TOGETHER NORTH JERSEY.

Climate Change & Wetland Restoration

Together North Jersey (TNJ)
Resilient Task Force

Webinar 1 of the TNJ Resiliency Webinar Series
May 30, 2018

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WEBINAR INSTRUCTIONS

- Please mute your phone
- This webinar is being recorded and will be available at togethernorthjersey.com
- Direct questions to the bottom right chat section to be answered in last 10 minutes of webinar
- If we run out of time, please email either:
  - Stacy Krause, perrines@ejb.rutgers.edu
  - Eliot Benman, ebenman@ejb.rutgers.edu

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TNJ RESILIENCY WEBINAR SERIES

The Resiliency Webinar Series is a product of the TNJ Resilient Task Force.

Thank you to the following Resilient Task Force members for their guidance and assistance:

Rob Freudenberg, Co-Chair – Regional Plan Association
Tim Van Epp, Co-Chair – Sustainability Planning Consultant
Kelly Pflicke – New Jersey Department of Environmental Protection
Linda Weber – Sustainable Jersey
Melissa Harclerode – CDM Smith

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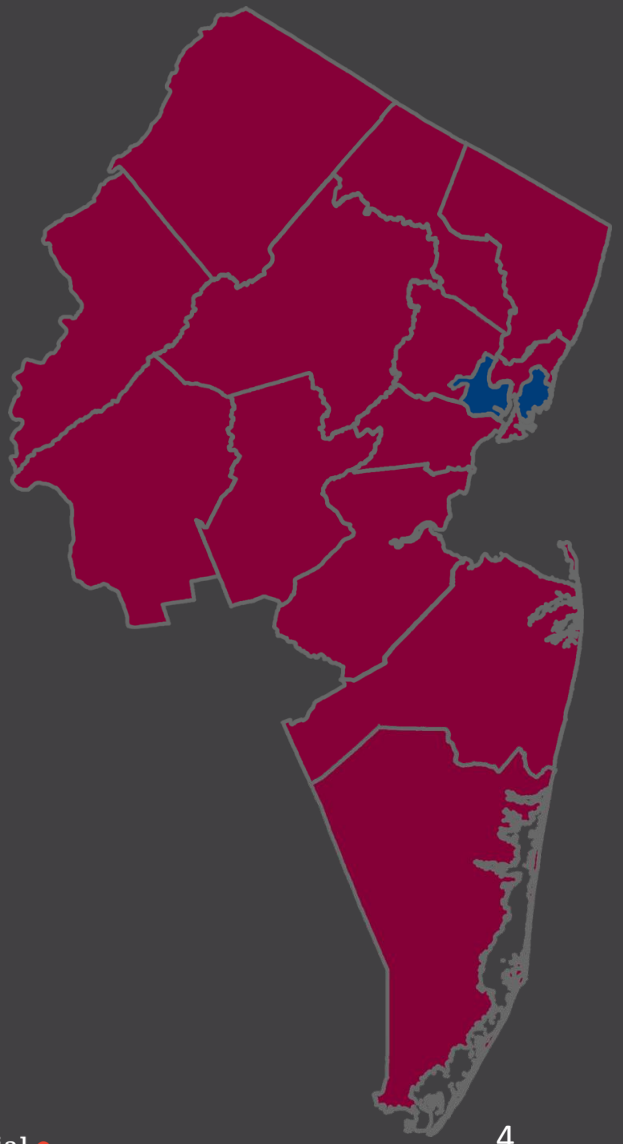
TNJ RESILIENCY WEBINAR SERIES

This webinar series is co-sponsored by the North Jersey Transportation Planning Authority (NJTPA).



NJTPA Region

Bergen	Middlesex	Passaic
Essex	Monmouth	Somerset
Hudson	Morris	Sussex
Hunterdon	Newark	Union
Jersey City	Ocean	Warren

TOGETHER NORTH JERSEY RESILIENT VISION.

A resilient North Jersey is ready for adverse events—extreme weather, climate change, economic downturns or other major setbacks—and can quickly bounce back from them. It protects wetlands and other crucial ecosystems, and has strong, well-maintained infrastructure (transportation, utilities, water, sewer, etc.). A resilient North Jersey takes steps to be prepared and reduce negative impacts on our communities.

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SPEAKERS

Stacy Krause, PP/AICP, CFM

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AGENDA: CLIMATE CHANGE & WETLAND RESTORATION

- Climate change impact projections
- Impacts on wetlands
- Using wetlands to combat climate change
- Project examples
- Funding opportunities and incentives
- Resources

Images: USDA

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CLIMATE CHANGE & WETLAND RESTORATION

CLIMATE CHANGE IMPACT PROJECTIONS

Connecting People, Places, and Potential

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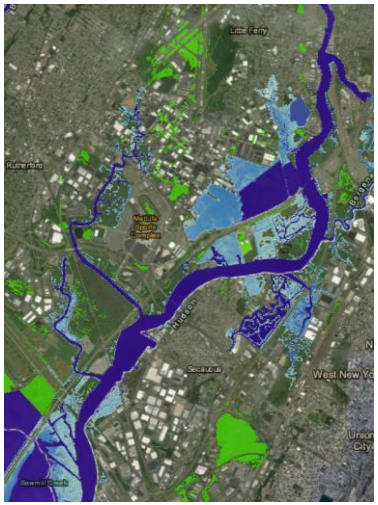
SEA-LEVEL RISE (SLR) IN NEW JERSEY
Meadowlands Region

