

***Advancing Nature-based Stormwater Strategies to  
Reduce Flooding and Improve Water Quality in North  
Carolina***

***Welcome***

**Kristiane Huber, The Pew Charitable Trusts**

March 25, 2020

# ***Advancing Nature-based Stormwater Strategies to Reduce Flooding and Improve Water Quality in North Carolina***

## **Zoom Information and Reminders:**

- Mute when not speaking (bottom left screen).
- Chat “tech Support” participant if having difficulties.
- Can’t see video? Follow along with agenda and slides.
- Dial-in from Zoom #s if you get disconnected.

***This meeting is being audio recorded for note taking purposes only and to share with any work group members unable to participate today. The recordings will not be shared with the public.***

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***Statement by:***

**Michael S. Regan, Secretary  
N.C. Department of Environmental Quality**

# *Advancing Nature-based Stormwater Strategies to Reduce Flooding and Improve Water Quality in North Carolina*

## **Meeting Overview:**

- Four Work Groups Meeting Today and Concurrently
  - a.m. - New Development and Roadways
  - p.m. - Stormwater Retrofit and Working Lands

## **Agenda Overview:**

- Project Overview and Defining “Nature-based Stormwater Strategies”
- Remarks from The Pew Charitable Trusts
- Facilitated Group Session
  - Nature-based Stormwater Strategies and Future Opportunities
  - Existing and Perceived Impediments to Implementation
  - Identify Research Needs
  - Next Steps

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***Project Overview and Defining  
“Nature-based Stormwater Strategies for Working Lands”***

**Todd Miller, North Carolina Coastal Federation**

# ***Advancing Nature-based Stormwater Strategies to Reduce Flooding and Improve Water Quality in North Carolina***

## **Increased Volumes of Stormwater Runoff and Flooding**

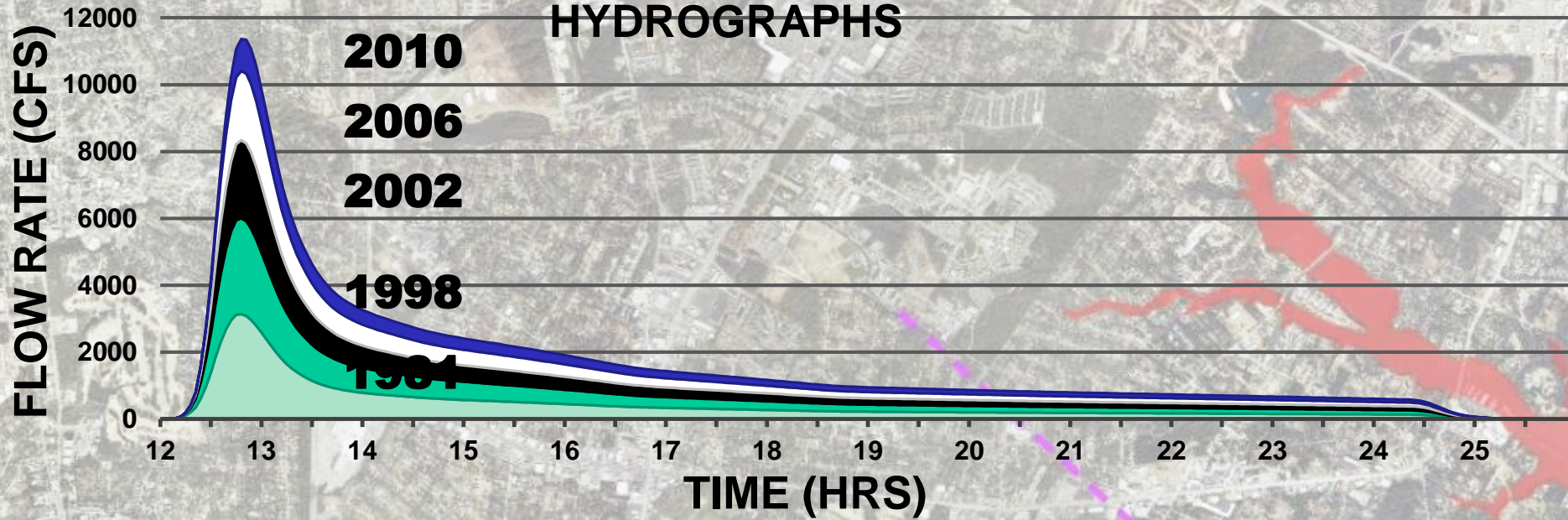
- Both urban and rural land uses alter natural hydrology.
- Alterations effect the land's capacity to collect and absorb rain and storms.
- Stormwater runoff causes flooding.
- Stormwater runoff carries pollutants to surface waters.
- Intensity and frequency of storms are magnifying problems.
- Statewide Issue.

