to trainings on our NJADAPT tools, we are currently working in consultation with NJDEP, NJOPA, NJDCA and NJOEM on an in-person resilience training 101 that we will offer during the first quarter of 2023.

3. **We offer direct technical assistance to communities to better understand their vulnerabilities to extreme weather events and changing climate conditions.** We have formed the New Jersey Climate Corps which is a cohort of highly skilled graduate students that are working with municipalities, especially municipalities that have limited capacity, to use our own guidance and data tools to examine local vulnerabilities to climate-related natural hazards which is now required as a result of 2021 amendments to the Municipal Land Use Law. This is a great opportunity for municipalities to get free assistance from our students who are guided by a professional member of our team and it's an equally great experience for our students to build their own knowledge and skills.
4. **We conduct research that can be readily applied.** For example, we are just finishing up development of a heat vulnerability index that provides a relative comparison of vulnerability to extreme heat at a census tract level based on several physical characteristics, such as the proportion of a census tract with impervious cover, and socioeconomic factors such as the percentage of the population living below the poverty line. We have seen other states use indices such as these to develop measures for occupational safety and public housing. Another example is our release this past spring of an updated State of the Climate Report for New Jersey that assembles all the most recent science to outline anticipated climate futures for New Jersey. The law creating the Resource Center directs us to engage with other academic institutions here in New Jersey to form collaborative efforts on applied research to benefit the state's preparedness and climate resilience efforts. We will be launching a major effort in this regard by convening a spring 2023 symposium of academic and other researchers, including county and community colleges, who are working on diverse research that can support natural hazard preparedness and climate change resilience efforts here in New Jersey. The outcome will be a network of researchers focused on climate change vulnerabilities and solutions here in New Jersey.

Let me add a fifth item here. Five years ago, Rutgers launched a nationally innovative program with funding from the National Science Foundation called the Coastal Climate Risk and Resilience Training Program (C2R2). The program is designed to prepare graduate students in diverse disciplines – engineering, community planning, environmental science, geology and geography, ecology and public policy – to address the wicked programs associated with building sustainable solutions to natural hazards and changing climate conditions. Our students are trained to think outside of the boundaries of their own disciplines to build solutions that intersect socioeconomic, ecological and engineered solutions. Students are trained to become effective communicators and to understand the processes that lead to sound decision-making and public policy. We are now seeing the outcomes of the program with students professionally placed in federal, state and local agencies, in Congressional offices, in private sector firms where they are leading planning and engineered solutions, and in research

institutions. We are now planning an enhancement of the program to build in all climate hazards and not just those related to coastal flooding and to tie the students' experiences to service to New Jersey through integration with the Resource Center's New Jersey Climate Corps.

So, given all that, I offer three things that we have learned:

- We have learned that preparing our communities and our state for natural disasters and changing climate conditions is a wicked problem that demands holistic strategies. Long term and sustainable solutions cannot be piecemeal: wetlands here, affordable housing there, historic preservation way over there, building codes up there, transportation down here and health over on the side, etc. Long term and sustainable solutions demand integrated systems thinking. We need bold solutions that assess the impact that individual policies and actions will have on other goals.
- We know that, here in New Jersey, the issues are not so much about whether our residents "believe" in climate change. The 2021 Yale public opinion polls indicate that 65% of New Jerseyans are worried about climate change and 71% of us believe it will harm future generations. We know from our engagement with hazard planners, local officials, public health officers, flood plain managers and others that they are well aware of the impact that natural hazards and climate change have on their communities. Our challenge is about putting the systems in place that makes it easy for those leaders to make informed, sustainable and holistic choices.
- We have learned that underlying social inequities – structural racism/discrimination, underinvestment in certain communities, exclusion of marginalized populations from decision-making – result in a reality where risks and opportunities are not equally shared. Our work has involved engaging community leaders to identify climate resilience strategies that ensure that opportunities are directed to people hardest hit by climate change. We hear a consistent response from communities: by ensuring equitable access to the conditions that allow all of us to lead happy and healthy lives - affordable housing, well-paying jobs, health care, vibrant communities, etc. – we will build resilience for generations to come.

Before I wrap up, I am compelled to mention that one hat I wear at the University is to facilitate the New Jersey Climate Change Alliance. For a dozen years, the Alliance has operated as a cross-sector network of diverse organizations that have a shared commitment to science informed climate action in New Jersey. In terms of the focus of today's hearing, I urge you to review several products of the Alliance including its 2014 recommendations on actions needed to build resilience in New Jersey, its 2021 review of policies and programs in four other states, and its recently developed outline of options for legislation to advance preparedness and resilience in New Jersey (Links to documents are included in the box on the next page).

Bottom line: We have learned that advancing bold solutions on complex climate resilience issues demands decisive guidance, funding resources, technical assistance and training. We believe that THAT is where the Climate Change Resource Center and our university, in general, came come in - by developing the science, the data, the guidance and the solutions that can be translated into state and local actions and policy. Thank you for your ongoing support and please consider a resource to your work.

New Jersey Climate Change Alliance Highlighted Products

- Outline of legislative elements: February 2022 - [https://njadapt.rutgers.edu/images/FINAL legislative elements 2-5-22_1.pdf](https://njadapt.rutgers.edu/images/FINAL_legislative_elements_2-5-22_1.pdf)
- Brief overview of programs in 4 states MD, MA, NY, RI
- [https://njadapt.rutgers.edu/images/reports/REVIEW OF 4 STATE RESILIENCE PROGRAMS.pdf](https://njadapt.rutgers.edu/images/reports/REVIEW_OF_4_STATE_RESILIENCE_PROGRAMS.pdf)
- 2014 policy recommendations (spoiler alert - not much has changed) - <https://njadapt.rutgers.edu/docman-lister/resource-pdfs/209-njcaa-recommendations>
- 2013 Analysis of policy gaps to advance resilience - <https://njadapt.rutgers.edu/docman-lister/resource-pdfs/73-njcaa-gap-analysis-final-pdf/file>



10th Hurricane Sandy Anniversary Climate Change Adaptation & Resiliency Testimony
Doug O'Malley, Director
Assembly Environment & Assembly Infrastructure & Natural Resources Testimony
October 6, 2022

Good morning, thank you for the opportunity to testify today. My name is Doug O'Malley, and I am the Director at Environment New Jersey. Environment New Jersey is one of the state's largest citizen-based environmental advocacy organizations, representing more than 80,000 dues-paying members & activists.

As we approach the 10th anniversary of Hurricane Sandy, New Jersey is still experiencing the negative impacts of climate change. Last year's powerful storms, Elsa, Henri and Ida, have had a lasting effect on our communities and are a constant reminder that the impact of Hurricane Sandy – and the increased intensity of storms fueled by climate change – was not a one-off. Communities need additional tools to help address the negative impacts of climate change. The emergency NJPACT rule are one set of tools that will be helpful in minimizing these climate change impacts. New Jersey has outdated standards for stormwater management that do not adequately address current storms or protect our communities from future, powerful storms. Additionally, the emergency NJPACT rules would require new development to build stormwater systems to account to handle more rainfall. This will help to minimize the flooding that may occur and damage our community may experience.

NJPACT REAL Flooding Rules:

The environmental community applauded in January 2020 when Gov. Murphy issued Executive Order 100 pledging to protect New Jersey residents, municipalities, businesses and the environment from the impacts of climate change. This executive order was an important step in fulfilling campaign promises regarding climate change and the environment. We have been eagerly awaiting action to implement the executive order for more than two years and were excited to hear that the New Jersey Department of Environmental Protection (NJDEP) was preparing emergency rules to prevent new developments in flood prone areas and make our state's stormwater mitigation rules more effective. In mid-June, we heard that these overdue rules changes were being delayed once again.

New Jersey cannot afford more delays. As Hurricane Ida and other more recent storms have made clear, New Jersey's current land use regulations are out of date and not sufficiently protective. Many communities in New Jersey endured devastating floods – many experiencing historic levels of flooding, 30 people lost their lives including many residents in basement apartments and people who sadly drowned in their cars. The storm caused hundreds of millions of dollars of property damage, resulting in FEMA payouts of more than \$247 million to close to 45,000 New Jersey residents. As we approach the one-year anniversary of Ida, many New Jersey residents are still not back in their homes and still lack the funds they need to move out of harm's way. While the memory of Hurricane Sandy is more distant, its impacts

had an even greater impact statewide, and a reminder that we can't predict the intensity of the approaching storms.

As Gov. Murphy announced at the signing of Executive Order 274 last November to reduce New Jersey's climate pollutants by 50% by 2030, "We must meet the devastating impacts of global warming and climate change, with bold intentional action." The November statement was not the first time that Gov. Murphy acknowledged the dangers of climate change and committed that the Murphy administration would take action. According to Executive Order 100, "[t]he State's ability to reduce the severity of adverse climate change impacts will depend on the collective effort and commitment of our political and community leaders, businesses, industries, and government entities to undertake considerable efforts to reduce greenhouse gas emissions on an economy-wide basis."

Gov. Murphy directed NJDEP to adopt NJPACT (New Jersey Protecting Against Climate Threats) regulations that "[i]ntegrate climate change considerations, such as sea level rise, into its regulatory and permitting programs, including but not limited to, land use permitting, water supply, stormwater ..." and promised that this work would be completed by January 27, 2022. Not only have these rules called for in EO 100 not been adopted, they have not even been proposed. New Jersey is still waiting for the bold action Gov. Murphy rightly told us our state needs.

The provisions we understood were to be included in NJDEP's proposed emergency rule were pragmatic, reasonable steps that came as a result of a transparent process. NJDEP held stakeholder meetings in 2018, 2019, and 2020 in which the agency acknowledged that the data the State has been using to calculate the regulatory storm events was outdated. It was readily understood that using this outdated data results in stormwater management systems that cannot treat the storms our state is experiencing. The scientific data to support this widely recognized problem was released in November 2020. Now is the time to act on the only possible conclusion; to update the regulations to use the most current, protective data. Similarly, in the 2020 stakeholder meetings regarding the NJPACT initiative, NJDEP acknowledged the need to adjust the mapping of flood plains to adequately reflect recent storms and flooding in New Jersey.

Tens of thousands of New Jersey's residents have experienced expensive and heart-breaking losses, because their homes were built in floodplains, especially during Hurricane Ida, damage that had strong echoes of the damage inflicted by Hurricane Sandy. Gov. Murphy saw first-hand this devastation in the harrowing days after the storm when he declared that we need "a new playbook" when we are responding to climate change. Municipalities have had to rebuild roads, bridges and other public spaces and infrastructure damaged by flooding at great expense. Gov. Murphy visited Lambertville early in May, which was devastated by Hurricane Ida to announce new federal dollars that would allow the state to increase the Blue Acres flooding buy-out program by \$50 million and community stormwater grants by \$10 million. The NJPACT rules and, in particular, the emergency rules, are an important step to limit these huge economic and personal expenditures in the future.

