

North Coast Resilience Project

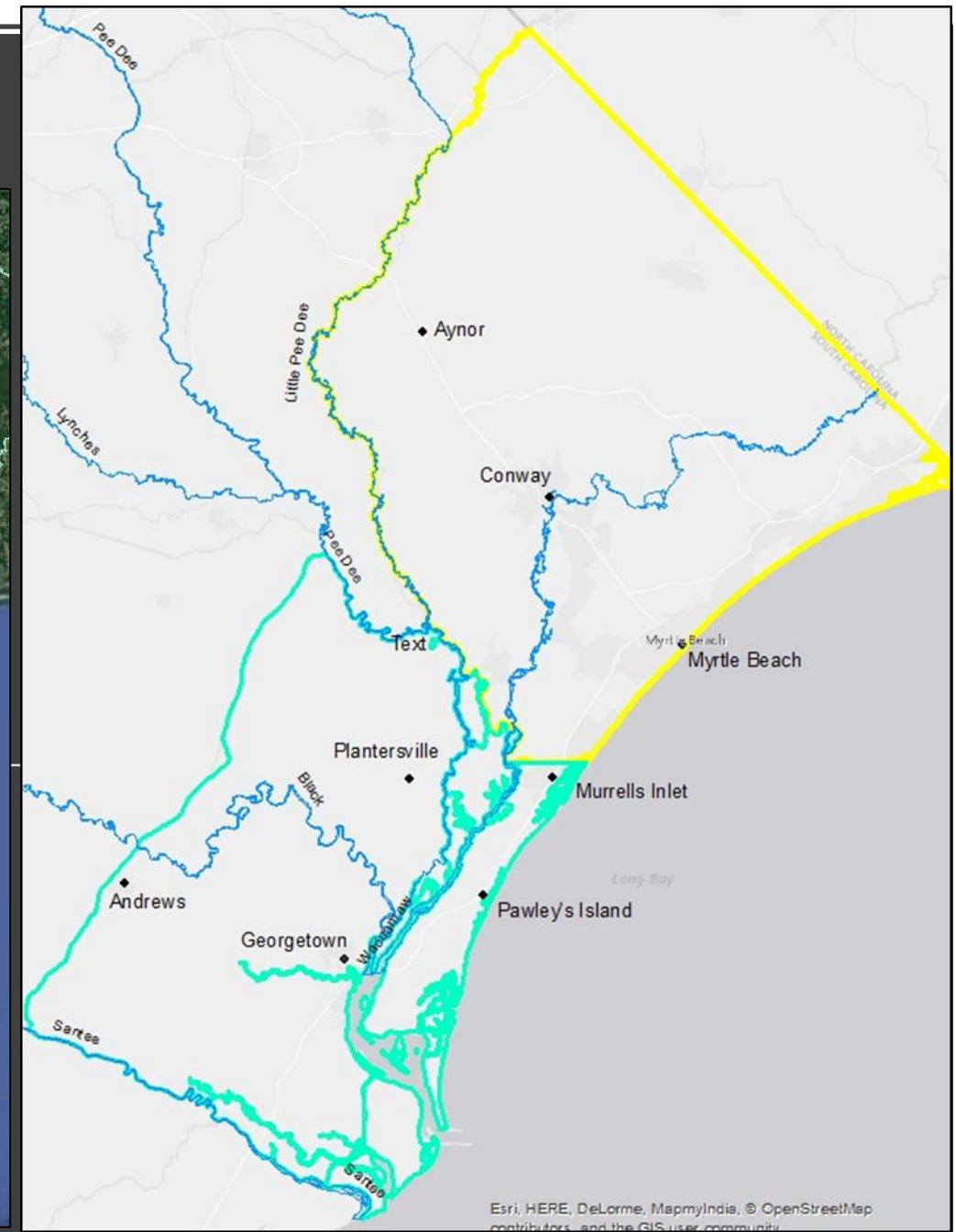
Mitigating flood risk through green infrastructure

