# NC Coastal Habitat Protection Plan Amendment Update

*DEPARTMENT OF ENVIRONMENTAL QUALITY*

Marine Fisheries Commission

Jimmy Johnson and Anne Deaton | Marine Fisheries Commission | August 20-21, 2020

# *Coastal Habitat Protection Plan (CHPP)*

## Origin and Purpose

**G.S. 143B-279.8 - Fisheries Reform Act of 1997**

- Required Department of Environmental Quality (DEQ) to draft the plan
- Required the Environmental Management (EMC), Coastal Resources (CRC), and Marine Fisheries (MFC) commissions to approve and implement recommendations

**Purpose**

- Long-term enhancement of coastal fisheries by addressing habitat and water quality needs of fishery species

# *Coastal Habitat Protection Plan (CHPP)*

## Four Overarching Goals

- Improve effectiveness of existing rules and programs protecting coastal fish habitats
- Identify, designate and protect strategic habitat areas
- Enhance habitat and protect it from physical impacts
- Enhance and protect water quality

# 2021 Amendment Process

- Select priority habitat issues
- Draft issue papers
- Build support for proposed actions
- Revise and approve CHPP
- Implement recommended actions

# *Coastal Habitat Protection Plan*

## Timeline

| Action | Completion Date |
|---|---|
| Select priority habitat issues | Nov 2019 |
| Draft half of issue papers | Summer 2020 |
| Review with the CHPP Steering Committee | July 2020 |
| **Informational update to Commissions** | **Aug/Sep 2020** |
| Draft remaining issue papers | Late Summer 2020 |
| Review and discuss with the CHPP Steering Committee | Oct 2020 |
| Review and discuss within the Department | Oct 2020 |
| Complete plan update | Nov 2020 |
| Review with full commissions to take out for public comment | Nov 2020 |
| Public comment period | Jan 2021 |
| Take to full commissions for final approval | Spring/Summer 2021 |

# *2021 Coastal Habitat Protection Plan*

## Five Priority Issues

1) **Submerged Aquatic Vegetation (SAV) protection and restoration, with focus on water quality improvements**
2) **Environmental rule compliance to protect habitat and water quality**
3) **Reducing inflow and infiltration (I&I) associated with wastewater infrastructure to improve coastal water quality**
4) **Wetland protection and enhancement with focus on nature-based methods**
5) **Habitat monitoring to assess status and regulatory effectiveness**

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# 2021 Coastal Habitat Protection Plan

## Issue Papers

# Why is SAV important?

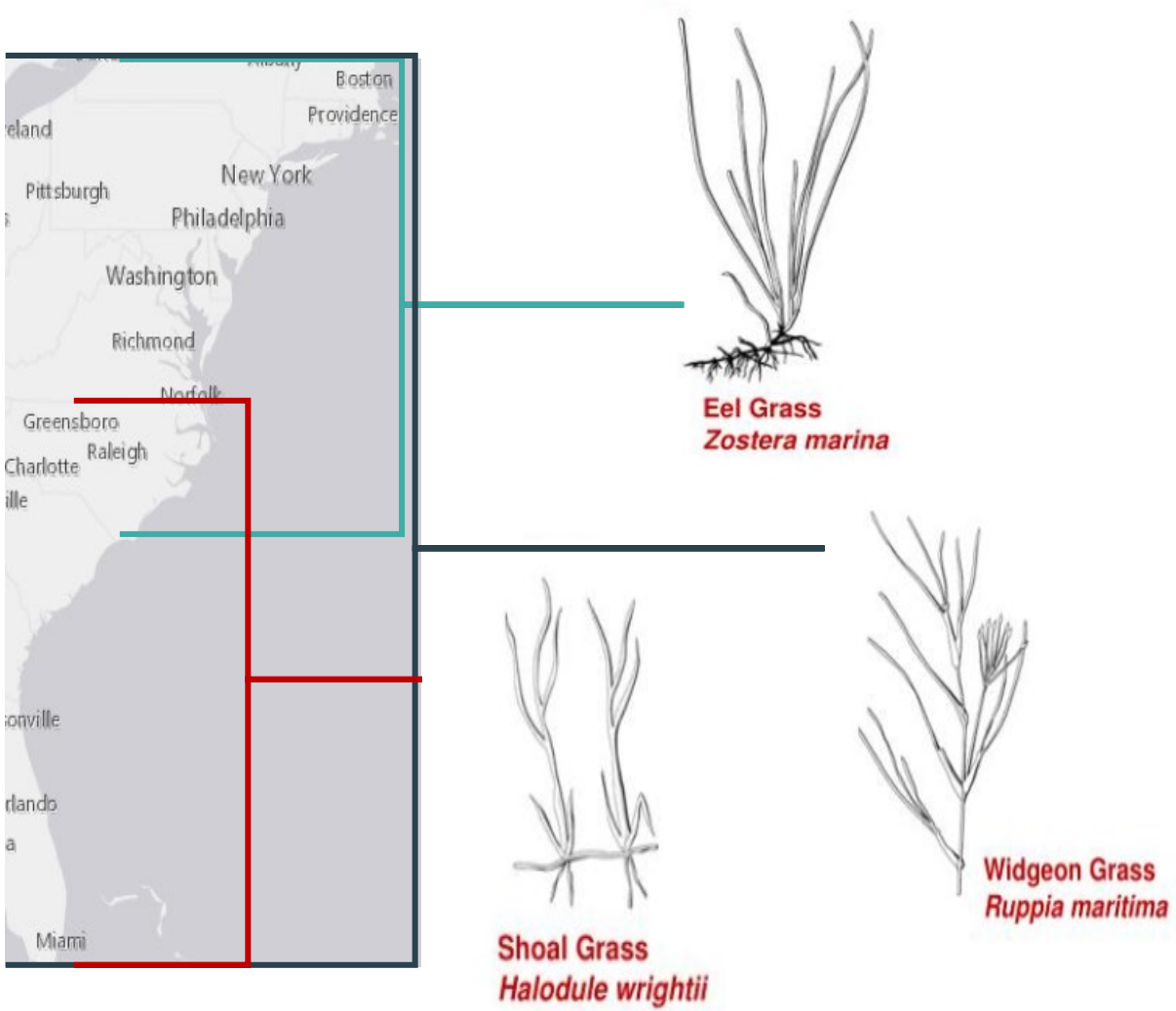
- Provides habitat for animals
- Stabilizes sediment and shoreline
- Reduces wave energy
- Improves water quality/clarity
- Sequesters carbon



