



May River Watershed Action Plan Advisory Committee Meeting

Thursday, April 24, 2025 at 3:00 PM

**Theodore D. Washington Municipal Building, Henry “Emmett” McCracken Jr. Council Chambers,
20 Bridge Street, Bluffton, SC**

AGENDA

I. CALL TO ORDER

II. ROLL CALL

III. ADOPTION OF MINUTES

1. Adoption of January 23rd, 2025 Meeting Minutes

IV. PRESENTATIONS, CELEBRATIONS, AND RECOGNITIONS

1. South Carolina Department of Natural Resources May River Watershed Baseline Assessment Update Presentation - Dr. Andrew Tweel, Associate Marine Scientist, SC Department of Natural Resources
2. South Carolina Sea Grant Consortium and College of Charleston Resiliency Analysis Presentation - Dr. Levine, Professor | Director, Santee Cooper GIS Laboratory and Lowcountry Hazards Center, and Landon Knapp, Coastal Resilience Program Manager

V. PUBLIC COMMENT

VI. ADJOURNMENT

NEXT MEETING DATE: July 24, 2025

“FOIA Compliance – Public notification of this meeting has been published and posted in compliance with the Freedom of Information Act and the Town of Bluffton policies.”

In accordance with the requirements of Title II of the Americans with Disabilities Act of 1990 ("ADA"), the Town of Bluffton will not discriminate against qualified individuals with disabilities on the basis of disability in its services, programs, or activities. The Town of Bluffton Council Chambers are ADA compatible. Auditory accommodations are available. Any person requiring further accommodation should contact the Town of Bluffton ADA Coordinator at 843.706.4500 or adacoordinator@townofbluffton.com as soon as possible but no later than 48 hours before the scheduled event.

Executive Session – The public body may vote to go into executive session for any item identified for action on the agenda.

**Please note that each member of the public may speak at one public comment session and a form must be filled out and given to the Town Clerk. To submit a public comment online, please click here:*

<https://www.townofbluffton.sc.gov/FormCenter/Town-15/Public-Comment-60>

Public comment is limited to 3 minutes per speaker.

May River Watershed Action Plan Advisory Committee Meeting

Virtually Held on Microsoft Teams

January 23, 2025

I. CALL TO ORDER

Chairman Rogers called the meeting to order at 3:00pm.

Chairman Rogers stated the meeting was being recorded for Town records.

II. ROLL CALL

PRESENT

Amber Kuehn

Vice Chair Al Stokes

Chair Stan Rogers

Jessie White

Chris Kehrer

ABSENT

Chris Shoemaker

Larry Toomer

III. ADOPTION OF MINUTES

1. Adoption of December 5th, 2024 Minutes

The committee voted unanimously to adopt the December 5th, 2024 meeting minutes.

Motion made by Stokes, Seconded by White

Voting Yea: Kuehn, Vice-Chair Stokes, Chair Rogers, White, Kehrer

IV. PUBLIC COMMENT

V. OLD BUSINESS

1. Update on Work to Develop Town Wetland and Resiliency Zone Protections and Wetlands Restoration Program Data Gathering - Beth Lewis, Water Quality Program Manager

Ms. Lewis provided an update to the committee regarding Town Council's decision during their January meeting. Ms. Lewis stated Council authorized the Town Manager to issue a Master Service Agreement (MSA) task authorization for work related to the development of ordinances that will protect wetlands and enhance resiliency. Ms. Lewis stated directly following Town Council's approval, the Town Manager executed the task authorization and staff held the project kickoff meeting with the consultant team. Ms. Lewis stated that staff would keep the committee informed, as needed.

VI. NEW BUSINESS

1. Introduction of New Stormwater Inspector - Bill Baugher, Watershed Management Division Director

Mr. Baugher introduced the new Town of Bluffton Stormwater Inspector, Konnor Harrell, to the committee.

2. May River Watershed Action Plan Implementation Status Report - Dan Rybak, Project Manager

Mr. Rybak provided the committee with an update on the status of May River Watershed Action Plan and Modeling Report projects. He then detailed three (3) of these projects proposed for funding in Fiscal Year 2026. The committee unanimously recommended that the Town Council allocate funds for the proposed May River Watershed Action Plan Impervious Restoration Projects as part of the Town's Fiscal Year 2026 Capital Improvement Program (CIP) budget, as presented.

Motion made by Kehrer, Seconded by White.

Voting Yea: Kuehn, Vice-Chair Stokes, Chair Rogers, White, Kehrer

3. Progress Report on the May River Watershed Baseline Assessment - Beth Lewis, Water Quality Program Manager

Ms. Lewis shared the Preliminary Land Use Assessment Report conducted by the South Carolina Department of Natural Resources (SCDNR) as part of the ongoing May River Watershed Baseline Assessment Update. Ms. Lewis also informed the committee that this study will be completed soon. Dr. Tweel, the Principal Investigator for the project, will attend the April WAPAC meeting to present the study's findings.

VII. ADJOURNMENT

The committee unanimously voted to adjourn the meeting at 4:02pm.

Motion made by White, Seconded by Kehrer.

Voting Yea: Kuehn, Vice Chair Stokes, White, Kehrer

NEXT MEETING DATE: April 24th, 2025

May River Project

Assessing Change After 20 Years

Andrew Tweel, Ph.D.

Pamela Marcum, Denise Sanger, Ph.D.,

Gary Sundin, Peter Kingsley-Smith, Ph.D.

Marine Resources Research Institute



Rationale

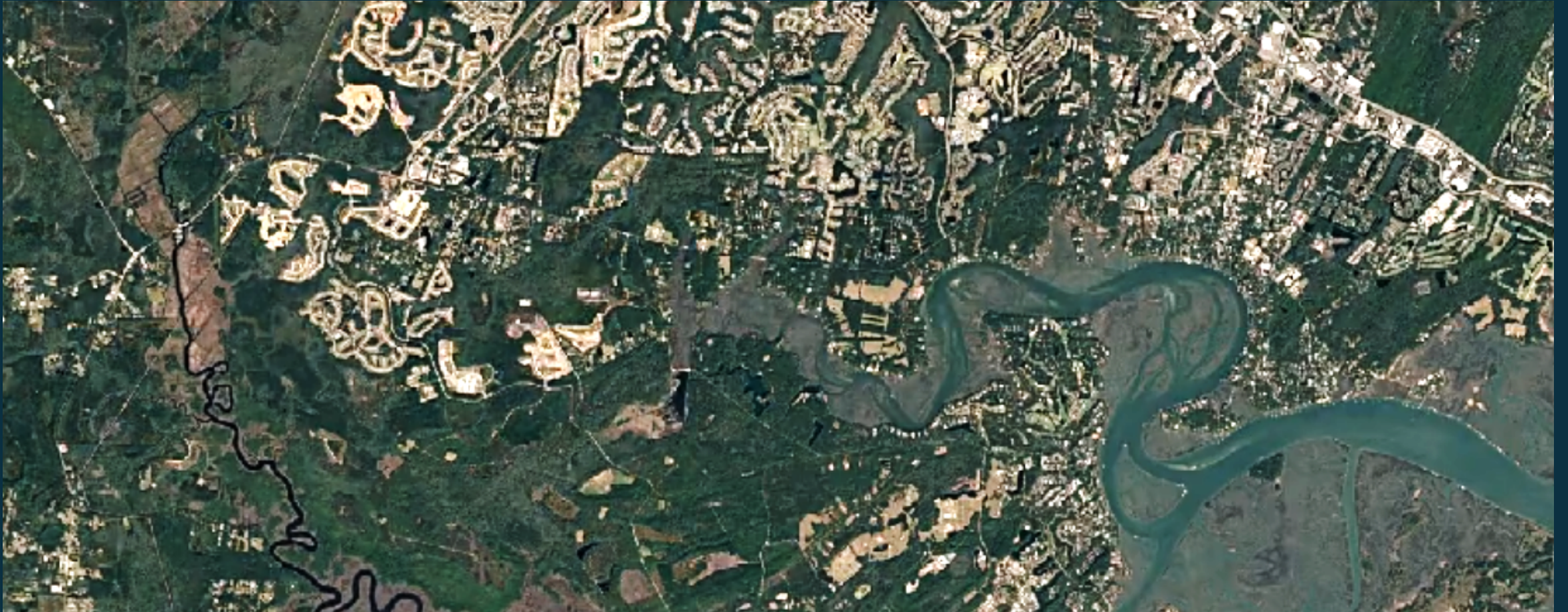
- In 2002, with several large developments planned, the Town of Bluffton commissioned a study to characterize the environmental condition of the May River and its contributing tidal creek habitats.
- This *Baseline Study* leveraged existing state-wide monitoring programs and research to allow for comparison to other areas
 - SCECAP, The Tidal Creek Project, state-wide oyster research

The watershed has changed

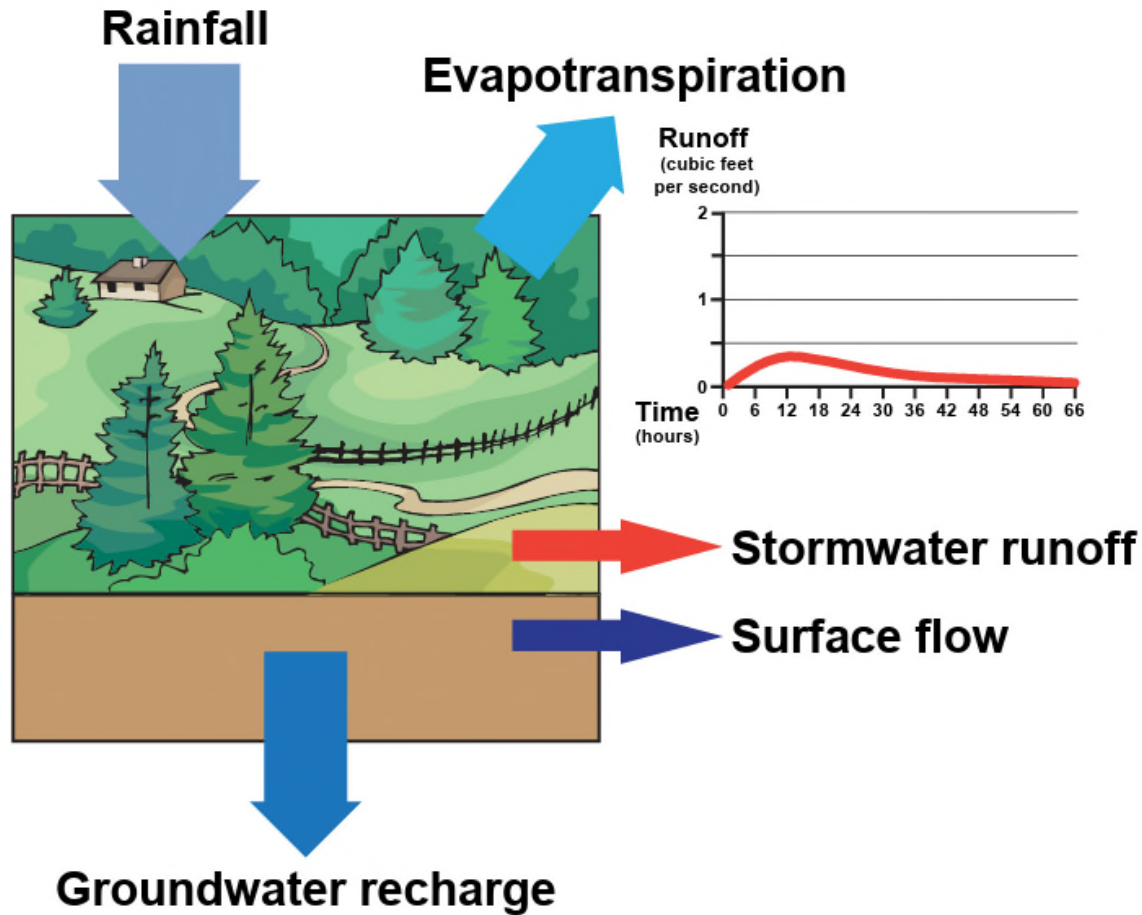


1984

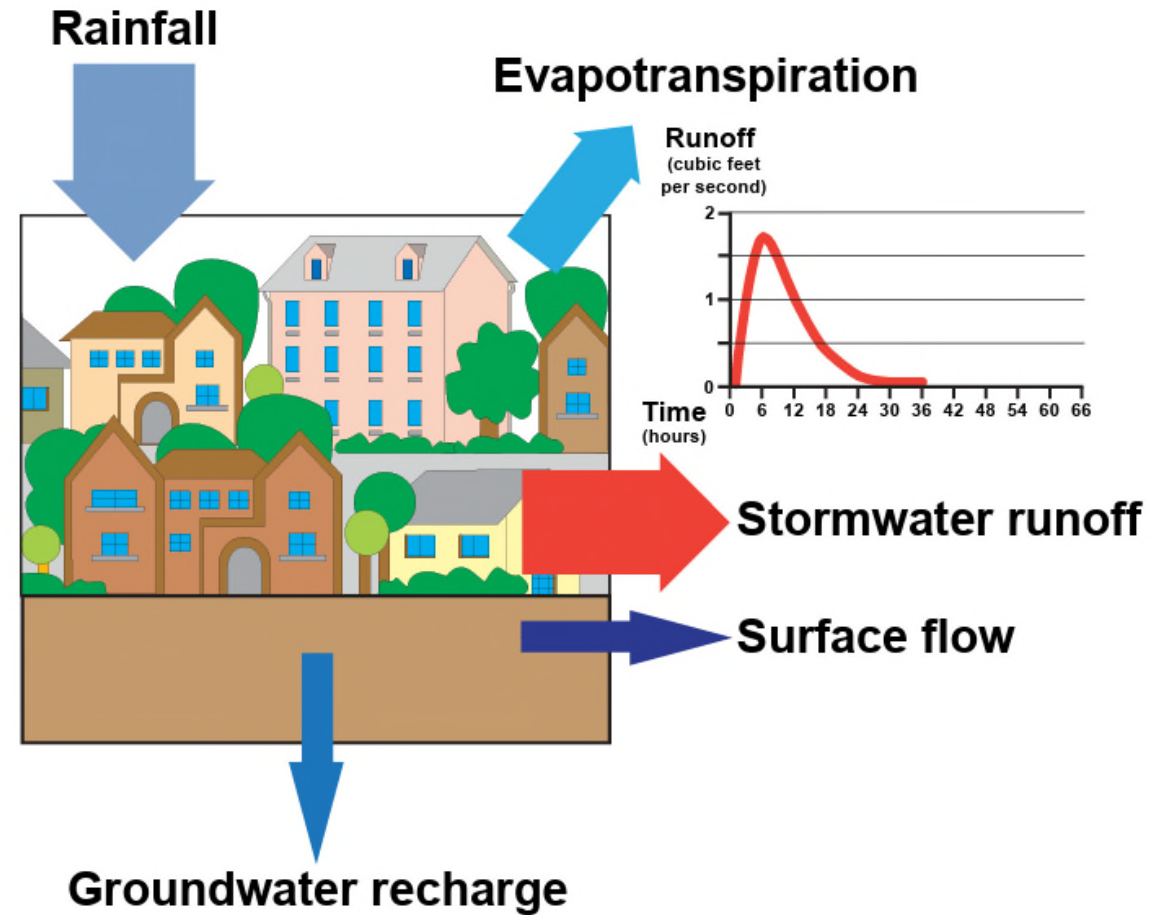
The watershed has changed ... a lot



2022



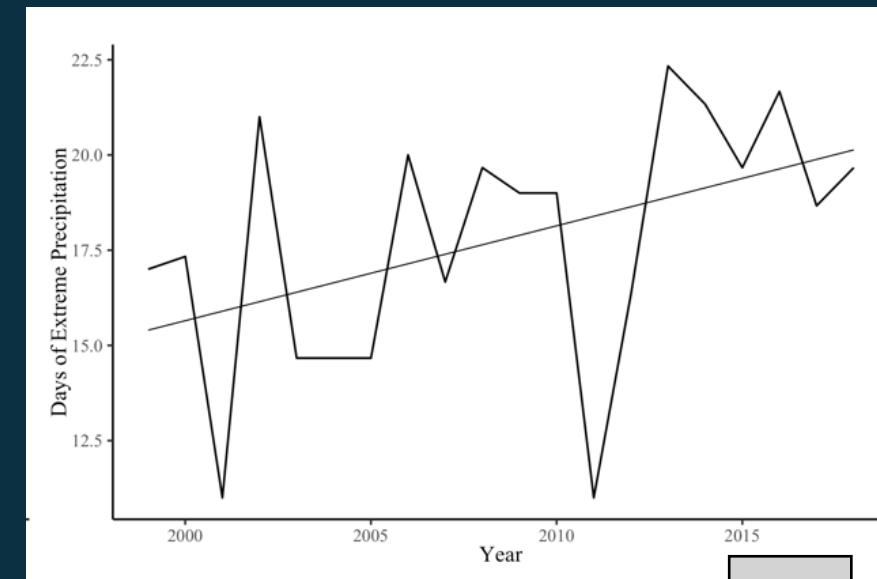
Forested Watershed



Developed Watershed

Some outcomes of development and BMPs

- Net result of increased impervious cover:
 - Increased volume of water conveyed to coastal system
 - Increased concentration of contaminants in stormwater
 - Increased contaminant load conveyed to coastal system
 - Often occurs in tandem with loss of natural buffers such as wetlands and vegetated areas
- Other changes, such as increases in precipitation magnitude may further exacerbate this

