Coastal Resilience Community of Practice Meeting Notes

Thursday, October 19 – 10:00am - 12:00pm

Purpose of the COP: Bring together diverse coastal stakeholders to focus on how ecosystem resilience can build local community resilience. We don't necessarily have to have a "thing" to work on but will take on projects as appropriate and mutually agreed on. Website: https://deq.nc.gov/coastal-resilience-cop

In attendance:

- Adrianna Weber – Moffatt & Nichol
- Amanda Merrill – Moffatt & Nichol
- Amanda Mueller – Climate Leaders Program, NCSU
- Anna Cherry – Currituck County
- Brian Byfield – NC Office of Recovery and Resilience
- Cat Bowler – Audubon North Carolina
- Claire Rapp – North Carolina Coastal Federation
- Erin Seekamp – NC State University
- Eryn Futral – NC Emergency Management
- Gloria Putnam – North Carolina Sea Grant
- Holly White – NC Office of Recovery and Resilience
- Jennie Turner – Currituck County
- Joe Heard – Town of Duck
- Kate Jones – The Berkley Group
- Kiera O'Donnell – Duke University
- Lora Eddy – The Nature Conservancy
- Mackenzie Todd – NC Division of Coastal Management
- Michelle Lovejoy – Environmental Defense Fund
- Phillip Todd – Freese and Nichols
- Rachel Love-Adrick – NC Division of Coastal Management
- Robin Hoffman – NC Division of Water Resources
- Sarah Spiegler – North Carolina Sea Grant
- Savannah Newbern – Wetlands Watch
- Steve Anderson – Albemarle Pamlico National Estuary Partnership
- Whitney Jenkins – NC Coastal Reserve & National Estuarine Research Reserve

Notes

Presentation: SWISLR RCN: A network for studying saltwater intrusion and sea level rise across the north American coastal plain – Kiera O'Donnell at Duke University, kiera.odonnell@duke.edu & SWISLR_RCN@duke.edu

Q&A with Kiera

- You can join the SWISLR listserv – they host monthly webinars. Mark your calendars for the next SWISLR project webinar on Nov 3
    - Is it ok for people not working in research to join? Yes! Webinars are focused on the Project Captains sharing updates.
- Worked with a graphic facilitator at Visual Works, their website is Kiera's slides
- Septic systems – have you investigated through SWISLR? We aren't finding studies on septic systems – more about water quality and salt in drinking wells. Kiera is very interested, working on a grant on how septic

systems are being inundated on the coast in NC. And septic system overtopping and innovations that folks are using.
    - Down East Carteret County – questions about septic systems. FEMA folks also asking. Not much done right now, really needed
    - Kiera would like to have a follow up conversation – when it fails its an issue, but what about in between times?
- Connection opportunity – NC Salt Marsh Plan led by Claire – modeling project SLR under intermediate SLR scenario. Resulting habitat transformation with saltwater intrusion, transition of forest and farmlands to marsh. Have you looked into that? How to work with coastal habitats and local communities to help with this change. Would love to continue this conversation.
    - Work with farmland, but not with marsh migration into farmland.
- Greatest needs? A lot of meta-analyses, synthesizing and data sharing. People want to know what we know. These meta-analyses are focused on the six themes listed in Kiera's slides.
    - NC Water Resources Research Institute – spring conference – call for abstracts is out right now. Data sharing is a need, opportunity
    - NC Sea Grant Coastal Conference next fall
- There's lots of great work going on around septic and groundwater in NC. Sea Grant was a big part of that discussion along with researchers from ECU, Charlie Humphries and Mike O'Driscoll. The Town of Nags Head was involved in research with these guys.
    - Septic/groundwater work: https://ncseagrant.ncsu.edu/coastwatch/current-issue/summer-2022/the-new-pioneers/
    - Town of Nags Head- Decentralized Wastewater Management Plan; addresses interaction of groundwater and septic and highlights research: https://www.nagsheadnc.gov/DocumentCenter/View/4436/Town-of-Nags-Head-DWMP-April-2022?bidId=
    - Climate Change and Onsite Wastewater Treatment Systems in the Coastal Carolinas
        - https://ncseagrant.ncsu.edu/wp-content/uploads/2022/09/Project-Report_Climate-septic_FINAL_8.31.2022.pdf
        - https://ncseagrant.ncsu.edu/climate-change-and-onsite-wastewater-treatment-systems-in-the-coastal-carolinas/
    - Folly Beach Study on septic: https://research.fit.edu/media/site-specific/researchfitedu/coast-climate-adaptation-library/united-states/east-coast/carolinas-amp-georgia/Sea-Grants.--2017.--SLR-Adaptation-Report-Folly-beach-SC-(2).pdf
- Adaptation attempt to address SWISLR, Alligator River National Wildlife Refuge/Albemarle-Pamlico Peninsula Climate Adaptation Project: https://www.cakex.org/case-studies/alligator-river-national-wildlife-refugealbemarle-pamlico-peninsula-climate-adaptation-project