Photo Credit: Jay Fleming/Getty Images

# *Types of SAV in North Carolina*

## High salinity (>10 ppt)



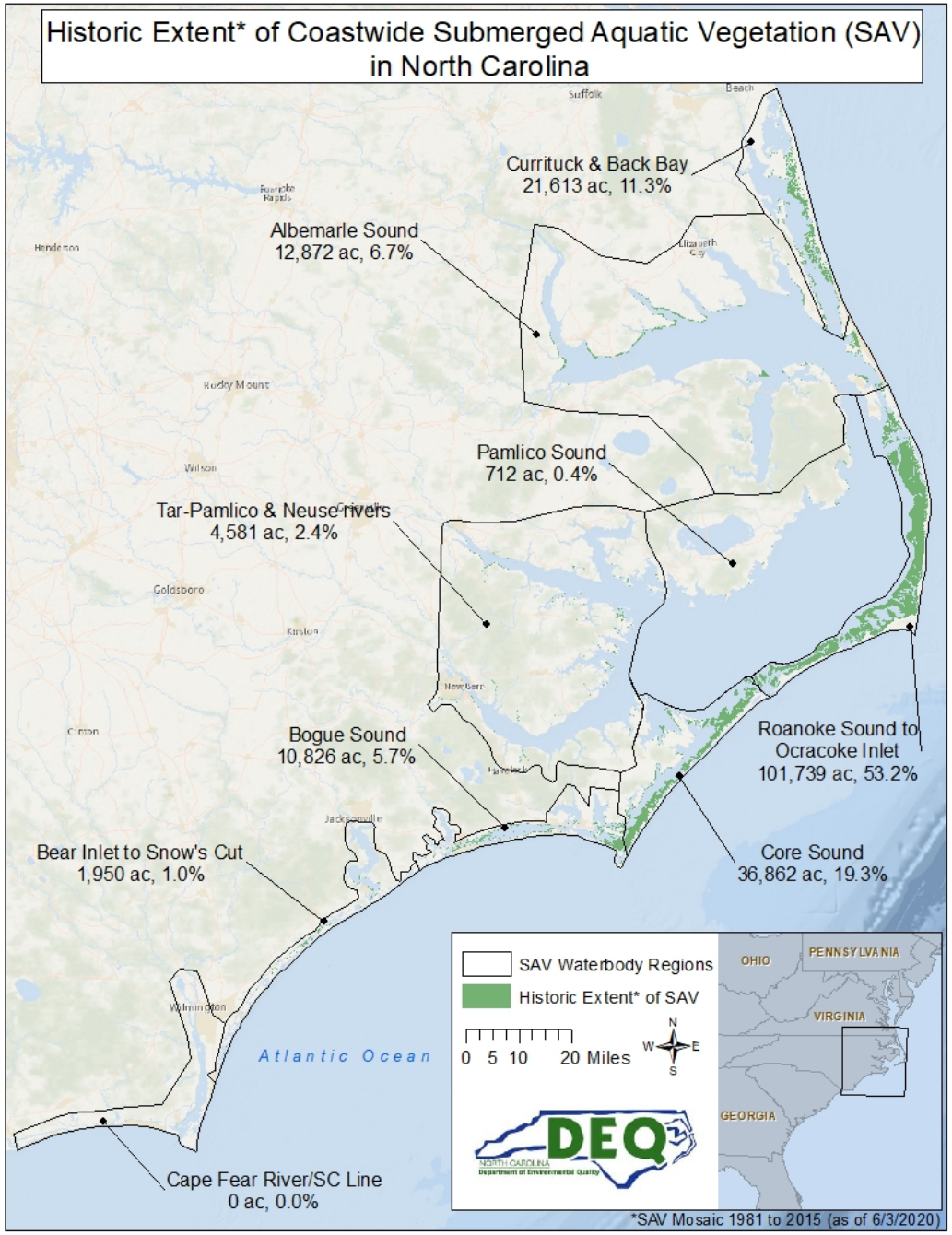

## Low salinity (≤10 ppt)

Redhead Grass
*Potamogeton perfoliatus*

Sago Pondweed
*Stuckenia pectinata*

Wild Celery
*Vallisneria Americana*

Photo credits: Chesapeake Bay Program




# *What is the historical extent of SAV in NC?*

| SAV Region Name | Historic Extent* (ac) | Percent of Historical Extent* (%) |
|---|---|---|
| Currituck and Back Bay | 21,613 | 11.3 |
| Albemarle Sound | 12,872 | 6.7 |
| Tar-Pamlico & Neuse rivers | 4,581 | 2.4 |
| Pamlico Sound | 712 | 0.4 |