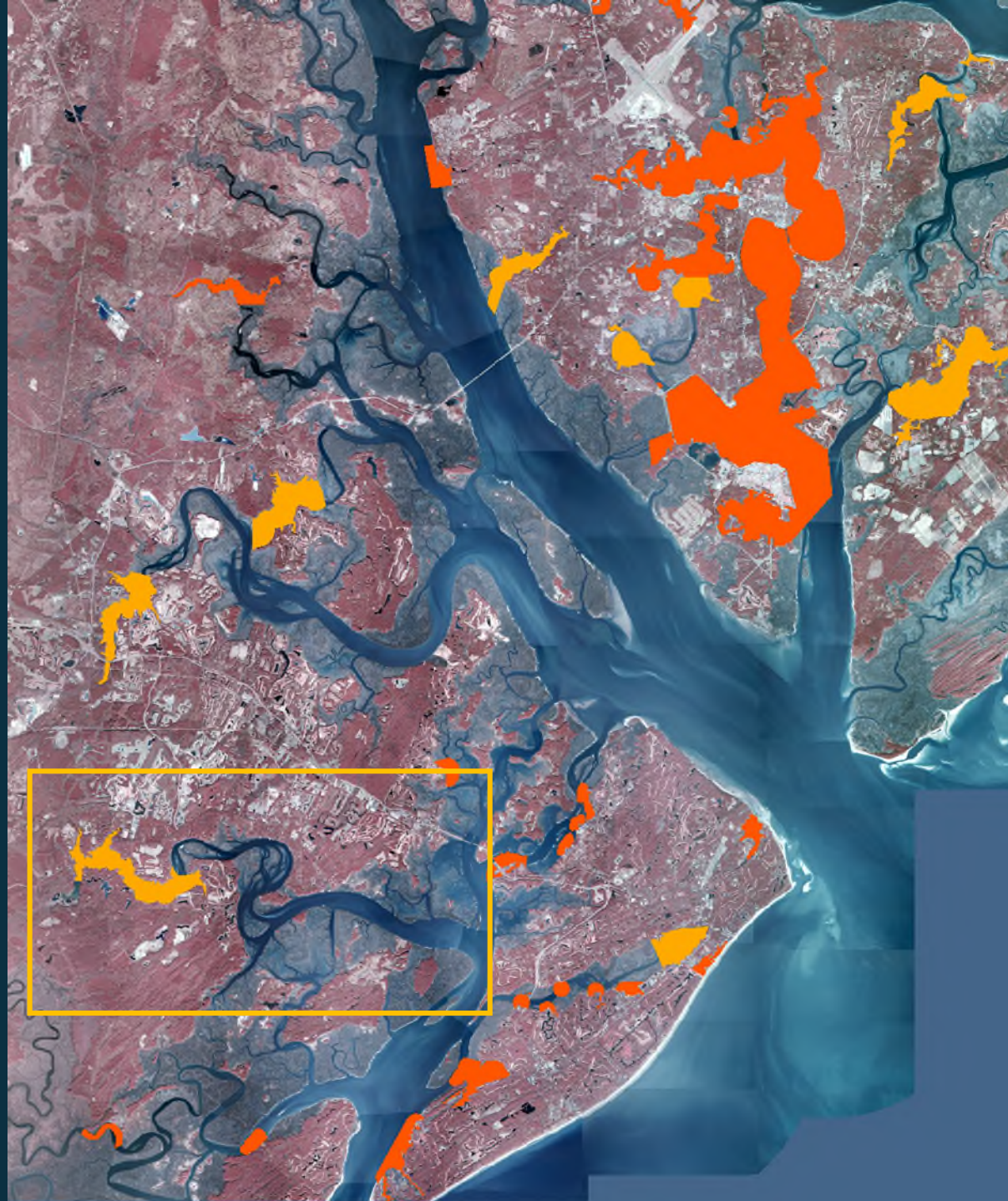


Some outcomes of development and BMPs

- Net result of increased impervious cover:
 - Increased volume of water conveyed to coastal system
 - Increased concentration of contaminants in stormwater
 - Increased contaminant load conveyed to coastal system
 - Often occurs in tandem with loss of natural buffers such as wetlands and vegetated areas
- Other changes, such as increases in precipitation magnitude may further exacerbate this
- Stormwater ponds are designed as a BMP to counteract some of these changes
 - Rain event/storage requirements
 - Detain/retain stormwater, slow flow to coast
 - Allow for particle settling

**Prohibited
shellfish
harvesting**

**Restricted
shellfish
harvesting**



Goals of current study

- Assess changes that have occurred since 2002 Baseline Study
 - Land use/watershed
 - Variety of coastal waters ranging from small to large
 - Oyster demographics, disease, and stressors
- Assess current state of May River watershed
- Provide recommendations for mitigating impacts

Definitions

- Small tidal creeks: Headwater tidal creeks, primary interface with upland areas. Intertidally-dominated, < 30 ft wide. Typically 10-15 ft.
- Tidal channels: Larger tidal rivers, secondarily connected to uplands. Subtidally-dominated, > 30 ft wide



Design of current study 1

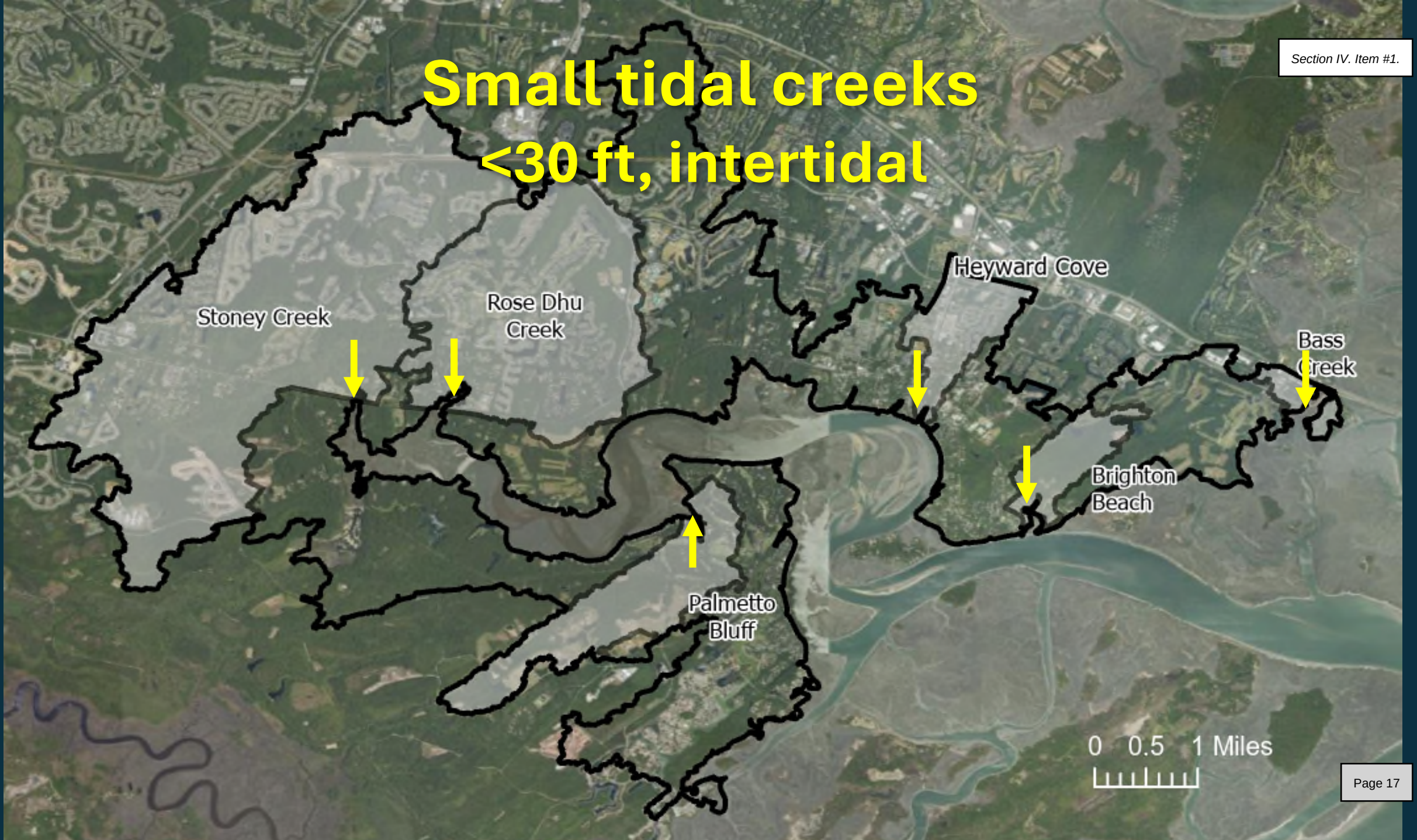
- Land use assessment
 - Impervious cover
 - Wetland and vegetated cover
 - Development types (high, medium, low density)
 - 2001 to 2021 (9 time points)
- Town-provided basins
- Small tidal creek sub-watersheds

Design of current study 2

- Small tidal creek study
 - Primary interface between upland and coastal systems
 - Sentinel ecosystem
 - Shows impact before larger system
 - Leverage SCDNR long-term Tidal Creek Project, 1994-
 - Six creeks
 - Variety of parameters



Small tidal creeks <30 ft, intertidal



**Extent of
headwater
tidal creek**

Heyward Cove



Random sites

Six sites

***benthic
community and
sediment comp.***

Heyward Cove



Primary site one
of six random
sites.

Sediment
chemistry

Heyward Cove



500 site
500 m
downstream

Water qual.
Continuous WQ

Heyward Cove

Design of current study 3

- Tidal channel study
 - Represents most of the coastal habitat by area
 - Leverages large SCDNR SCECAP dataset 1999-present
 - Indices to evaluate ecosystem holistically
 - Ten sites
 - Variety of parameters



**Tidal channels
> 30 ft wide, subtidal**

UPPER

MIDDLE

LOWER

U-01

U-03

U-02

M-01

M-02

M-03

L-04

L-03

L-01

L-02

0 0.5 1 Miles





Measures of habitat quality

Water Quality	Sediment Quality	Biological
Nutrients (5)	Contaminants (20+)	Benthic community
Fecal Coliform	legacy sources (e.g., DDT)	% poll. sens. (STC)
Chlorophyll a	ongoing sources (e.g., PAH)	% poll. Tolerant (STC)
Dissolved Oxygen	Grain size	B-IBI (channel only)
Salinity	Total Org. Carbon	Nekton (channel only)
pH (channel only)	Toxicity	

Design of current study 4

- Oyster demographics, disease, and stressors
 - Ecosystem engineer
 - Creates or maintains habitat for other species
 - Sessile
 - Good indicator to represent a location
 - Culturally and economically important
 - Six sites (2 upper, 2 mid, 2 lower)



Measures of oyster quality

Demographics	Disease and Stress	Contamination
Density	Dermo (preval./intens.)	Contaminants (20+)
Size	MSX (preval./intens.)	legacy sources (e.g., DDT)
Recruitment	Stress metabolites (2)	ongoing sources (e.g., PAH)
Mortality	Genetic markers (3)	
Associated fauna		

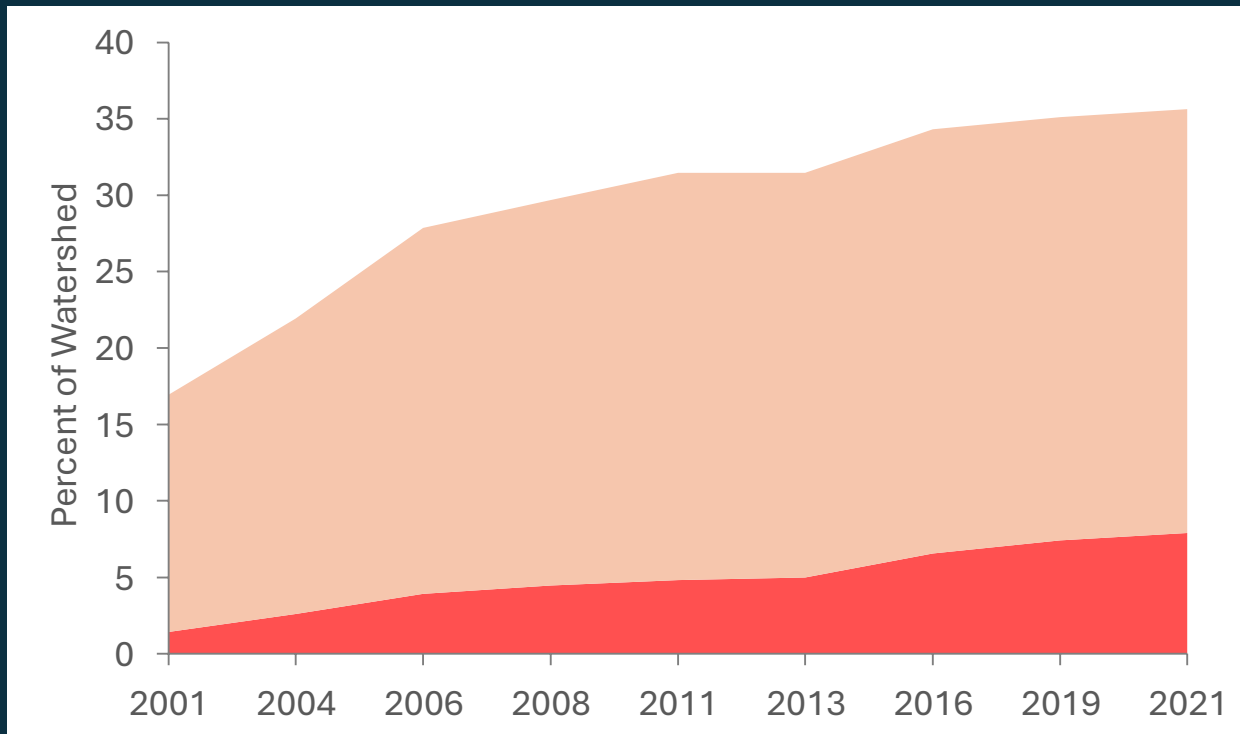
Timeline

- Small tidal creek and tidal channel sampling: summer 2023
- Oyster sampling: collection summer 2023, retrieval of trays spring 2024



Results: Land Use

- Developed land cover classes increased rapidly between 2001 and 2021

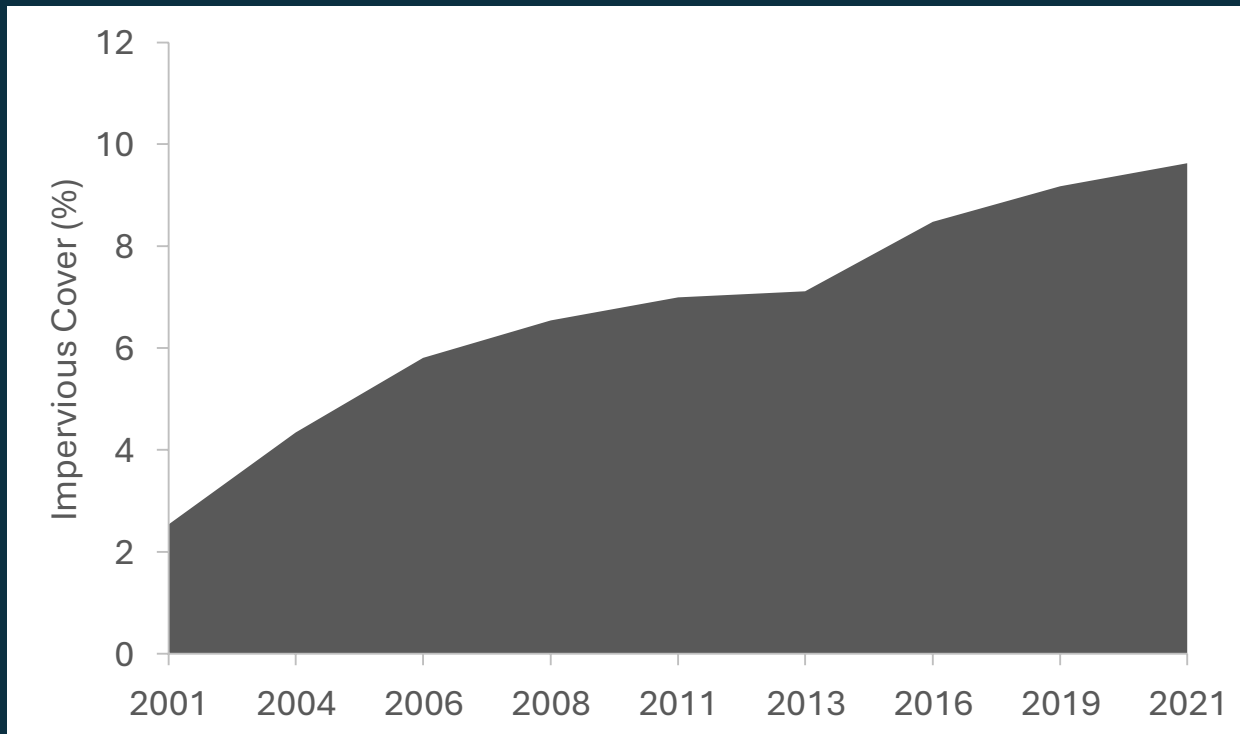


Low intensity

High and medium intensity

Results: Land Use

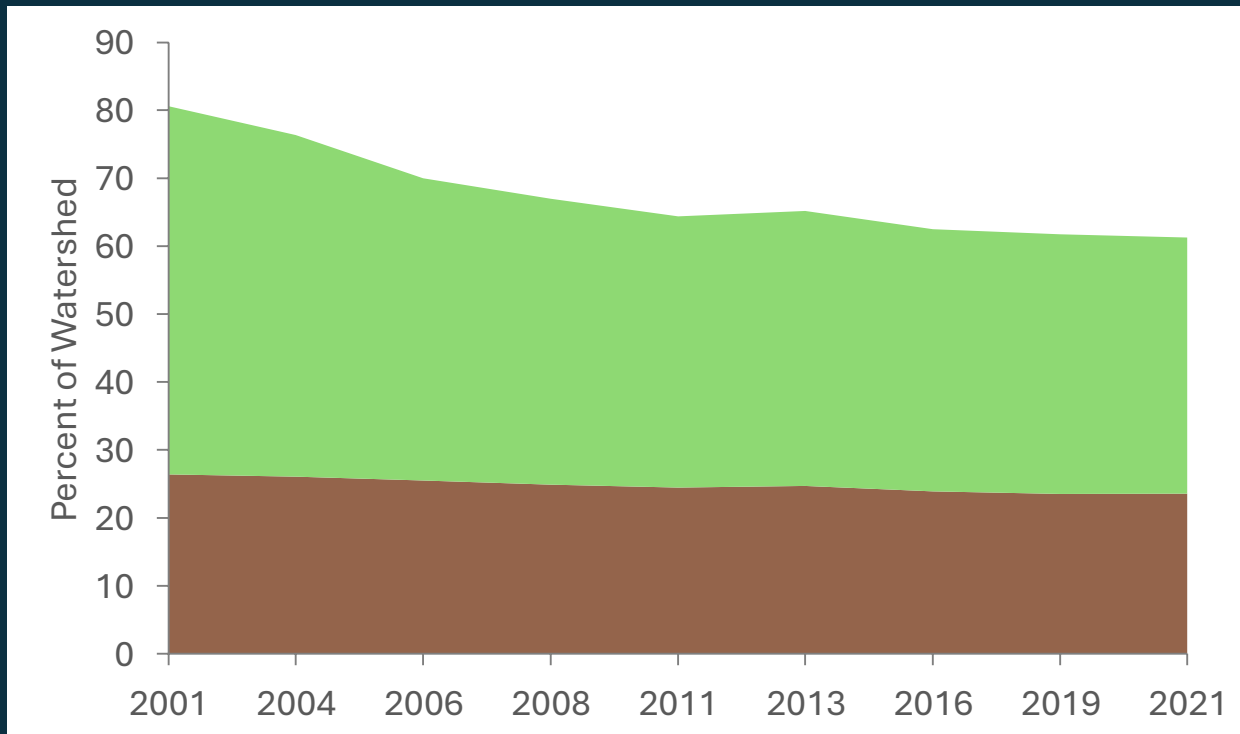
- Along with development, impervious cover increased similarly



9.6%

Results: Land Use

- Vegetated land cover classes decreased
 - Vegetated uplands (fields, forests)
 - Wetlands (forested or woody wetlands, emergent wetlands or fresh marsh)