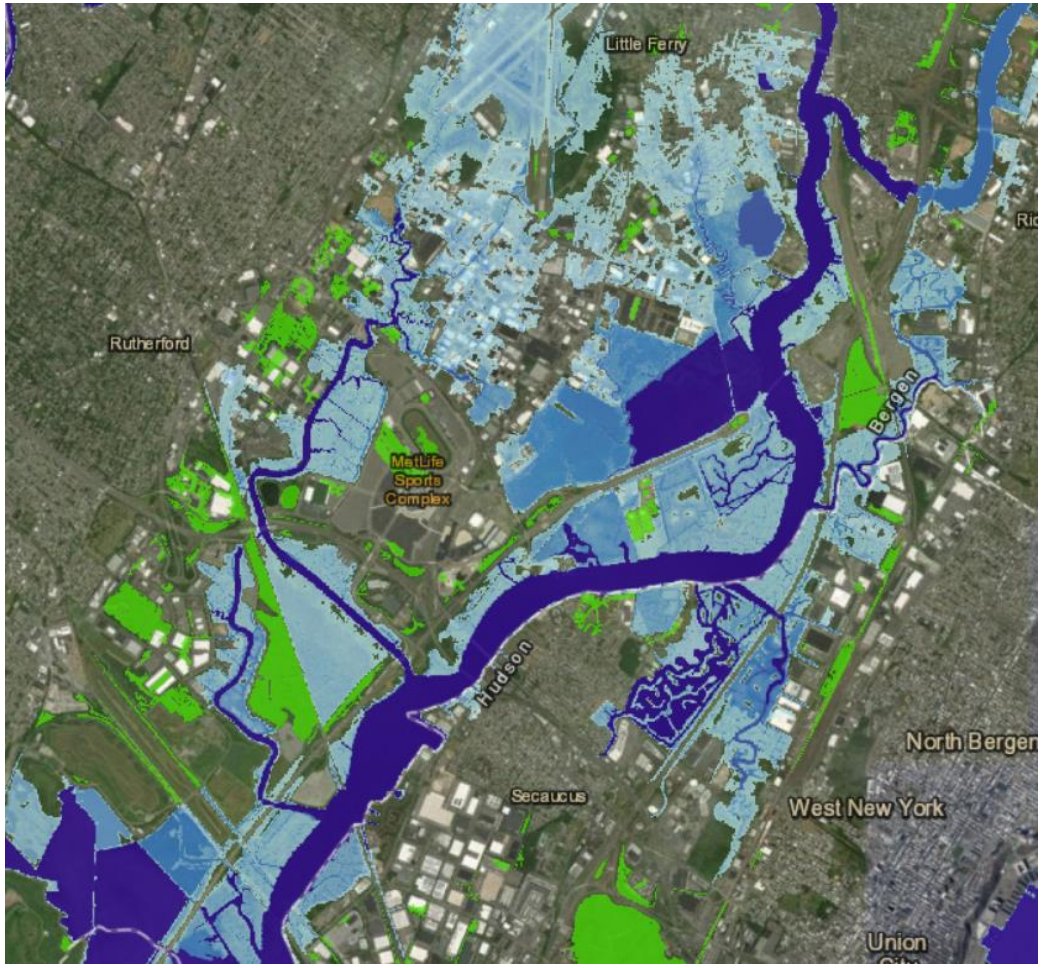


Current day high tide

Legend

Water Depth

Low-lying Areas



2 Ft. SLR

Map Source: NJ Floodmapper
www.njfloodmapper.org

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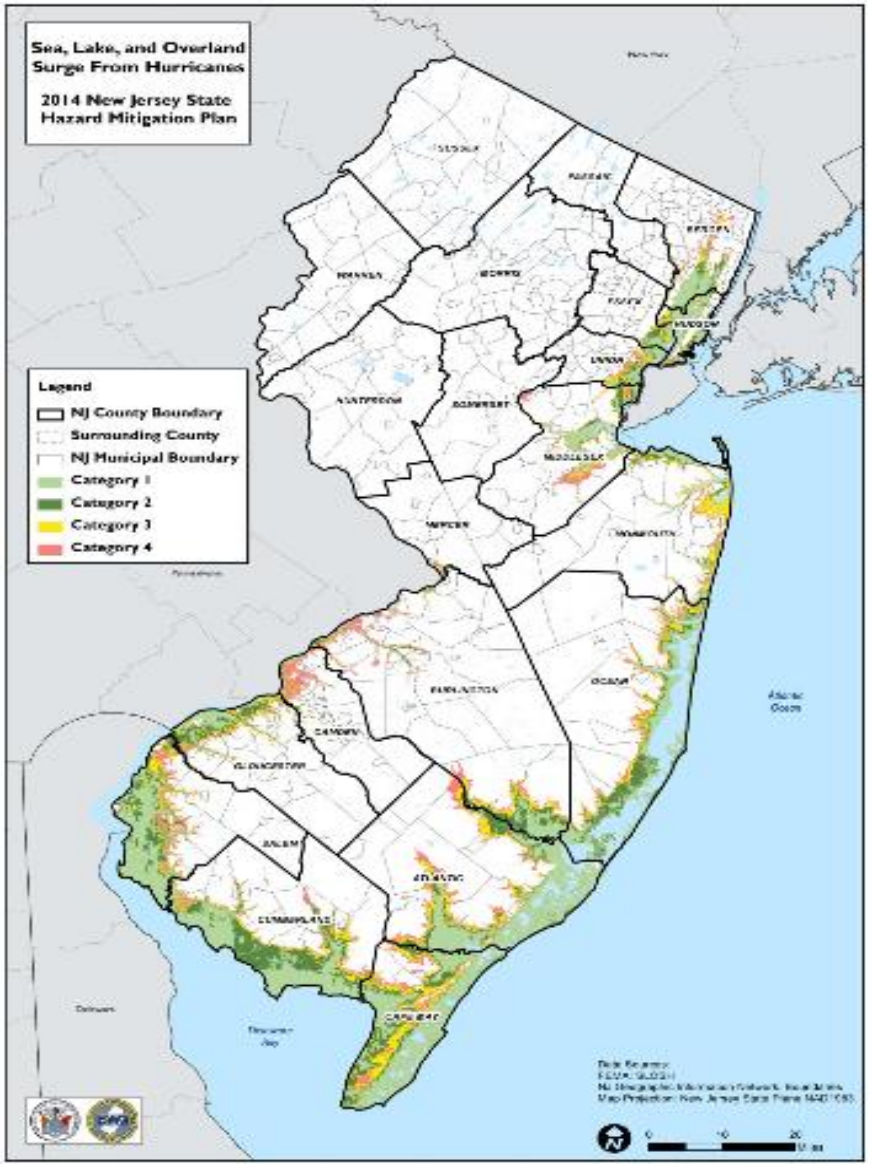
STORM SURGE IN NEW JERSEY

- Rise in sea water above the predicted high tide
- Caused by wind pushing water onshore
- Rising temperatures of ocean water will fuel more intense hurricanes likely resulting in greater storm surge