| Roanoke Sound to Ocracoke Inlet | 101,739 | 53.2 |
| Core Sound | 36,862 | 19.3 |
| Bogue Sound | 10,826 | 5.7 |
| Bear Inlet to Snow's Cut | 1,950 | 1.0 |
| Cape Fear River to SC line | 0 | 0.0 |
| | 191,155 | 100.0 |

***SAV Mosaic 1981 to 2015 (as of 6/3/2020)**

Online Map: https://arcg.is/08bSij0

# *Submerged Aquatic Vegetation*

## How is SAV Doing in NC?

## High salinity SAV change analysis, 2006/07 vs 2013

(APNEP, in review)

North Zone
- 5.98%

Central Zone
- 2.67%

South Zone
- 10.38%

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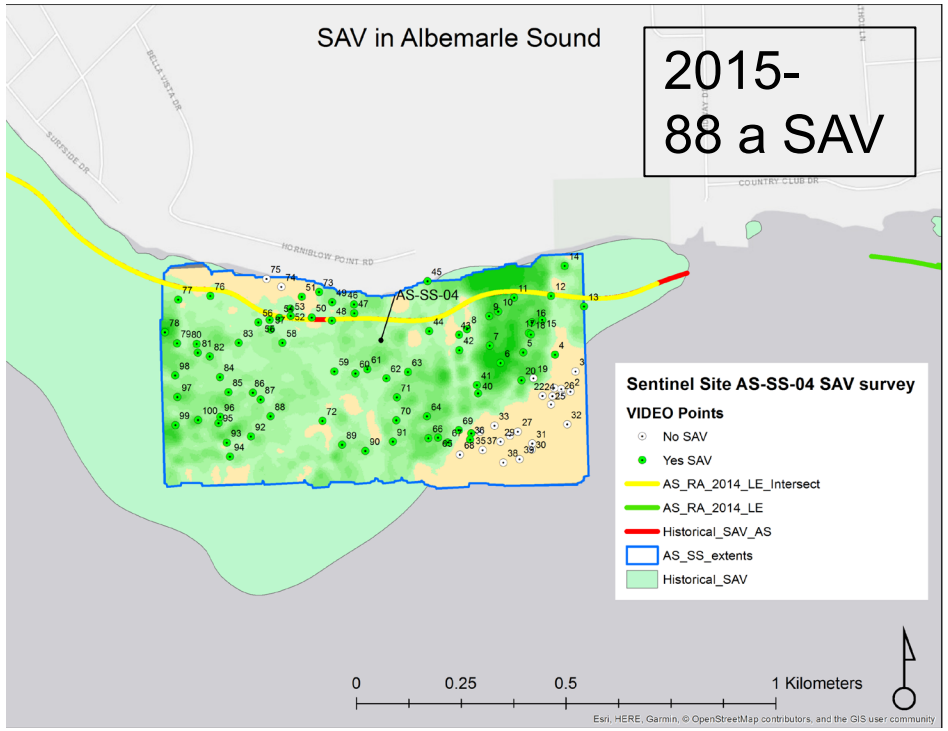
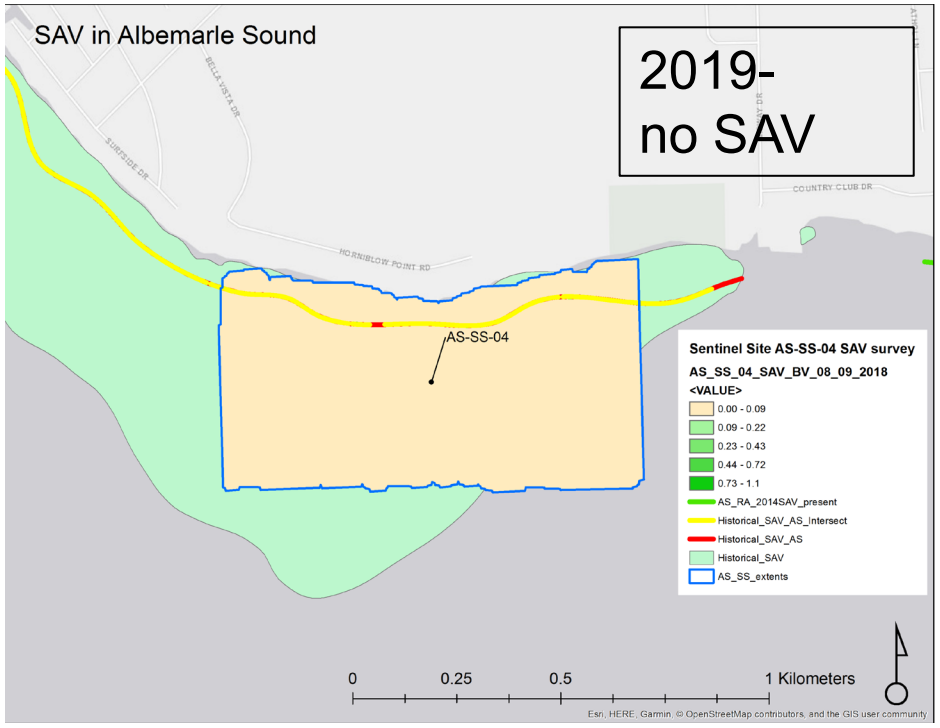
# *Submerged Aquatic Vegetation*