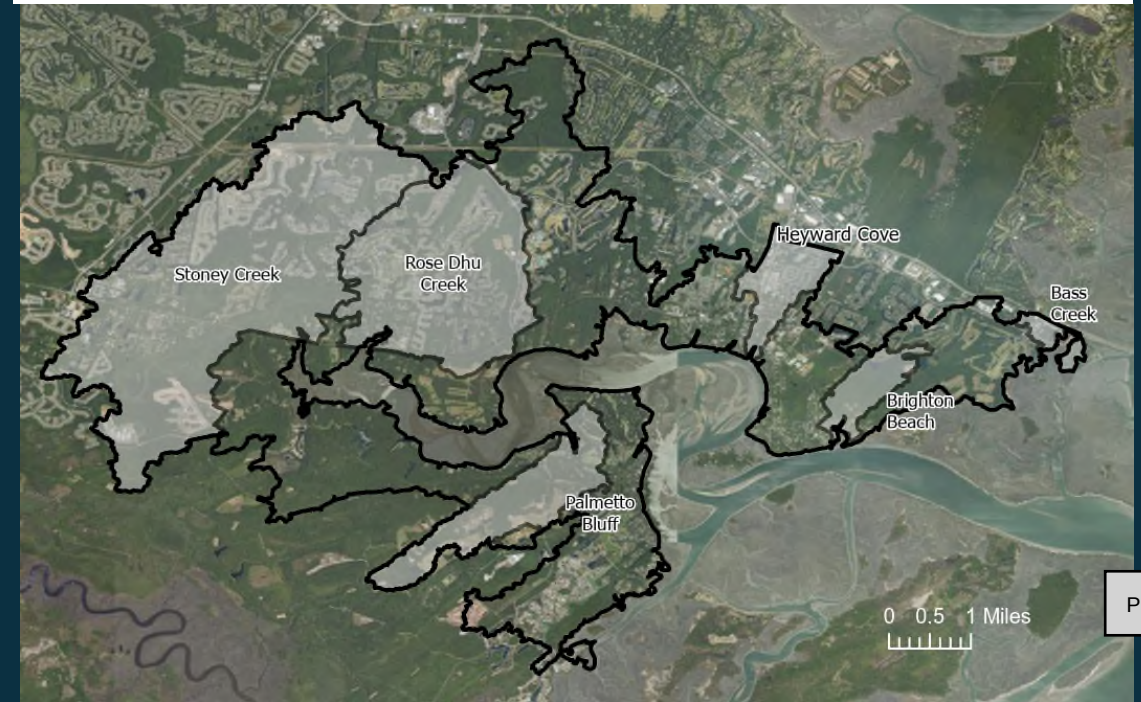
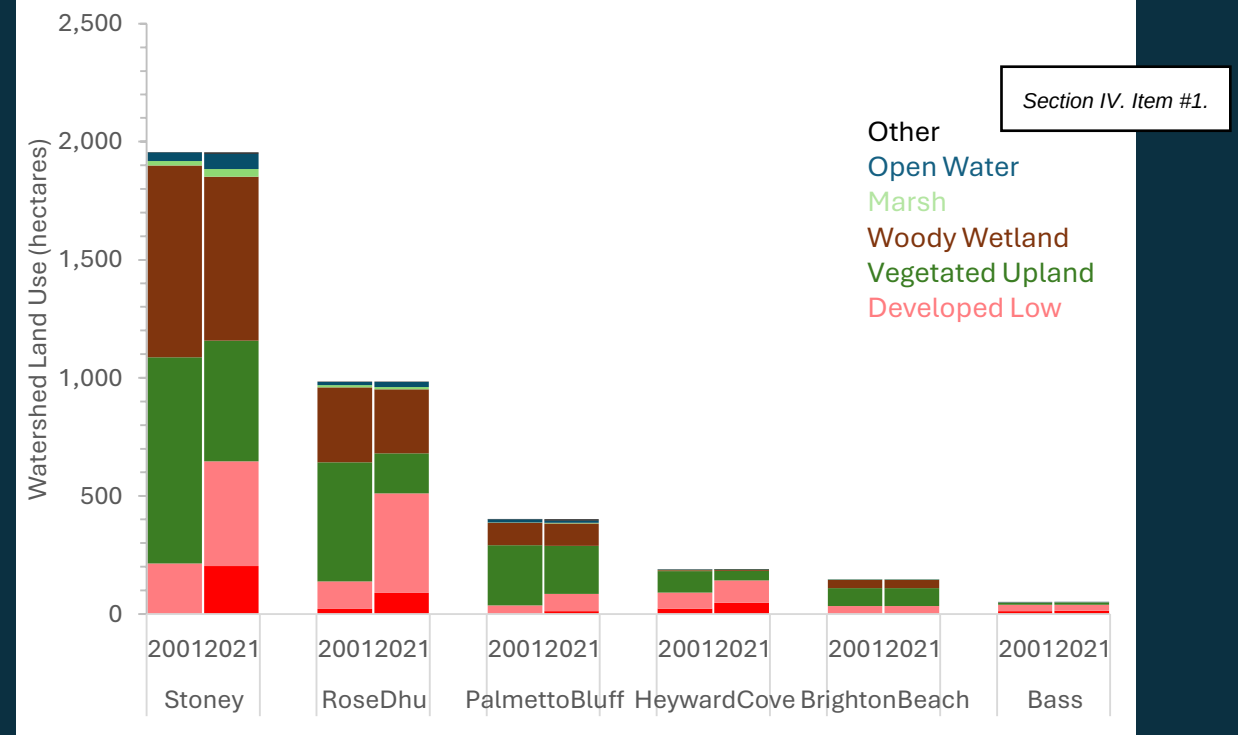


**Vegetated cover excl.
forested wetlands (3019 ac lost)**

Forested wetlands (513 ac lost)

Results: Small Tidal Creek Land Use

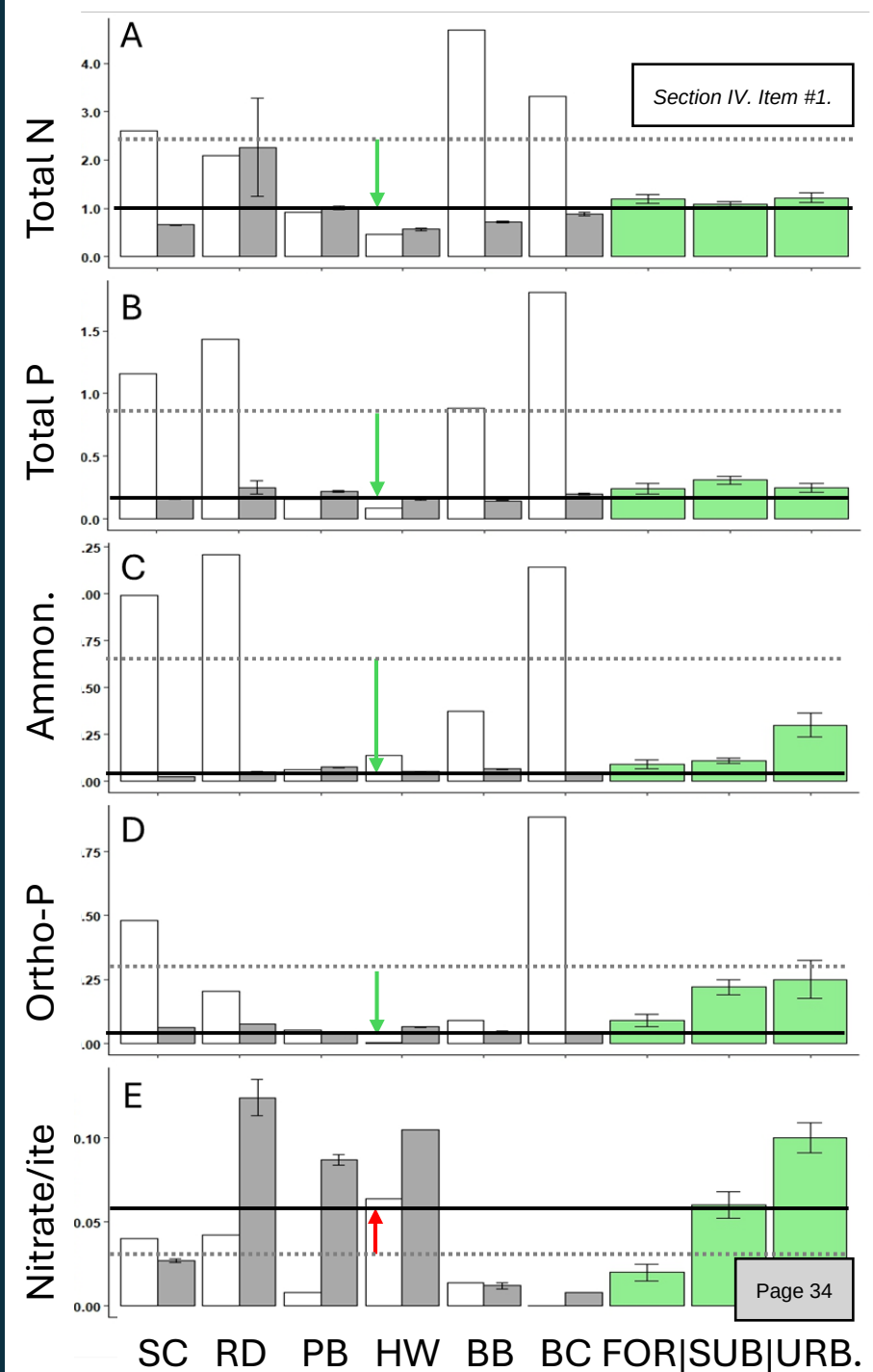
- Stoney and Rose Dhu Creek subwatersheds contain a large proportion of this development
- Still contain most of the remaining forested wetlands
- Heyward Cove developed earliest and among most developed



Results: Small Tidal Creek Water Quality

- One-time sampling events, may include natural variability
- Most parameters decreased except nitrate/nitrite.
- Surrounding land use may explain high nitrate/nitrite values

Baseline Study
Current Study
Comparison Sites

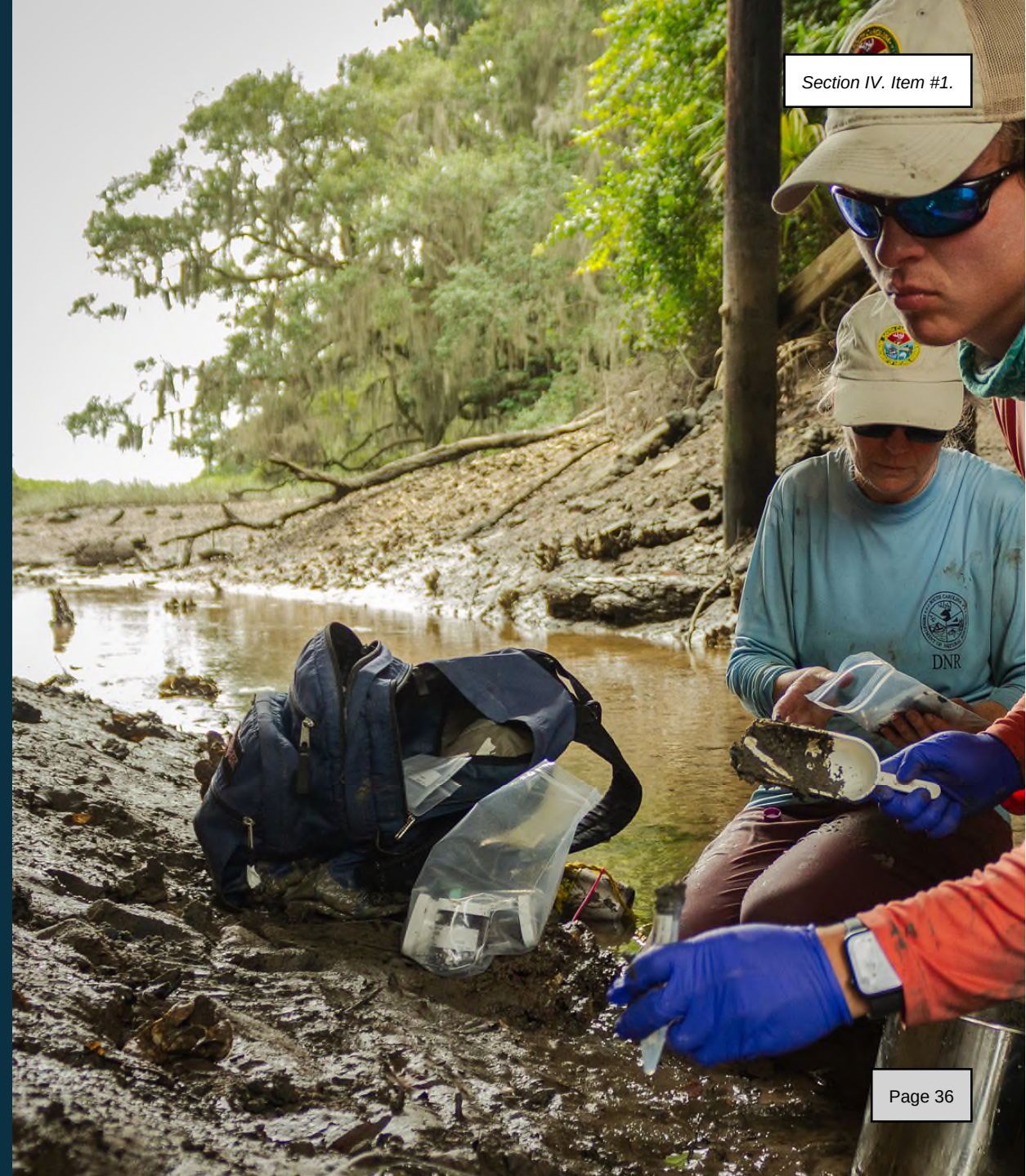


Section IV. Item #1.

-
- The figure is a scatter plot with a regression line and a shaded confidence interval. The x-axis is labeled 'Impervious Cover (%)' and ranges from 0 to 70. The y-axis is labeled 'Nitrate/ite' and ranges from 0.0 to 0.4. The legend indicates three cover classes: Forested (black circle), Suburban (black triangle), and Urban (black square). Data points are labeled with site abbreviations: PB, BB, SC, RD, HW, BC, and others. The regression line shows a positive correlation between impervious cover and nitrate levels, with a shaded gray area representing the confidence interval.

Results: Small Tidal Creek Sediment Contaminants

- Mixed results— some higher, some lower.
 - Legacy contaminants DDT, PCB
 - PAH, Pesticides, Metals

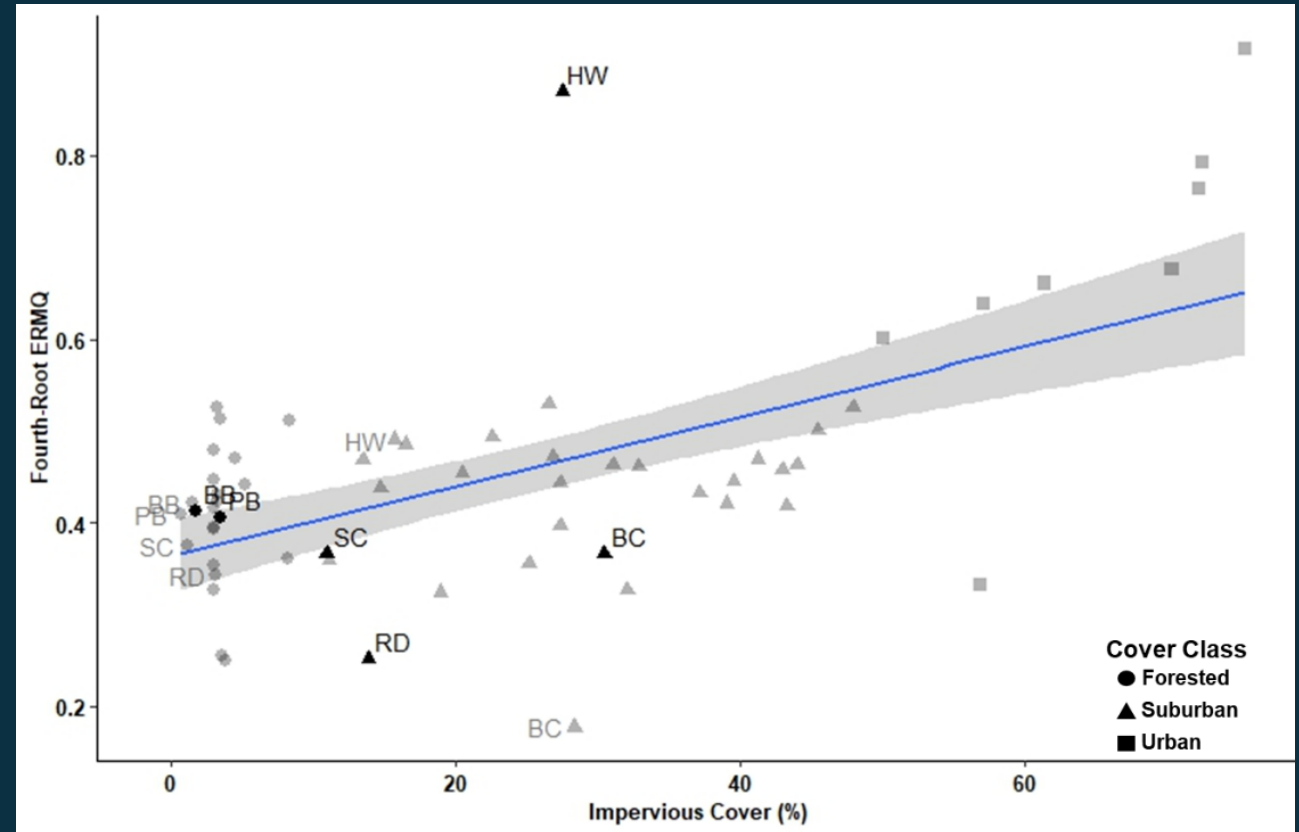


Section IV. Item #1.

Results: Small Tidal Creek Sediment Contaminants

Section IV. Item #1.