Presentation: Town of Nags Head's Estuarine Shoreline Management Plan – Kate Jones, former Deputy Planning Director, now Principal Planner with The Berkley Group

Q&A with Kate

- Town of Nags Head has a history of good community planning efforts – many public access sites on both the ocean and sound side. Lucky to have Jockey's Ridge and other public lands to test these ideas. Great example for other growing communities, importance of prioritizing public access
- If anyone is interested in the marsh terracing project in Back Bay, VA that Kate mentioned, here is a presentation by CJ Bodnar, the Program Manager for Virginia Beach's Public Works Department. The project will result in 51 acres of marsh terraces that will support the restoration of the marsh habitat and reduce marsh erosion. The project is funded, and they anticipate breaking ground in the spring. https://youtu.be/IxOxZ-Gz48k?si=eXqlOSBZApfIig0y&t=832

- Gloria – Coastal Landscapes Initiative – one of our goals is to increase the supply of native plants, probably a challenge for folks working in restoration.
    - From Savannah - I wonder if the Chesapeake Bay Landscape Professionals (CBLP) have native and coastal plant sourcing contacts that could be shared.
    - From Claire - the North Carolina Coastal Federation is working on developing a "donor marsh" in which we can grow plants for living shorelines. We are also planning to work more with nurseries and marine contractors to find ways to increase their own plant supply
- Timeline? Permitting hurdles? Some project implementation is dependent on getting more grant funding for the Town.
    - Interesting studies on wind direction – idea of cost of this wind modeling? If you have the data for the model the cost goes down. The Town needed bathymetry data. First look at the data you have. Not sure about cost, the cost for whole project $125K – engineering and modeling were a smaller part of that. Research partners are important, they can do some of the background work.
    - From Holly - We can check with the Coastal Studies Institute (CSI) on the cost of the wind modeling. The bathymetry work was conducted by CSI and cost around $25,000-$35,000. We knew going into the project that there was limited data. Reide Corbett with CSI was able to get a grant from NC Sea Grant to cover the cost of the bathymetry work on their end. That was a huge cost savings for the Town.