## How is SAV Doing in NC?

Low salinity SAV change analysis – sentinel site monitoring




Comparing historical extent (aerials) vs. 2014-2017 (sonar): potentially 52 – 97% less SAV

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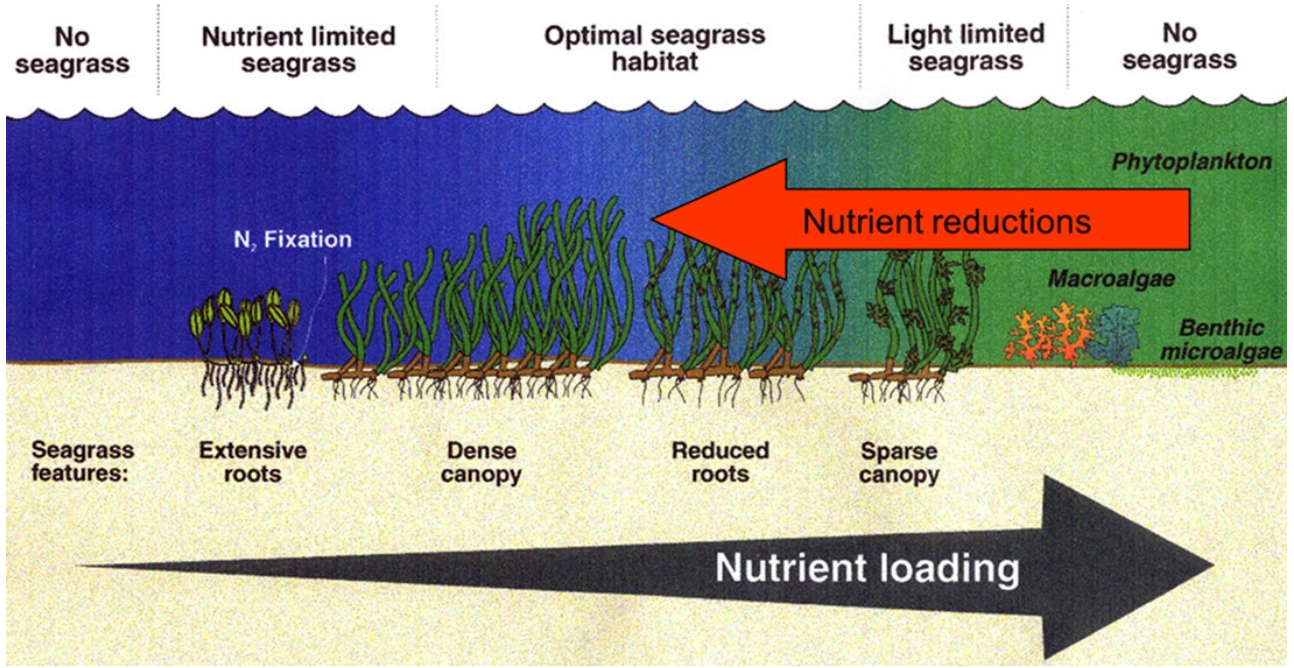
# What happened to the SAV?

Water quality!!!