- Mixed results– some higher, some lower.
 - Legacy contaminants DDT, PCB
 - PAH, Pesticides, Metals
- Heyward Cove had high PAH in 2001 and had even higher PAH in 2023
 - ERL (11) and ERM (7) exceedances in 2023, EPA classifies as ‘poor’
- Aside from PAH in Heyward Cove, levels generally within range of other systems



Results: Small Tidal Creek Benthic Community

- Paired t-test, no significant change in pollution-indicative or – sensitive species

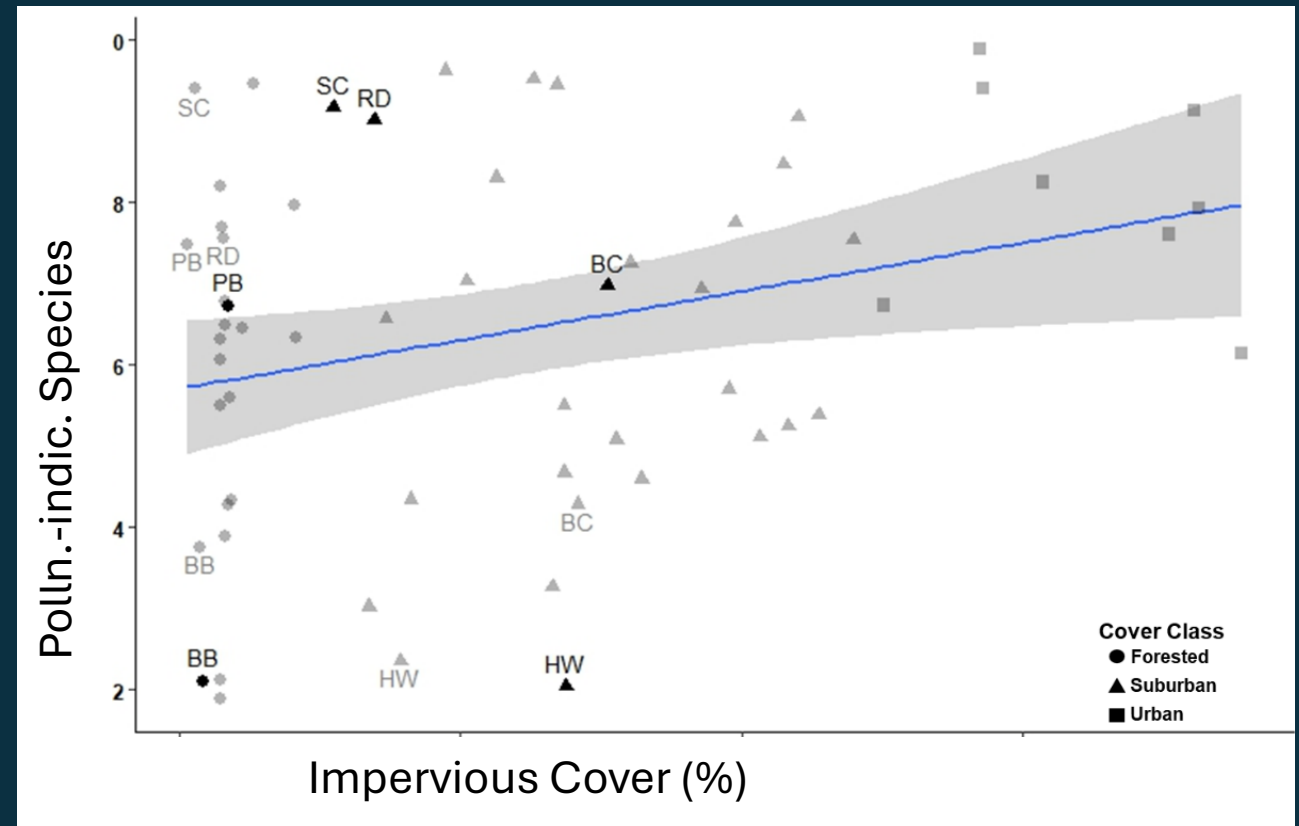


Section IV. Item #1.

Results: Small Tidal Creek Benthic Community

Section IV. Item #1.

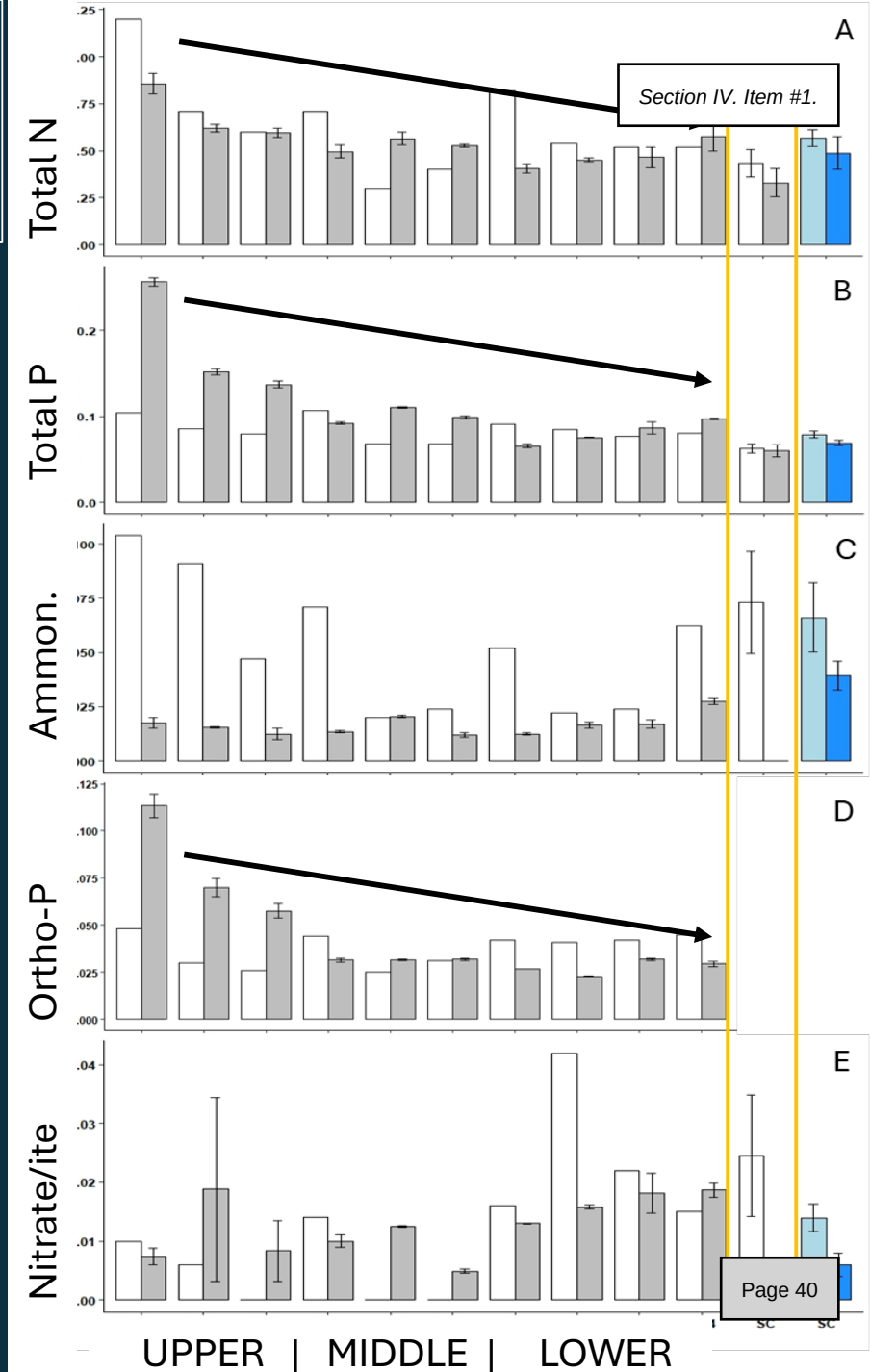
- Paired t-test, no significant change in pollution-indicative or – sensitive species
- Overall, across all creeks studied, impervious cover is significantly correlated to an increase in pollution-indicative species



Results: Tidal Channels Water Quality

- One-time sampling events, may include natural variability
- Total N, P, Ortho-P higher in upper watershed

Baseline Study
Current Study
SCECAP Same Year
SCECAP Early/Late



Results: Tidal Channels Water Quality

Baseline Study

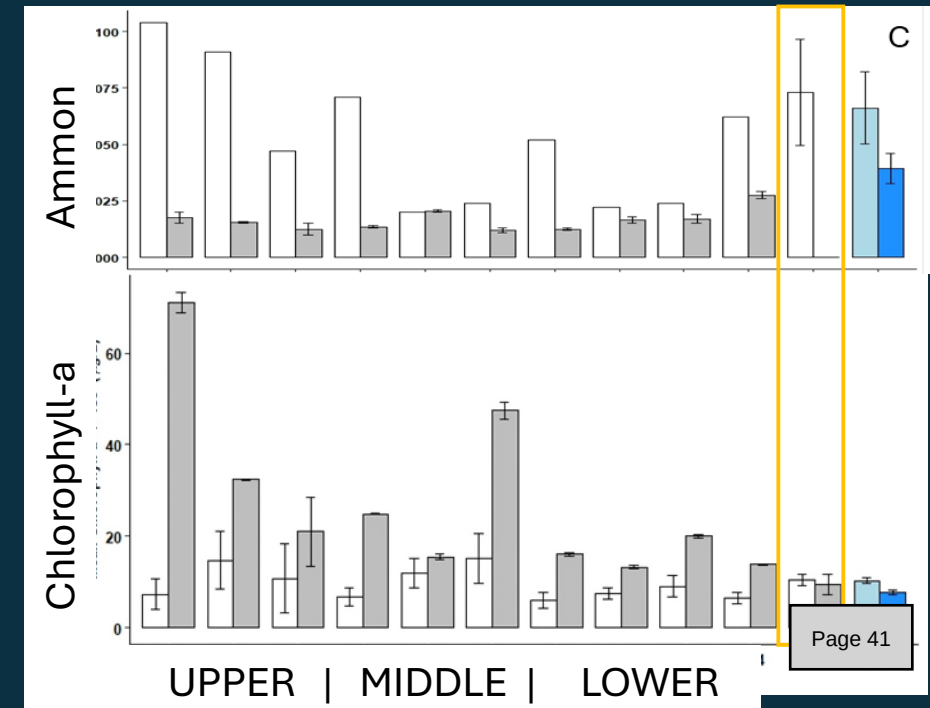
Current Study

SCECAP Same Year

SCECAP Early/Late

Section IV. Item #1.

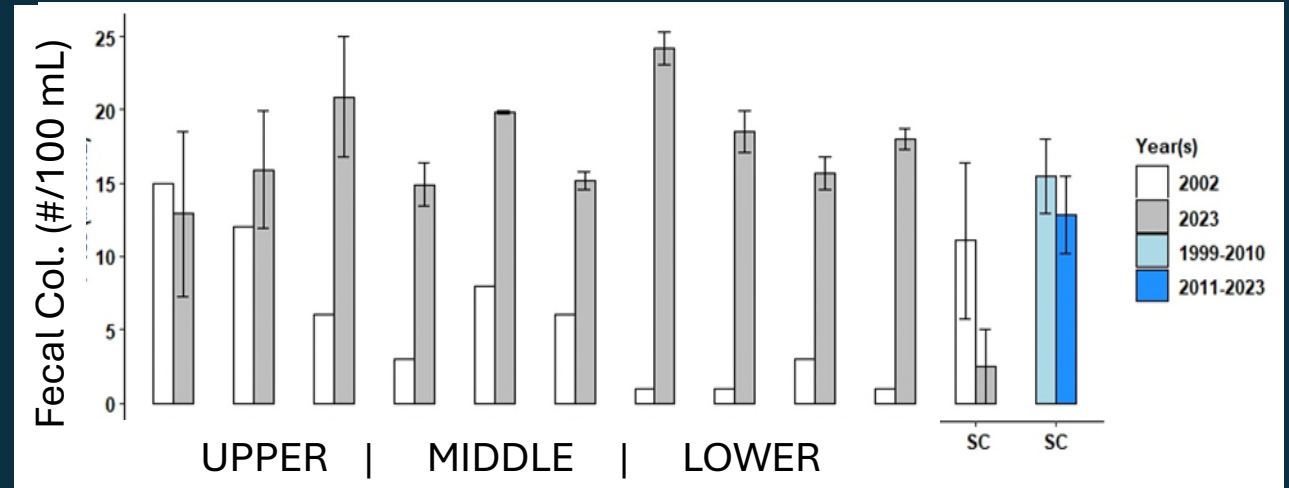
- One-time sampling events, may include natural variability
- Total N, P, Ortho-P higher in upper watershed
- Chlorophyll a significantly increased, ammonia significantly decreased



Results: Tidal Channels Fecal Coliform

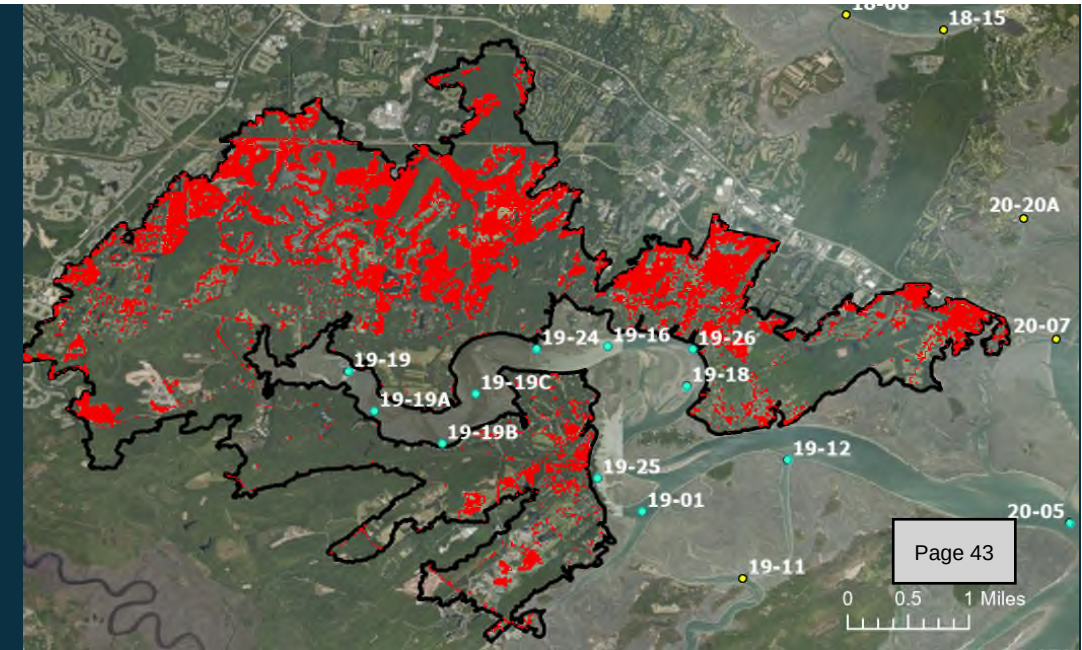
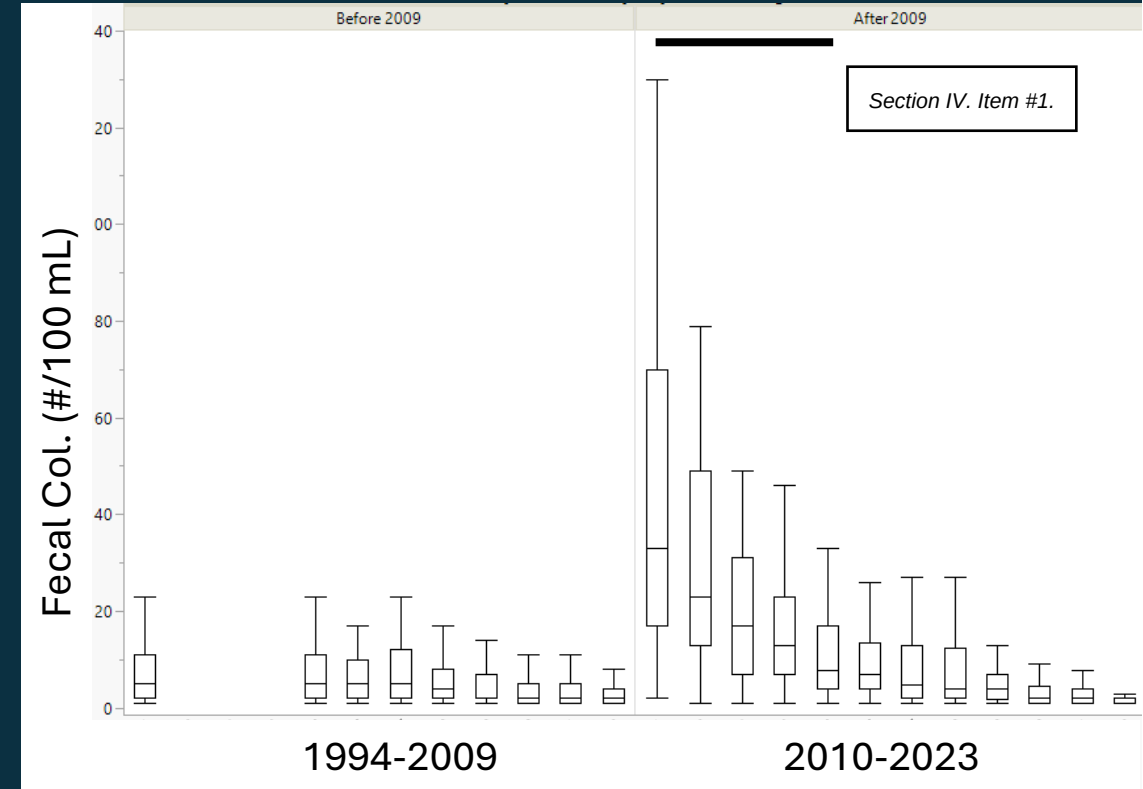
Section IV. Item #1.