Joy Brown

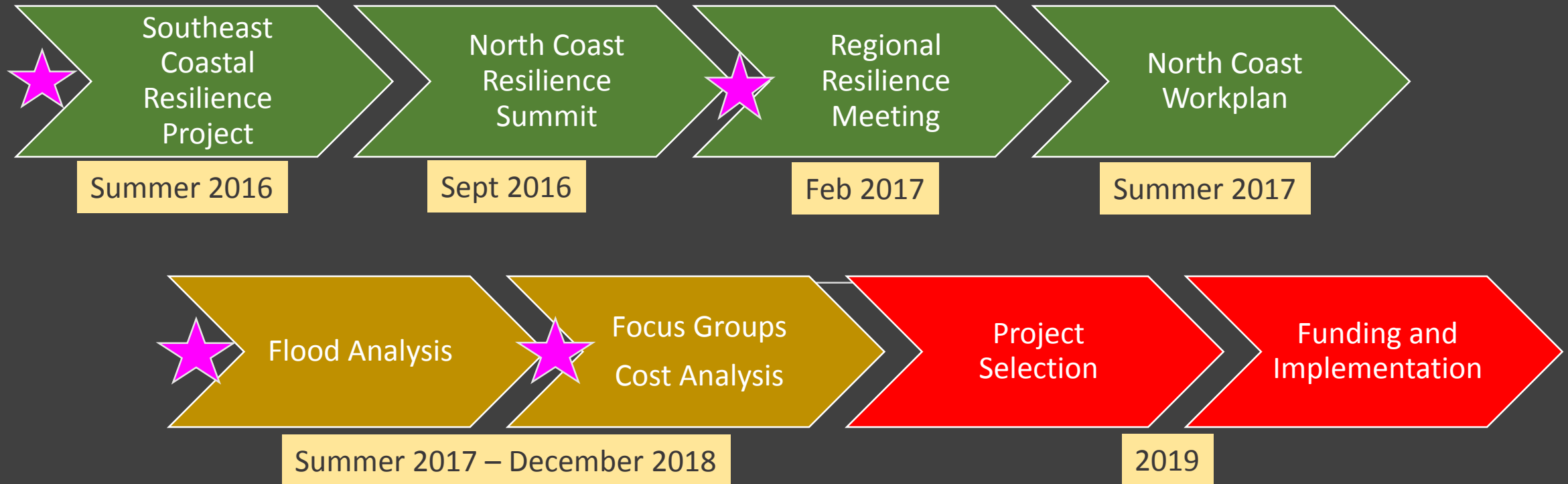
The Nature Conservancy
South Carolina



North Coast Counties in SC



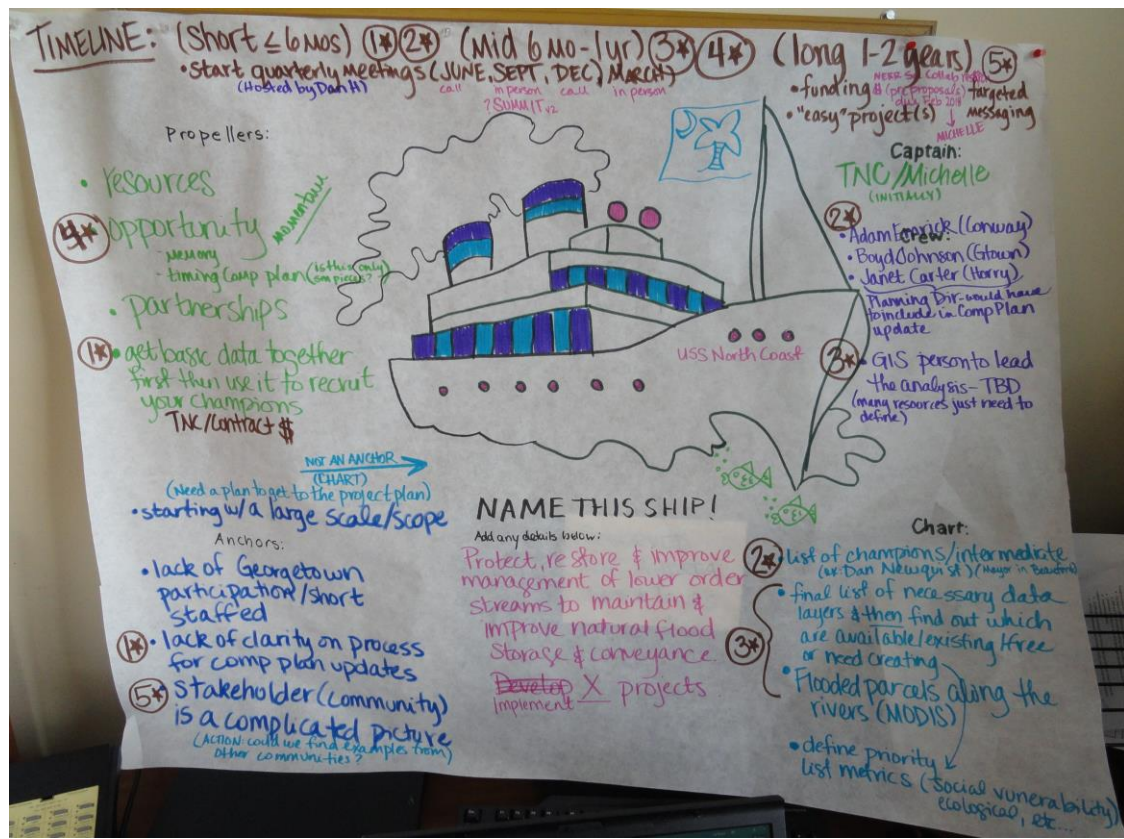
Project Timeline



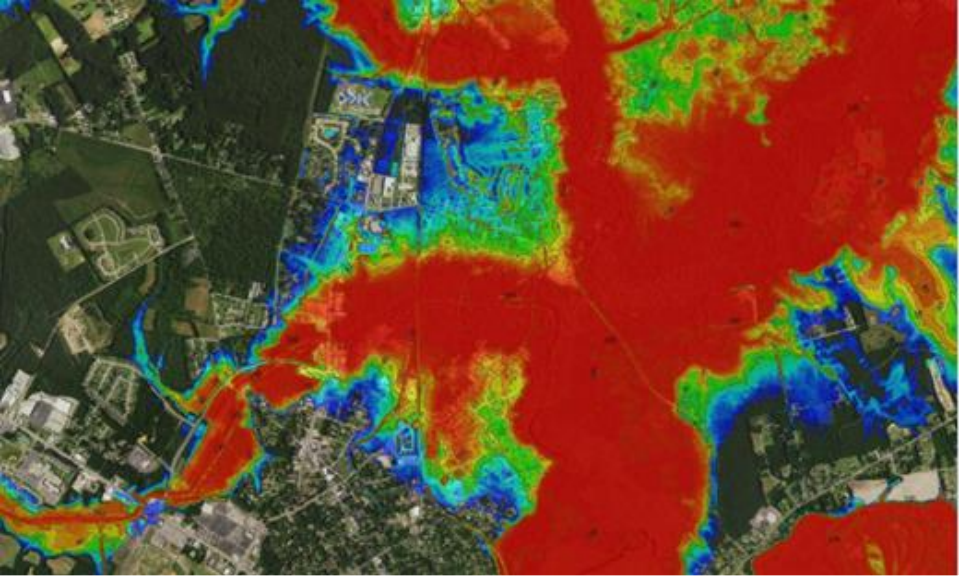
★ = Flood Event



TNC Regional – State Resilience Effort