# ***Urban and Rural Land Uses Alter Natural Hydrology Flooding and Surface Water Degradation Can Result***

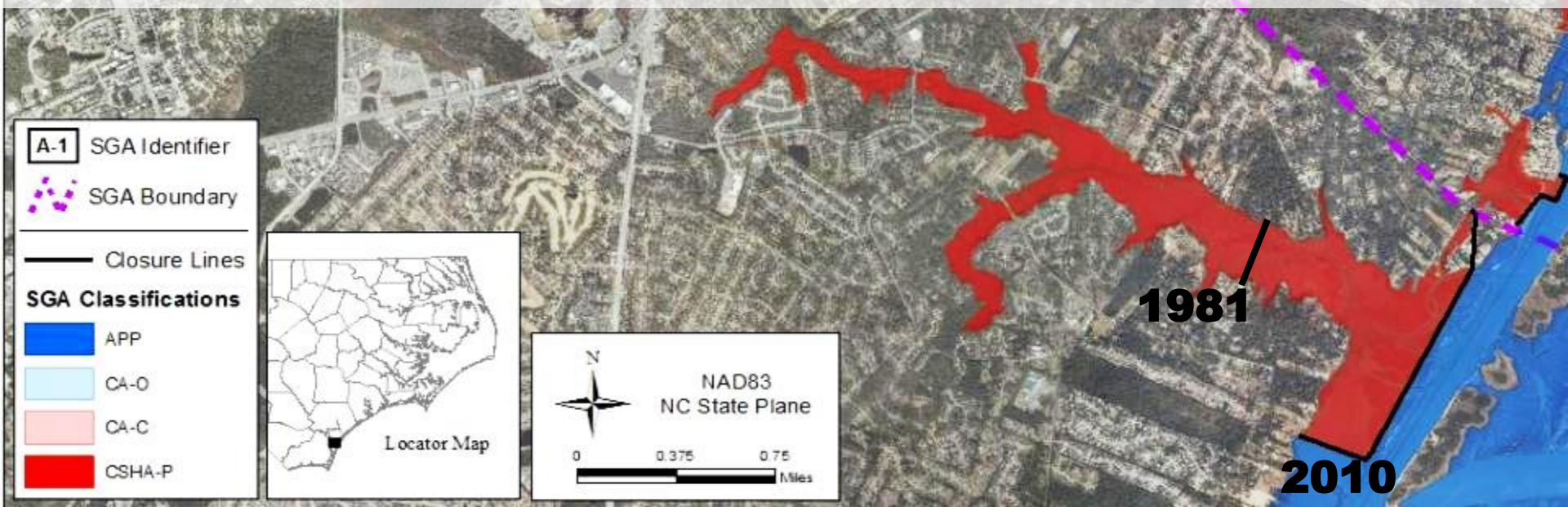




# HEWLETTS CREEK WATERSHED 1-YR STORM HYDROGRAPHS



# CHANGES IN SHELLFISH CLOSURE BOUNDARIES

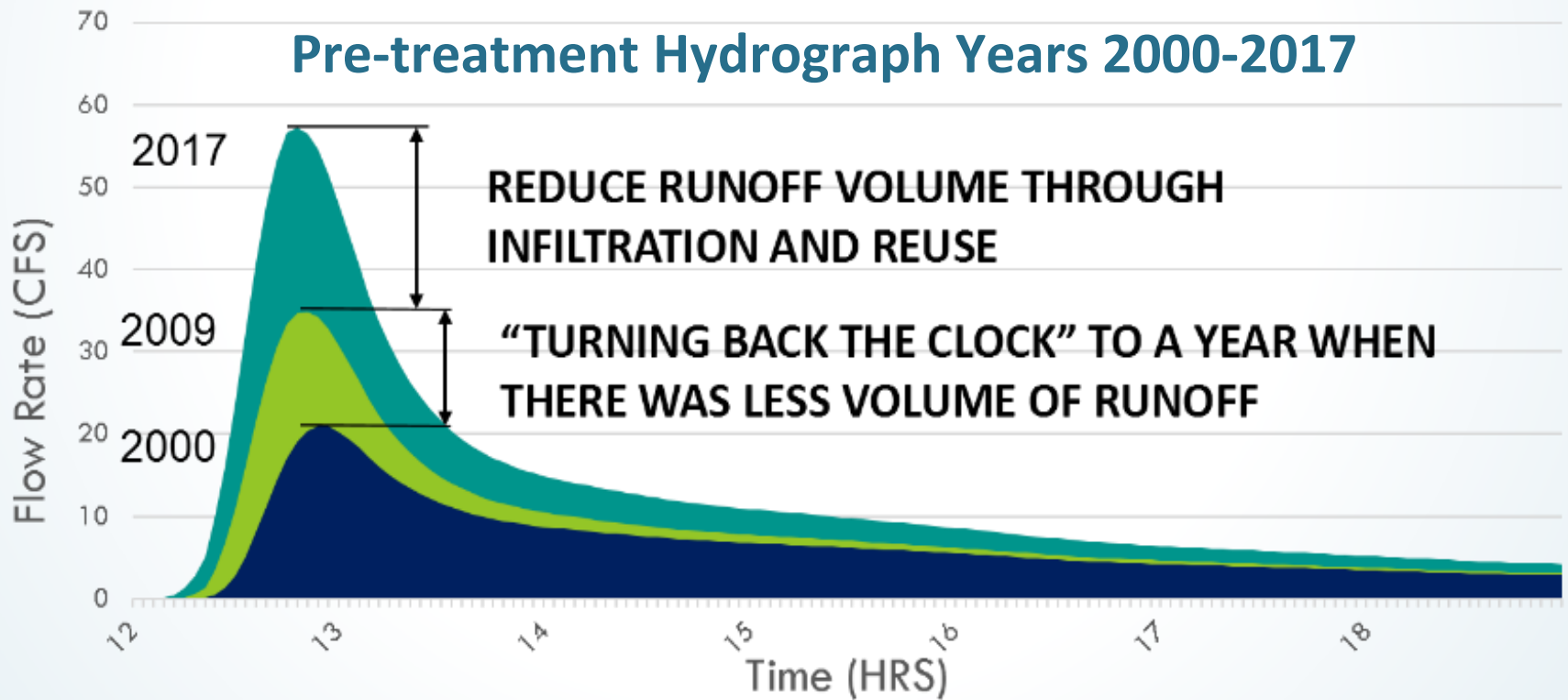




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## **Watershed Strategy**

Replicate natural hydrology by focusing on the watershed as a whole



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## **Impact of Nature-based Stormwater Strategy Approach**

- Maintain natural hydrology and capacity of land to collect and infiltrate.
- Mimic natural hydrology (retrofits).
- Reduce flooding.
- Protect and restore water quality.
- Result in more resilient communities statewide.
- Multiple co-benefits – including economic and aesthetic.