↑ nutrients = algal blooms ☹

↓ water clarity

Photo Credit: DWR

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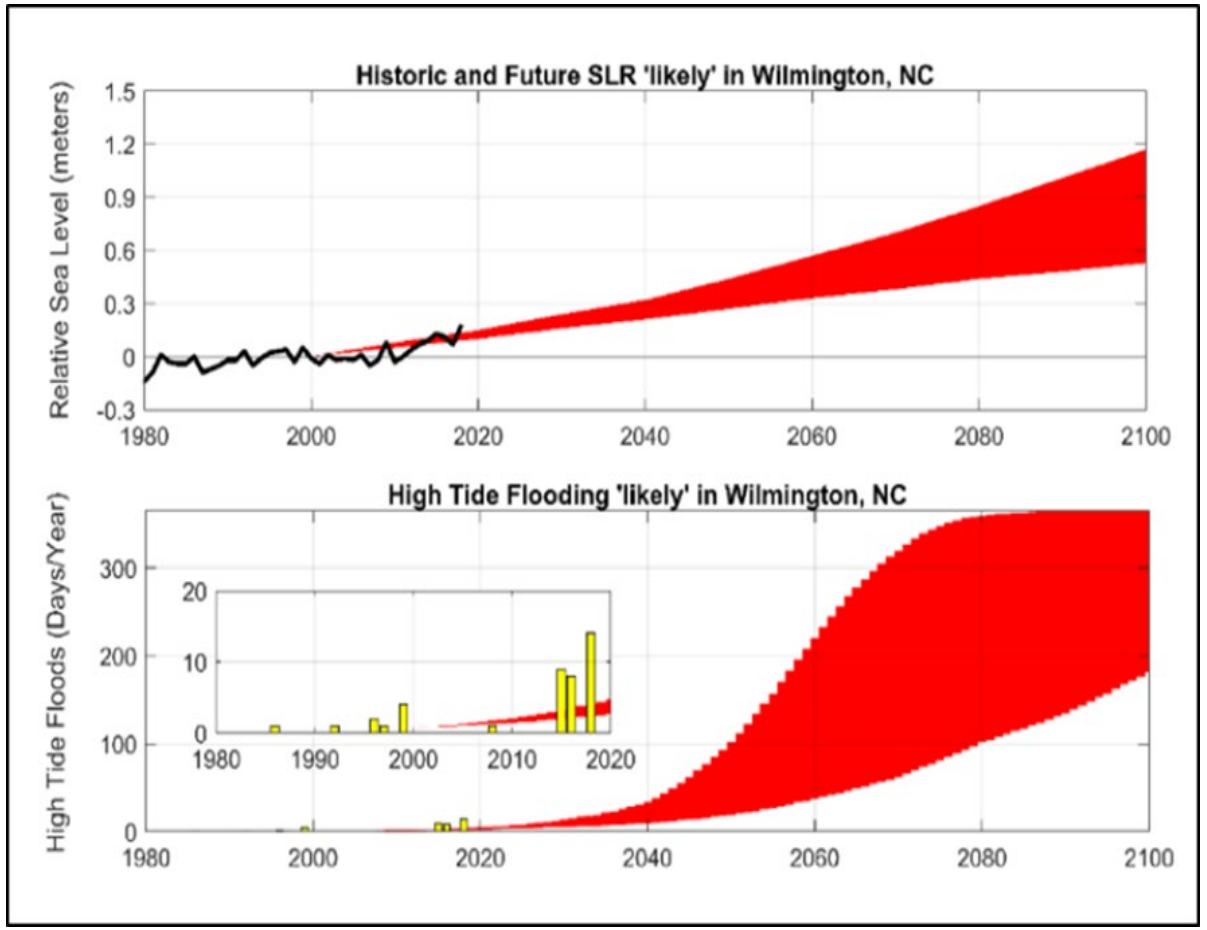
# Submerged Aquatic Vegetation




Kunkel et al. 2020

## Other Factors

- Direct physical disturbance
  - Dredging, docks/marinas, fishing gear, mariculture, prop scarring
- Climate change
- Chemical controls
- Pathogens