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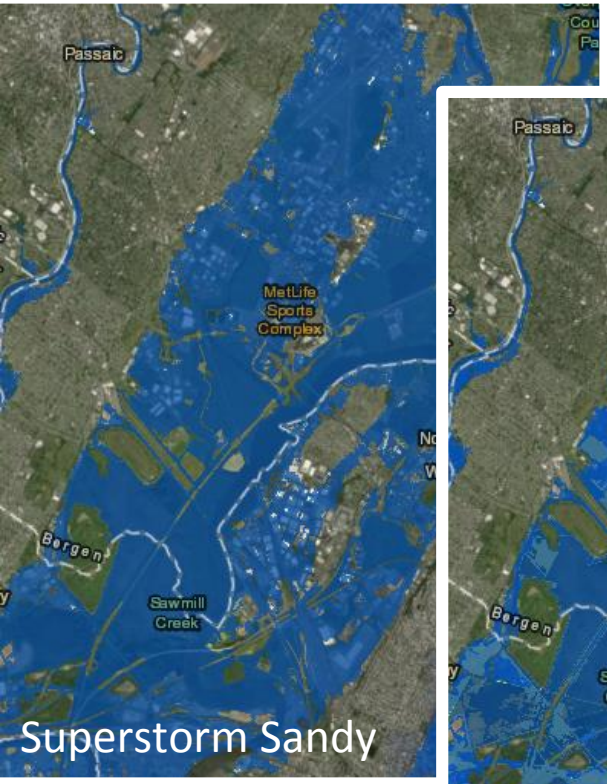
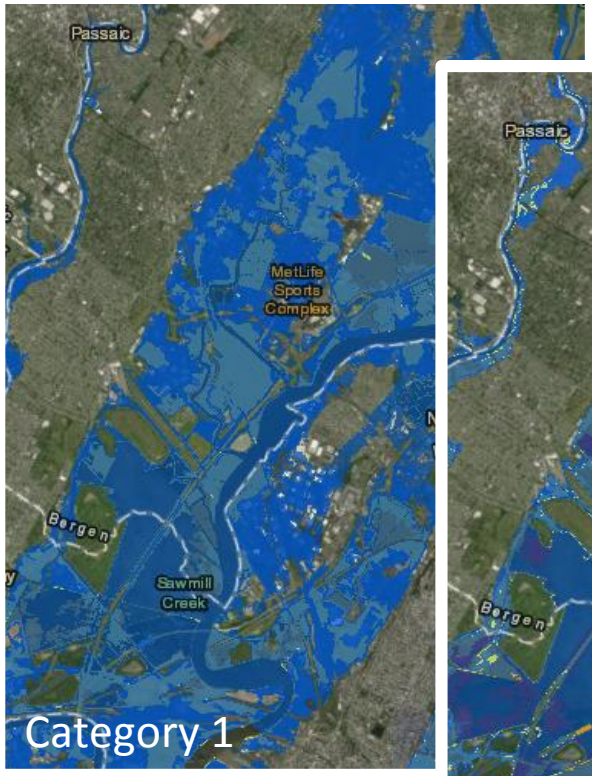
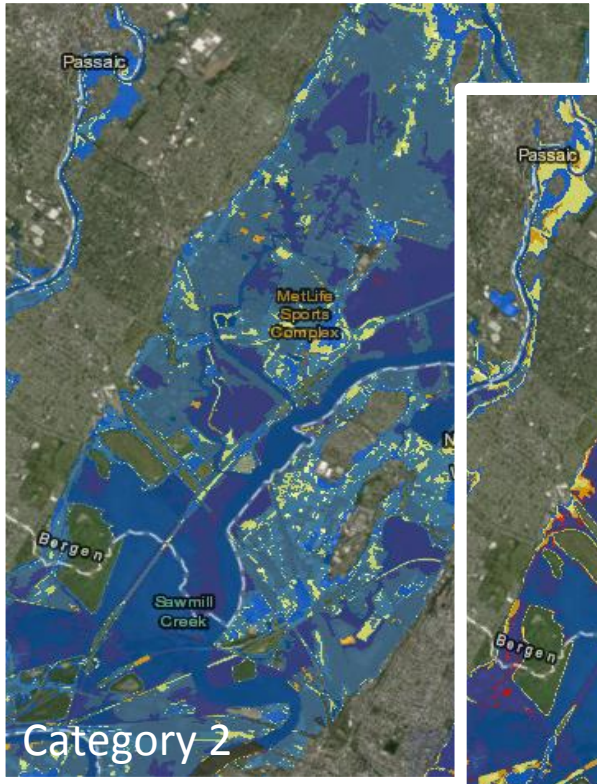
STORM SURGE IN NEW JERSEY (Meadowlands Region)



Superstorm Sandy



Category 1



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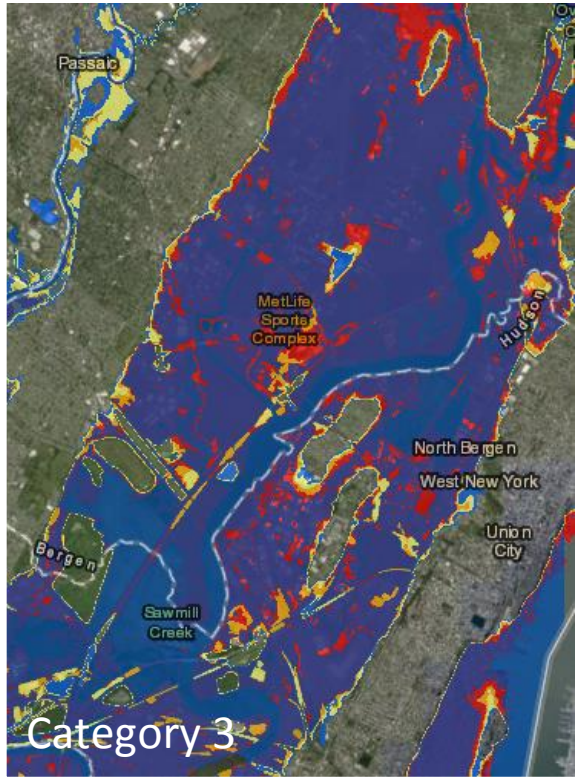

Category 3

Legend

Sandy Surge Extent

- Extent of Flooding

SLOSH

- 0 - 3 feet above ground level
- 3 - 6 feet above ground level
- 6 - 9 feet above ground level
- > 9 feet above ground level