We wish to commend the work of the New Jersey Department of Environmental Protection, NJDEP Commissioner Shawn LaTourette and countless NJDEP staff on this initiative. It is to their credit that the proposed emergency rules were revised in the immediate wake of Hurricane Ida early last fall (following on the heels of damage from Tropical Storms Henri and Elsa last summer) to reflect this new normal in inland flooding across the state.

The additional time that has been proposed for additional stakeholder meetings on these topics, which have been discussed for more than four years and announced for more than two years, at best can be seen as a delay tactic. At worst, it will provide an opportunity to push through land use permits before the emergency rules go into effect and to ultimately weaken the overall impact of the emergency rules. In short, it continues to put people and property in harm's way.

24x

The emergency rule would also refine the flood plains to better account for the actual risk of floodings. The current standards rely on old data that is no longer relevant. By updating the flood plain criteria, New Jersey can help prevent new development from being built in harm's way. By issuing these new rules, all new development whether in our community, upstream from us or downstream will have conform to the realities today. We will all be better protected than we are today.

We – along with a broad set of environmental organizations – urge the Legislature to tell the Murphy Administration to release the NJPACT rules without further delay and to propose the rest of the NJPACT flooding rules by the end of this year. We cannot and should not wait for another storm to flood our neighbors and families before we act. It is time to put the interests of New Jersey residents above those seeking to build yet more development in flood plains, with under designed controls on stormwater.

Coastal Resiliency & Beach Replenishment:

The Shore Protection Fund has provided the state's share of funding for beach replenishment projects in the age of climate change. We believe beach replenishment is an overused tool that the State has relied on almost exclusively in response to climate change, sea level rise, and increasingly active coastal storms and we are proud to join the New Jersey Coastal Alliance is an affiliation of more than 20 conservation and environmental groups concerned with the ecological and recreational resources of the New Jersey coastline.

It is critical that the state and shoreline communities adopt an overall comprehensive approach to beach erosion and shoreline damage from storms, shoreline migration and sea-level rise. Therefore, beach replenishment projects in dollars must be matched with the removal of structures from the water's edge, restoring natural features such as dunes, wetlands, natural habitats, and stream buffers, and undertaking other shoreline restoration projects. In addition, shoreline municipalities receiving funding from this act must adopt ordinances that will preclude development in flood-prone areas and complete the state recommended Climate Resiliency Assessment.

We also have reservations concerning how this funding is managed by the New Jersey Department of Environmental Protection (NJDEP). The requirement outlined in the legislation 13:19-16.2, 1a requires the preparation of a priority list, and review of this list by the State Assembly and Senate. These are specific requirements to ensure transparency and public participation (in the form of hearings) that have not been met once in over two decades since the requirement was instituted in 1999.

Instead, monies have been authorized from the annual appropriations act which according to 13:19-16.2, 1c is only to be used if the legislature has not approved the priority list by June 1st, as outlined in 13:19-16.2, 1b. We feel that this effectively games the system, because if no list is ever submitted, the Legislature can't approve one.

We are living in an era of more extreme weather events fueled by climate change, which has only intensified in the decade post Sandy. Our state resiliency policies should reflect that and not rely on endless beach replenishments as the permanent solution to increased storm surges. We need a comprehensive approach to beach erosion and sea-level rise that doubles down on natural barriers like dunes and living shorelines, expansion of Blue Acres and climate resiliency programs from NJDEP that restrict development in coastal floodplains. With the current need for climate mitigation, it does not make sense for the state to double funding for beach replenishment.

The Surfrider Foundation gave the state of NJ an "F" grade in their annual State of the Beach Report in 2018 and only a "D minus" in 2019. An over reliance on beach replenishment is one of the reasons for the poor grade. Beach replenishment alone will not be sufficient to meet the challenges of the coming climate catastrophe.

Since dredge and fill operations began in NJ, an enormous amount of money has been spent placing sand on beaches. The Program for Studies of Developed Shorelines out of Western Carolina University tracks all beach replenishment projects across the country and their costs. Their total for NJ from 1989 to 2018 is \$1,542,879,751.

The state of NJ has already laid out a variety of ways to prepare NJ for climate change and sea level rise. Many different strategies have been outlined in the NJDEP document, Climate Change Resilience Strategy. These are the strategies we should be focusing on as well as considering these alternatives.

Alternative way to pay - Special District

An alternative way to pay for replenishment should be considered. Imagine a special district, not unlike a Business Improvement District, where the beneficiaries of replenishment are the ones paying into it. In this scenario, oceanfront homeowners would pay the most since they are getting the most benefit from replenishment. The second row of homes would pay less since they get less benefit, and so on. In this scenario, we do not get rid of beach replenishment, but we change how we pay for it. Every taxpayer in New Jersey and farmers in Iowa would no longer be paying for sand that they may or may not ever sit on.

Stronger Building Codes

Flooding is not the only cause of property damage in a hurricane or storm event. Wind damage can be substantial in such an event. Stronger building codes in the coastal area would prevent property damage from wind. This would undoubtedly save life and property.

Buyouts

New Jersey's Blue Acres program is a great program, but it only buys properties on floodplains along rivers. It does not buy repeatedly-flooded properties along the Atlantic Coast or any of the coastal bays of NJ. A much larger pot of money is needed to accommodate buyouts in these areas with the same philosophy as the Blue Acres program.

Relocations

Coupled with buyouts, relocation projects that encourage property owners to relocate to safer areas could assist and speed the process of moving properties away from the coast. For example, if waterfront property owners were always and automatically given the right of first refusal to buy any property up for sale in safer areas of that town. This would speed the vacating and relocating of the most vulnerable frontline of housing. This obviously requires a massive pot of money to buy these waterfront properties, but it would be faster than waiting for "willing sellers" to sell their properties to the government.

Living Shorelines

There is ample evidence that living shorelines can provide defense from storm surge and flooding. Living shorelines are an alternative to hard structures along shorelines made of natural materials and native vegetation. In lower energy environments like bays, the living materials can be animals instead of plants like oyster reefs. On ocean-facing beaches, a living shoreline would be a natural or constructed dune, well vegetated with native plants.

BOROUGH OF WESTWOOD

Mayor Ray Arroyo



TELEPHONE 201-664-7100 · FAX (201) 664-4260 · 101 WASHINGTON AVENUE · WESTWOOD, NJ 07675

October 5, 2022

Assembly Environment & Solid Waste Committee
Assemblyman James Kennedy, Chair
VIA EMAIL

RE: A4200/S790

Dear Assemblyman Kennedy:

I am writing to share cost projections that underscore the need for S790 and A4200 to be signed into law. Westwood's Governing Body has been considering applying for grants to implement DEP permitted Stream Stabilization. The FEMA nomenclature Stream Restoration describes the same scope of work.

This program allows removal of some portion of the accumulated muck that has shallowed the creek bed, slowed the channel's flow, altered its course and reduced its effective drainage capacity. The removed material is reallocated along the badly eroded banks. The banks are reinforced with rip rap (and/or retaining walls where necessary) and the vegetation is replanted.

The Westwood Borough Clerk is the designated point person for researching flood programs. She did a preliminary cost analysis based on estimated unit costs supplied by the Borough Engineer. A 15% allowance for soft costs was added in. (See the enclosed spread sheet, which has been reviewed and confirmed by the Borough Engineer).

Based on these estimates, the cost of removing/reallocating shoals to stabilize, reinforce and restore both sides of the Pascack Brook all along its travel through Westwood would range somewhere between 5 and 20 million dollars (plus the 15% added to the final amount), depending upon the mix of applications employed in a final scope of work.

To put the cost scale of the worst-case scenario into perspective: \$23,000,000 is more than Westwood's entire 2022 municipal budget. It is almost 30 times the cost of our 2022 road milling and paving program. And it's about the cost of the latest round of Westwood Regional School District expansions and improvements to the district's learning infrastructure.

The physical improvements cited above address purely local conditions. Improving the flow of the Pascack Brook along both sides of its Westwood banks will send more water, more swiftly to the next unimproved stretch in a downstream town. The bottleneck simply follows the path of least resistance.

Still - strictly as a thought experiment - were Westwood, River Vale and Hillsdale to join together and get this done, it would be an impressive drive downfield, setting rushing records and scoring touchdowns. It might win a welcome reprieve of some duration for the residents along the Brook in our respective towns. But it doesn't win the war against an endless cycle of erosion, silt accumulation, and destabilized stream banks that are ever shallowing the drainage conduits, now carrying more runoff from overdevelopment along the watershed, dropped there by the increasing intensity of rain events. That would require a coordinated, regularly-maintained, top-of-drainage-basin-to-bottom, federally- or state-funded effort that has not been forthcoming.

27x

Whether that failure to launch is due to the aggregate cost of such an effort, the priorities of state and national politics, or simply inertia, the fact remains that the individual municipalities will never be able to fund capital projects to restore channel capacity and flow in any meaningful way. A full blown, more universally-effective stream stabilization effort along the entire length of the drainage basin would generate costs that are many multiples of the spread sheet analysis – and even more out of reach.

In the meanwhile, FEMA 's recent Risk Rating 2.0 shifts more of the cost burden of its taxpayer-subsidized flood premiums onto the covered property owners. This is intended to dissuade new construction in flood prone areas. It also analyzes the unique risks to a particular property (actual distance from water and 100% value of replacement cost) versus the general standard of a home's elevation relative to a designed flood zone. By FEMA's own internal estimates this approach could, due to unaffordable premium increases, force 1 million ratepayers to forego flood insurance by the end of the decade.

Since inception of the new pricing parameters, 165,00 households nationwide have already left the NFIP. These homeowners will risk catastrophic losses, which may generate ancillary, public-safety-net costs. Such statistical data indicates most cost-effective flood mitigation for our Pascack Valley residents and businesses is the passage of S790 and A4200.


The piecemeal approach the Pascack towns might implement via Stream Stabilization/Restoration, while providing highly localized relief, can nevertheless produce other problems downstream even as it multiplies the municipal debt service. Compelling the water utilities to manage their product can significantly mitigate physical damages, alleviate the upward pressure on flood premiums, and reduce the scope of Stream Stabilization projects to a more cost-effective level.