Round robin – members share what they are working on related to resilience

- Michelle – NFWF Coastal Resilience Fund, Coastal Dynamics Design Lab, flood mitigation plan in Northern Sampson County. Overlayed with USDA water quality plan. Opportunity to look at confluence of water quality and water management. Community Floodprint process. Cultural resources process with local Tribe.
    - From Erin Seekamp – Michelle, will you send me more information b/c there could be an opportunity for additional funding from the SE CASC given the cultural resource lens.
- Amanda Mueller – NC State Climate Leaders Program – hosted 2nd climate leaders symposium – energy and food, adaptation to extreme weather, and carbon capture were the focus: https://climateleaders.kenan.ncsu.edu/. We also work with undergrad and grad students, looking for internship partners for work on climate issues. We usually have funding to provide students with stipends, so no cost to partners.
- Bryan – NC Office of Recover and Resilience, Regions Innovating for Strong Economies & Environment (RISE) projects, moving forward. Project concierge service, paper to reality, we help with finding partners, project leads, funding sources.
    - Holly – we are spending a lot of time on this implementation assistance – meeting with communities to help stand-up projects. Working with APNEP, crossover with their goals and RISE projects. Any interest in participating in RISE portfolio projects? Check out the portfolios here: https://www.rebuild.nc.gov/resiliency/resilient-communities/rise/portfolio
- Holly – Albemarle Algal Bloom Summit, in person event on Friday Nov 3. Registration link: https://bit.ly/AlbemarleHABsummit. There is a history of algal blooms in the region, bringing together partners to share what we know, ID gaps and a path forward, reconnect folks working on the issue to enhance collaboration and potentially seek funding.
- Cat – marsh restoration pilot projects at Pine Island on Currituck Sound – would like to share lessons learned on permitting. Also awarded a NOAA underserved communities grant. Working in northern Tyrrell County. Looking forward to coordination with the Scuppernong Study Engagement Project Team (including Whitney and Lora on this call) and with NCORR and RISE to coordinate on portfolio projects.
    - From Erin Seekamp: Great news Cat! If you are working with Alligator folks – I conducted research there years ago on their adaptive capacity and happy to chat about what we learned.
- Claire – NC Salt Marsh Action Plan – finished later this year. Focusing on marsh restoration and facilitating marsh migration. Lots of room for collaboration with folks. Submitted a NFWF grant, hope to get funding to reach out to underserved communities on marsh restoration work to build resilience.

- Eryn – Coastal Construction Course to educate coastal code officials, floodplain administrators, building and code officials, planners, local gov. officials, etc. on importance of development codes. To sign up for the course scheduled for Nov 7-9, visit: https://terms.ncem.gov/TRS/courseDesc.do?sourcePage=courseSearch&cofId=155167
- Robin – Nonpoint Source Planning Branch meeting soon to pick awardees for 205J planning grants. These grants are available to Councils of Governments to do water quality planning.
- Joe – After 30 years of working with FEMA, funding with BRIC grant, broke ground yesterday on the Town of Duck's Coastal Resilience Project! Under construction throughout winter and spring – can present on next summer. Successful living shoreline and marsh restoration project: https://www.townofduck.com/living-shoreline-and-resiliency-project/ .
- Lora – Scuppernong Engagement Project – community engagement on the Scuppernong Water Management Study, which is an engineering study. Working with Whitney and Woody Webster with the Buckridge Coastal Reserve. Participatory mapping at the community meeting scheduled for Oct 23 in Columbia as well as post-modeling outreach. This will broaden vulnerability understanding and continue to promote partnerships in the area.
    - Also supporting an intern doing a refresh of open space mapping Currituck County. Includes conservation subdivisions and setting aside hazard areas as the county grows. The county can use this to improve its FEMA Community Rating System points to reduce flood insurance premiums and improve connection to conservations lands.
- Rachel – Resilience Coastal Communities Program (RCCP) and Division's land use planning program – looking how to incorporate those two programs to integrate resilience and land use planning.
    - Also attended the American Planning conference last week in Raliegh – interesting presentation from Union County – how zoning is affecting trees. Urban forestry grant for local govts, they only got one application last year. Here's the program's contact: NC Urban & Community Forestry Grant Program, Andrew Pleninger, (919) 857-4842, andy.pleninger@ncagr.gov
- Mackenzie – RCCP is now in its second round of Phase 1 and 2 with 15 communities participating. Phase 4, construction phase, five communities are fully contracted, implementing planning ideas from 2021. $10M was awarded by the General Assembly to continue this effort! Working to figure out how to budget, will have more money for Phases 3 & 4.
- Savannah – Wetlands Watch is expanding our "Catch the King" king tide mapping citizen science project into NC this year, and the big mapping event is next weekend, October 27-29th. Here is a link if anyone is interested in sharing or participating: https://wetlandswatch.org/catchthekingnc
- Erin Seekamp - NC State will be seeking community partners for six summer AmeriCorps members (working in pairs) to conduct asset mapping and vulnerability assessments. Ideally supporting underserved communities who may not have funding or representation at the county-level to conduct this first step of DCM's RCCP program. Holly & Andrea at NCORR and Tancred and Mackenzie at DCM are partners, along with Conservation Corps NC & NC State's Amanda Mueller and Rebecca Ward.