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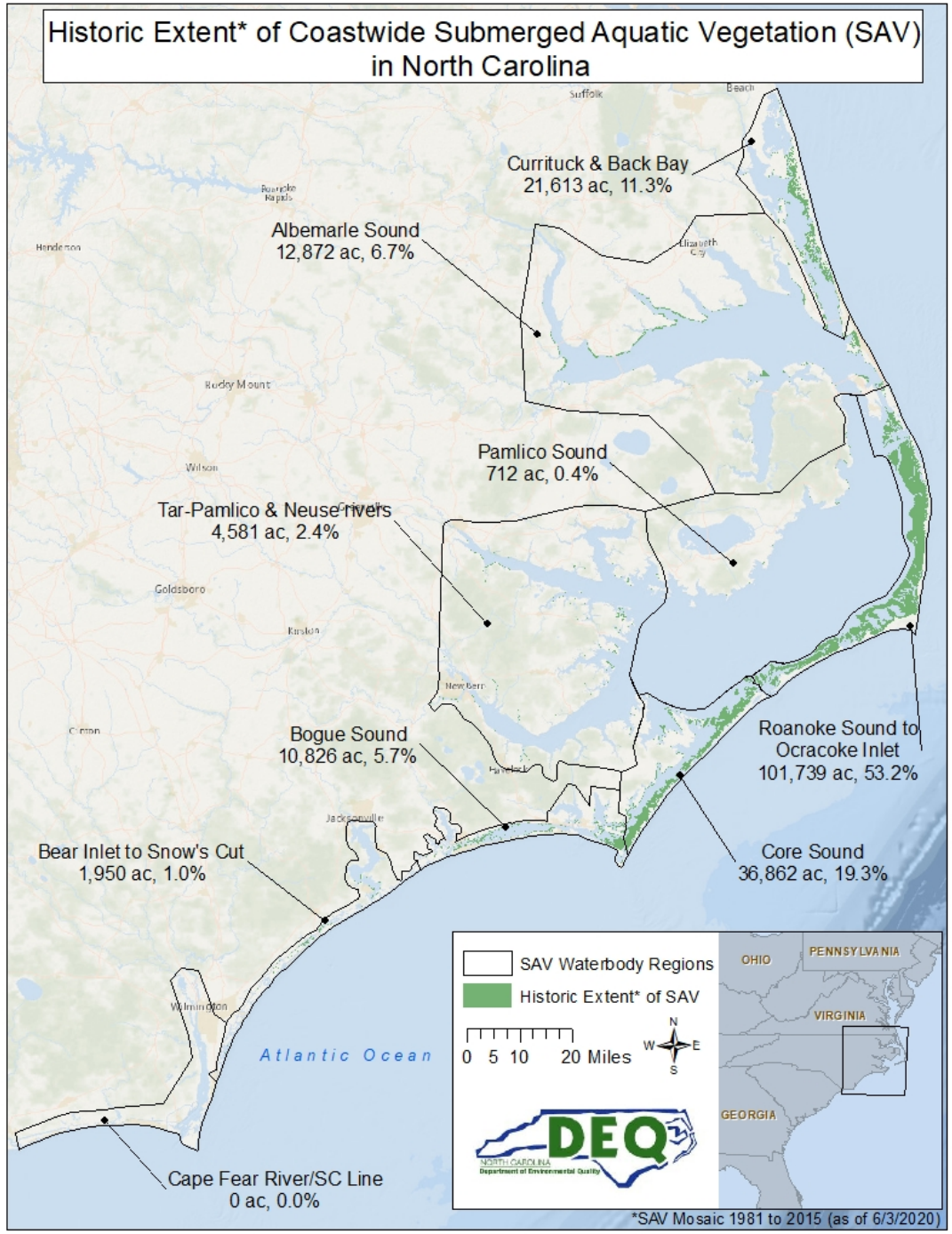


# *How much SAV do we want in North Carolina?*

As much as we have had in the past!

**191,155 acres**

Online Map: https://arcg.is/08bSij0

# How do we reach our SAV acreage goal?

Photo Credit: APNEP

- Support water quality improvement efforts
- Protect and restore
- Enhance SAV research and monitoring
- Improve collaboration

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# *Environmental Rule Compliance to Protect Habitat and Water Quality*

376 (34%) DEQ positions cut from 2008-2018

Less compliance inspections due to staff shortages

Increased non-compliance

Increased wetland loss and water quality impairment

**"NC in Top 4 to environmental budget cuts"** *Washington Daily News Dec 31, 2019*

**"NC's environmental protection agency has lost 1/3 of its funding over ten years. How has it impacted our area?"** *Port City Daily January 2020*

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# *Environmental Rule Compliance*

## Authorized Impacts

Authorized wetland impacts in coastal river basins under Section 401 WQ certifications:

- 2014-2019:  ~1,499 acres wetlands
- 1999-2019: ~ 8,125 acres of wetlands and 1.3 million linear feet of stream impacts

# *Environmental Rule Compliance*

## Ecosystem Services of Wetlands

- Provides habitat for animals
- Improves water quality
- Reduces flooding
- Stabilizes shorelines
- Sequesters carbon
- Support recreational and commercial fisheries

# *Environmental Rule Compliance*

## Compliance and Enforcement Studies

Dorney et al. 2015

- EPA funding for three full time compliance positions
- Compared compliance rates before and after dedicated compliance positions
- Over five year study, rate of compliance ↑ and civil penalties ↓

# *Environmental Rule Compliance*

## Compliance Inspections, 2014 - 2019

| Agency | Program Type | Compliance (%) 2014-2019 | Compliance (%) 2011 |
|---|---|---|---|
| DWR | 401 WQC, buffers, wetland and stream standards - DOT | 88.7 | |
| DWR | 401 WQC, buffers, wetland and stream standards – non DOT; routine inspection | **68.2** | **82.0** |
| DWR | 401 WQC, buffers, wetland and stream standards – non DOT; complaint | **22.5** | **68.2** |
| DCM | GP and Major permits | 99.8 | |
| DEMLR | NPDES State and Phase 2 Stormwater | 72.0 | |
| DEMLR | Erosion and Sedimentation Control | 38.0 | |
| Forest Service | Forest Practice Guidelines Related to Water Quality | 99.0 | |