Recent events underscore yet another reason why the status quo makes no sense. We've had a dry summer with no appreciable rain since the Memorial Day week. We'd flirted with flood then, yet the reservoir level, with the gates set to Summer Mode at 95 feet, had room for the influx due to the drought. On September 1st the gates, on schedule, automatically went into Winter Mode at 91 feet, with the reservoir level at 89.5 ft.

Heavy rains that passed through the area over a 24-hour period (Sept. 6 to Sept. 7) came with flood advisory alerts from Bergen County OEM as the rain and runoff quickly filled the newly-narrowed headroom, crested the gates and began to overspill. After hearing all summer about drought conditions, this scenario begs the question of why the gates were not raised to retain more water. Were the dam operators subject to more flexible and situational interventions, more of the water asset might have been retained. AND, had the gates been moved higher than the rote Winter Mode protocol, the flood alert would have been unnecessary, rendering the inevitable stress on our residents and business owners - avoidable.

S790 has not moved in committee since it landed there on January 18 of this year. Neither has A4200. Our local flood association – NJ Flood Solution Advocates - has collected (as of this writing) over 650 signatures in support of this legislation.

It deserves a hearing and a debate before the next Ida, or its ilk, wreaks havoc upon our towns.


Ray Arroyo
Westwood Mayor

Enclosure

cc: Senator Holly Schepisi
Assemblyman Robert Auth
Assemblywoman DeAnne DeFuccio

28X

**Pascack Brook
Bank Stabilization Estimates**

	\$150/linear foot	\$600/linear foot	\$600 plus 15% for soft costs
Westwood owned bank (16,289.7 ft)	\$2,443,455	\$9,773,820	\$11,239,893
Westwood side visually, border to border, inclusive of small spits into Rivervale not owned by Westwood (18,554.2 ft)	\$2,783,130	\$11,132,520	\$12,802,398
Hillsdale bank (6,796.6 ft)	\$1,019,490	\$4,077,960	\$4,689,654
Rivervale bank (10,930.6 ft)	\$1,639,590	\$6,558,360	\$7,542,114
Both sides, border to border (34,016.9)	\$5,102,535	\$20,410,140	\$23,471,661

29x

October 5, 2022

Governor Philip D. Murphy
Office of the Governor
225 West State Street
Trenton, NJ 08625

Dear Governor Murphy:

We, the undersigned 49 organizations, are writing today to follow up on our letter sent June 21, 2022, calling for the immediate release of the New Jersey Protecting Against Climate Threats emergency rules. It has been over three months since the Department of Environmental Protection was to issue these rules and nothing has occurred. It is urgent that NJ put in place every protection possible against the threats from flooding to life, public health, and property damage.

Every development application submitted to the NJDEP or a local land use board for approval since June continues to use outdated, insufficient data, subjecting all of New Jersey to threats of ongoing, unnecessary flooding. It could result in increased threat of death from flooding; the loss or damage to our homes and cherished memories from flood water damage; and ongoing threats to public health. Unnecessary flooding that the emergency rules would have avoided.

There is a real cost borne by all of New Jersey when we flood. This cost was laid bare during the recent public hearing on DCA's Action Plain: For the State of New Jersey Tropical Storm Ida. Speaker after speaker revealed that they are still not in their homes, one year after Ida. Many lost everything that they owned. It was also very clear that many of them may never be made whole from their loss. The trauma from flooding out is real and impacts people's lives. These are the costs that cannot be quantified: the disruption to lives displaced from their homes; memories lost in wedding albums; children's art carefully saved by proud parents; cherished heirlooms damaged in floods -- the cost of a lost way of life. And the emotional scars many are living with.

There is also a cost borne by municipalities, counties, and the state in rescuing people from flood waters; closing roads that are flooding; repairing those roads and bridges; removing debris for our public properties; the damage to public buildings, etc. Jobs may be lost when a place of business is damaged or destroyed.

30x

New Jersey has the tools ready, failing to use them ignores the consequences above and potential more. Developments must be required to design to the current storms and relocate proposed buildings out of flood plains, lest we unnecessarily put future owners and occupants in jeopardy and force them to bear the cost. As it stands, we are allowing development to occur under standards we know are not protective. It is also important to note that even with these new standards, there are relief valves, in the rules, for those projects that cannot be located outside of the flood plains. The opponents to the emergency rule have not objected to the science informing the updates nor have the submitted contrary data. The objectors object to the proposed process because they have invested time and money in plans that may put people at risk

We vehemently disagree with critics that say "there is no imminent threat." The law places wide discretion in the determination of an imminent peril justifying the use of an emergency rule. Your best staff and scientists at NJDEP have already made that determination and recommended emergency rules to avoid loss of life and property. Both you and the Department have acknowledged the imminent peril that climate change presents to New Jersey.

While we all hope that another intense storm or hurricane will not impact New Jersey, we cannot rely on hope. It was fortunate that Hurricane Ian did not make its way to New Jersey, but we know that the next Ida or Sandy is around the corner. As you have said, "we must become proactive in our approach to protect the communities and businesses that continue to bear the brunt of flooding and damage from these storms" (May 3, 2022 Press Release "Governor Murphy, Department of Environmental Protection Commissioner Announce New Investments in Flood Protection").

It is time to be proactive. Issue the full suite of emergency NJPACT rules today. When you do, we stand ready to vigorously defend your action and are confident we will win in the court of public opinion and the court of law. More importantly, we will know that you did all you could to save lives and property. To do any less puts more people in harms' way and endangers the lives of state residents.

Sincerely,

Jim Waltman, Executive Director, The Watershed Institute

Bill Kibler, Policy Director, Raritan Headwaters

Ed Potosnak, Executive Director, New Jersey League Conservation Voters

Julia Somers, Executive Director, New Jersey Highlands Coalition

Doug O'Malley, State Director, Environment New Jersey

31x

Kelly Knutson, Director, Coalition for the Delaware River Watershed
Clea Carchia, Executive Director, Rahway River Watershed Association
Captain Bill Sheehan, Riverkeeper & Executive Director, Hackensack Riverkeeper, Inc.
Laurie Howard, Executive Director, Passaic River Coalition
Fred Akers, Administrator, Great Egg Harbor Watershed Association
Lori Charkey, Director, Bergen Save the Watershed Action Network
Jennifer Coffey, Executive Director, Association of New Jersey Environmental Commissions
Heather Fenyk, PhD, AICP/PP, Board President, Lower Raritan Watershed Partnership
Jaclyn Rhoads, Ph.D, Assistant Executive Director, Pinelands Preservation Alliance
Alex Ireland, Ph.D, Acting President & CEO, New Jersey Audubon
Laura McBride, President, Deal Lake Watershed Alliance
Cindy Zipf, Executive Director, Clean Ocean Act
Tom Gilbert, Co-Executive Director, New Jersey Conservation Foundation
Faith Teitelbaum, Director, The Whale Pond Brook Watershed Association
Sally Rubin, Executive Director, Great Swamp Watershed Association
Ames Hoyt, President, Save Hamilton Open Space
Brita Forsberg, Executive Director, Save Barnegat Bay
Anne Poole, President, New Jersey Environmental Lobby
Greg Remaud, Baykeeper & CEO NY/NJ Baykeeper
Maya K. van Rossum, Delaware Riverkeeper, Delaware Riverkeeper Network
Kate Tallon, Executive Director, Crafts Creek Hill Brook Watershed Association,
Anjuli Ramos-Busot, Director, New Jersey Sierra Club
Jesse Burns, Executive Director, League of Women Voters of New Jersey
Tim Dillingham, Executive Director, American Littoral Society
Amy Goldsmith, NJ State Director, Clean Water Action
Staci Berger, President & CEO, Housing & Community Development Network of NJ
Chief Vincent Mann, Turtle Clan of the Ramapough Nation
Chief Vincent Mann, President, Ramapough Culture and Land Foundation
Cali Alexander, Policy Chief, Northeast Organic Farmers Association of NJ
Silvia Solaun, Director, New Jersey Forest Watch.
Richard Lawton, Executive Director, New Jersey Sustainable Business Council
Dave Pringle, Empower NJ
Lindsey Kayman, Environmental Education Fund
Chris Vitalos, Director, Save Roaring Rock Park
Dr. Lynn R. Siebert, President, Burnham Park Association
Bill Honachefsky, President, Union Forge Heritage Association
Laurie Cleveland, Executive Director, Sourland Conservancy
Thomas Dallessio, Executive Director, Musconetcong Watershed Association
Janet Goehner-Jacobs, Executive Director, Saddler's Woods Conservation Association
David Epstein, President, The Land Conservancy of New Jersey
Tom Koven, Citizens for Sustainable Planning
Rev. Fletcher Harper, Executive Director, GreenFaith
Alex Ambrose, Transportation & Climate Policy Analyst, New Jersey Policy Perspective

Greg Westfall, Executive Director, Crosswick Creek & Doctor's Creek Watershed Association

Cc: Sheila Y. Oliver, Lieutenant Governor,
George Helmy, Chief of Staff, Governor Murphy
Shawn M. LaTourette, Commissioner, NJ DEP
The Honorable Nicholas Scutari, Senate President
The Honorable M. Teresa Ruiz, Senate Majority Leader
The Honorable Steven Oroho, Senate Republican Leader
The Honorable Bob Smith, Senate Environment and Energy Chair
The Honorable Craig Coughlin, Assembly Speaker
The Honorable Louis Greenwald, Assembly Majority Leader
The Honorable John DiMaio, Assembly Minority Leader
The Honorable James Kennedy, Assembly Environment and Solid Waste Chair
Seth Hahn, Executive Director, Assembly Majority Office
Mark Duffy, Executive Director, Assembly Republican Office
Tim Lydon Executive Director, Senate Majority Office
Christine Shipley, Executive Director, Senate Republican Office
Jess Cohen, Senior Advisor, Senate Majority Office
Dan Harris, Deputy Executive Director, Assembly Majority Office



AMERICAN LITTORAL SOCIETY

18 Hartshorne Drive, Suite 1, Highlands, NJ 07732

Coastal Resilience and Habitat Restoration Projects
Of
The American Littoral Society
Along the New Jersey Coast

PhotoLog

Presented to

The Assembly Environment and Solid Waste Committee
Assemblyman James J. Kennedy, Chair

The Assembly Special Committee on Infrastructure and Natural Resources
Assemblyman Robert J. Karabinchak, Chair