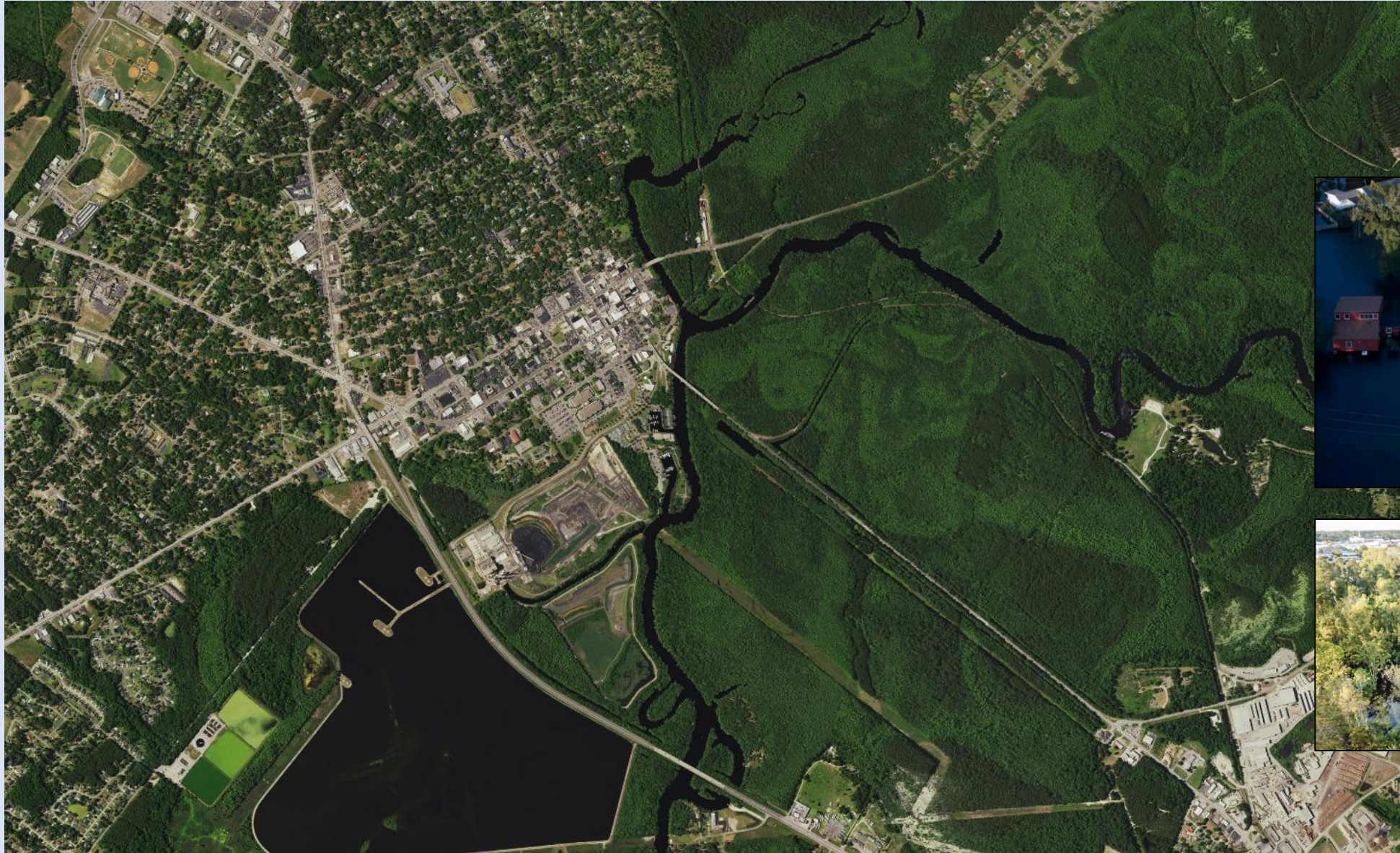
TNC Regional Meeting – February 2017



Project Goals

- Better understand localized flood risk
- Identify opportunities to use nature based solutions to mitigate flood risk
- Provide “shovel-ready” project ideas
- Implement at least one on-the-ground project