Next meeting in January. Whitney will send a meeting poll

- January meeting topics –
    - Discuss ideas for implementation of APNEP BIL strategy – Stacey Feken, Albemarle Pamlico National Estuary Partnership (APNEP)
    - Marae West – salt marsh sparrow and MOTUS tower project
    - NC Salt Marsh Plan – Claire Rapp - penciled in for January meeting
- Future meeting ideas –
    - SASMI – final conservation plan – Amanda (new coordinator), connection to NC stakeholders – state teams/action plans, get more info. Coastal Fed lead partner in NC
    - RCCP contractor – Jamie Heath with Mid East Commission working with RK&K – working well together and through all 4 phases of RCCP

SWISLR RCN: A network for studying saltwater intrusion and sea level rise across the north American coastal plain

Oct. 19th, 2023

Kiera O'Donnell, Emily Bernhardt, Xi Yang, Ryan Emanuel, SWISLR RCN

SWISLR

What is it?

Why do we care about it?

What do we do?

The Washington Post
Democracy Dies in Darkness

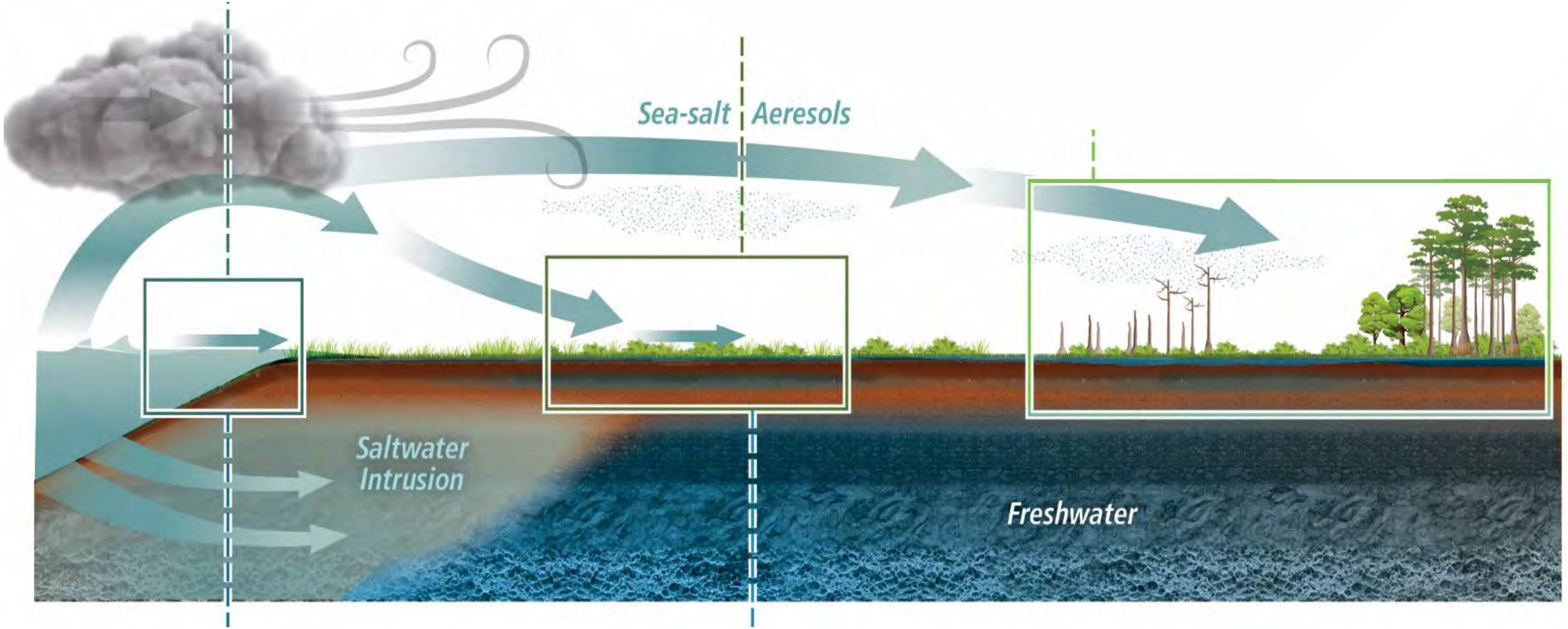
The Mississippi River's saltwater intrusion problem, explained