# *Snapshots of Nature-based Stormwater Strategies*





# *Advancing Nature-based Stormwater Strategies to Reduce Flooding and Improve Water Quality in North Carolina*

## **Working Together Toward Solutions:**

- Governor's Executive Order 80
- June 2019 Workshop
- Determined Need to Assemble Experts to Collaborate Toward Solutions
- Project Team Formed
- Work Groups Assembled

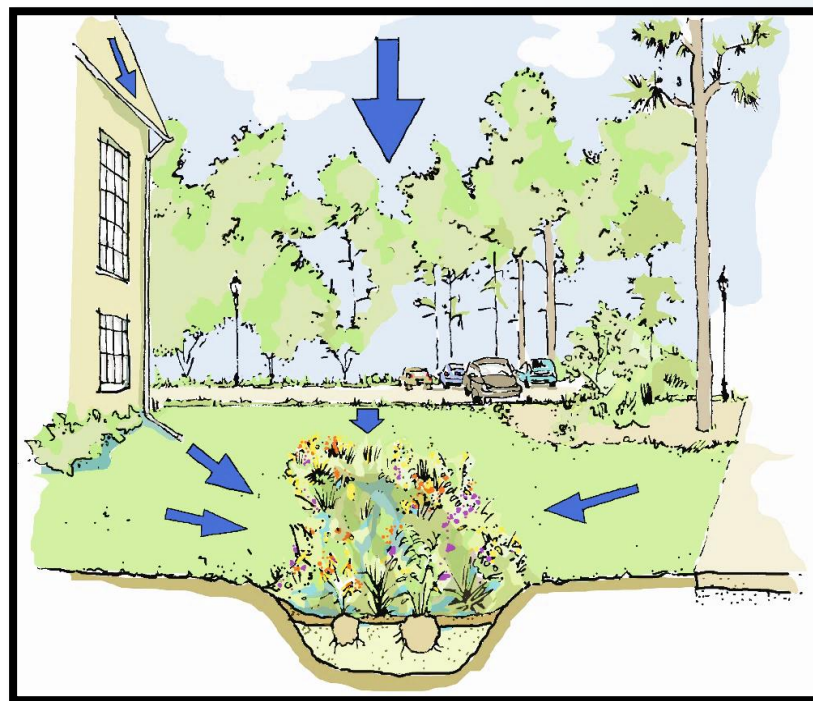




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## **Work Group Goals:**

- Develop and implement consensus-driven statewide Nature-based Stormwater Strategy Action Plan.
- Increase the use of nature-based stormwater strategies where practicable to reduce flooding and protect water quality.



# ***Advancing Nature-based Stormwater Strategies to Reduce Flooding and Improve Water Quality in North Carolina***

## **Work Group Charge:**

- Evaluate current use of nature-based stormwater strategies, opportunities and need.
- Identify real and perceived impediments to using nature-based strategies.
- Formulate set of consensus recommendations for advancing nature-based strategies where feasible.

# *Advancing Nature-based Stormwater Strategies to Reduce Flooding and Improve Water Quality in North Carolina*

## **Project Schedule:**

<b>March 2020</b>	Introductory meeting, identify impediments to implementation
<b>May 2020</b>	Compile policy, funding, and promotion needs for nature-based strategy implementation
<b>July 2020</b>	Develop draft Plan with tools to advance policies, funding, and promotion
<b>Nov. 2020</b>	Review and finalize Plan
<b>March 2021</b>	Host Nature-based Stormwater Strategy Summit

# ***Nature-based Stormwater Strategies for Working Lands***

Nature-based stormwater strategies for working lands include devising strategies to actively manage drainage water, wetlands, and riparian areas to infiltrate and filter runoff.

Nature-based strategies restore or replicate the natural hydrology and the capacity of the land to reduce flooding and naturally treat runoff within and from farm and forest lands.





# *Nature-based Stormwater Strategies for Working Lands*

ENHANCING ENVIRONMENTAL STEWARDSHIP



MATTAMUSKEET DRAINAGE ASSOCIATION

## **WATERSHED RESTORATION PLAN**



- Developed a watershed restoration plan to evaluate cost-effective strategies to actively manage drainage using new pumps and drainage infrastructure, restored wetlands, and improved dikes and berms.
- Designed new drainage infrastructure to replicate natural movement and rates of runoff.
- Formulated set of consensus recommendations that are advancing nature-based infrastructure improvements and wetland restoration that accommodate the needs of landowners and the environment.