Hydrologic Land Cover Mapping



Conway area
chosen as a high
priority location



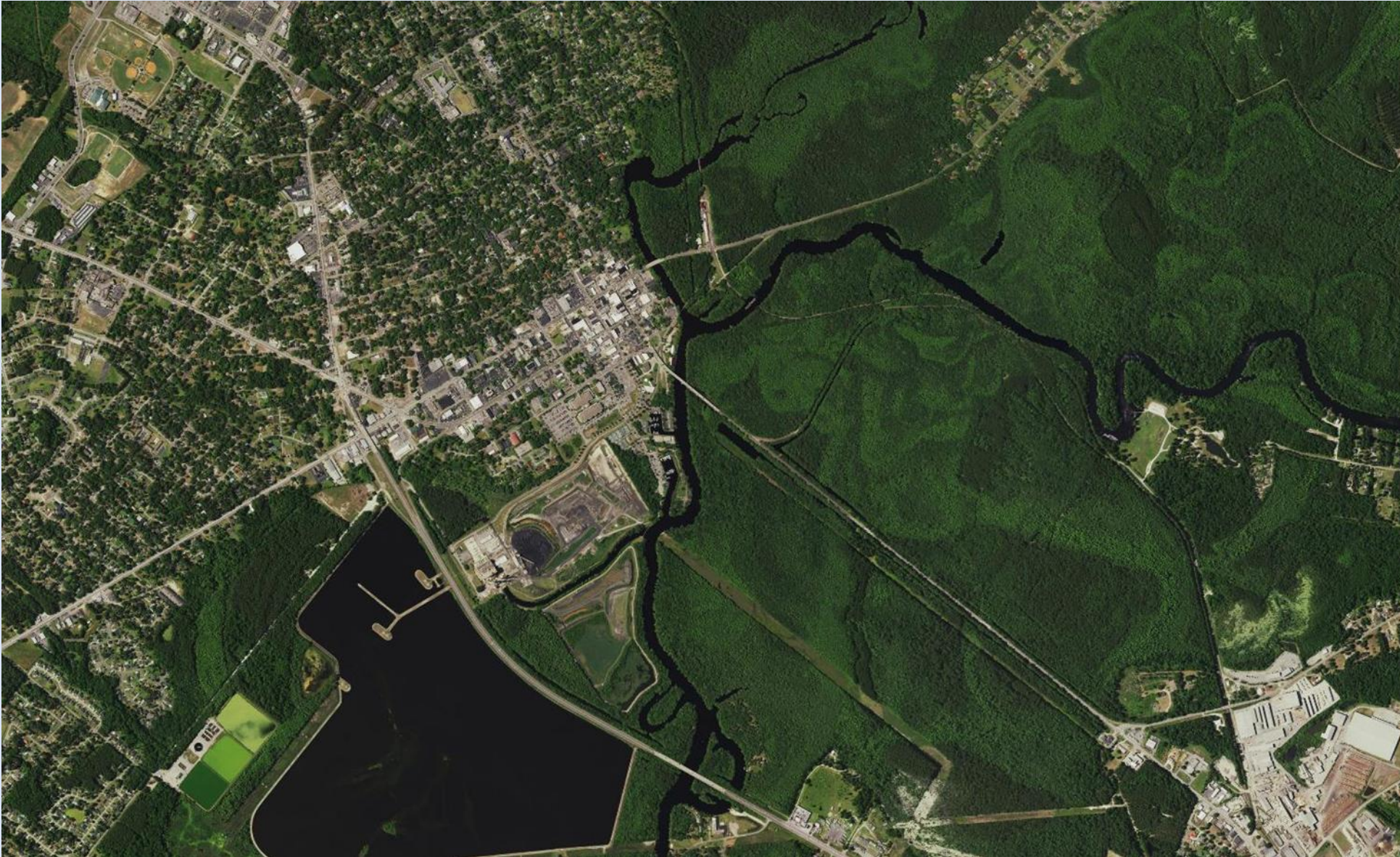
Hydrologic Land Cover Mapping - Developed



- Rainy Day Land Cover
- Moisture driven classification scheme

■	River flooded Bare/Paved
■	Trees
■	Scrub/Shrub
■	Grass/Low Veg
■	Wetland Grass/Low Veg
■	Palustrine Trees
■	River flooded Grass/Low Veg
■	Palustrine Scrub/Shrub
■	Wet Bare/Paved
■	Surface Drainage
■	Structures
■	Bare/Paved
■	Water Bodies
■	River flooded Trees
■	River flooded Scrub/Shrub