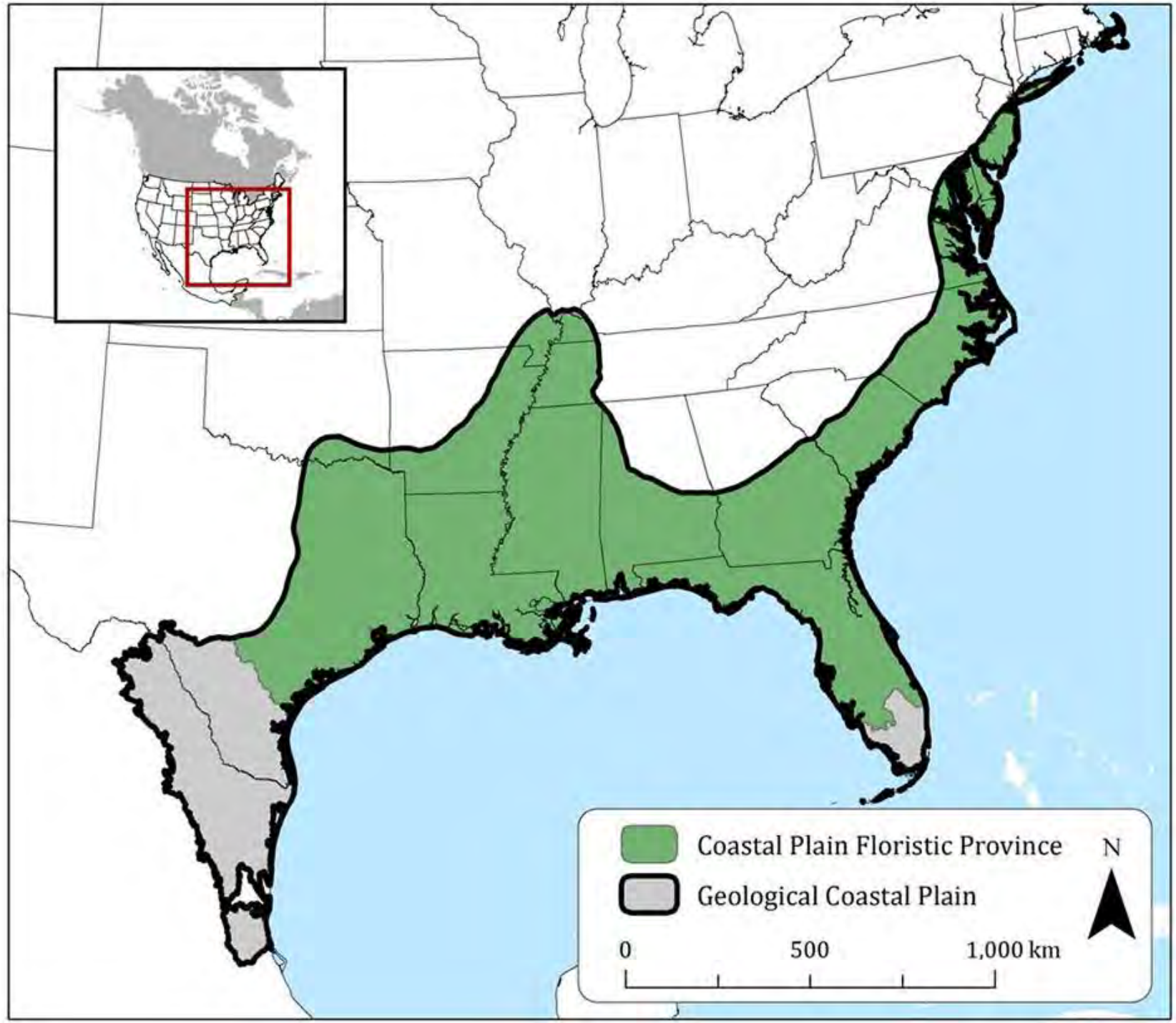
President Biden this week approved an emergency declaration for four parishes dealing with the potential impacts along the drought-stricken river.