- Most consistent trend observed, values higher than other sites sampled in 2023



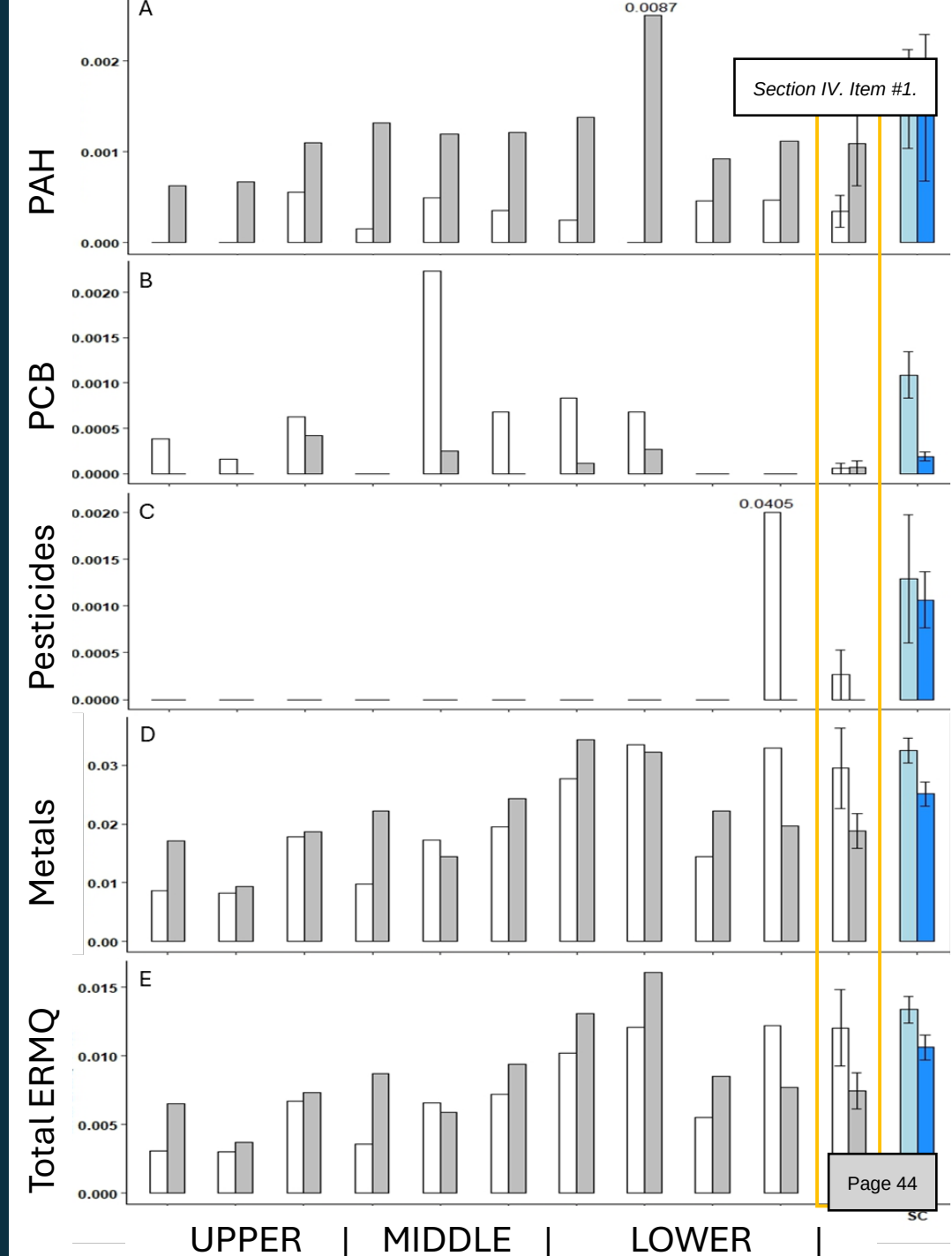
Results: Tidal Channels Fecal Coliform

- Most consistent trend observed, values higher than other sites sampled in 2023
- Consistent with SCDES Shellfish Sanitation data
 - Restricted harvest
- Uppermost long-term sites both increased most
- Lower sites decreased



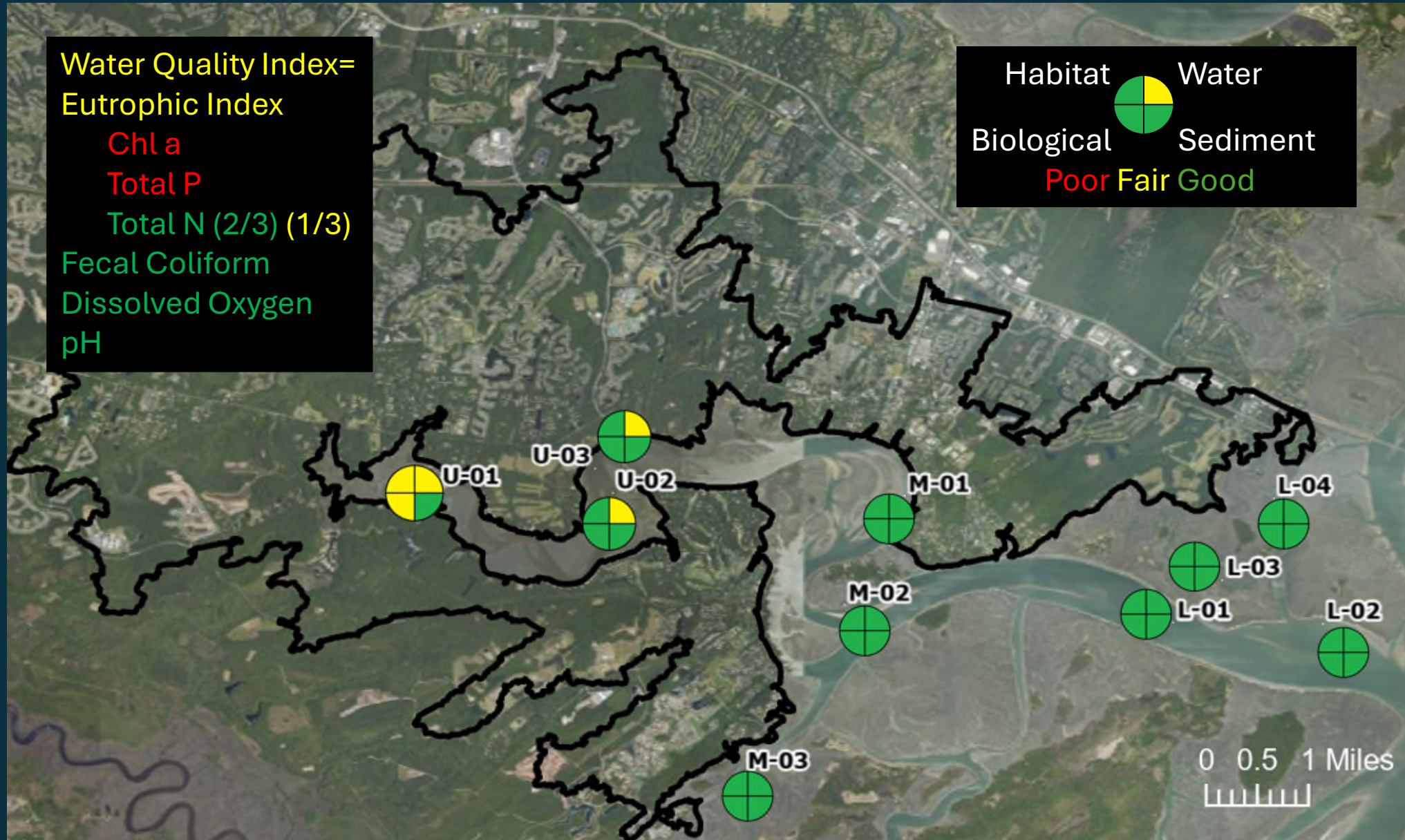
Results: Tidal Channels Sediment Quality

- ERMQ: biologically-relevant concentrations
- Large increase in PAH all sites, PCB decrease
- Overall ERMQ driven by metals, 2002-2023 patterns
- No ERL or ERM exceedances, levels are ok



Results: Tidal Channels Indices

Section IV. Item #1.



Results: Oyster Demographics

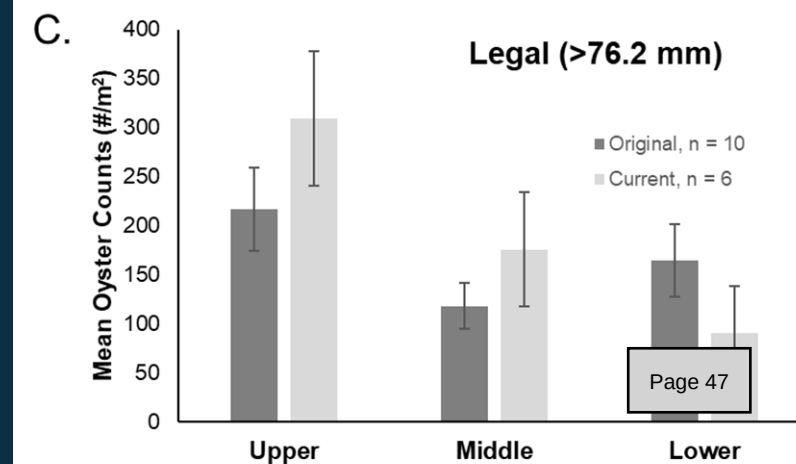
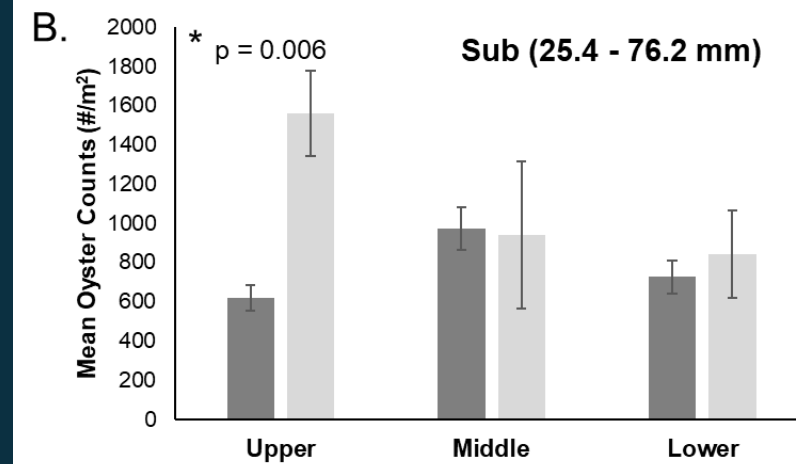
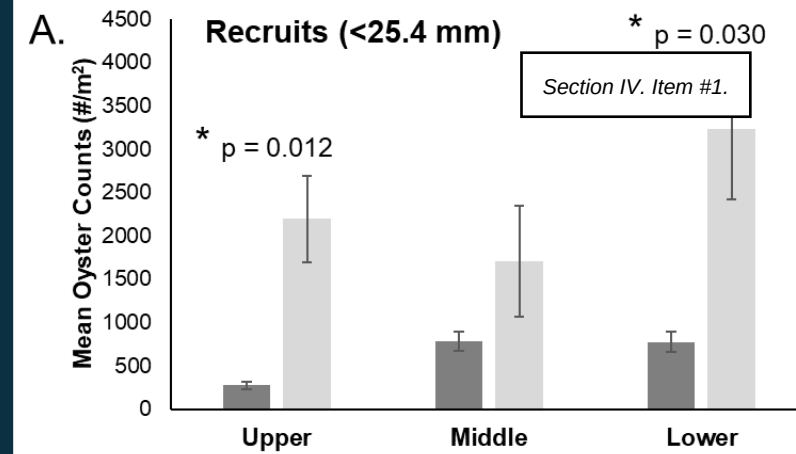
- Quadrats: smaller mean shell height & higher density
 - More small oysters
- Trays: similar or larger recruit height
- Low mortality
 - Consistent with state-wide average (2023-24 lowest in last 9 years)



Section IV. Item #1.

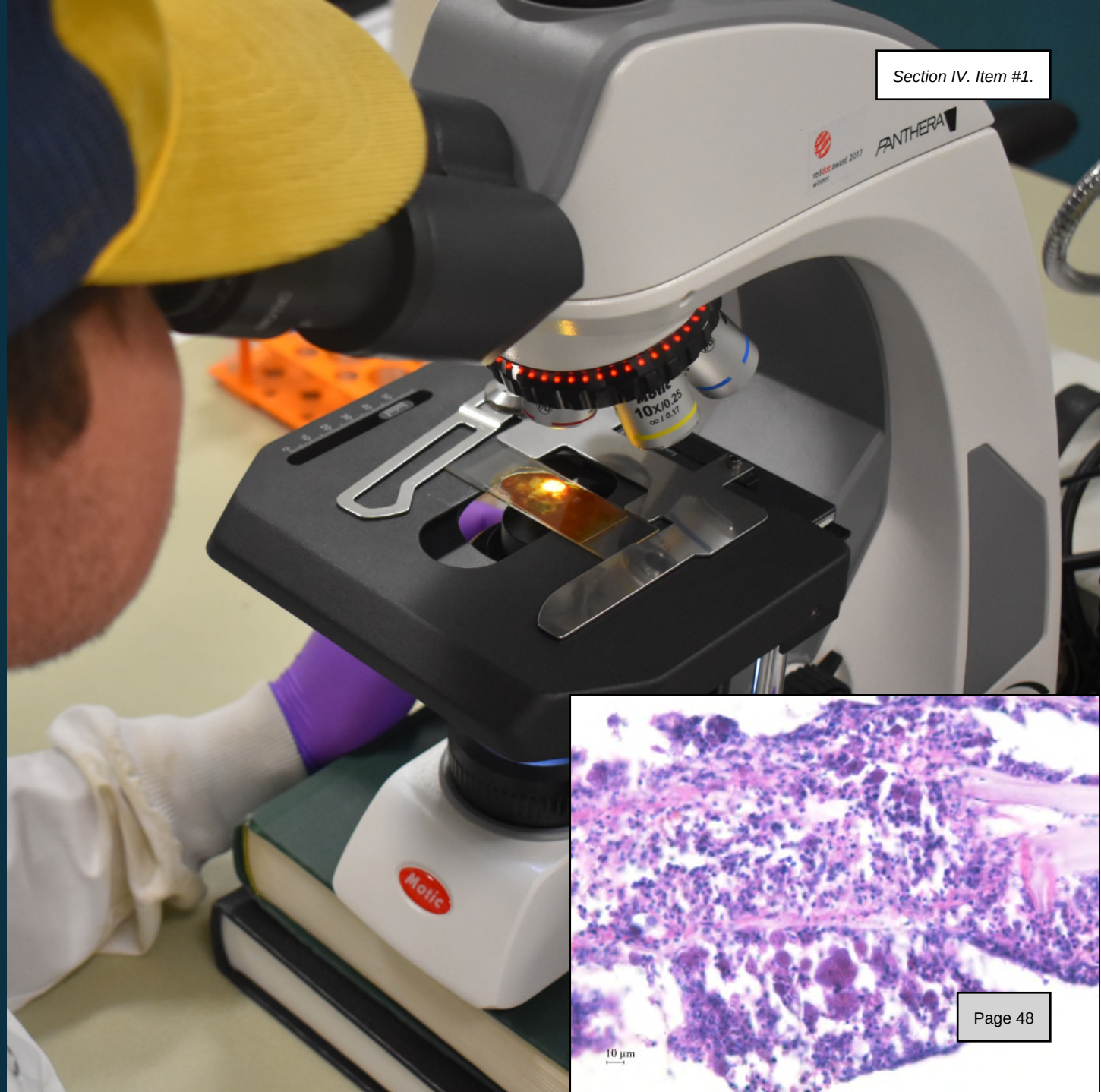
Results: Oyster Demographics

- Higher density of recruits and sub-legal oysters in upper section
- Larger average size of recruits in upper section
- Upper section closed to harvest since 2009
- Part of lower section (L-02) opened to increased harvest



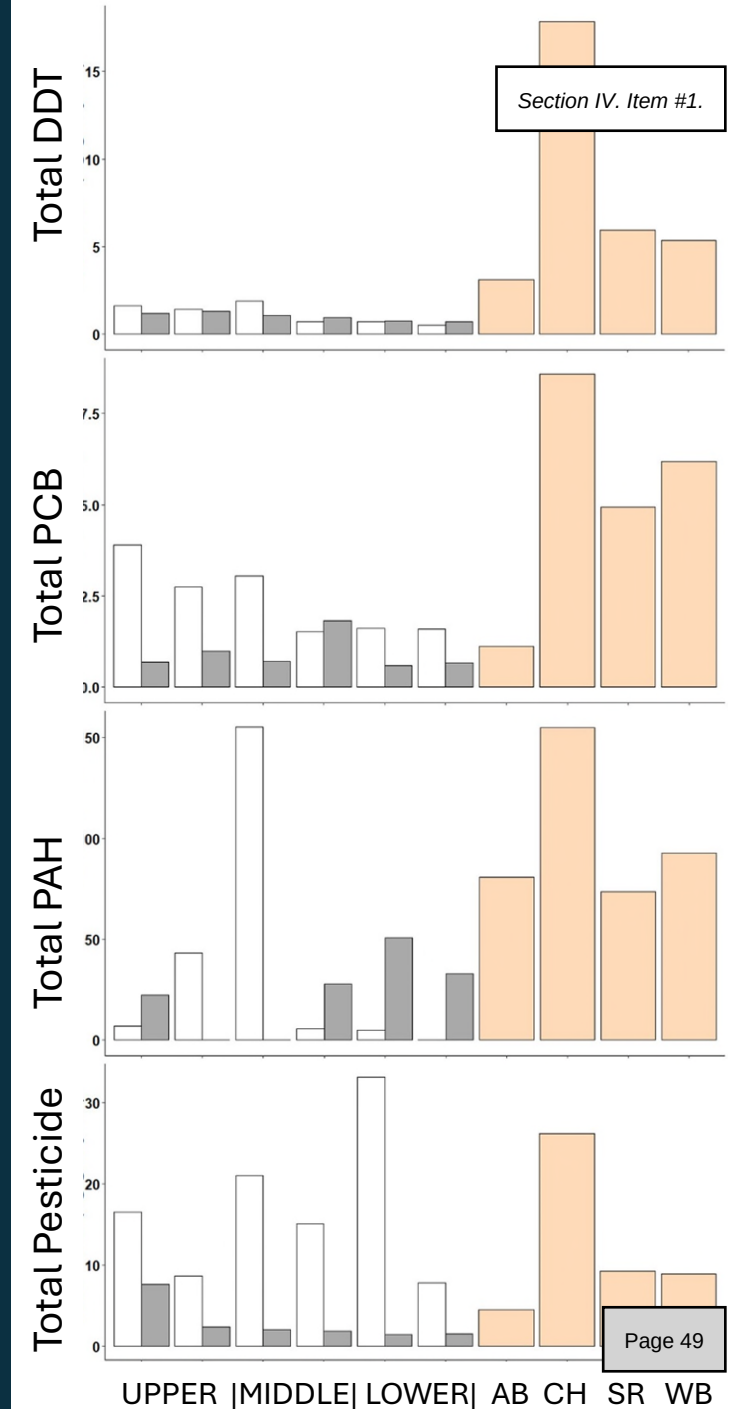
Results: Oyster Study Health and Disease

- Dermo (*Perkinsus marinus*)
 - Ubiquitous
 - Prevalence slightly higher
- MSX (*Haplosporidium nelsoni*)
 - Mid and lower sites only
 - Consistent with previous study
- Consistent with previous study and with state-wide findings



Results: Oyster Study Tissue Contaminants

- Values generally low compared to urbanized watersheds
- Values decreased for pesticides, PCB between 2002 and 2023
- PAH is mixed. Consistent increase at lower sites
- Higher than adjacent sediments, Biota-sediment accumulation



Key Results

- The May River watershed has developed substantially since 2002, converting a forested and agricultural watershed to a suburban landscape
- Despite these changes, marine habitats in the May River watershed are still relatively healthy in many regards, but there are also several indicators of degradation
 - Chlorophyll, nutrients (nitrate/nitrite in small tidal creeks, phosphorus in tidal channel), fecal coliform.
 - Heyward Cove PAH in sediments
 - Small tidal creeks and upper reach of main May River
- Oyster populations and health are consistent with other areas of the coast and primarily reflect changes in management rather than urbanization

Recommendations

- Continued monitoring, especially for metrics that indicate degradation could help:
 - Identify focus areas (i.e. spatially targeted sampling)
 - Distinguish natural variability from urbanization impacts
- Potential management priorities:
 - Improvements to stormwater and wastewater infrastructure (public and private)
 - Conservation of remaining natural landscape features
 - Public education- stormwater, septic, upland-marine connections