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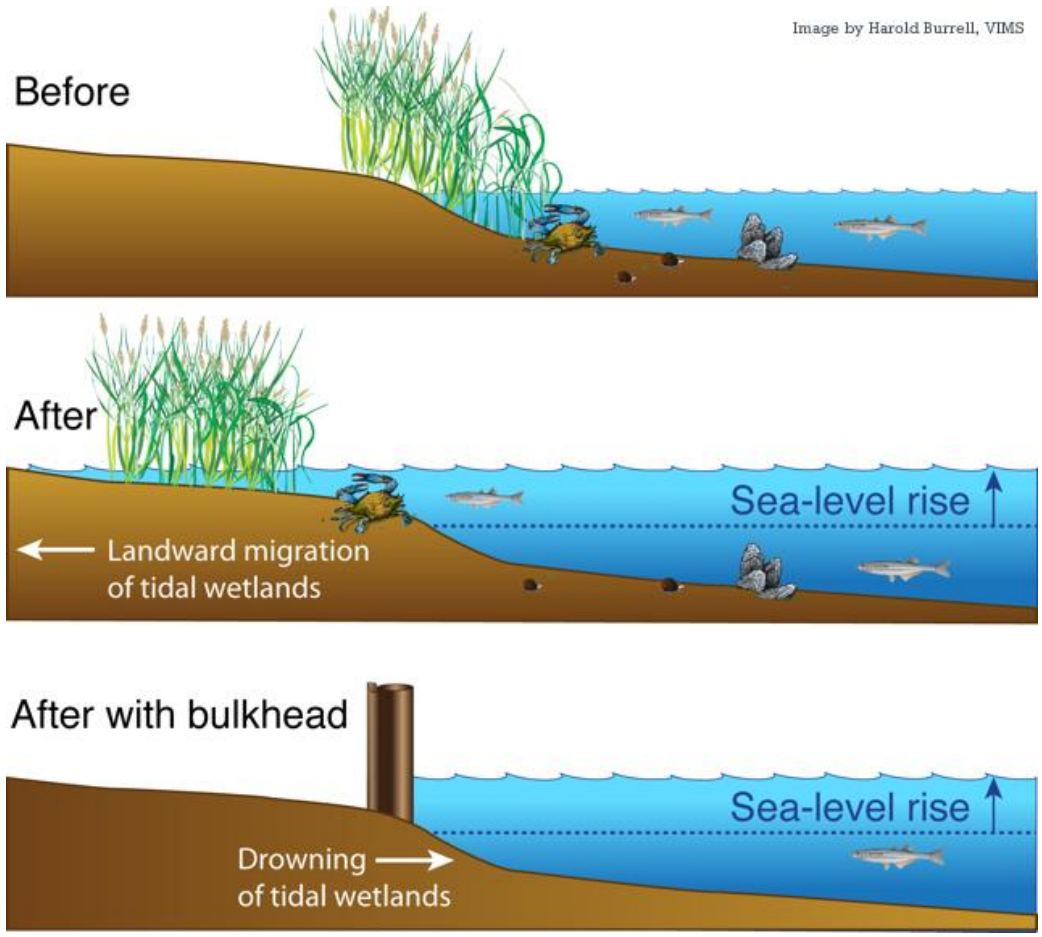
CLIMATE CHANGE & WETLAND RESTORATION

CLIMATE CHANGE IMPACTS ON WETLANDS

Connecting People, Places, and Potential

WETLAND MIGRATION

- As seas rise, wetlands migrate inland
- Inability to migrate caused by:
  - Development of land
  - Engineered structures built too close to wetlands
- Some wetlands may keep up with rising seas due to buildup of sediment



WETLAND SEDIMENT


Image: NFWF

- Wetlands lose sediment due to dams and canals
- Projects are taking place to restore sediment in areas vulnerable to storm surge


Image: NFWF

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WETLAND CONVERSION

- SLR and storm surge cause wetland salinity
- Freshwater wetlands inundated by ocean water
- Impacts ability to support plant and animal life