By Brady Dennis

September 29, 2023 at 6:00 a.m. EDT

How SWISLR Moves:




Coastal Plain Floristic Province
Geological Coastal Plain
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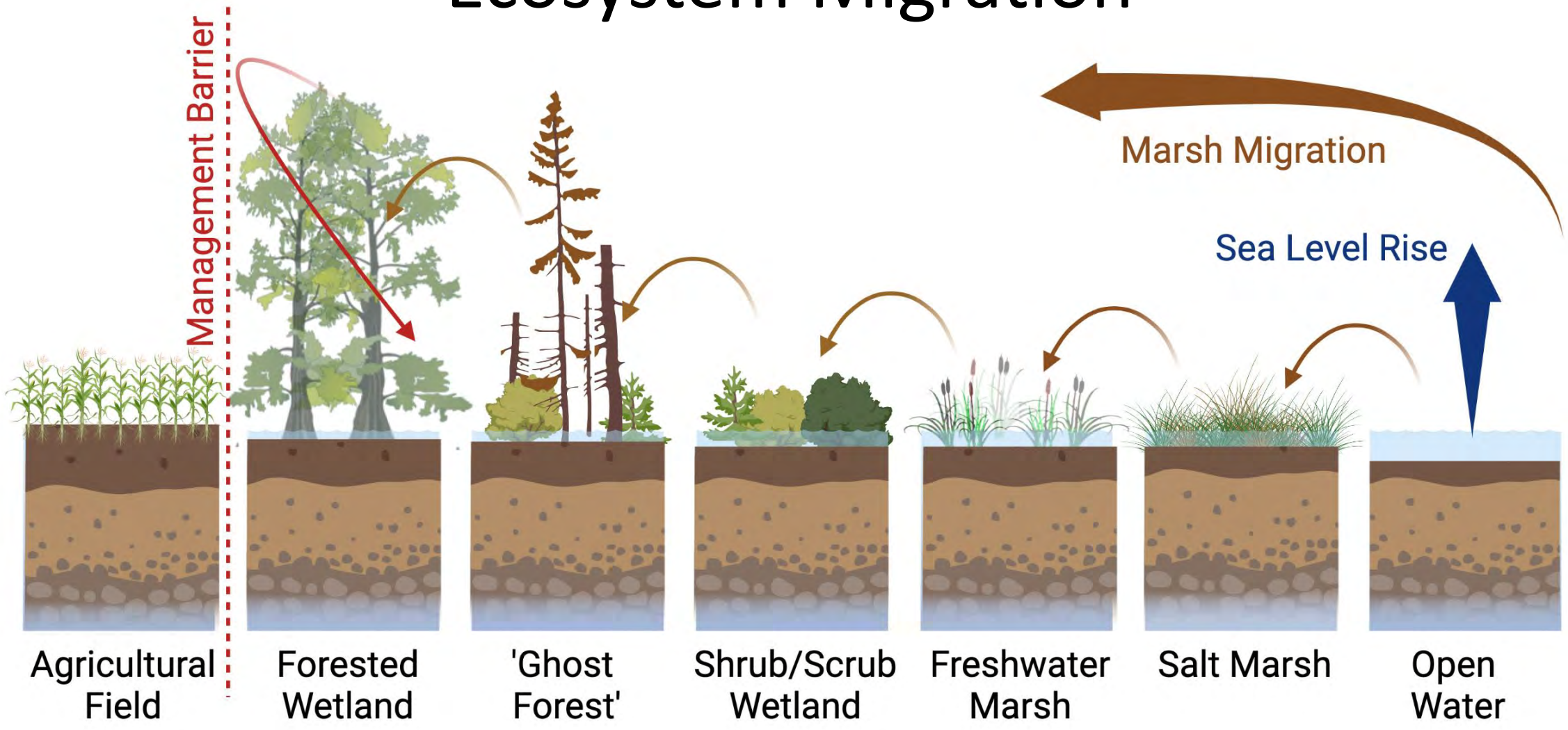
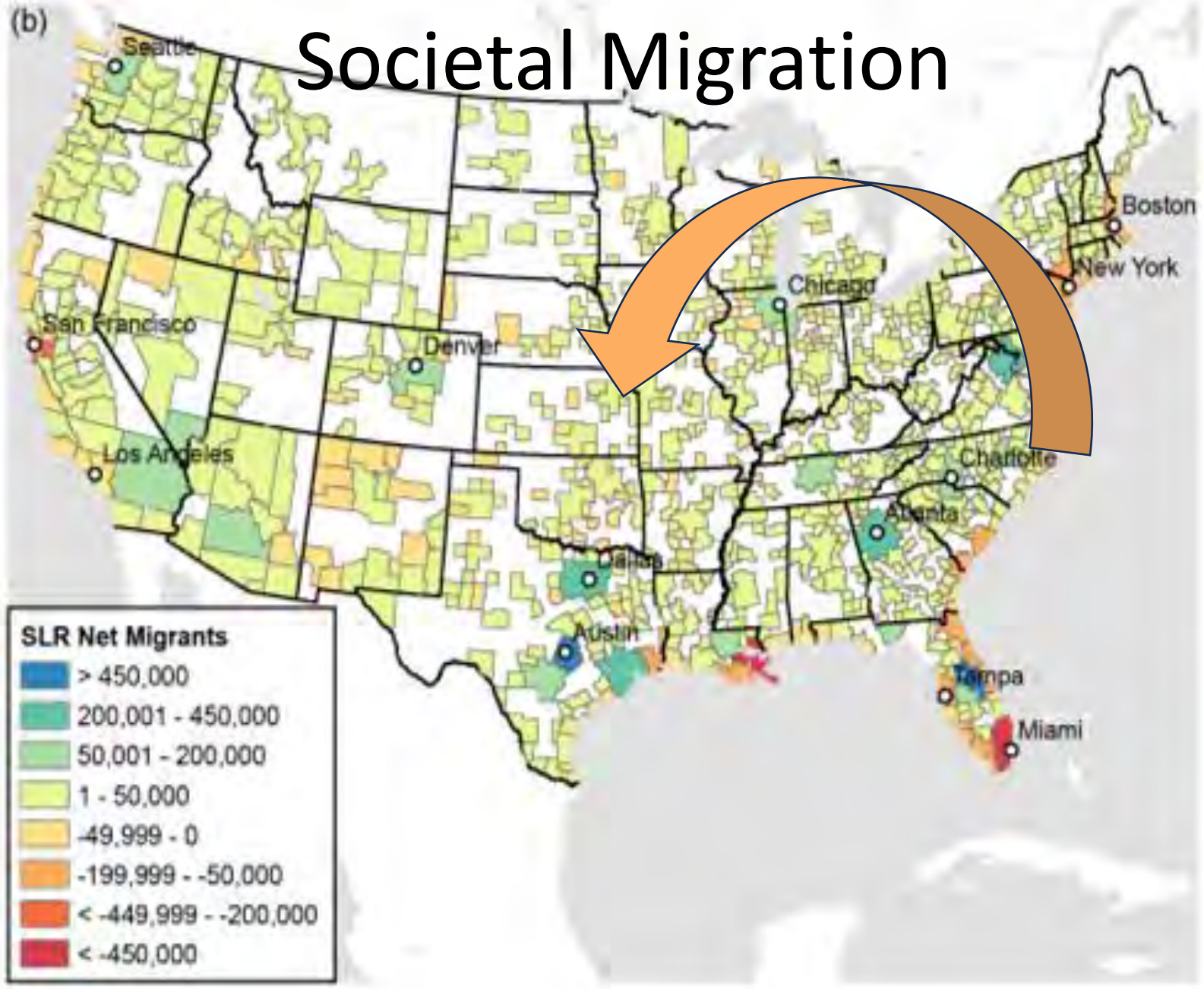
1,000 km