Thank you

tweela@dnr.sc.gov

Thank you to SCDNR staff, Town of
Bluffton, SCDNR support



S.C. Sea Grant Consortium

Town of Bluffton Resilience Planning Analysis



April 24, 2025




Sea Grant
S.C. SEA GRANT CONSORTIUM

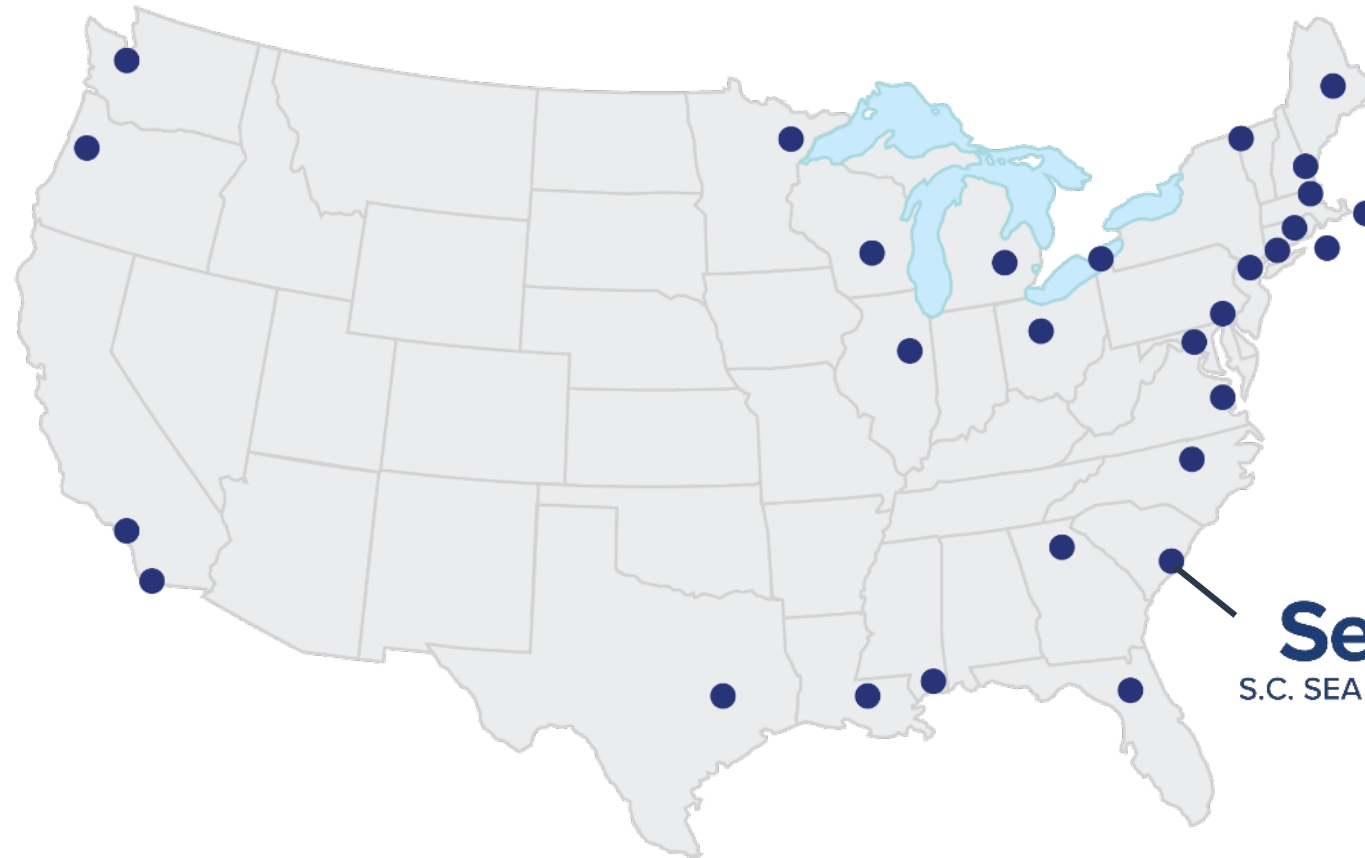


Overview

- **Lowcountry Hazards Center and S.C. Sea Grant Consortium**
- **Community Engagement**
- **Policy and Planning**
- **Mapping and Modeling**
- **Recommendations**

NATIONAL SEA GRANT

34 Programs Nationwide




Sea Grant
S.C. SEA GRANT CONSORTIUM

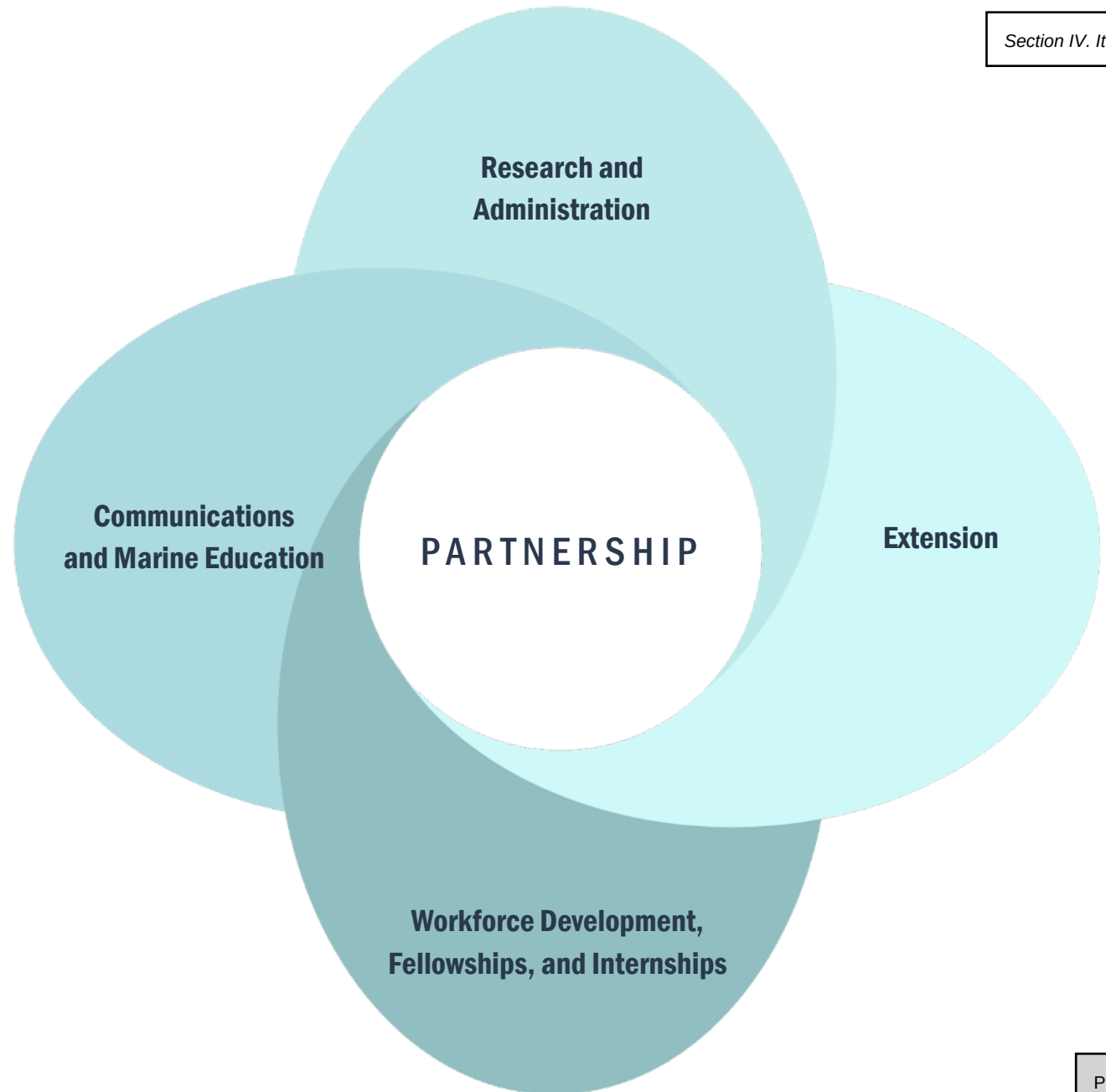
THE CONSORTIUM IN SOUTH CAROLINA

9 Member Institutions



HOW WE WORK

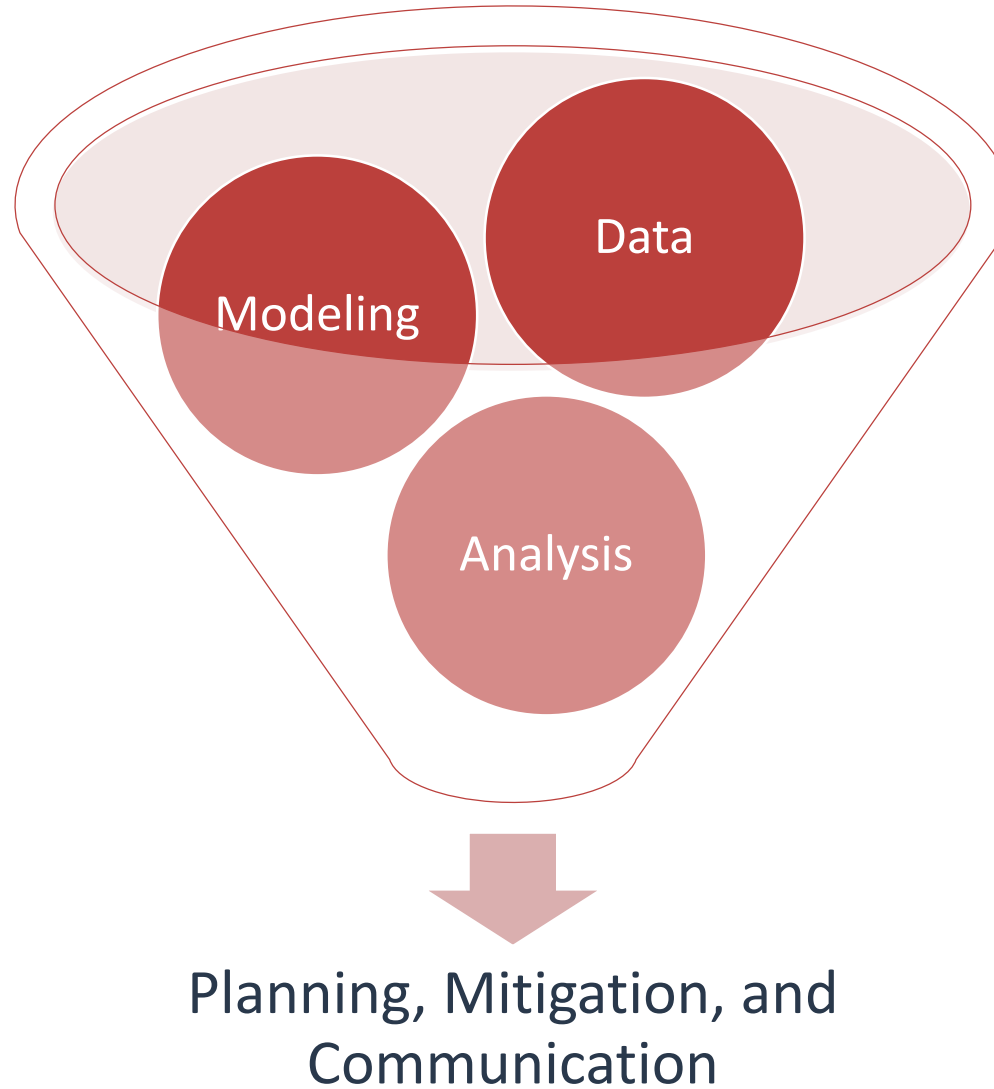
- Community engagement and outreach
- Provide information and skills
- Fellowships and internships
- Educator professional development

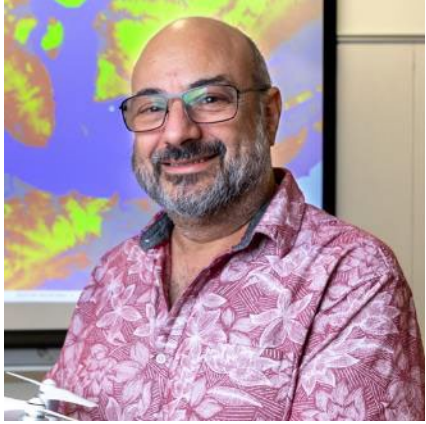


College of Charleston – SC Sea Grant Partnership

Section IV. Item #2.

- Science
- Students
- Co-Production





Norman S.
Levine, Ph.D.

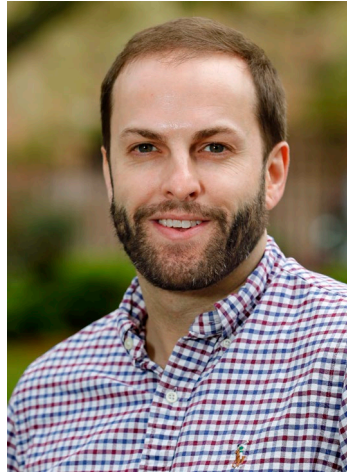
*Professor, Director:
Santee Cooper GIS
Laboratory and
Lowcountry
Hazards Center*

College of Charleston



Hailey Connell

*Research Assistant
College of Charleston*



Landon Knapp

*Coastal Resilience
Program Manager
S.C. Sea Grant
Consortium/College of
Charleston*



Sophia Truempi

*Coastal Community
Engagement
Specialist
S.C. Sea Grant
Consortium*



Katie Finegan, PE

*Coastal Processes
Program Specialist
(Former) S.C. Sea
Grant Consortium/
Coastal Carolina
University*



Shu-Mei Huang

*Coastal GIS
Specialist
S.C. Sea Grant
Consortium/College of
Charleston*

Project Team

Community Engagement

- Three public engagement events at locations throughout town
 - Bluffton Rotary Community Center
 - Pritchardville Elementary School
 - Historic Bluffton Arts & Seafood Festival
- Residents mapped flood hotspots using Survey123 online survey and at events
 - Deployed signs in flood-prone areas

Town of Bluffton

Coastal Flooding

Public Input Opportunities



About the Study

The Town of Bluffton, working with the S.C. Sea Grant Consortium and the College of Charleston, is undertaking a Resiliency Analysis. The public is invited to help us document past floods and assist researchers in understanding how flooding occurs in the Town. For more information on the project, please visit <https://www.sceagrants.org/community-flooding-survey/>

Public Input Opportunities

- Share your experience by completing the online Bluffton Flood Observations Survey. This survey can be found using the website below or the QR Code provided: <https://arog.is/10a5Sn>
- Attend one of the three drop-in events detailed below.

EVENT 1

LOCATION: BLUFFTON ROTARY, 11 RECREATION COURT, BLUFFTON, SC 29910

DATE: THURSDAY, JULY 18, 2024
6:00PM - 7:00PM

EVENT 2

LOCATION: PRITCHARDVILLE ELEMENTARY SCHOOL, 9447 EVAN WAY, BLUFFTON, SC 29910

DATE: TUESDAY, AUGUST 20, 2024
6:00PM - 7:00PM

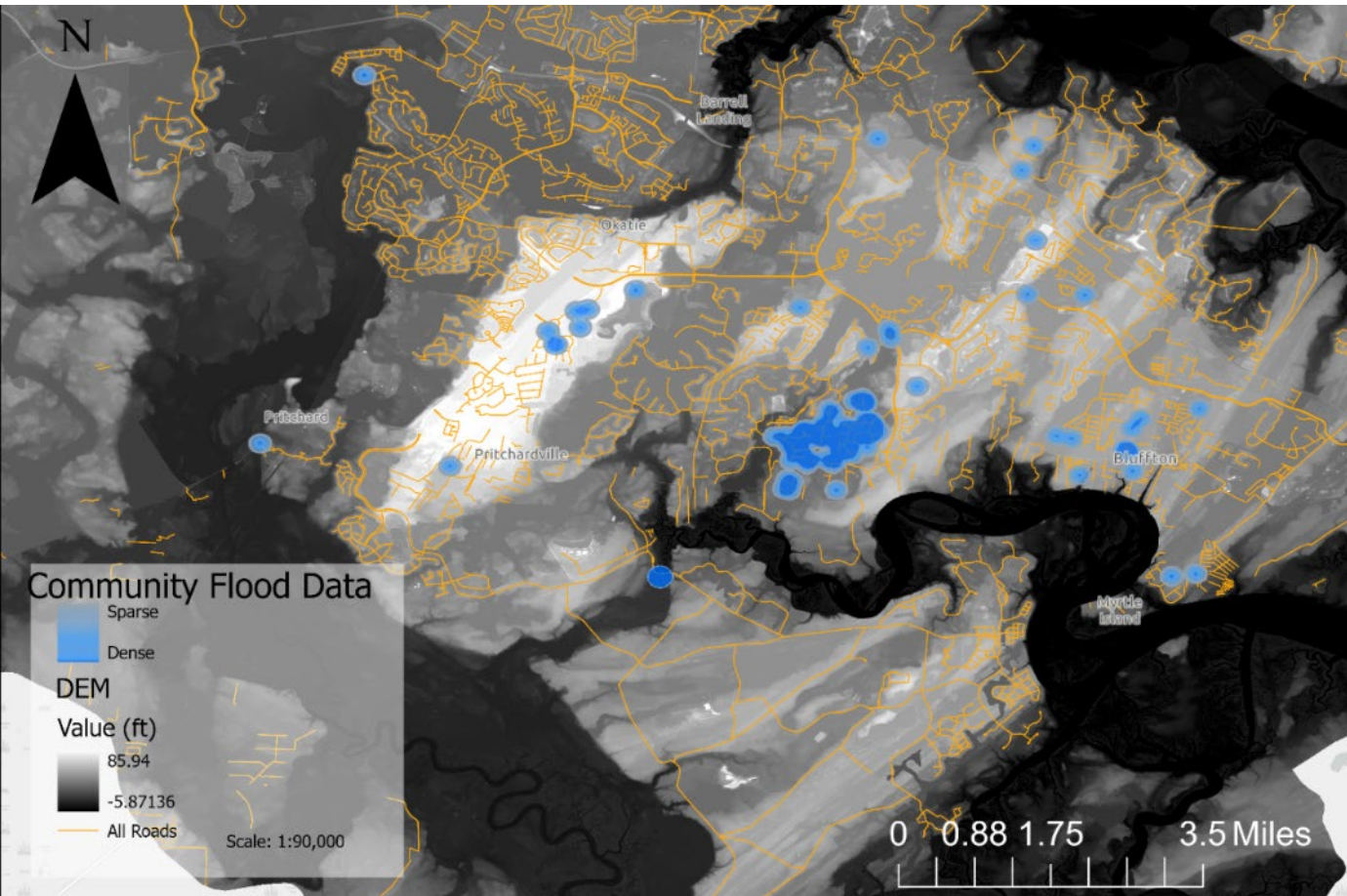
EVENT 3

LOCATION: ARTS AND SEAFOOD FESTIVAL, TOWN BOOTH AT STREET FEST

DATE: SATURDAY, OCTOBER 19, 2024
10:00AM - 5:00PM

TELL US ABOUT
FLOODING
IN YOUR COMMUNITY





- 85 survey responses
 - Paper, in-person, online
- Hotspots of current flood issues
- Photos of past flood events

Flood Surveys

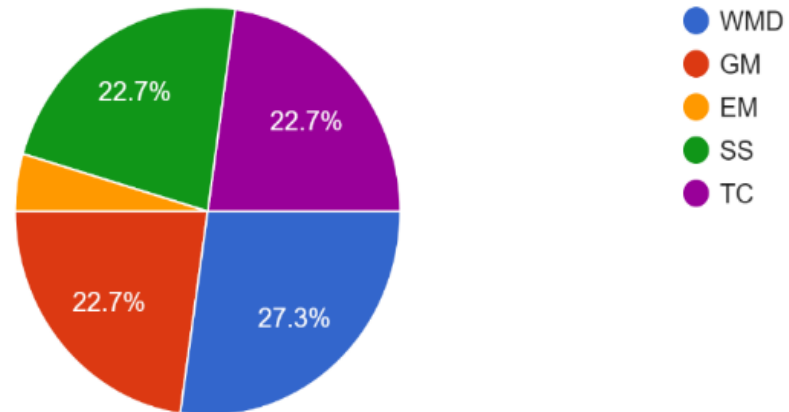


Resilience Concerns

- Conducted survey of Town staff from multiple departments and Town Council to determine greatest needs/concerns
- Highest concerns:
 - Water Quality
 - Evacuation Routes
 - Wetland Loss
 - Flooding Inundation
 - Green/Blue Space
 - Rainfall Runoff
 - Storm Frequency and Intensity...