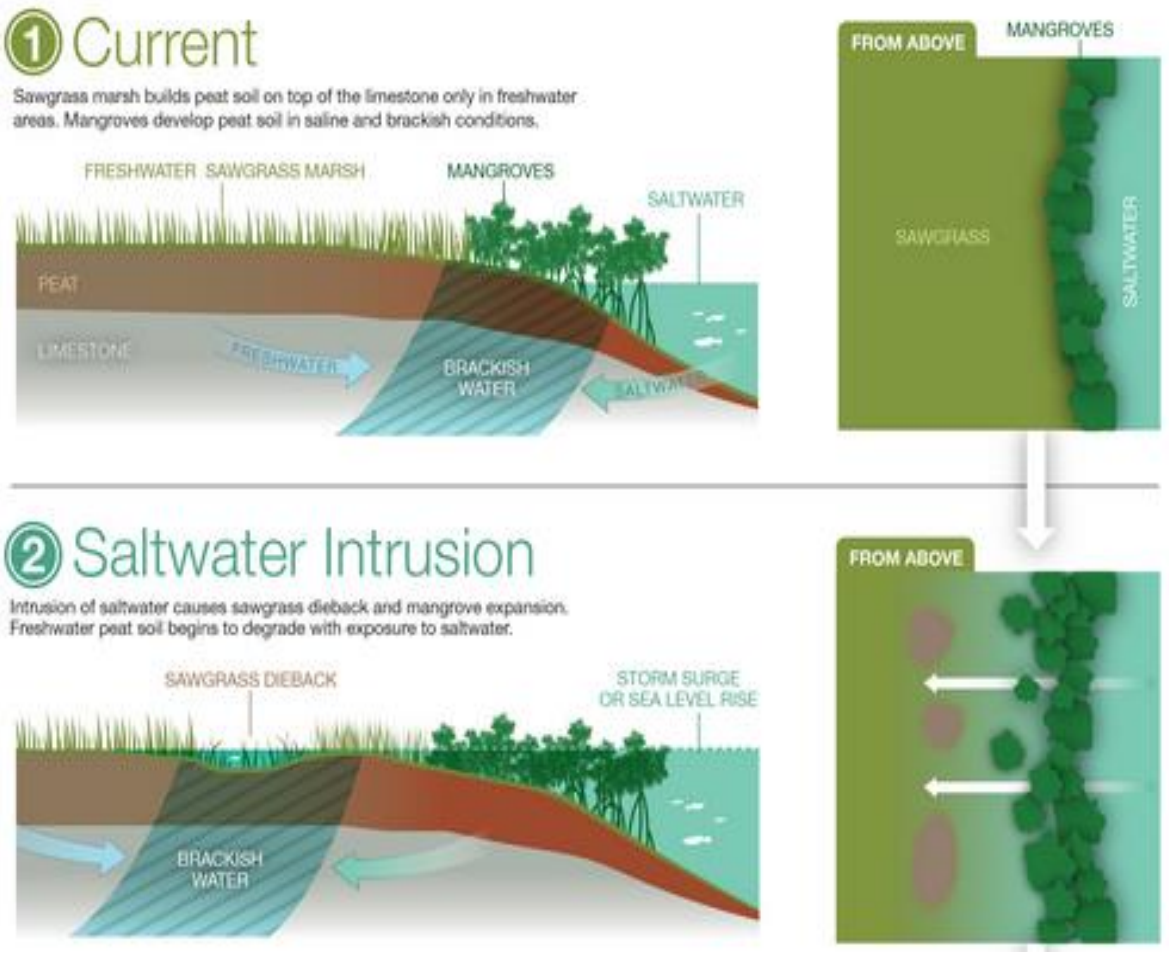

Image: Water Symposium of Florida

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CLIMATE CHANGE & WETLAND RESTORATION

USING WETLANDS TO COMBAT CLIMATE CHANGE

Connecting People, Places, and Potential

WAVE ATTENUATION

- Wetlands provide wave attenuation, protecting adjacent properties
- But, erosion occurs over time
- Areas vulnerable to climate change impacts need restoration and maintenance

CARBON SEQUESTRATION

- Emission of greenhouse gases from human activity #1 climate change indicator
- Greenhouse gases: #1 Carbon Dioxide, #2 Methane
- Carbon Dioxide is taken in by vegetation
  - Plants die, buried in soil and covered by tidal water
  - Plants break down slowly, resulting in carbon storage

- Also, evidence that expansion of wetlands contributes to methane emissions


Image: USFW

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WHAT CAN WE DO?

- Wetlands can be created, restored, and mitigated
- Specific projects range from wetland creation to restoration

Image: NJ.com

RESTORE WETLANDS

- Return ecosystem to as close to condition prior to disturbance.
- Ecosystems are biological communities of interacting organisms and their physical environment
- Restoration assists the recovery and management of ecological integrity
- Ecological integrity includes:
  - Biodiversity
  - Natural processes
  - Natural structures
- Should include the reintroduction of native plants

  - Society for Ecological Restoration

Image: ICUN

CREATE WETLANDS

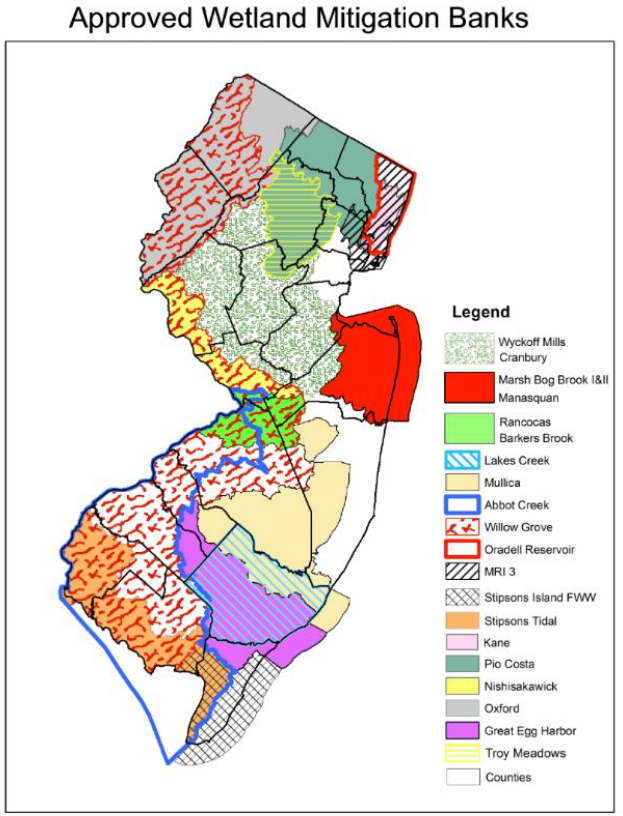
- Construct wetlands where they did not previously exist
- Water sits in a depression, establishing hydrology to support wetland species
- Created for specific purposes, such as flood storage


Image: Duke Farms

- Constructed Wastewater Wetlands at Duke Farms, Hillsborough, NJ:
  - Clean and filter wastewater from building using native plants
  - Clean wastewater is discharged back into groundwater

MITIGATE WETLANDS

- Create or restore wetlands to compensate for loss elsewhere
- Section 404 of Clean Water Act allows for wetlands to be destroyed, but mitigation must happen elsewhere
  - Ideally should result in "no net loss"
- 21 wetland mitigation banks selling credits
- Bought by developments on or near a wetland or stream that will negatively impact the ecosystem
- Mitigation banker responsible for upkeep and maintenance



Graphic: NJDEP

USE OF NONINVASIVE SPECIES

- Restoring native species and avoiding non-native species is key
- Avoid introduction of invasive species during restoration
- Phragmites are a common type of invasive species in NJ
  - Roots excrete toxic compound, choking out other plant life and altering ecosystem and landscape


Image: Vinyardgazette.com

BIOENGINEERING

- Use bioengineering techniques to prevent further site disturbance
- Combines live and dead plants or inorganic materials to produce living, functioning systems
- Erosion prevention, habitat, nutrient control, and flood mitigation
- Example: Gandy's Beach, NJ
  - Interwoven coconut fibers bound together with biodegradable netting to help establish the vegetation


Image: The Nature Conservancy

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Climate Change & Wetland Restoration

PROJECT EXAMPLES

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LINCOLN PARK WETLANDS RESTORATION

- Restoration of 42 acres of tidal wetlands that had become an illegal dumping ground
- Co-benefits: creation of recreational space and beneficial reuse of dredge material from Hudson River
- Project partners:
  - NJDEP
  - Louis Berger
- Funding:
  - NOAA (through the American Recovery and Reinvestment Act): $10.6 million


Image: Louis Berger

RICHARD P. KANE NATURAL AREA

- Restoration of 217 acres of wetlands in Hackensack Meadowlands to reestablish plant and animal life, improve water quality, and provide flood protection
- Provides mitigation credits for wetlands lost to area transportation projects
- Project partners:
  - New Jersey Meadowlands Conservation Trust
  - EnviroFinance Group, LLC
  - US Army Corps of Engineers