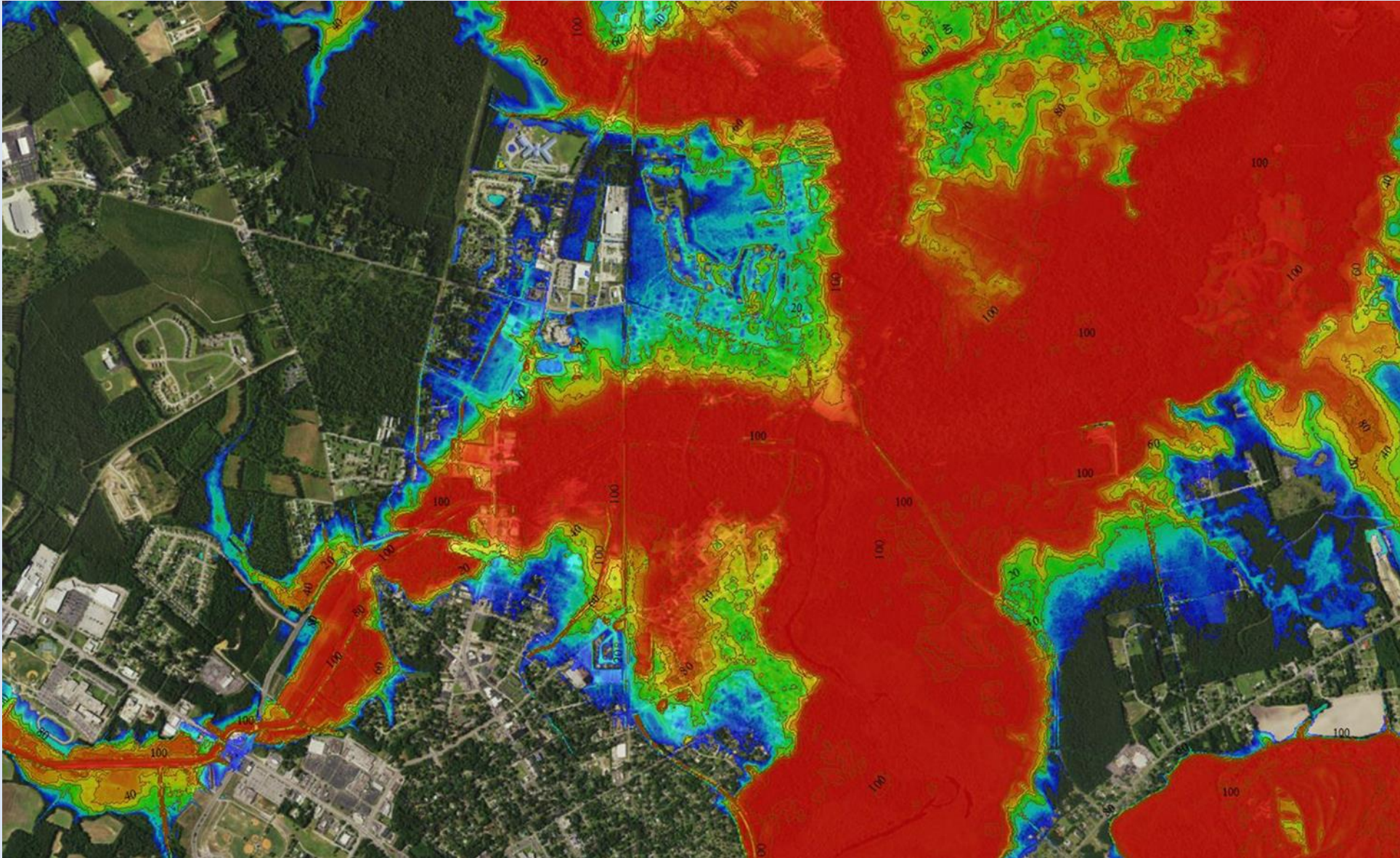
Projected Surfaces (2035, 2060)