Please note your group affiliation: Watershed Management Division = WMD Growth Management = GM Emergency Management = EM Senior Staff = SS Town Council = TC

22 responses

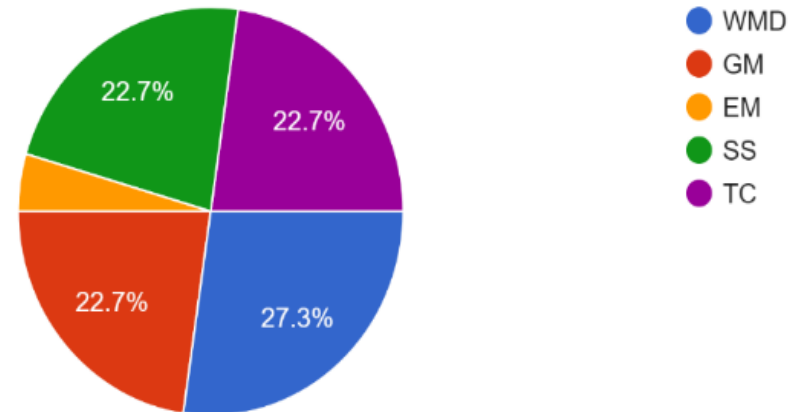


Resilience Concerns

- Conducted survey of Town staff from multiple departments and Town Council to determine greatest needs/concerns
 - Highest concerns:
 - *Water Quality*
 - *Evacuation Routes*
- Wetland Loss
 - Flooding Inundation
 - Green/Blue Space
 - Rainfall Runoff
 - Storm Frequency and Intensity...

Please note your group affiliation: Watershed Management Division = WMD Growth Management = GM Emergency Management = EM Senior Staff = SS Town Council = TC

22 responses



Policy and Planning

- Partnered with National Sea Grant Law Center to conduct review of local wetland protection ordinances
- Conducted review of policy and land acquisition options to strengthen resilience

Mapping and Modeling



Bluffton Development Agreements

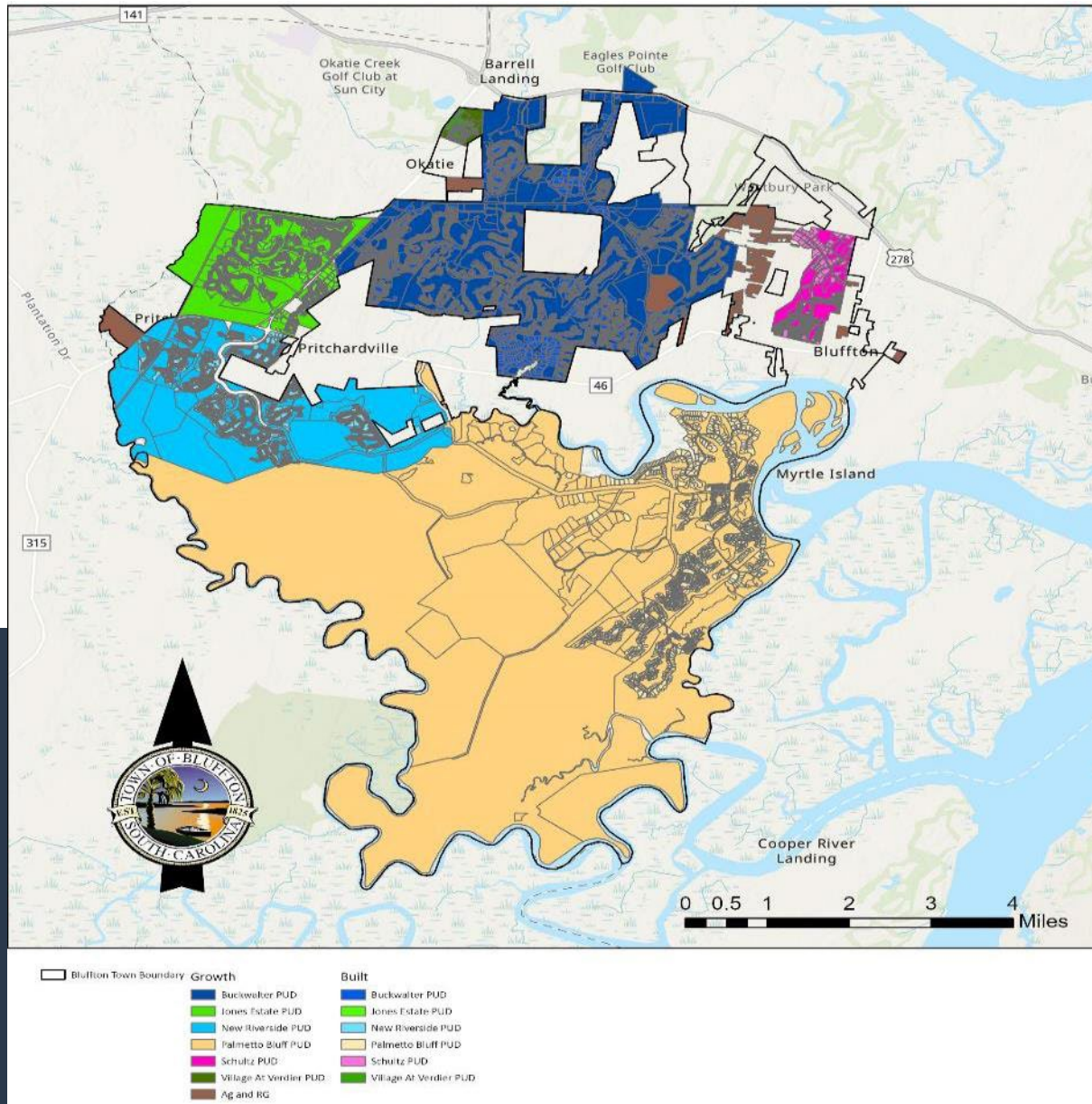
- Development Agreement: a legal binding agreement between local government(s) and property owner(s) for the long-term development of large tracts of land
- Purpose:
 - Plan for future to include the maximum build out and includes general uses, **density** and general site layout
 - Vested right for term of the agreement...
 - Reservation or dedication of land for public purposes...
- Referred to as Planned Unit Development agreements (**PUDs**)

Planned Unit Development Agreements (PUDs)

Remaining Residential Dwelling Units (as of 12/31/24):

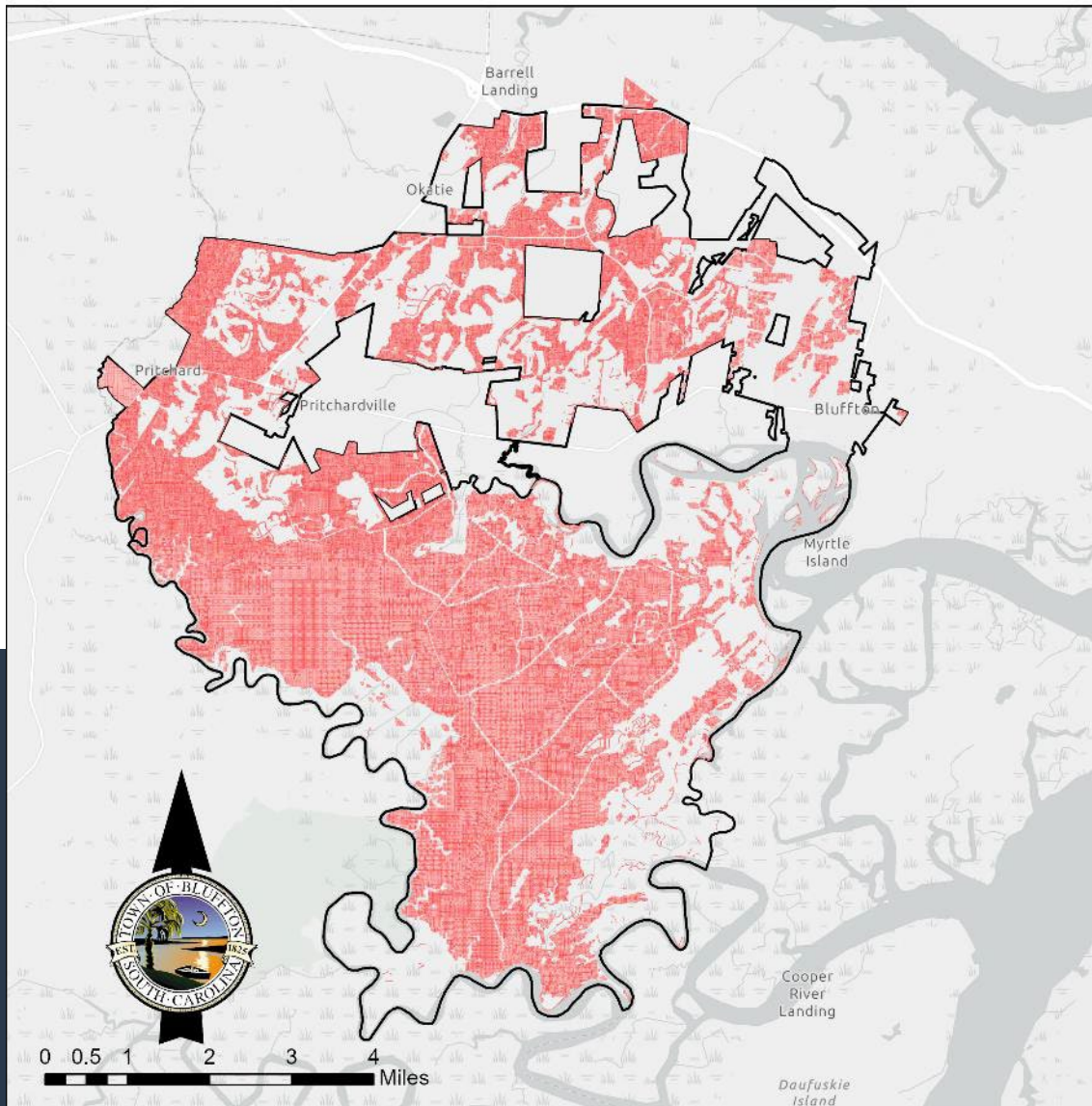
- Buckwalter: 2,176
- Jones Estate: 413
- New Riverside: 724
- Palmetto Bluff: 2,515
- Shultz Tract: 66
- Village at Verdier: 9
- **Total: 5,903**

* Served as the constraint for our analysis



Buildout Analysis

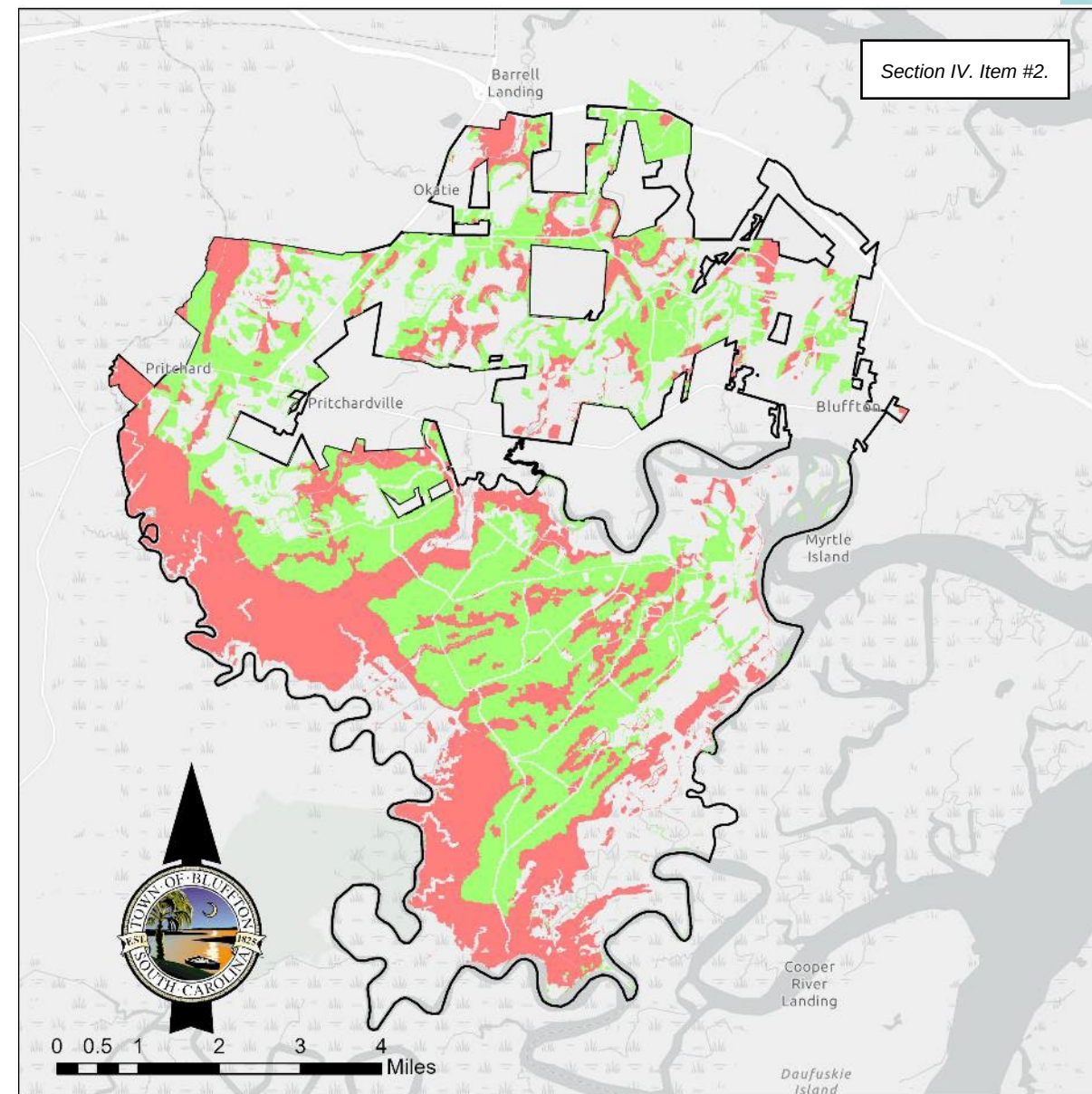
- Simulates subdivision of all developable parcels (>5 acres) into maximum development density
- Density from PUD agreements
- Removed SCDES critical area, water features, rights of way
- Resulted in 99,423 potential parcels
 - Far exceeded 5,903 remaining for development
- Used to analyze risk based on areas of development



Bluffton Town Boundary
Bluffton Buildout Parcels

Flood Risk

- Utilized First Street Flood Model from SC Office of Resilience
- Flood model that incorporates:
 - Rainfall
 - Riverine Flooding
 - Coastal Storm Surge
- Year 2023 and 2053 conditions
- Overlaid with current and future potential (buildout) development
- Four flood scenarios modeled:
 - 1-in-2
 - 1-in-100
 - 1-in-20
 - 1-in-500

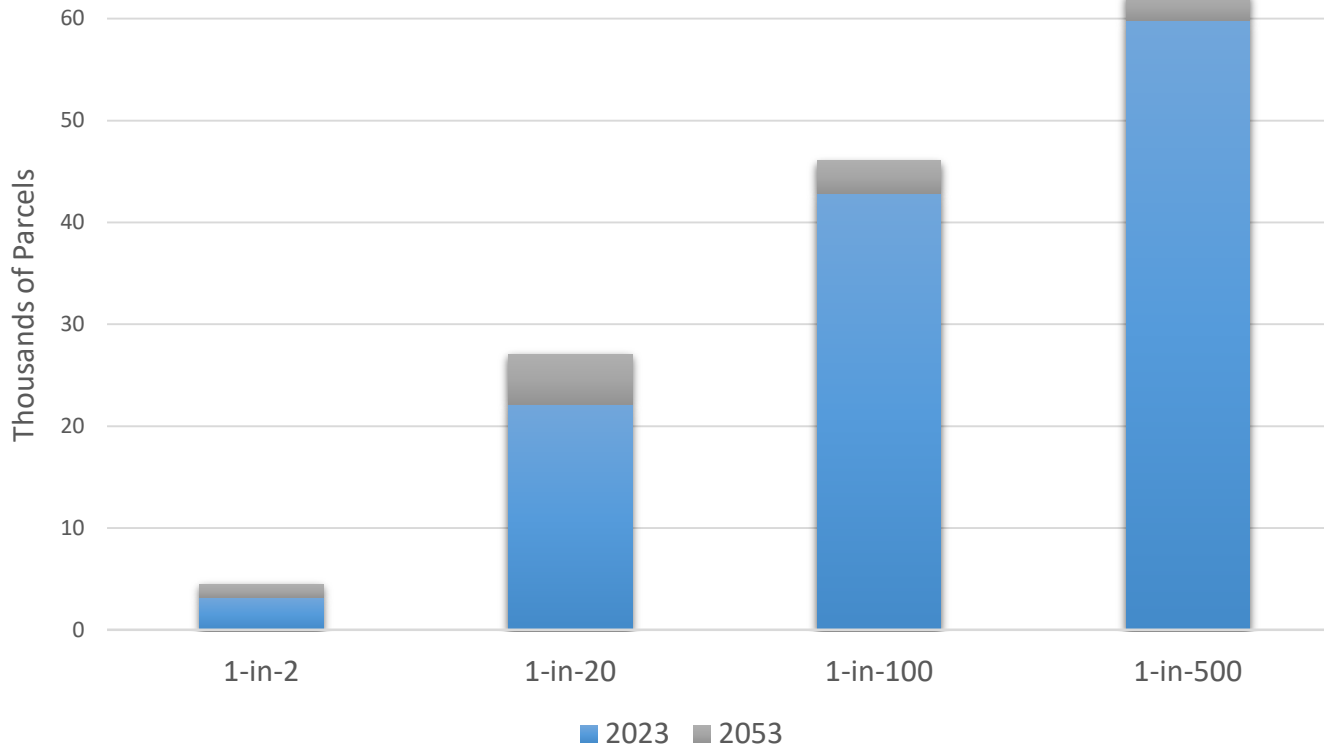


Damage Assessment

- U.S. Army Corps of Engineers Depth-Damage Curves
- Percentage of damage from different flood depths depending on size of home
- Average home value from 2021 U.S. Census Bureau estimates
- Reveals damages avoided based on location of development