Image: geoocn.net

NEWARK BRANCH BROOK PARK LAKE RIVER EDGE RESTORATION

- Restoration of lake edge using storm water runoff controls and creation of a riparian buffer
- Area students assisted in data collection, invasive species removal, and planting
- Project partners:
  - US EPA
  - Newark CDBG
  - NJ Corporate Wetlands Restoration Partnership
- Funding: $97,000 total budget

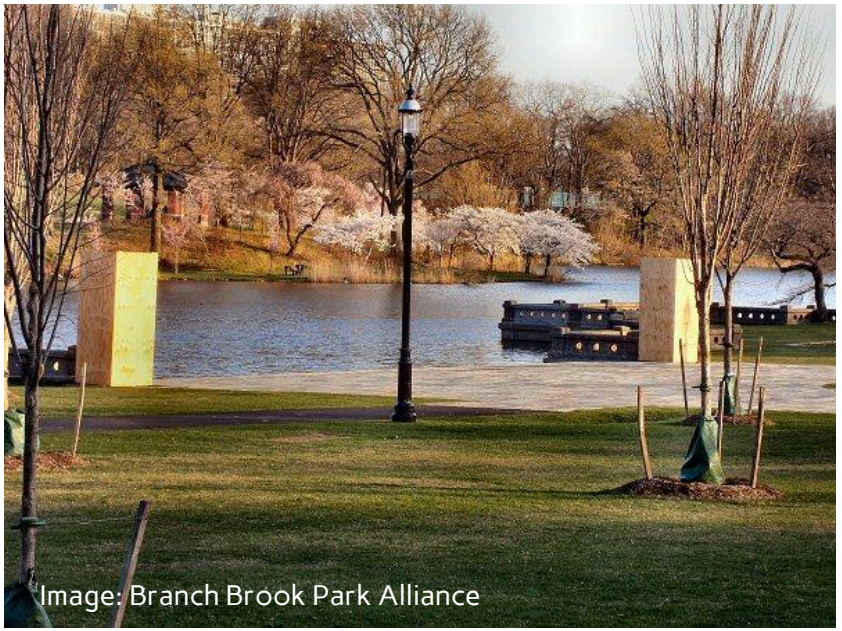

Image: Branch Brook Park Alliance

HARRISON AVENUE LANDFILL

- Cap/close 62 acre landfill and creation of Cramer Hill Waterfront Park
- Create/restore 17.5 acres of tidal and non-tidal wetlands and 3.5 acres of open water
- Co-Benefits: public recreational space, wetlands and diverse ecological habitats, shoreline stabilized, beneficial reuse of Cooper River dredge material
- Project partners:
  - NJDEP ONRR and DCE, CDM Smith/Sadat, Camden Redevelopment Agency, Cooper's Ferry Partnership, TSAC/the Kroc Foundation, Cramer Hill Community Development Corporation, USEPA, and other non-profits


Image: NJ.gov

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PROJECT EXAMPLES

Little Egg Harbor Resiliency Project

LOCAL RECOVERY MANAGER PROGRAM

- New Jersey Future
  - Revitalize cities
  - Preserve open space
  - Keep housing affordable
  - Encourage transportation choices


Mantoloking, USGS image

- Local Recovery Managers
  - Little Egg Harbor / Tuckerton
  - Sea Bright / Highlands
  - Commercial /Maurice River


Tuckerton Beach, Tuckerton Borough image

- Objectives
  - Provide local capacity for long term resilience
  - Identify vulnerability to likely hazards
  - Advance dialogue on long term planning
  - Develop projects to increase resiliency


Damaged home in Little Egg Harbor, photo by Leah Yasenchak

RESILIENCY PROJECT: MARSH RESTORATION

- Funding
  - National Fish and Wildlife Foundation
  - NJ DEP Section 319(h)
  - NJ Corporate Wetlands Partnership
- Proposed Project Components
  - Beach replenishment
  - Living Shoreline
  - Thin layer deposition
  - Dredging


Iowa Court Cul-de-sac, LEH photo by Matthew Brener


Marsh at Great Bay Boulevard, photo by Matthew Brener


Marsh at Great Bay Boulevard, photo by Matthew Brener

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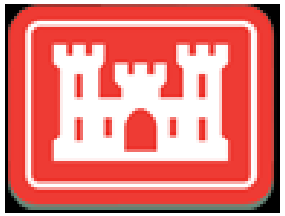
RESILIENCY PROJECT: PARTNERS

State of New Jersey
Department of Environmental Protection

National Fish and Wildlife Foundation NFWF

NJCWRP
New Jersey Corporate Wetlands Restoration Partnership



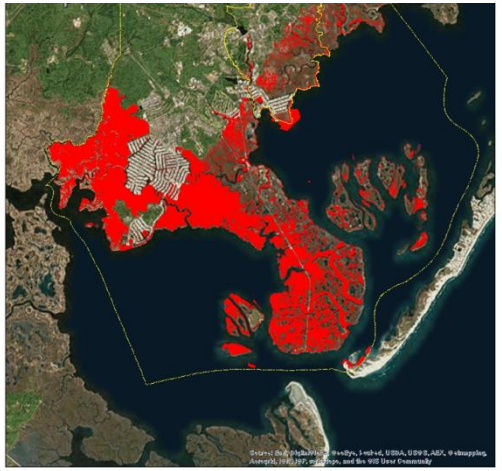
Barnegat Bay Partnership
Research · Educate · Restore

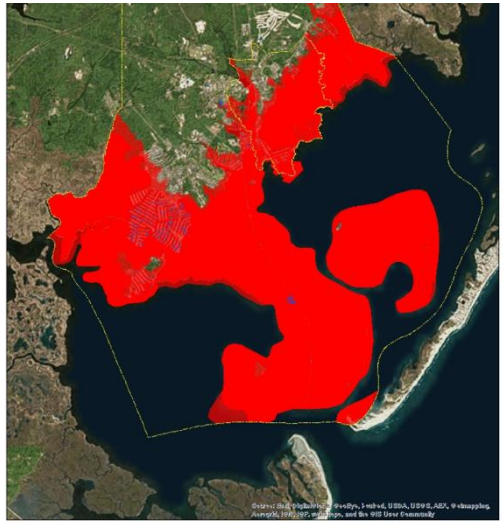
NEW JERSEY FUTURE

BRS inc

RESILIENCY PROJECT: IMPLEMENTATION

- Programmatic Challenges
- Permitting Challenges
- Administrative Challenges
- Project Revisions