October 6, 2022

(732) 291-0055 www.littoralsociety.org

34x

American Littoral Society Project Photolog Monmouth County and Barnegat Bay

Wreck Pond, Spring Lake and Sea Girt, Monmouth County, NJ

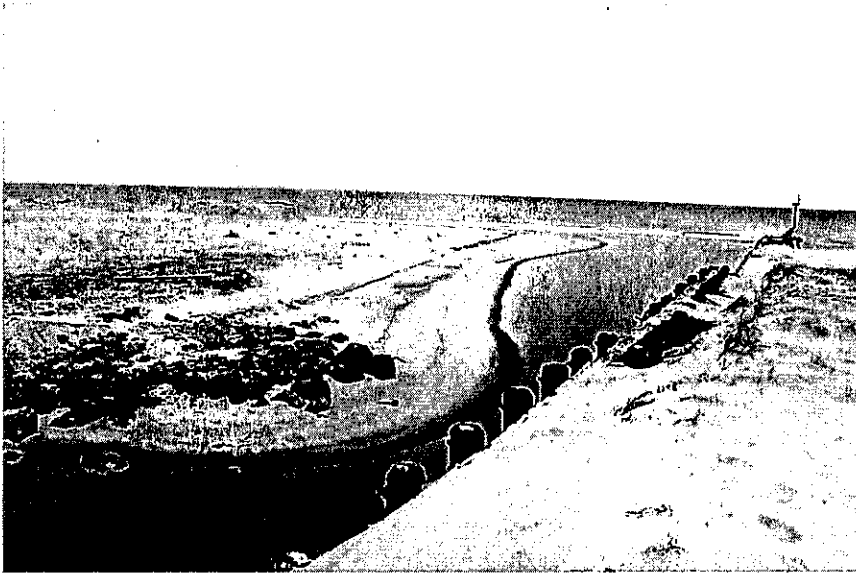


Figure 1: BEFORE - Wreck Pond Inlet facing East showing original outfall pipe

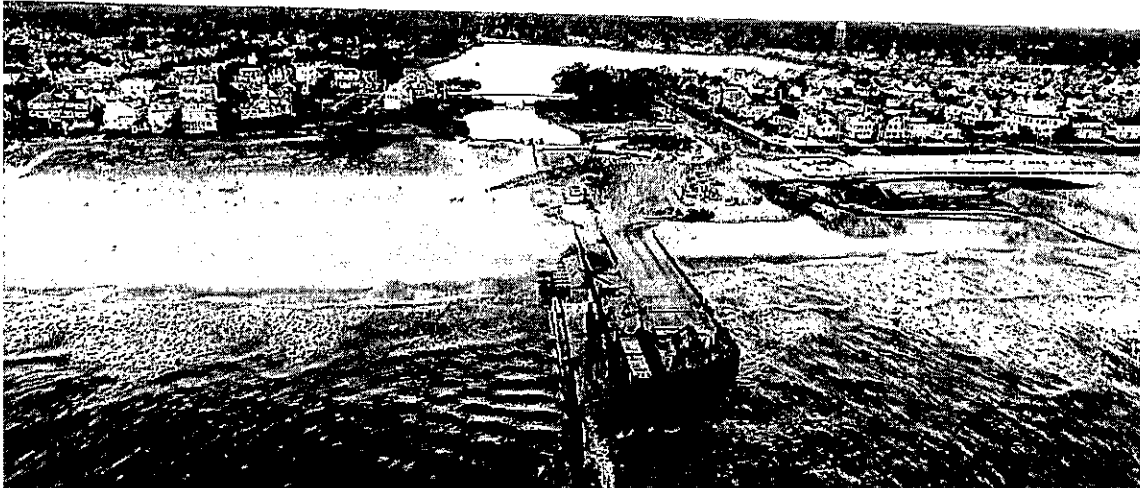


Figure 2: AFTER – Aerial view looking west showing the installation of the fish passage culvert adjacent to original outfall pipe

Old Mill Dam Fish Ladder, Spring Lake Heights, Monmouth County, NJ

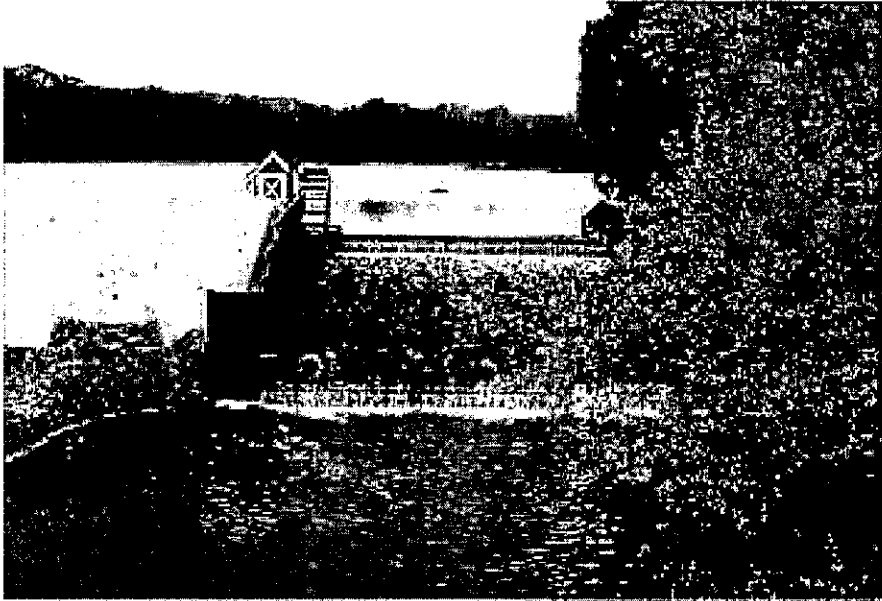


Figure 3: BEFORE – Old Mill Dam facing West

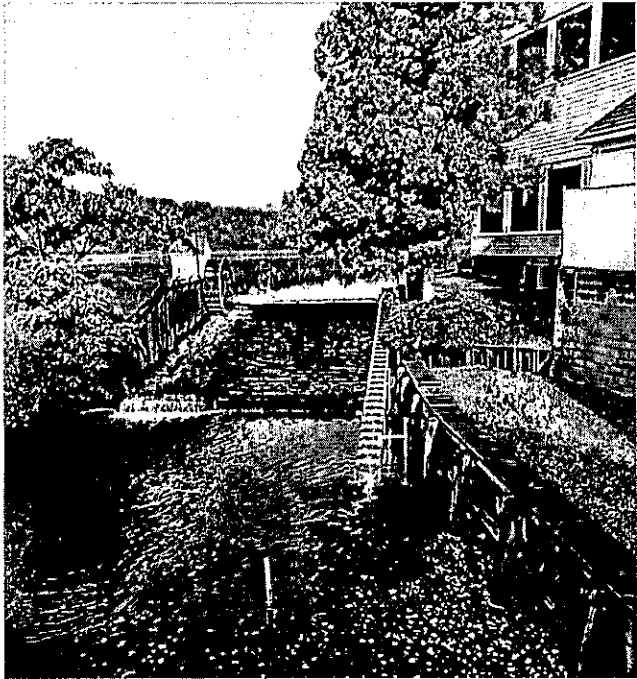


Figure 4: AFTER – Installed Alaska Steeppass fish ladder on the north side of Old Mill Dam facing West

Slade Dale Sanctuary, Point Pleasant, Monmouth County, NJ

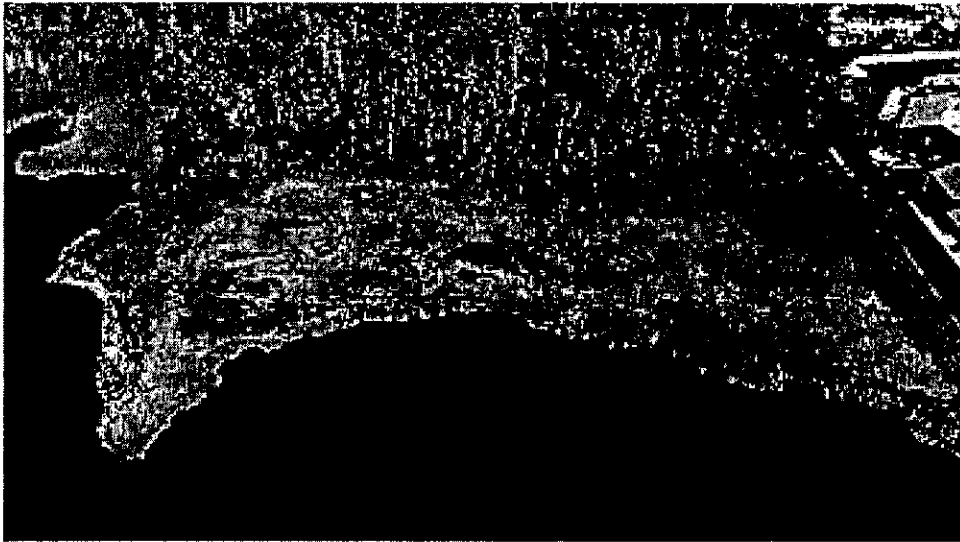


Figure 5: BEOFRE – Slade Dale Sanctuary facing North

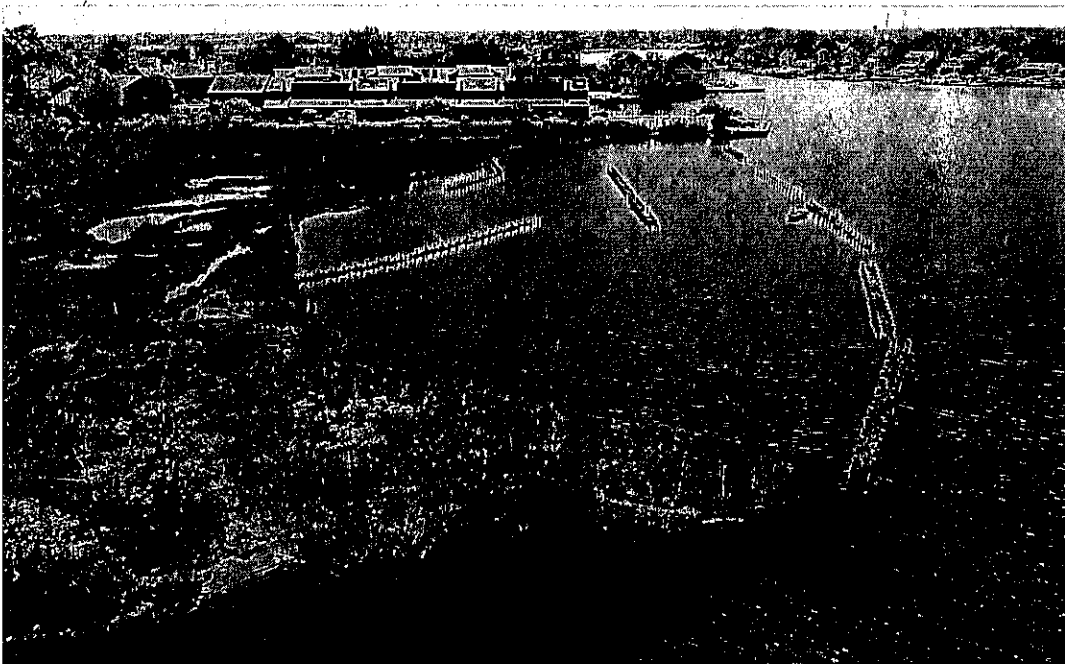


Figure 6: AFTER – Tree branch box breakwaters at Slade Dale Sanctuary. View facing East