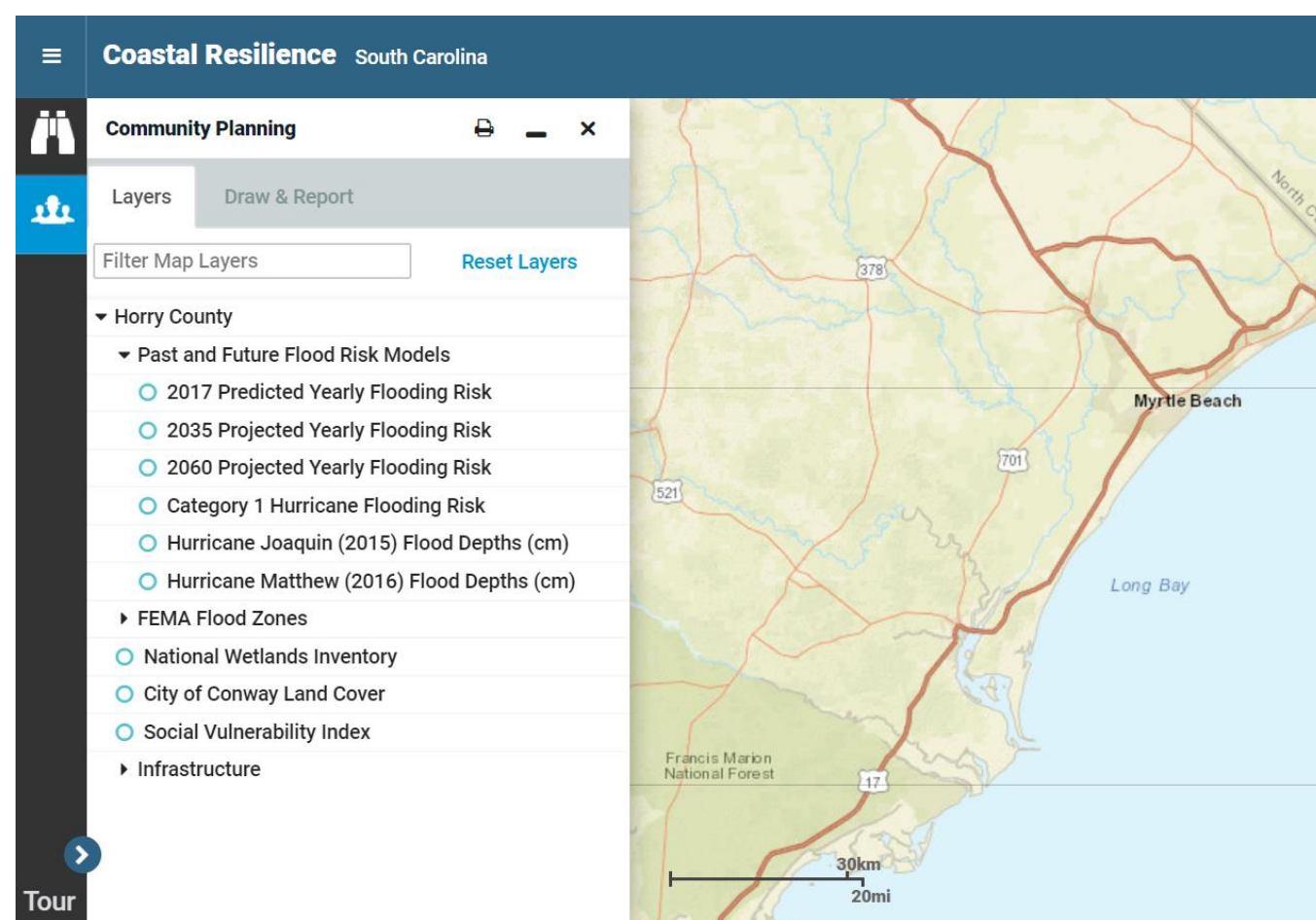
- Empirical Data
- FEMA modified
- Rainfall Projections (EPA)
- SLR Projections (NOAA, USACE)

Projected Surfaces (2035, 2060)

2060 Projected Annual Flood Risk



- Empirical Data
- FEMA modified
- Rainfall Projections (EPA)
- SLR Projections (NOAA, USACE)



TNC's Coastal Resilience Website

<http://coastalresilience.org/>

Projects

<http://coastalresilience.org/project/southcarolina/>

Mapping Portal

<http://maps.coastalresilience.org/network/>

TNC's Website

Mapping Portal

Resources

For the latest reports, publications and other resources on coastal resilience visit the [Coastal Resilience Resource Library](#) on the Conservation Gateway.

[Charleston Resilience Network](#)

[National Sea Grant Resilience Toolkit](#)

[South Carolina Sea Grant – Coastal Climate resources](#)

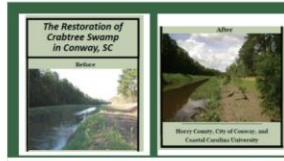
[Coastal South Carolina Community Rating System \(CRS\) Users Group](#)

[South Carolina Department of Health and Environmental Control \(SC DHEC\) Living Shorelines Working Group](#)

[Nature-based Resilience for Coastal Highways](#)

[Naturally Resilient Communities – Using Nature to Address Flooding](#)

Related Stories and News



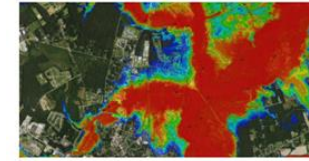
Horry County Focus Group

Goal: Utilize local knowledge and expertise to identify flood prone areas around the rivers in Horry County.
Outcome: Prioritized list of focus areas and nature based projects to reduce flood potential.



Georgetown County Focus Group Meeting Notes

Goal: Utilize local knowledge and expertise to identify flood prone areas around the rivers in Georgetown County.
Outcome: Prioritized list of focus area and nature based projects to reduce flood potential.