# *Environmental Rule Compliance*

## Compliance Inspections Deter Violations

Authorized impacts : Unauthorized impacts

1 : 1.54

(2014-2019)


Applicants deterred from violating rules:

- if the risk of penalties is real
- compliance is cheaper than penalty
- maintaining good reputation matters

↑ compliance = ↓ wetland loss with no new rules

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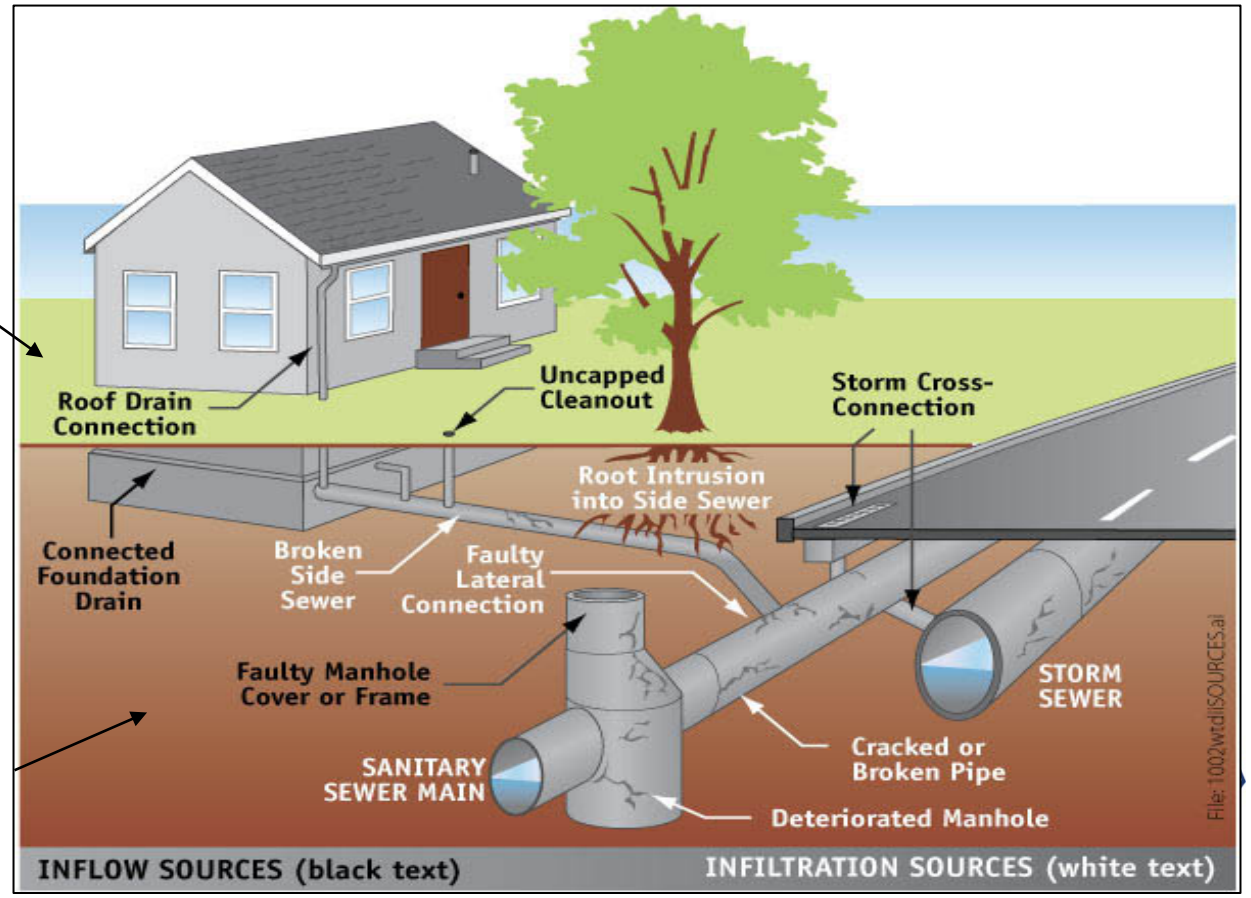
# Reducing Inflow and Infiltration (I&I) to Improve Water Quality

## What is I&I and What Causes It?

- Sewer pipe deterioration
- Construction materials (pipe type) and methods
- Insufficient maintenance
- Improper customer use (ex. grease down the drain)
- **Site conditions (shallow water table)**
- **Heavy or prolonged rainfall**

Inflow

Infiltration



# *Inflow and Infiltration*
## The Connection with Sewer Overflows

- Excess flows into the sewer lines may cause sanitary sewer overflows (SSOs)
- Sewer lines, pump stations, and WWTPs are designed for specific flows and peak flow volumes and rates.