Bradley Beach Maritime Forest, Bradley Beach, Monmouth County, NJ



Figure 7: BEFORE – Aerial view showing Bradley Beach DPW storage parking lot

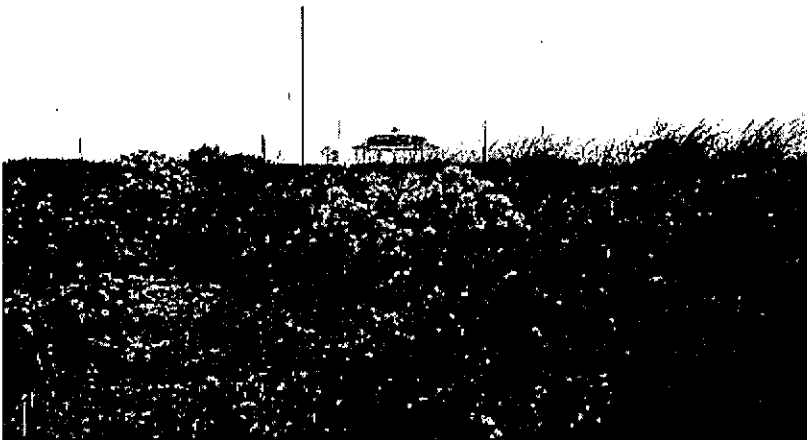


Figure 8: AFTER – Fully planted maritime forest with walking path facing East

Shark River Island, Neptune City, Monmouth County, NJ

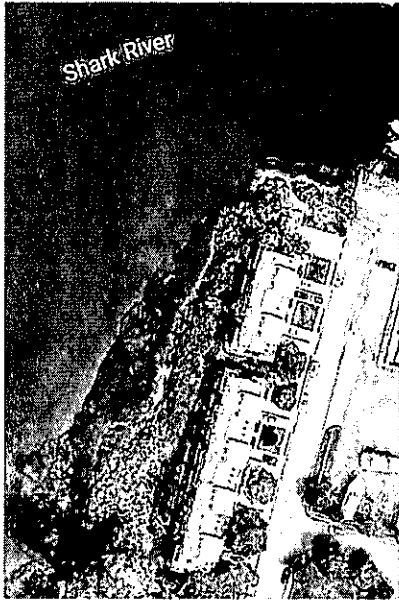


Figure 9 (left): BEFORE – Aerial view of Seaview Condo Association and eroding shoreline and marsh
Figure 10 (right): BEFORE – Shark River Island shoreline facing South



Figure 11 (left): AFTER – Vegetated berm and eco blocks stabilizing shoreline facing West
Figure 12 (right): AFTER – Vegetated marsh with rip-rap breakwater facing North

Forked River Beach, Forked River, Ocean County, NJ



Figure 13: BEFORE – Erosion along Forked River Beach. The red arrow indicates a portion of beach where property owners have now faced property damage. The red circle indicates where shuffle board courts once existed

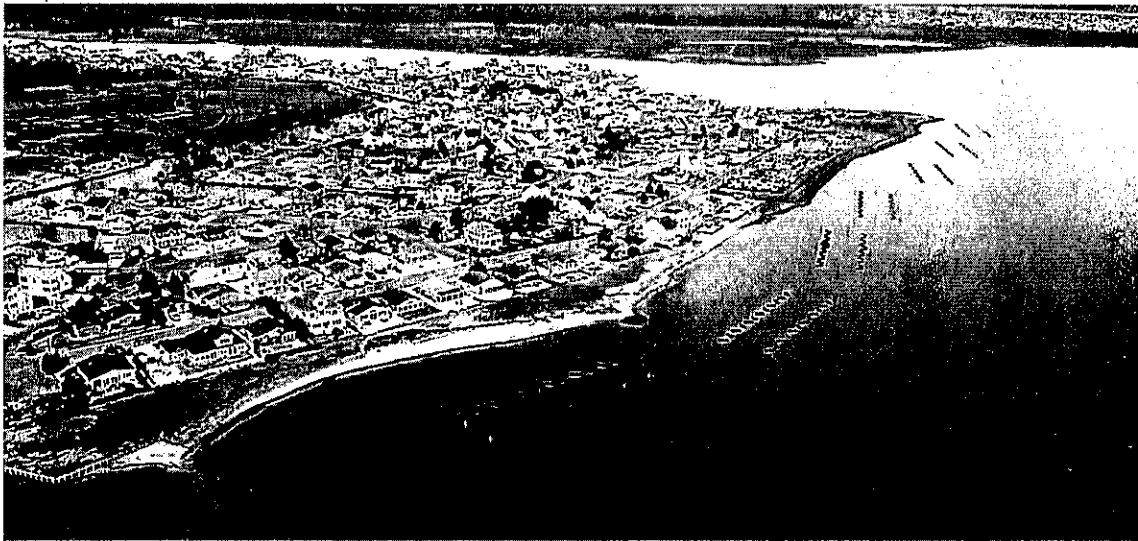
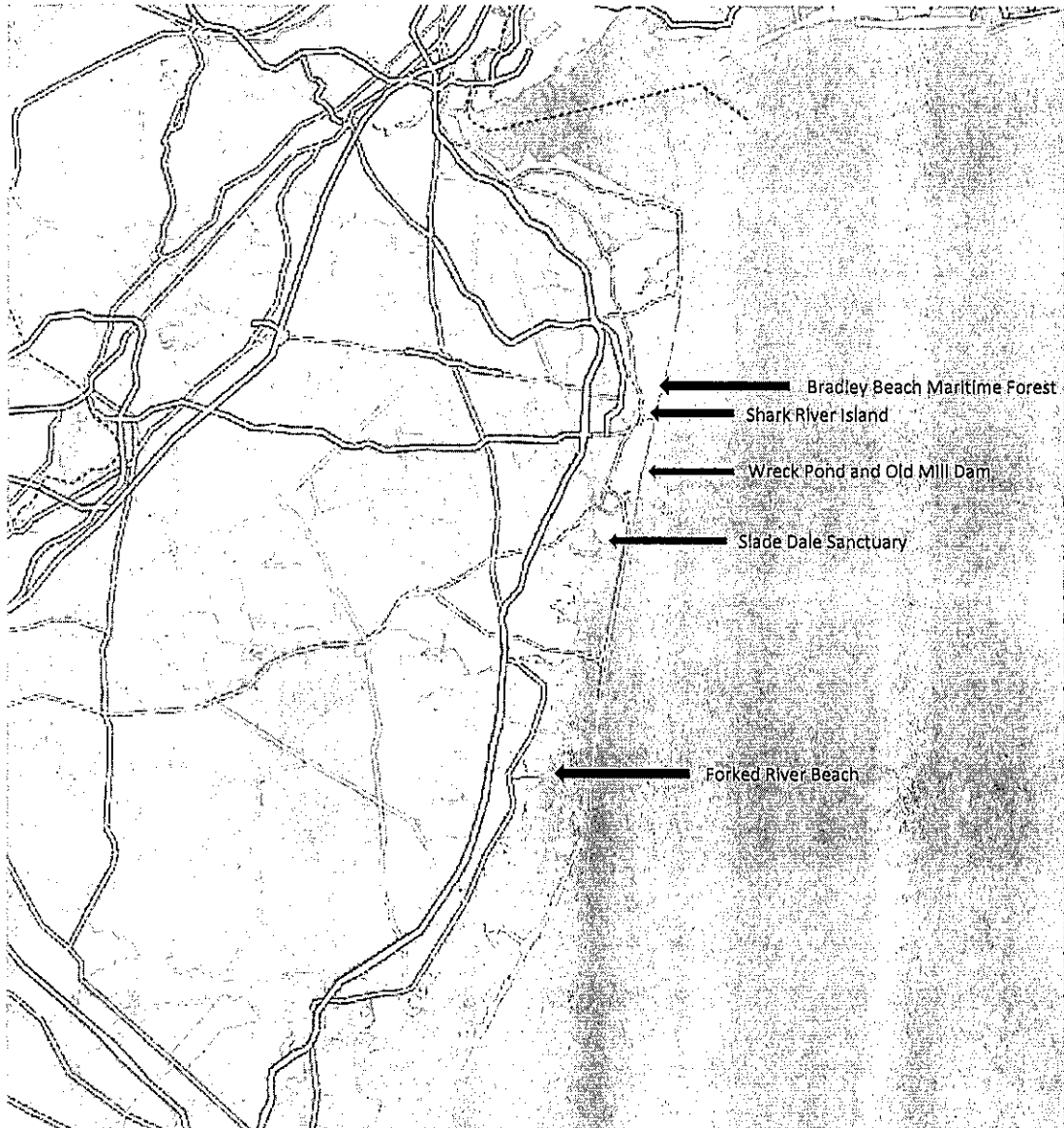


Figure 14: AFTER – Seven (7) implemented breakwater oyster reefs, double rowed, facing North

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Project Site Locations, Monmouth and Ocean County, NJ