# Nature-based Stormwater Strategies for Working Lands

## What does this mean for association members?



This is a *voluntary* program to reduce pumped drainage, but the goal of the plan is to restore water quality through wetland restoration and water reallocation. The proposed projects will be implemented with grant funds and will include capital improvements to association infrastructure. Benefits to landowners include:

- Significant savings in association pumping costs.
- Road improvements through project implementation.
- Enhancement of water management capabilities for waterfowl impoundments and agricultural uses.
- Improved coastal water quality supporting oysters, blue crabs, shrimp and other fisheries.
- Retention of perimeter pumps for use during storm events.
- Involvement with non-traditional partners.

## MOVING FORWARD: COMPLETED & PENDING PROJECTS

The N.C. Coastal Federation and association landowners have already partnered to implement several projects identified in this plan. This includes a Shorebird Project that enhanced 600 acres of wetlands to create habitat for migrating shorebirds. Three other projects currently underway will enhance nearly 3,000 acres of wetlands and enable them to store pumped drainage. Future plans call for an additional 9,000 acres of wetlands restoration.

### PROJECT ACKNOWLEDGEMENTS



Enabled landowners to receive financial incentives and technical guidance to restore wetlands and improve their drainage infrastructure.

Reduce the potential for flooding by improving dikes and pumping capacity for working lands.

Improved water quality by reducing the need to directly discharge drainage waters into Pamlico Sound.