Description of North Coast Mapping

Geoscience Consultants has developed custom Hindcasted Flooding, Risk, and Land Cover maps and information for The Nature Conservancy to support an ongoing project in Horry and Georgetown Counties.



Low Impact Development in Coastal South Carolina: A Planning and Design Guide

The purpose of this manual is to remove barriers to Low Impact Development implementation by providing engineering tools, planning guidance, and case study examples that are relevant to the South Carolina coastal zone.



Exploring nature-based mitigation, including post-disaster solutions and their impact.

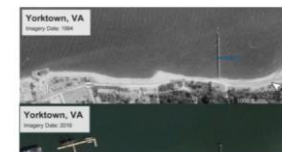
Introduction to nature-based solutions

- Case studies
- Nature-based solutions in a post-disaster environment
- Barriers to implementation
- Potential and innovative funding sources



Utilizing Nature-Based Solutions to Enhance Flood Resilience & Recovery

- Introduction to natural and nature-based solutions
- Approaches, case studies, and resources
- Considering natural and nature-based solutions for redevelopment and recovery
- How these approaches fit into FEMA programs



Nature-Based Solutions for Coastal Highway Resilience

This white paper briefly describes the current state of practice regarding the use of nature-based coastal solutions in general and with specific emphasis on their use along coastal highways. It provides an overview of available tools for design, implementation challenges, and knowledge gaps.



Using Natural Infrastructure To Protect Coastal Roads and Bridges

The Federal Highway Administration (FHWA) is producing research and technical assistance to enable transportation agencies to use natural and nature-based features to improve the resilience of transportation systems.

TNC's Website

Projects

FOCUS GROUP MEETINGS FOR THE NORTH COAST RESILIENCE PROJECT

February & July
2018

Goal: Utilize local knowledge and expertise to identify flood prone areas around the rivers in Horry County.

Outcomes: Prioritized list of focus areas and nature based projects to reduce flooding potential.



Data

- Parcel level maps
 - 2017, 2035 & 2060
- Georgetown Past Flooding
 - Road closures & ponding areas
- Conserved Lands
 - State, Federal & Private

Public & Supplemental Data

Ex: Stream Restoration



MAY 2011



JUNE 2012



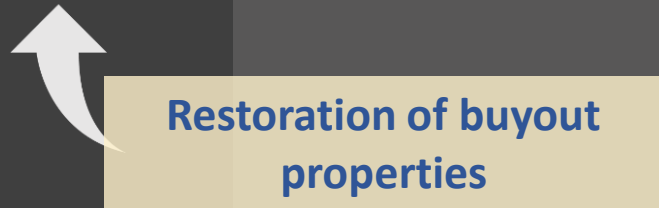
JULY 2013



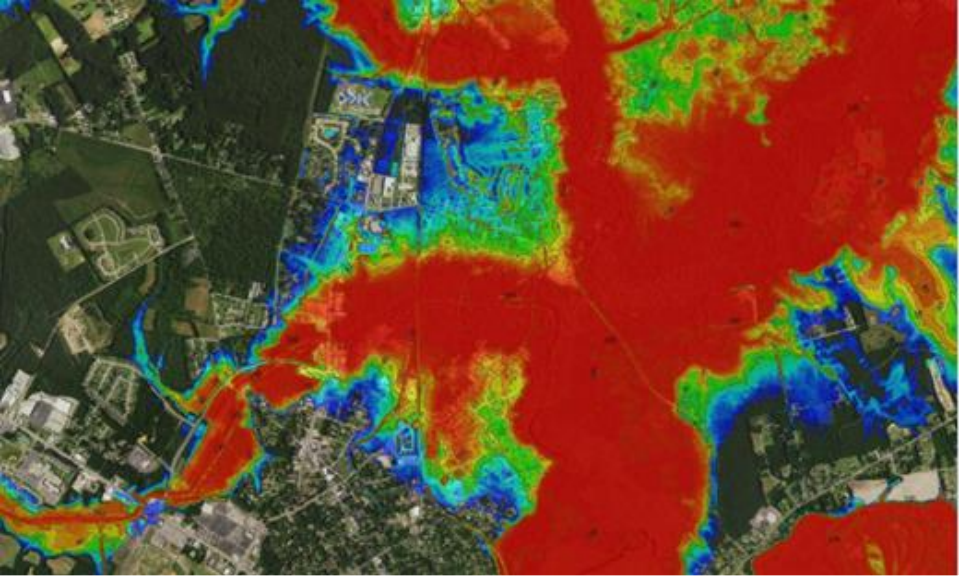
JUNE 2014

Benefits: Reduce flooding and erosion; Improve water quality; Restore habitat for important species

Ex: Preserving and Expanding Open Space



Benefits: Reduce flood risk; Increase Community Rating System points, Provide public access to nature



Cost Analysis

- Contract with Clemson (*Horry Co Projects*)
- Developing a list of example projects
- Use projects identified during Focus Meeting
- List of projects and cost estimates to municipalities