41x

Cumberland & Cape May County, Delaware Bay

Maurice River, Commercial & Maurice River Townships, Cumberland County, NJ

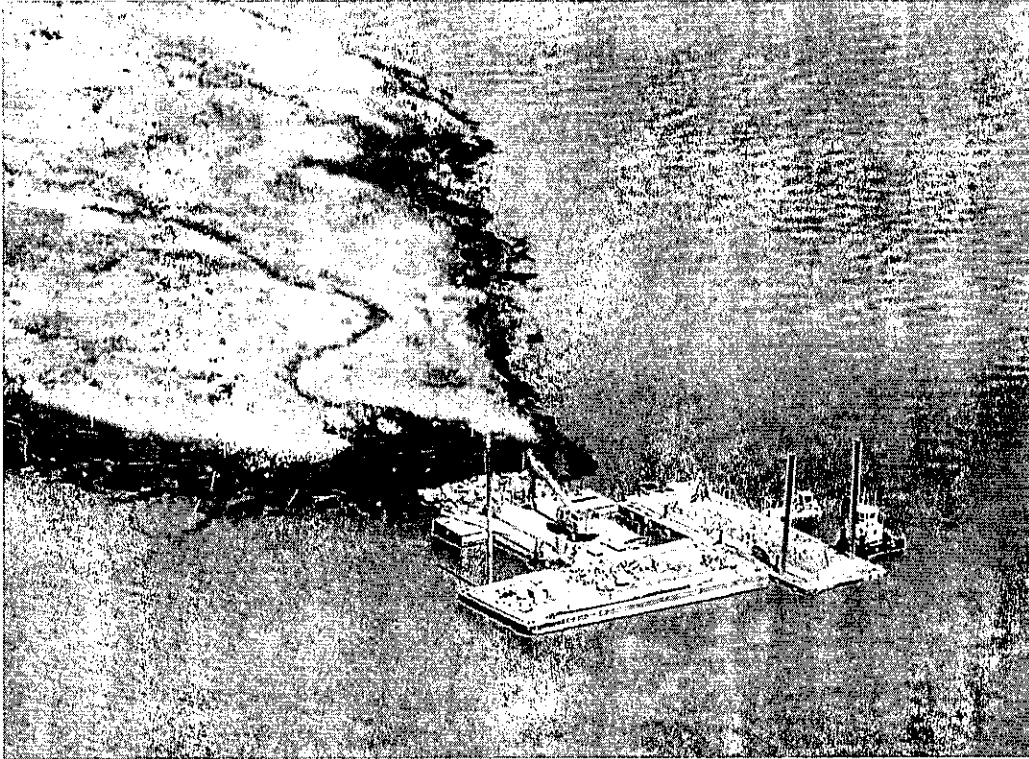


Figure 15: Beginning stages of revetment construction and restoration at the tip of Basket Flats at the mouth of the Maurice River. August 2022. Project in progress.

Thompsons Marsh, Maurice River Township, Cumberland County, NJ

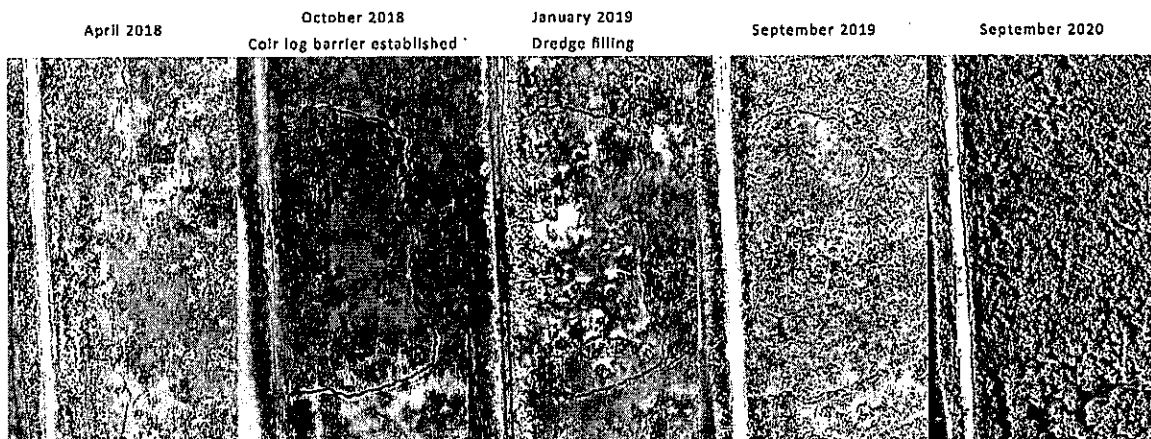


Figure 20: Thompsons Marsh timeline series depicting prior conditions through two years after coir log barrier placement and dredge fill.

42x

Fortescue, Downe Township, Cumberland County, NJ



Figure 16: BEFORE – Exposed rubble and concrete core dune at Fortescue. 2014.



Figure 17: AFTER – Rubble removal and sand placement at Fortescue. 2014.

43x

Thompsons Beach, Maurice River Township, Cumberland County, NJ



Figure 18: BEFORE – Rubble and eroded beach face at Thompsons Beach. April 2014.

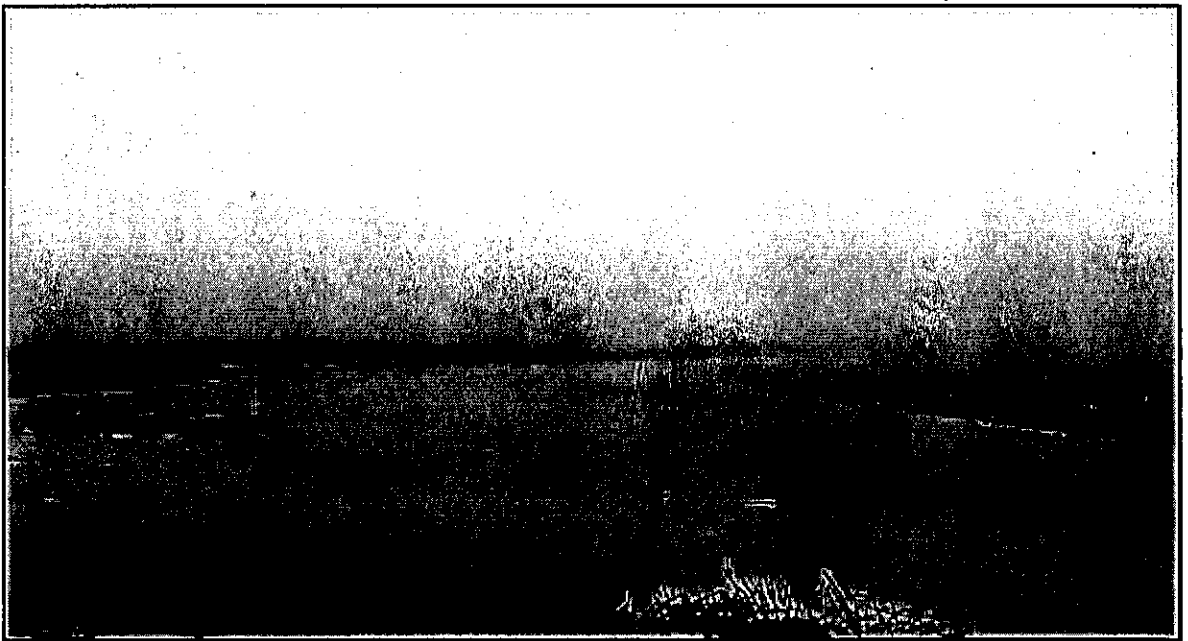


Figure 19: AFTER – Thompsons Beach after rubble removal and sand placement. April 2014.

44X

Reed's Beach, Middle Township, Cape May County, NJ

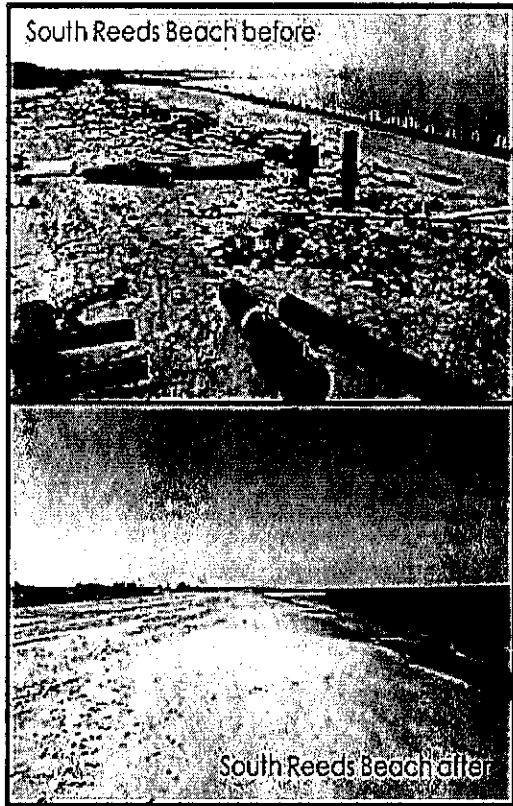


Figure 21: Before and after rubble removal and sand placement at Reed's Beach. 2014.



Figure 22: Intertidal shell bag reef pictured shortly after construction in at Reed's Beach. April 2014.

45x

Cook's Beach, Middle Township, Cape May County, NJ



Figure 23: BEFORE – Eroded beach face prior to sand placement at Cook's Beach. April 2019.



Figure 24: AFTER – Beach face after sand placement at Cook's Beach. April 2019.

46x



Figure 25: Cooks Beach intertidal shellbag reef shortly after installation. 2019.



Figure 26: AFTER – Aerial view of Cook's Beach after reef installation and in the final stages of sand berm construction. April 2020.

Pierce's Point, Middle Township, Cape May County, NJ

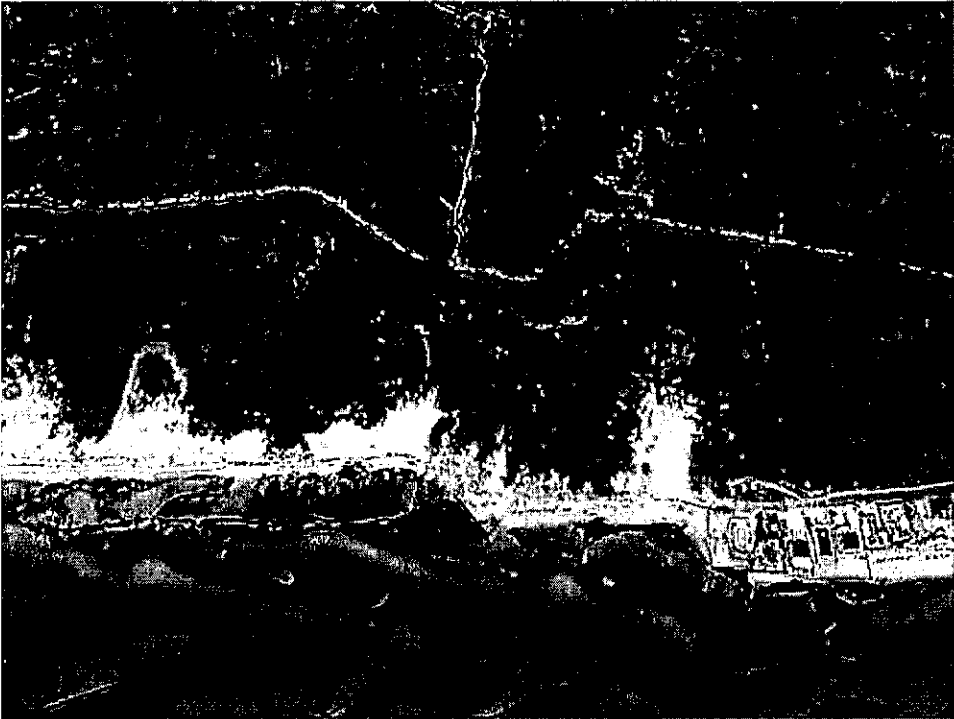


Figure 27: BEFORE – Aerial view of two overwash areas at Pierce's Point. March 2021.