Tuckerton and Little Egg Harbor maps, New Jersey Future, Vulnerability and Exposure Analysis for the Township of Little Egg Harbor (April 2015)

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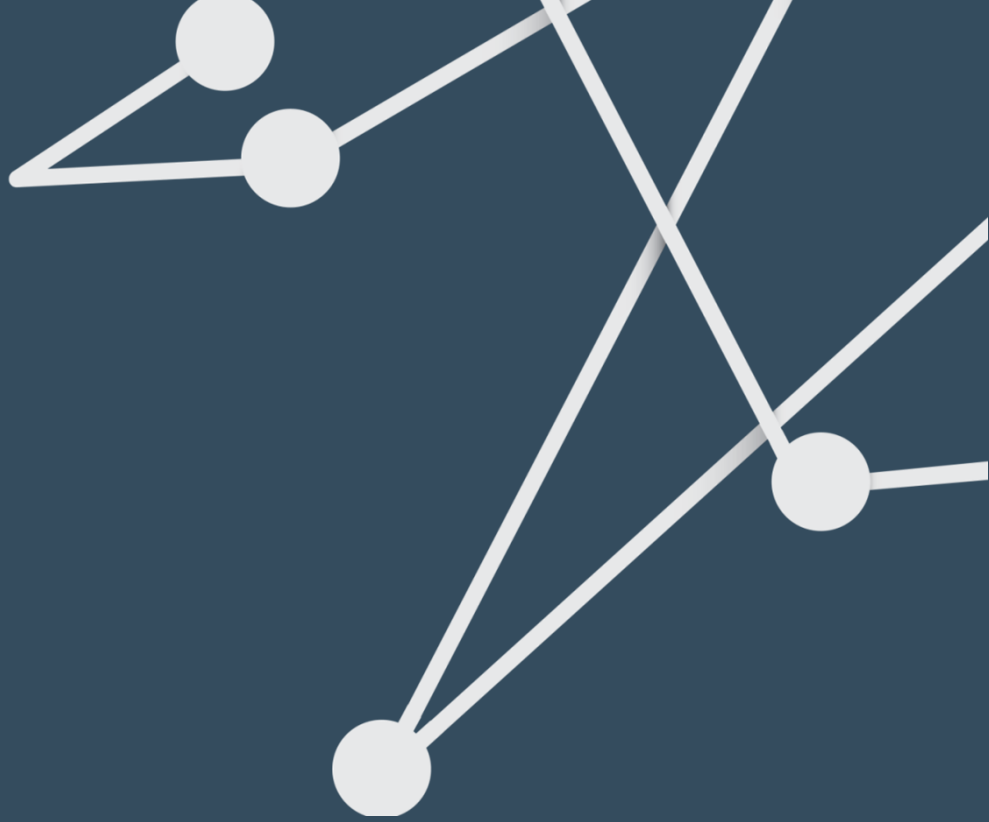

Climate Change & Wetland Restoration

FUNDING OPPORTUNITIES & INCENTIVE PROGRAMS

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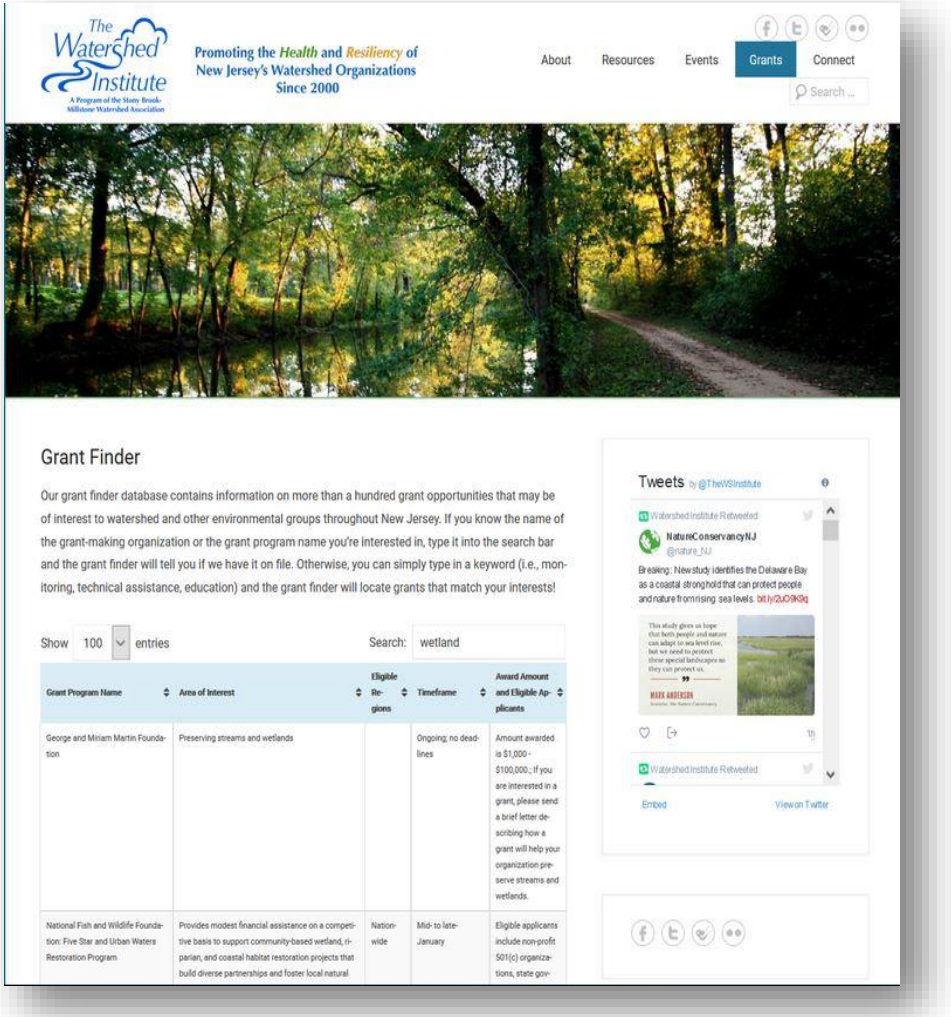
GRANT FINDER