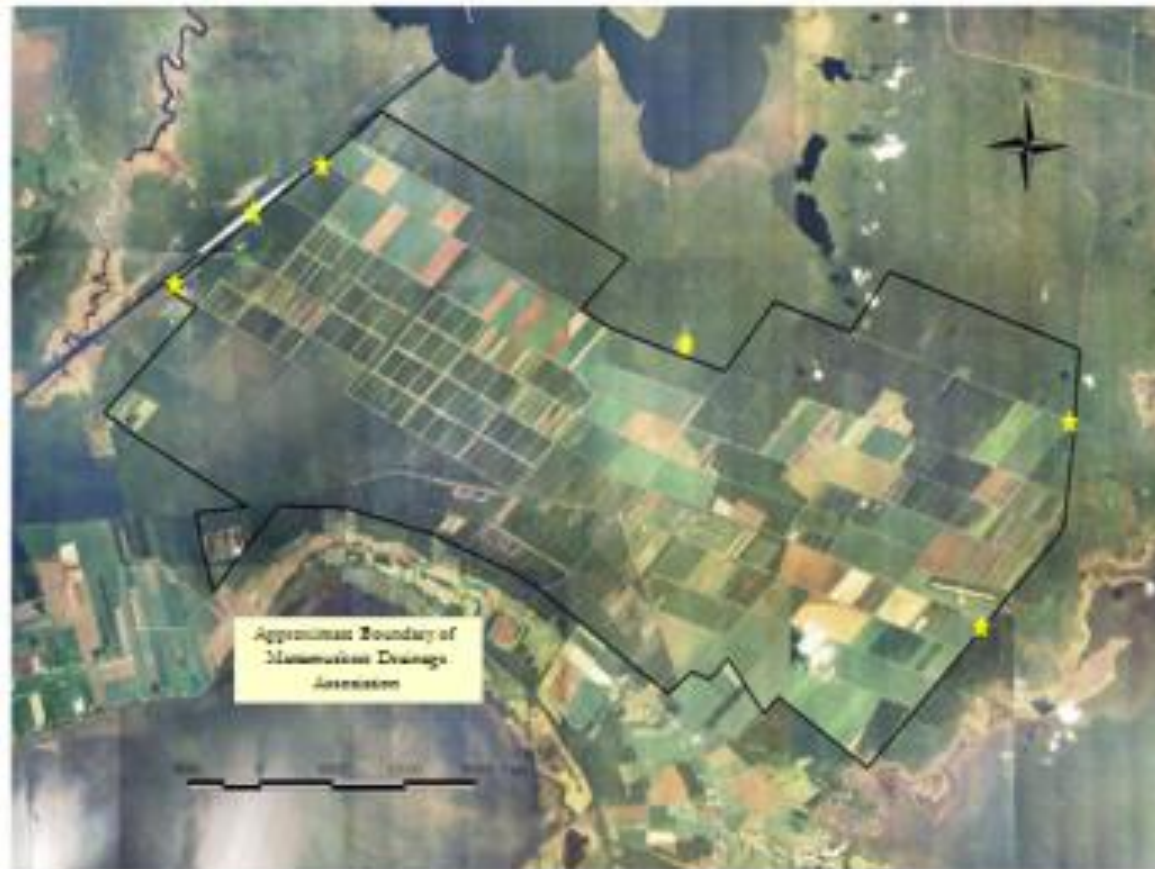


For more information contact the N.C. Coastal Federation at 252.393.8185

[www.nccoast.org](http://www.nccoast.org)



## *Nature-based Stormwater Strategies for Working Lands*



The 42,500-acre Mattamuskeet Drainage District (approximately 64 square miles) in Hyde County is one of the largest drainage districts in North Carolina. It has been the focus of wetland and hydrologic restoration efforts since 2003.

# *Nature-based Stormwater Strategies for Working Lands*



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## LAKE MATTAMUSKEET WATERSHED RESTORATION PLAN

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An anchor to the past, a path to the future

NOVEMBER 30, 2018

PREPARED BY: NORTH CAROLINA COASTAL FEDERATION

On behalf of: Hyde County, U.S. Fish and Wildlife Service, and N.C. Wildlife Resources Commission

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Similar planning effort for Lake Mattamuskeet has identified numerous nature-based strategies to address flooding and water quality problems plaguing the lake.



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**Working Together:  
Remarks From The Pew Charitable Trusts**

**Kristiane Huber, The Pew Charitable Trusts**



**Flood-Prepared Communities  
The Pew Charitable Trusts**





**Reduce the impact of weather-related catastrophes, such as floods and hurricanes, on the U.S. taxpayer and environment by better preparing communities through federal and state policy reform in four areas: federal flood insurance, infrastructure, pre-disaster mitigation, and nature-based solutions to flood control.**



# North Carolina Climate Science Report



## Looking Back:

An upward trend in the number of heavy rainfall events (3 inches or more in a day), with 2015–2018 having the greatest number of events since 1900.

## Looking Forward:

It is *likely* that annual total precipitation in North Carolina will increase.

It is *very likely* that extreme precipitation frequency and intensity in North Carolina will increase.



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***Working Lands Work Group Facilitated Session***  
**Kristiane Huber, The Pew Charitable Trusts**

# ***Advancing Nature-based Stormwater Strategies to Reduce Flooding and Improve Water Quality in North Carolina***

## ***Opportunities***

- How are nature-based stormwater strategies being applied on working lands in North Carolina?
- With optimal, un-impeded application of nature-based stormwater strategies on working lands, what does North Carolina look like in 10 years?
- Can you share additional nature-based stormwater strategy successes on working lands? (in NC or other states)

# ***Advancing Nature-based Stormwater Strategies to Reduce Flooding and Improve Water Quality in North Carolina***

## ***Impediments***

- What are the impediments to implementing nature-based stormwater strategies on working lands?

Awareness?

Regulatory Constraints (fed, state and local level)?

Costs?

Demand?

- How are nature-based stormwater strategies perceived in your field? By your colleagues?



# ***Advancing Nature-based Stormwater Strategies to Reduce Flooding and Improve Water Quality in North Carolina***

## ***Research Needs to Advance Our Work***

- Current policies and regulations?
- Current funding sources?
- Initiatives from other states?
- Other?

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## ***Next Steps***

- Follow Up Form to Solicit Additional Ideas.
- Send Meeting Notes.
- Project Team Complete Research.
- Work Group Meeting late May (begin recommendation development).
- Questions? Contact Lauren Kolodij, North Carolina Coastal Federation at [laurenk@nccoast.org](mailto:laurenk@nccoast.org)
- Thank You!