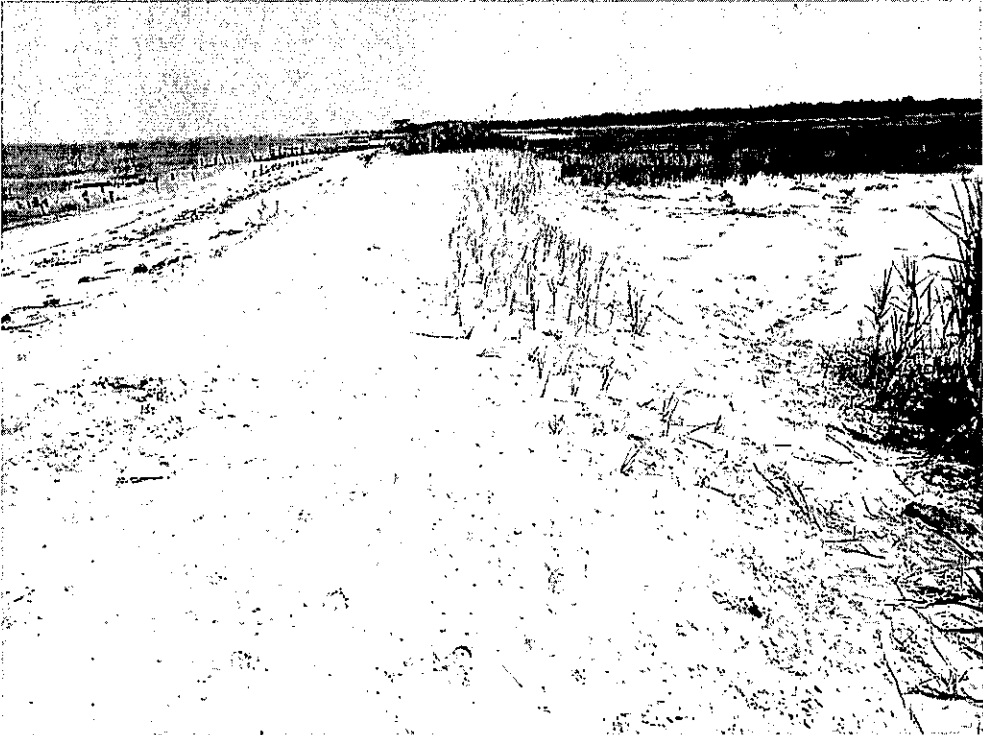


Figure 28: AFTER – Completed berm and planting in progress. April 2021.

48x

Barrett's Run, Hopewell Township, Cumberland County, NJ



Figure 29: BEFORE – Barrett's Run Grassland as a former farm field prior to restoration and plantings. 2015.

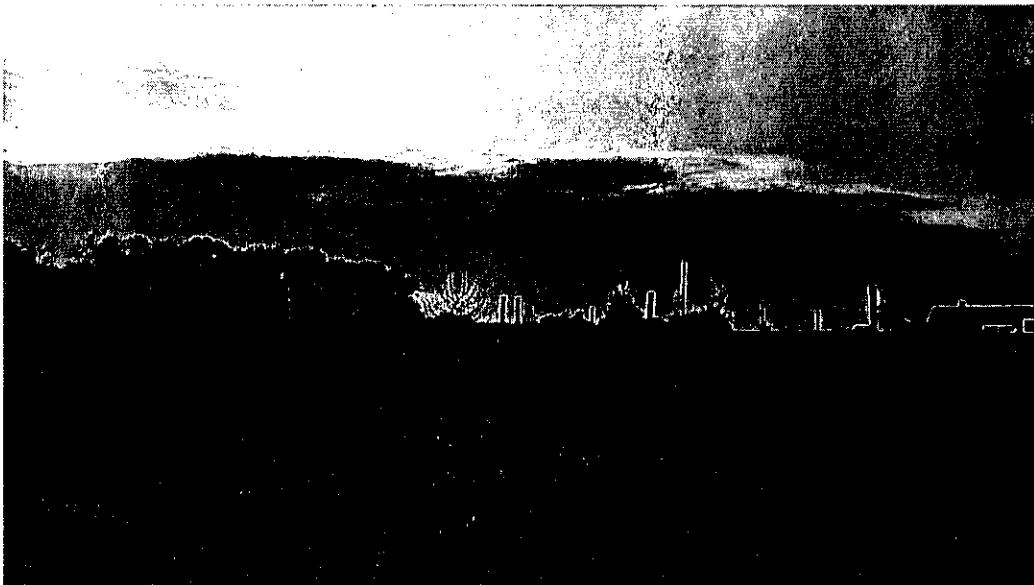


Figure 30: AFTER – Native grasses, trees, and pollinator garden complete after a few years of plantings. In addition, several educational signs and shade pergolas place. April 2019.

49x

Cumberland Insurance, Hopewell Township, Cumberland County, NJ



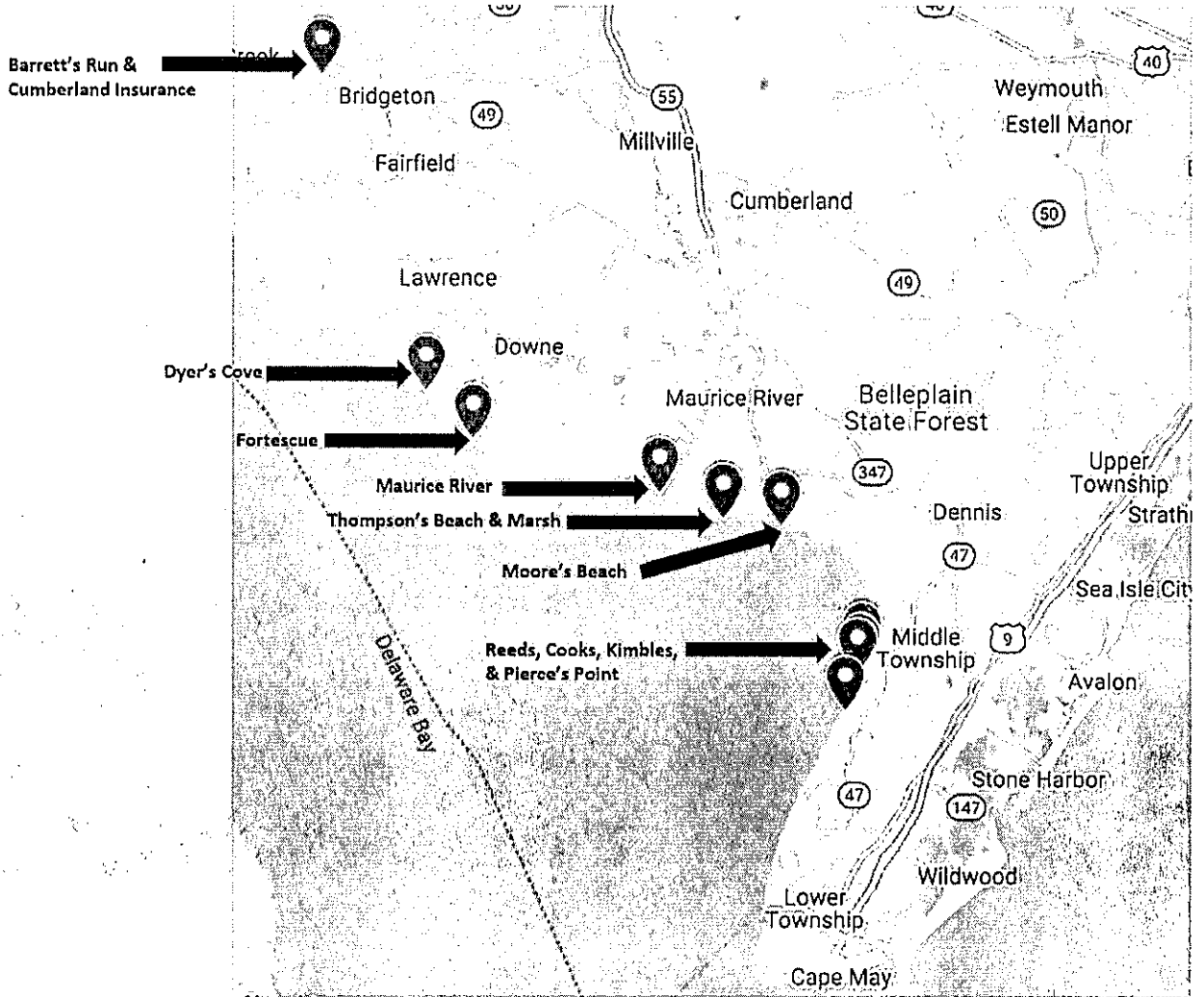
Figure 31: BEFORE – Severe erosion and runoff from adjacent farm field next to Barrett's Run stream. April 2017.



Figure 32: AFTER – check dams and grass mats after restoration to slow runoff into Barrett's Run. April 2019

50x

Project Site Locations, Cumberland and Cape May County, NJ



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The Assembly Environment and Solid Waste Committee and the
Assembly Special Committee on Infrastructure and Natural Resources
Superstorm Sandy 10th year Anniversary
October 6, 2022

Thank you Chairman Kennedy, Chairman Karabinchak, Vice-Chair Stanley and members of the joint committee for allowing us this time to highlight the work we have done in response to Superstorm Sandy and in preparation for future storms. And while we recognize results of the improvements made, the fact is our work is never complete when hardening our infrastructure and fortifying our resiliency to prevent future damage as a result of the next major weather event.

Superstorm Sandy demonstrated how vulnerable New Jersey was and is to major weather events. Of the 12 northeast States significantly impacted by Sandy, New Jersey experienced the largest number of electric utility outages with approximately 2.7 million peak customer outages representing approximately 70 % of all electric customers in the State, shattering the record set the previous year by Irene. Sandy remains the most destructive hurricane ever recorded in New Jersey and the fourth-costliest hurricane in U.S. history.