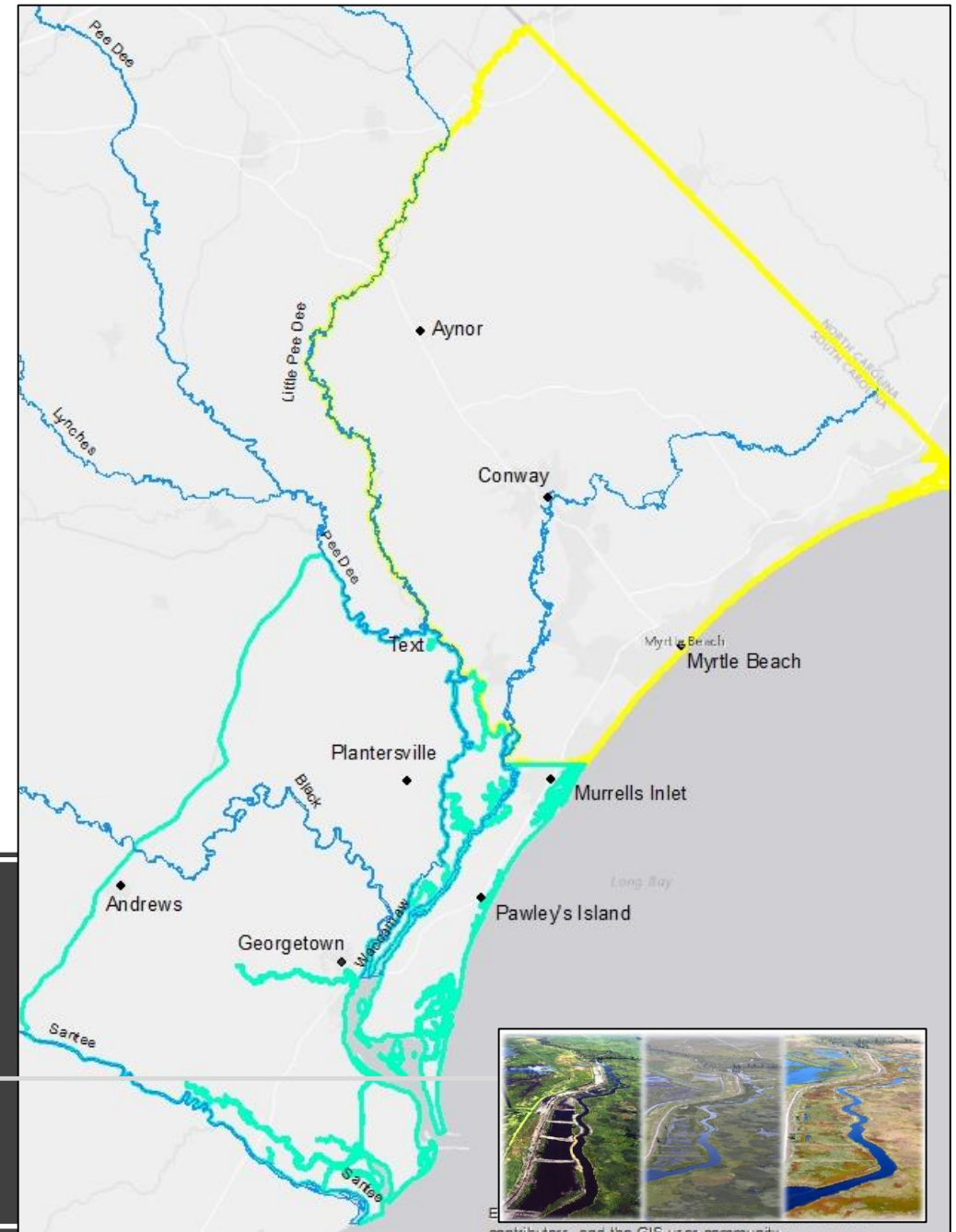
Summary of Projects & Costs



Project	Year	Area/Type	Cost	Location
Crabtree Swamp Stream	2009	0.5 acre	\$70,050	Horry County
	2012	0.5 acre	\$80,000	
Singleton Property	2017	116 acres	\$267,000	Horry County
Rocky Point Property	2015	462 acres	\$2,500,000	Georgetown
Constructed Wetland	2018	0.5 acre	\$159,246	Georgetown
LID Concepts	2015	Bioswales, rain gardens, green street, etc.	\$115,000,000	Norfolk, VA
Land Use Planning	2004	Regulation	\$5,000	Brevard, NC
Rush Creek	2010	Buy-out	\$17,000,000	Arlington, TX
Riverfront Park	2015	Bioswales, green roofs, green streets, buy-out.	\$52,000,000	Nashville, TN
South Cape May	2007	Renourishment	\$15M & \$35M/yr	S. Cape May, NJ
Snook Island	2005	70 acres	\$17,000,000	Palm Beach, FL
Goldbug Oyster Reef	2016	0.02 acre	\$79,296	ICW, Mt Pleasant



Fundraising & Implementation





Joy Brown

joy_brown@tnc.org

(843) 937-8807 x35

Marine Program Manager
The Nature Conservancy
South Carolina Chapter