The Watershed Institute Grant Finder

http://thewatershedinstitute.org/twig/grant-finder/



NEW JERSEY CORPORATE WETLANDS RESTORATION PARTNERSHIP

- Restore NJ wetlands and other aquatic habitats
- Must be located on public and protected lands within NJ and have a governmental partner
- Priority given to projects with educational component, matching funds available, permits in place
- Amount: Up to $25,000
- Funds go to general restoration efforts and materials purchases
- Project example: Restoration of 3,600 ft. of Squankum Brook in Monmouth County to provide wildlife habitat. Project partners included US Fish and Wildlife Service, Howell Township, and non-profit Trout Unlimited

NATIONAL FISH AND WILDLIFE FOUNDATION FIVE STAR AND URBAN WATERS RESTORATION GRANT PROGRAM

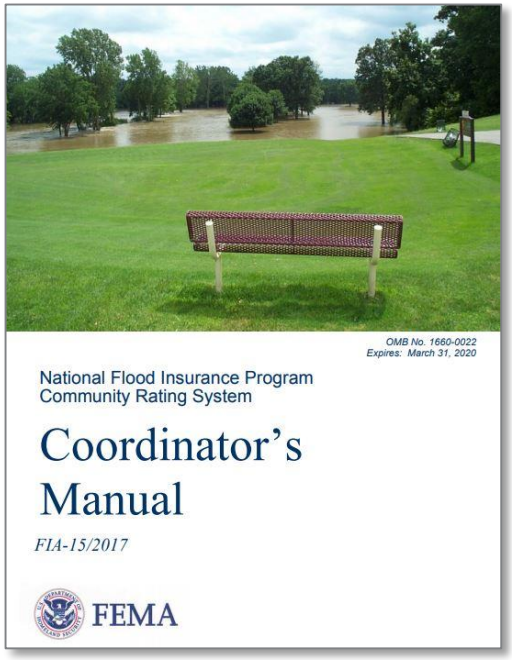
- Projects addressing water quality issues in priority watersheds
- Available to non-profits, local governments, and educational institutions nationwide
- Habitat restoration, education, community benefits, and diverse community partners
- Amount: $30,000 average
- Project example: Restoration of .5 miles of Schuylkill River wetland habitat near Philadelphia. Project partners include Drexel University and two local non-profits.

Image: PA Environmental Digest Blog

COMMUNITY RATING SYSTEM (CRS) APPLICABILITY

A voluntary incentive program that encourages community floodplain management activities exceeding National Flood Insurance Program (NFIP) minimum requirements:

- Aquatic and riparian habitat for threatened and endangered species (State and Federal)
- Section 294: Floodplain management plan/habitat conservation plan
- Section 321: Providing and publicizing map information service (outreach on protected areas)
- Section 421: Preserving open space
- Section 421: Attaching deed restrictions to open space parcels



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RESOURCES

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RESOURCES

- Together North Jersey Resilient Task Force
  - http://togethernorthjersey.com/?page_id=24563
- Sea Level Rise Projections: Assessing New Jersey's Exposure to Sea-Level Rise and Coastal Storms. Report of the New Jersey Climate Adaptation Alliance Science and Technical Advisory Panel
  - http://njadapt.rutgers.edu/docman-lister/conference-materials/167-njcaa-stap-final-october-2016/file
- Storm Surge Data: NOAA SLOSH (Sea Lake and Overland Surges from Hurricanes)
  - https://www.nhc.noaa.gov/surge/slosh.php
- What is Causing the Recent Rise in Methane Emissions? (Pearce, 2016)
  - https://e360.yale.edu/features/methane_riddle_what_is_causing_the_rise_in_emissions
- NJ Flood Mapper
  - http://www.njfloodmapper.org/
- NJ Wetland Mitigation Banks
  - http://www.nj.gov/dep/opi/mitigation-banks.html
- The Watershed Institute Grant Finder
  - http://thewatershedinstitute.org/twig/grant-finder/
- FEMA CRS Credit for Habitat Protection
  - https://www.fema.gov/pdf/about/regions/regionx/draft_crs_credit_for_habitat_protection.pdf
- NJDEP Building Ecological Solutions to Coastal Hazards
  - http://www.nj.gov/dep/oclup/docs/bescch-final.pdf

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ADDITIONAL TRAINING RESOURCES

Topics presented in this webinar series were selected based on the findings of a statewide training needs survey conducted by:

Jacques Cousteau National Estuarine Research Reserve (JC NERR)
NJ Coastal Management Program
The National Oceanic and Atmospheric Administration

To learn about JC NERR professional development and coastal training workshops or browse the resource library, please visit https://jcnerr.org/education/

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10 MINUTE Q&A

Questions taken from chat log at bottom right section of the screen

If we run out of time, please email either:

- Stacy Krause, perrines@ejb.rutgers.edu
- Eliot Benman, ebenman@ejb.rutgers.edu

Thank you!

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WEBINAR Q&A, Question #1

Q: Because much hotter summers are anticipated, how will native plants be affected? Are invasive species better at surviving the summer heat?

A: In the past hundred years the growing season across much of the US has lengthened by an average of two weeks. Forecasters also expect more frequent and intense extreme storm events. All of these factors combine to place added stress on both native and invasive species. However, invasive species in general are much better equipped to handle these new stressors. Source: US EPA

Also, according to work done at the Biodiversity Research Centre at the University of British Columbia, researchers found that many non-native species are changing their flowering schedule in concert with the longer growing season. More information on their research can be found at http://ibis.geog.ubc.ca/biodiversity/BiodiversityResearchatUBC.html

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WEBINAR Q&A, Question #2

Q: As wetlands are expanded, will additional insect controls be required?

A: This work is governed by General Permit 15—Mosquito control activities, under the Freshwater Wetland Protection Act Rules for the State of NJ. More information can be found at http://www.state.nj.us/dep/landuse/lawsregs.html

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WEBINAR Q&A, Question #3

Q: For projects such as the Lincoln Park Wetland Restoration and the Richard P. Kane Bank, are there current updates with the project, post-construction? It was not mentioned if the projects had recently finished construction or had been constructed for some time.

A: Lincoln Park Wetland Restoration: completed with project history available at https://www.louisberger.com/our-work/project/lincoln-park-wetlands-restoration-new-jersey-us

Richard P. Kane area: completed with project history available at http://meri.njmeadowlands.gov/mesic/sites/existing-restoration-preservation-mitigation-sites/kane-mitigation-site/

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WEBINAR Q&A, Question #4

Q: Is the Grantfinder website exclusive to New Jersey?

A: No, the Grantfinder website includes grant opportunities available nation-wide.

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