Wallace Park, Burnt Mill Creek, Wilmington, 2018


Photo credit: L. Cahoon

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# *Inflow and Infiltration*

## Water Quality Impacts of Sewer Overflows

- Shellfish harvest closures, swimming advisories due to ↑ fecal coliform bacteria
- Algal blooms and fish kills due to ↓ DO and ↑ nutrients
- Toxins (oil, heavy metals, endocrine disrupting chemicals)
- Pollutants accumulate in sediment

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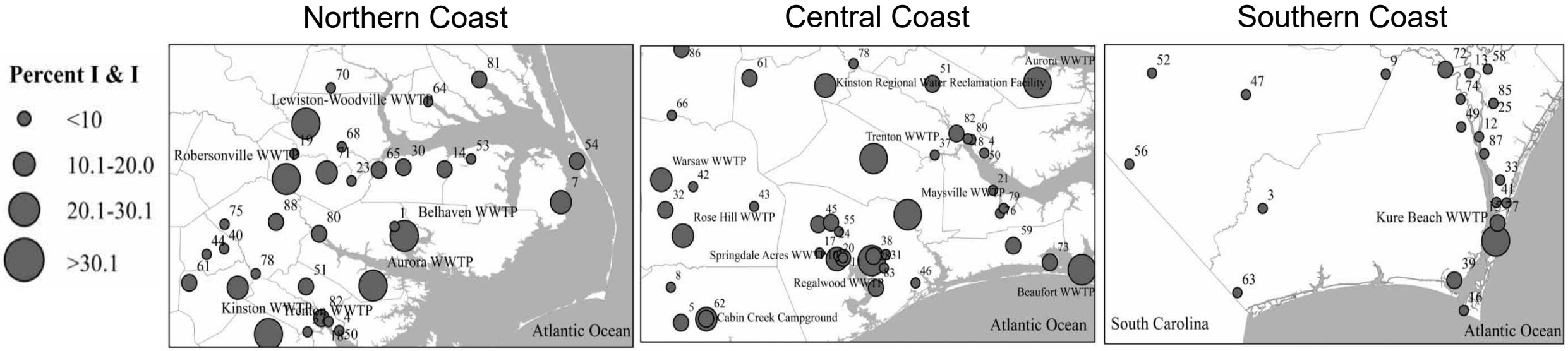
# *Inflow and Infiltration*

## Documented I&I Problems

- 577 Discharging and Non-charging WWTP facilities in CHPP region (DWR permitted)
- A study on effect of rain (2010-2011 data) found 92% of 93 municipal WWTPs had statistically significant flow response




Source: Cahoon and Hanke (2017)

# *Inflow and Infiltration*

## Coastal Conditions Intensify Issue

Excessive I&I - common in low-lying coastal areas

- High water table – leaky pipes sit in groundwater → more infiltration
- Saline water in pipes from groundwater → reduces effectiveness of waste treatment
- High rainfall and more high rain events on coast → more inflow and infiltration
- Rural municipalities with low tax base – less maintenance → more infiltration
- **Climate change will compound these factors**

Photo Credit: NC Health News

Photo credit: L. Cahoon

# *Inflow and Infiltration*
## Addressing Wastewater Issues

- State Water Infrastructure Authority and Division of Water Infrastructure established 2013
- NC Statewide Water and Wastewater Infrastructure Master Plan
- 2017-2027 – $7-11 billion needed for wastewater infrastructure
- Must prioritize most critical infrastructure needs
- **Challenging – widespread, costly, climate change**

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# *Wetland Protection and Restoration, with a Focus on Nature-Based Methods*

- Expanding on 2016 CHPP priority to encourage living shorelines
- Additional means of protection and restoration of coastal wetlands


Salt marsh

Three technical ***workshops*** in August

- Mapping and monitoring
- Threats and conservation
- Restoration and living shorelines


Riverine Swamp Forest Photo credit: R. Trone

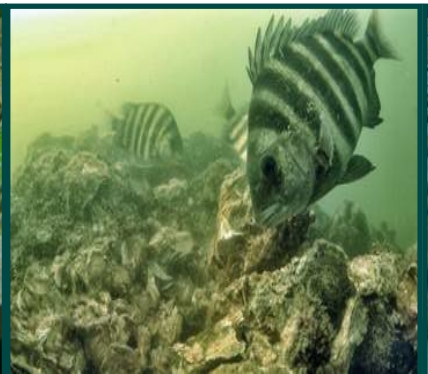
# *Habitat Monitoring to Assess Status and Regulatory Effectiveness*

- Status, trends, and monitoring needs for all six coastal habitats
- Will reference issue papers:
  - Submerged Aquatic Vegetation Protection and Restoration, with Focus on Water Quality Improvements
  - Wetland Protection and Enhancement, with Focus on Nature-Based Methods
- Fill information gaps and habitats not covered

**Water Column**

**Submerged Aquatic Vegetation**

**Shell Bottom**



**Wetlands**

**Hard Bottom**

**Soft Bottom**

# 2021 CHPP Amendment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