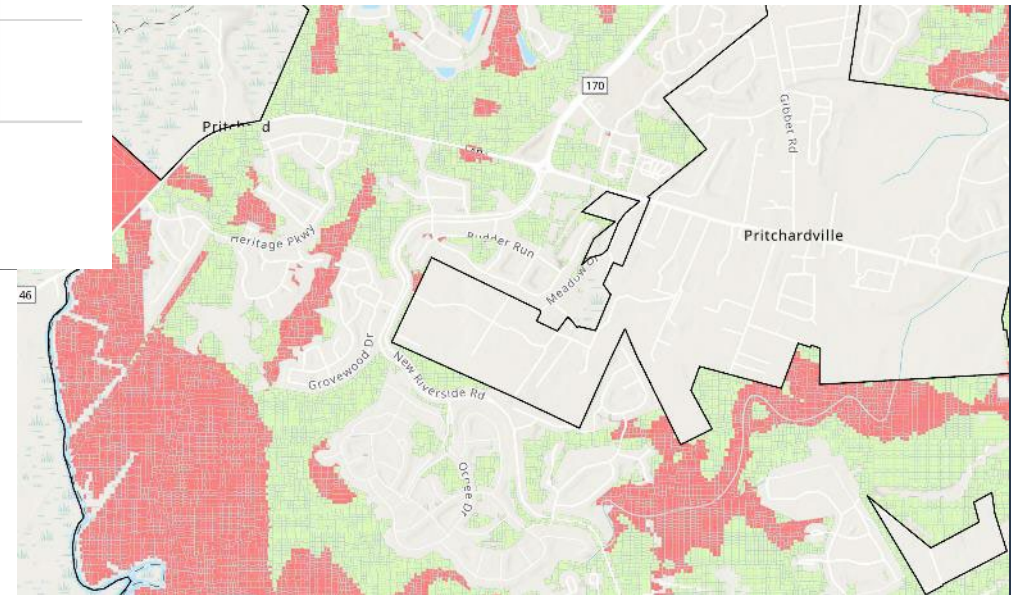


Buildout Parcel Vulnerability



- Large increase in vulnerability as flood event size increases
- Future conditions increase flood vulnerability
 - Greatest % increase for smaller events
- 63% of buildout parcels were flooded by the largest flood event leaving 37,000 dry parcels

Vulnerability of Buildout Parcels



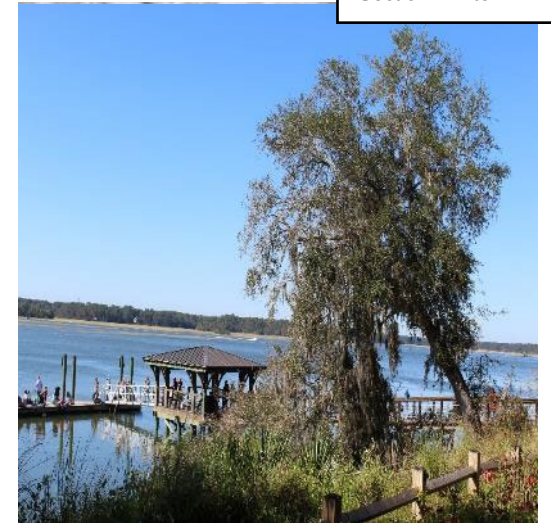
Policy Scenarios

Forested Wetlands Protections

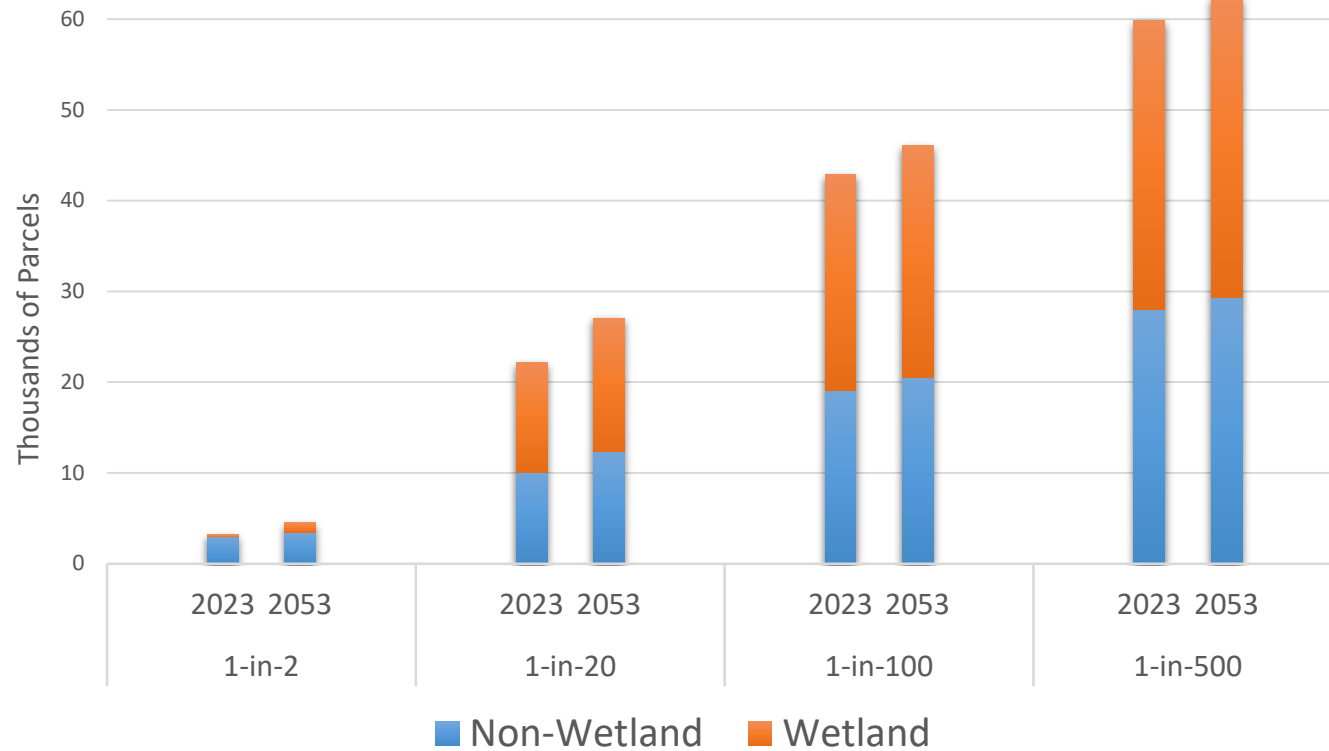
- Wetlands store, hold and filter water during storm events
- Calculated flood coverage and damages within and outside of wetland areas

Elevation-Based Zoning

- Lower elevations tend to accumulate water first during storm events
- Categorized low, moderate, and high elevation groups for each PUD
- Calculated flood coverage and damages within each zone

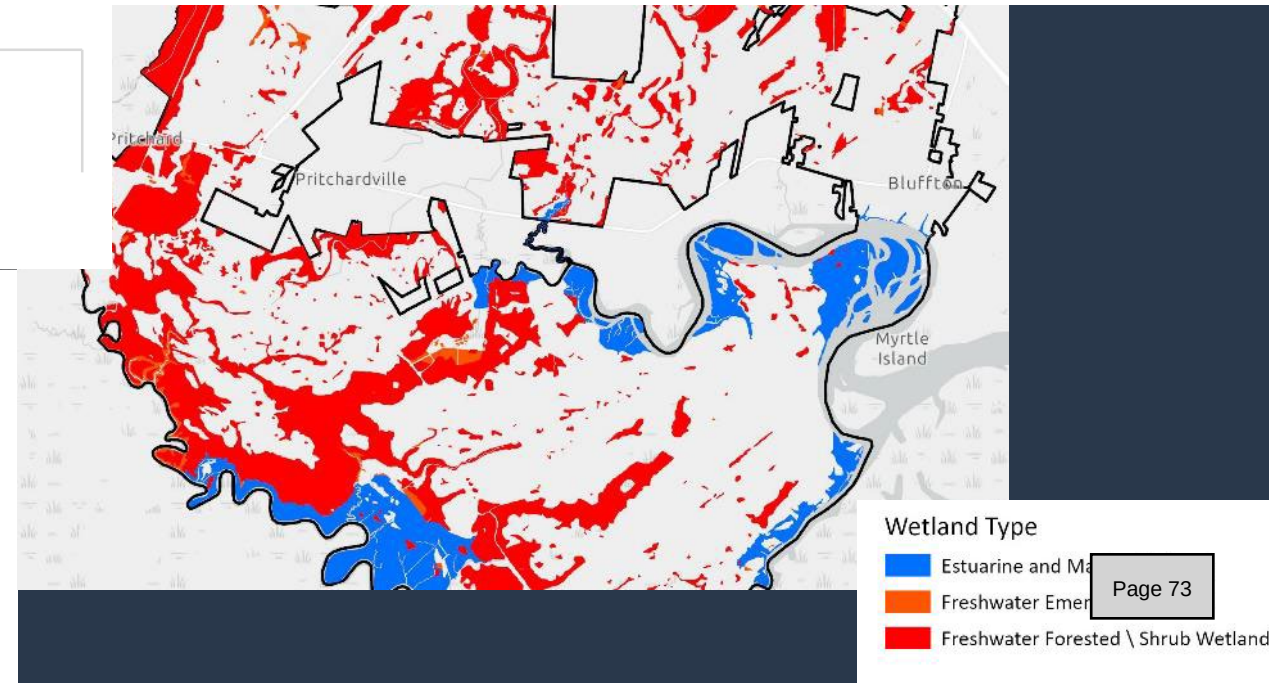


Wetlands - Buildout Parcel Vulnerability

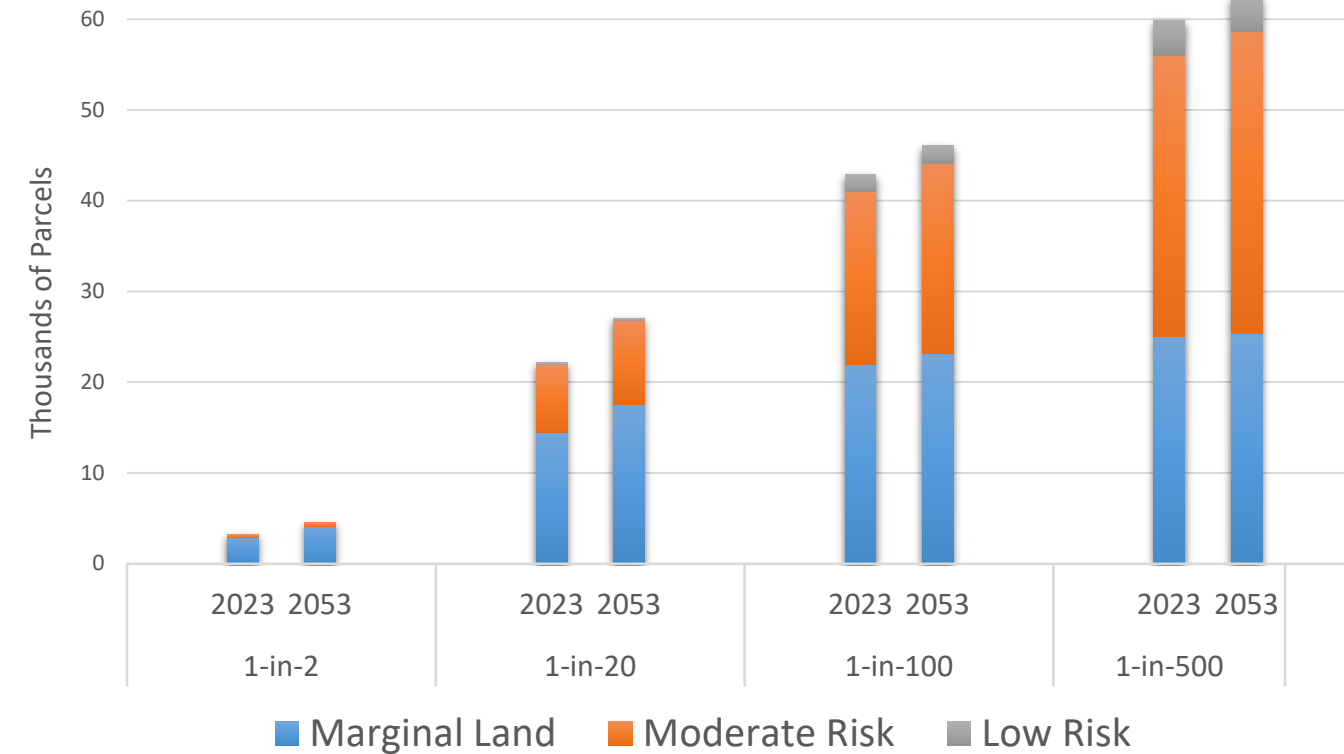


- Over half of vulnerability comes from wetland parcels for all but smallest event
- Wetland parcels held \$1.84 billion worth of modeled damages for the 1-in-100 storm event with 2023 conditions
- Protecting wetlands from development will significantly reduce future vulnerability

Forested Wetlands Vulnerability

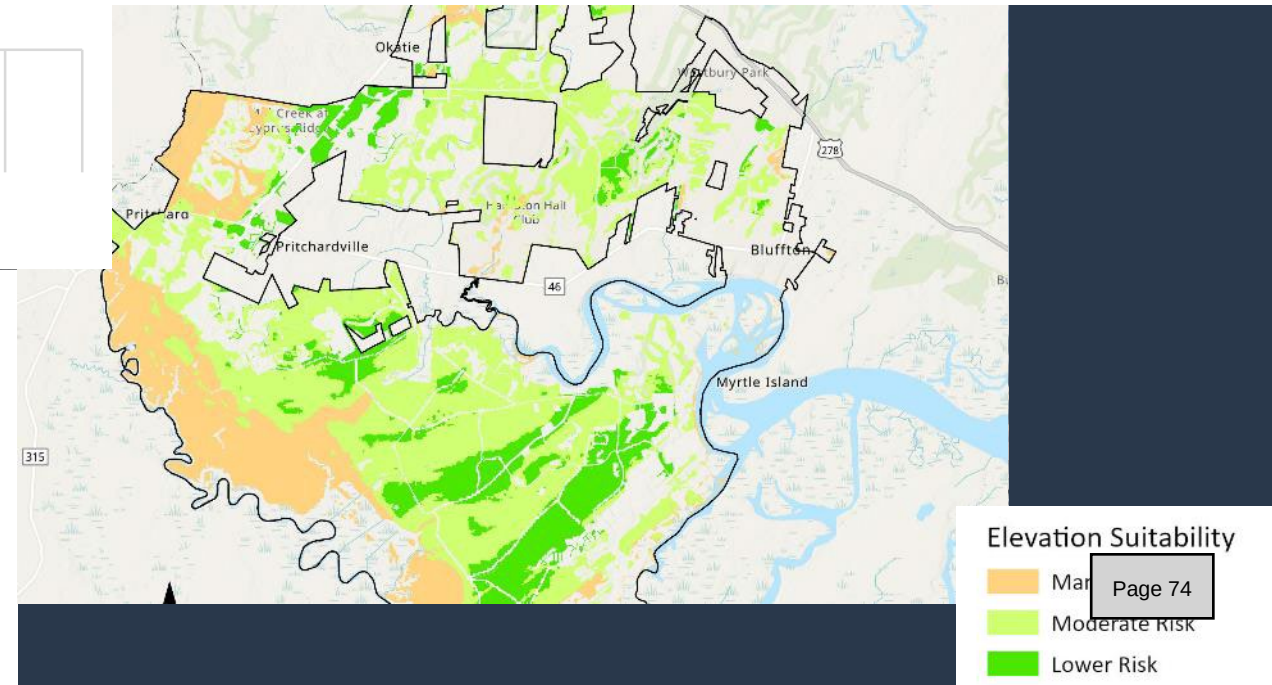


Elevation Groups - Buildout Parcel Vulnerability



- Marginal/Moderate Risk parcels held \$3.51 billion worth of modeled damages for the 1-in-100 storm event with 2023 conditions
- Low Risk contain 0-6% of flooded parcels and damages for any scenario
- Prioritizing development on higher ground would greatly reduce future vulnerability

Elevation Group Vulnerability



Ability to Reach PUD Agreements

Forested Wetlands

Planned Unit Development	Non-Wetland Available	Remaining Dwelling Units	Proportion Non-Wetland
Buckwalter	10,960	2,176	504%
Jones Estate	4,597	413	1,113%
New Riverside	10,408	724	1,438%
Palmetto Bluff	28,335	2,515	1,127%
Shultz Tract	604	66	915%
Village at Verdier	200	9	2,222%

- ✓ **Able to reach remaining dwelling units with Non-Wetland parcels**

Ability to Reach PUD Agreements

Forested Wetlands

Planned Unit Development	Non-Wetland Available	Remaining Dwelling Units	Proportion Non-Wetland
Buckwalter	10,960	2,176	504%
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Palmetto Bluff	28,335	2,515	1,127%
Shultz Tract	604	66	915%
Village at Verdier	200	9	2,222%

- ✓ Able to reach remaining dwelling units with Non-Wetland parcels

Elevation Groups

Planned Unit Development	Remaining Dwelling Units	Low Risk Available	Proportion Low Risk
Buckwalter	2,176	2,923	134%
Jones Estate	412	1,045	254%
New Riverside	724	2,880	398%
Palmetto Bluff	2,515	8,976	357%
Shultz Tract	66	176	267%
Village at Verdier	9	40	444%

- ✓ Able to reach remaining dwelling units with Low Risk parcels

Recommendations

Strengthen Wetlands Protection: Consider adopting stricter wetland protection policies to preserve sensitive areas and reduce future flood vulnerability. Options include:

- Implementing overlay zoning districts (e.g. marsh migration overlay zoning)
- Expanding the Preserve District

Recommendations

Implement Elevation-Based Zoning: Introducing elevation-based zoning would reduce flood risks by ensuring new development occurs in safer, higher-elevation areas.

- This strategy has been successfully adopted by other municipalities, such as the City of Charleston, SC, and the City of Norfolk, VA.

Recommendations

Update Flood Management Policies: Bluffton should update its floodplain management policies, potentially aligning them with successful models from other regions, like Hilton Head Island, SC, to ensure that new developments adhere to stricter flood protection standards.

- For example, Bluffton's 2008 flood damage ordinance, which does not restrict development within flood hazard areas, could be adapted to provide wetlands protection

Recommendations

Consider strengthening local financial incentive and land acquisition programs

- **Strengthening the Transfer of Development Rights (TDR) program**
- **Investigate land acquisition programs and build public-private and nonprofit partnerships (e.g. Nature Conservancy, Open Land Trust)**
- **Bolster existing land acquisition fund (e.g. fees from real estate development transactions or development agreements)**
- **Use tax abatement or other financial discounts for development in less vulnerable areas**
- **Require impact fees for development in flood-prone areas**