After Sandy, our Division of Reliability and Security conducted a thorough investigation into each of the four Electric Distribution Companies (EDCs) operating in New Jersey to assess what they did well and where improvements needed to be made. The investigation resulted in the Board ordering the EDCs to undertake approximately one hundred (100) actions falling within five main categories: Preparedness Efforts, Communications, Restoration and Response, Post Event, and Underlying Infrastructure Issues. While this testimony will not detail all 100 directives issued by the Board after Sandy, below is a description of many of the major directives which have resulted in improvements in the EDCs preparedness and restoration efforts since Sandy.

52x

Preparedness Efforts

Board directives focused on the organizational structure, roles and responsibilities of EDC personnel. This includes, but is not limited to, requiring the EDCs to use an incident command system structure and the establishment of an Emergency Management/Preparedness role as a stand-alone function within their organizational structures. The Board also requires the EDCs to update and file emergency response plans and implement continuous training and exercise drills. Lastly as part of the new Preparedness requirements after Sandy, the Board issued guidance on weather monitoring and forecasting.

Communications

The Board now requires the companies to:

- Provide a representative to physically staff any activated county OEM at the OEM's request. We also require the companies to have the scalable capacity to handle the number of calls and requests required by county and local officials during any size event. The companies shall include scalable communications capabilities in their annual exercises.
- Use social media in addition to company websites when providing restoration updates to the public.
- Develop plans to enhance their ability to provide local and more geographically targeted Estimated Time of Restoration (ETRs) earlier in the restoration process.
- Review and revise customer call back scripts to better convey the messaging from the companies

Effective communication in these weather related situations involves many elements, such as having reliable communications paths and maintaining a proper emergency plan for disseminating updated and accurate information to customers and the media. Use of both traditional and social media plays a major part as well. Effective communication plans must include pre-event communications, customer service/call center communications, and both internal and external communication strategies. This is an area that must continually evolve and improve as technology changes.

Restoration and Response

Board directives require the companies to:

- Develop and submit Storm Damage and Outage Prediction Models to Board Staff.
- Immediately request assistance upon determining a need to request additional human resources and/or equipment to prepare for, respond to, or recover from a Major Event.
- Provide periodic organized updates to Staff.
- Submit staffing reviews explaining any decreases in staffing.
- Develop a rapid damage assessment process.
- Provide customers a global ETR 24 hours after a major event outage.
- Provide daily updates for municipal officials concerning the number of customers out in their towns and the estimated number of customers that will be restored each day until restoration is completed.

Post Event

Board directives require the companies to:

- Implement storm restoration process metrics.
- Provide Board Staff with a list of Regional Mutual Assistance Groups (RMAG) and/or utilities they have agreements with.
- Solicit input regarding their performance from affected external stakeholders and document the feedback provided.

Underlying Infrastructure Issues

The Board has approved over \$771 million in gas utility infrastructure improvements and over \$1.4 billion in electric utility infrastructure improvements since Superstorm Sandy.

For the gas utility infrastructure, these investments have resulted in the hardening and reinforcement of the distribution system, replacement of low pressure mains and associated services with high pressure mains and associated services, the elimination of regulator stations and the installation of Excess Flow Valves (EFVs), and metering and regulating (M&R) station upgrades.

For the electric utilities, these investments have resulted in Electric Station Flood Mitigation, Contingency Reconfiguration, Grid Modernization, Communication Systems upgrades, Structural and Electrical Hardening, Selective Undergrounding, Barrier Island Feeder Ties, Distribution Automation, Electronic Fusing, New Substations; Overhead Circuit Reliability and Resiliency (included enhanced vegetation management; and distribution automation technologies).

A large portion of the investments right after Sandy were used for flood mitigation because of the damage to the system we saw from the record breaking flooding caused by Hurricane Irene the year prior to Sandy and then again during Sandy. The Board issued Orders in response to Hurricane Irene which contained the recommendation that the EDCs prepare a report on various levels of potential flooding at each substation and switching station at risk of flooding (up to and including the levels of water encroachment that occurred in both Hurricane Irene and Superstorm Sandy). Those reports were to include alternative response levels to hardening measures such as sandbagging, raising certain facilities in the substation or switching station to higher levels, constructing flood walls around the stations, raising the level of the station and/or moving the station to higher ground.

The EDCs identified 69 electrical switching/substations in New Jersey that had flood monitoring equipment installed, were eliminated or had flood mitigation work performed on them. Below is a breakdown of how these sixty-nine switching/substations fared regarding flooding following the Remnants of Hurricane Ida passing through the state on September 1, 2021.

- ACE identified 8 switching/substations that were at risk of flooding or had previously flooded. Four of them have flood monitoring equipment installed and flood mitigation work has been done at the other four locations. None of the 8 switching/substations, nor any other ACE switching/substation had their operations impacted by the Remnants of Hurricane Ida.
- JCP&L identified 20 switching/substations that were at risk of flooding or had previously flooded. All 20 switching/substations either had equipment raised, flood sensors installed, or flood barriers installed. None of the 20 switching/substations, nor any other JCP&L switching/substation had their operations impacted by the Remnants of Hurricane Ida.

- PSE&G identified 38 switching/substations that were at risk of flooding. Of those 38 substations, seven were eliminated, one was raised, and the remainder were rebuilt. None of the 31 remaining substations, or any other PSE&G switching stations or substations, had their operations impacted by Ida.
- RECO identified 3 substations that were at risk of flooding or had previously flooded. All three had flood mitigation measures installed. Two of those three were unaffected by Ida while the third did experience some initial flooding problems due to cut vegetation blocking a drainage swale the station shares with the Metro North/NJ Transit rail line.

While the flooding from Hurricane Ida was devastating on many levels, the total number of outages and the duration of those outages was far less than what we saw in Sandy. The investment approved by the Board for switching/substation flood monitoring or flood mitigation by the EDCs protected over sixty switching/substations across New Jersey from flooding during Ida. Conservatively, that work protected over 100,000 customers from electric outages due to flooding.

Flood mitigation is just one example of the lessons learned from Sandy that resulted in approved investments in the grid to protect against future major weather events. The Board has also approved enhanced vegetation management plans to help reduce the number of tree related outages and developed a program with the EDCs to track information such as the outage causation, proximity of the tree/vegetation to electrical facilities, last trimming cycle of the circuit that experienced the outage, location of tree/vegetation within or outside of the right-of-way (ROW) or easement, and any other pertinent factors, including storm event, local cutting, wind, etc.

The Board also approved Advanced Metering Infrastructure (AMI) plans for all four EDCs which, once fully deployed, is expected to improve the efficiency of the EDCs' restoration process by eliminating unnecessary truck rolls and dispatching restoration crews only to actual outage locations.

Another area the Board is investigating as a resiliency strategy is microgrids. The Board established the Town Center Distributed Energy Resources (TCDER) Microgrid Program. The program is designed to provide energy resilience for clusters of critical facilities located in town centers. Hospitals, town halls, police stations and fire stations are examples of the types of critical facilities included within the microgrids. The program began with the Board providing \$2.2 Million to fund feasibility studies. The program has now advanced to the Engineering Design Phase. The Board has provided a total of \$3.8MM to seven municipalities and counties who are participating in the program.

Superstorm Sandy was an energy resilience wake-up call for New Jersey. It demonstrated the vulnerabilities in the electric distribution system, the likes of which we had not seen before.

In the aftermath of Superstorm Sandy, the NJBPU began working with the state's investor owned utilities to build energy resilience and harden the grid on a number of fronts including distribution automation, raising substations, hardening poles, and vegetation management. This remains an ongoing effort. We may never prevent any outages from occurring, but with vigilant preparation and through prudent investments in our infrastructure, we continue to lessen the effects of these major weather events on the lives of New Jersey's residents.

55x



New Jersey Economic Development Authority
Assembly Environment and Solid Waste Committee and Assembly Special Committee
on Infrastructure and Natural Resources – Joint Meeting
October 6, 2022

As everyone is aware Superstorm Sandy devastated New Jersey businesses and communities when it made landfall along the coast on October 29, 2012.

With the cost of damages incurred by New Jersey businesses and communities exceeding \$37 billion, the impact to the State's economy was significant. Businesses and municipalities suffered direct damage to infrastructure and property, and rampant power outages and fuel shortages slowed recovery efforts and amplified the widespread economic impact.

As part of the State's coordinated response across all agencies and authorities the New Jersey Economic Development Authority (NJEDA) was called on to help meet the short- and long-term needs of impacted businesses and communities.

This coordinated response had the Authority being responsible for various State programs.

1. The tourism campaign "Stronger than the Storm", to make it known the Jersey Shore was open for business.
 - a. The tourism campaign produced results with an increase in year over year activity from 2012 to 2013 at the Shore. In fact, the annual Economic Impact of Tourism Report released by the Department of State in March 2014 showed that New Jersey's tourism industry set a new record in 2013, generating more than \$40 billion in overall tourism-related demand and visitation in New Jersey rose to 87.2 million in 2013, a 5.9 percent increase compared to 2012.
2. The Stronger NJ Business Grant Program with the goal of getting assistance of up to \$50,000 to each impacted business to ensure they had the capital needed to resume or maintain operations.
3. The Stronger NJ Business Loan Program, to help businesses that were experiencing additional financial gaps beyond what the grant program provided, offering loans of up to \$5 million for working capital and construction needs, with zero interest and no payments for the first 24 months.
4. The Neighborhood and Community Revitalization (NCR) Program which provided grants and loans to support development and public improvement projects and streetscape projects to local municipalities.

- a. Collectively, the Grant, Loan and NCR programs assisted over 1,310 small businesses and municipalities providing over \$210 million in assistance.
5. The New Jersey Energy Resilience Bank (ERB) which was designed to support development of distributed energy resources at critical facilities, such as hospitals and wastewater treatment facilities, that will enable them to remain operational during future outages.
 - a. The Authority has approved 12 ERB projects for nearly \$185 million and disbursed over \$118 million.
 6. And lastly, the Retail Fuel Station (RFS) program which provided gas stations with grants for permanent generators and/or “quick connect” devices, which allow for the use of portable generators.
 - a. This Program disbursed over 115 applications for nearly \$4 million to gas stations located along evacuation routes throughout New Jersey.

While the Authority is proud of the work done during Superstorm Sandy, what we learned through administering these programs, helped the Authority be prepared for future disaster type events. This was evident with the NJEDA’s ability to stand up a Covid small business Grant Program which to date has approved over 77,000 small businesses for nearly \$590 million in assistance.

In addition, when Henri/Ida hit the State in 2021, the Authority stood up a Grant Program within two weeks of the storm to provide immediate support to small businesses impacted from those storms and approved 974 businesses for over \$3.4 million.

The Authority appreciates the Committees’ interest in our Sandy Response and look forward to answering any questions you may have.