Photos by SWISLR RCN members

Ecosystem Migration



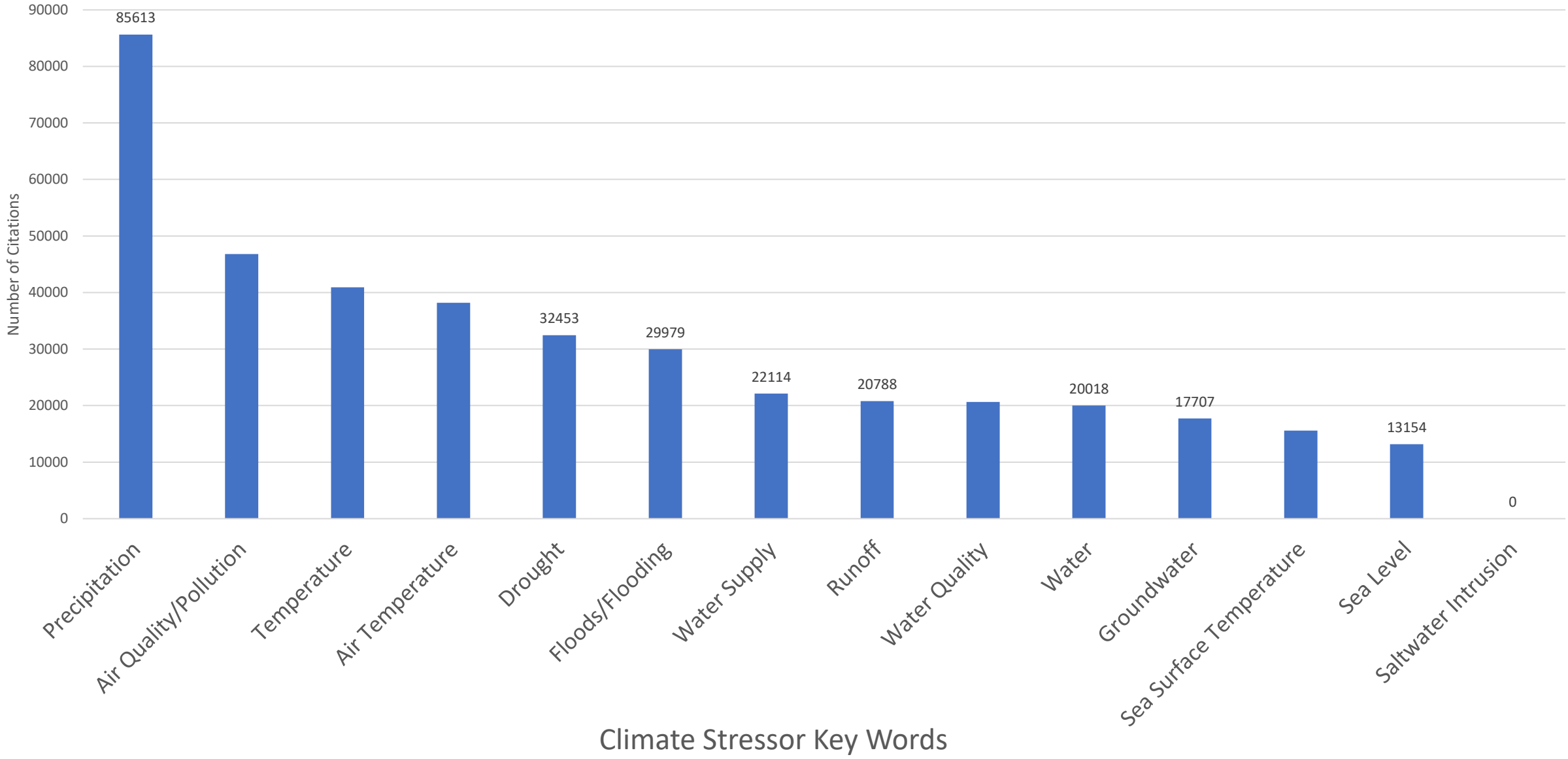
Societal Migration



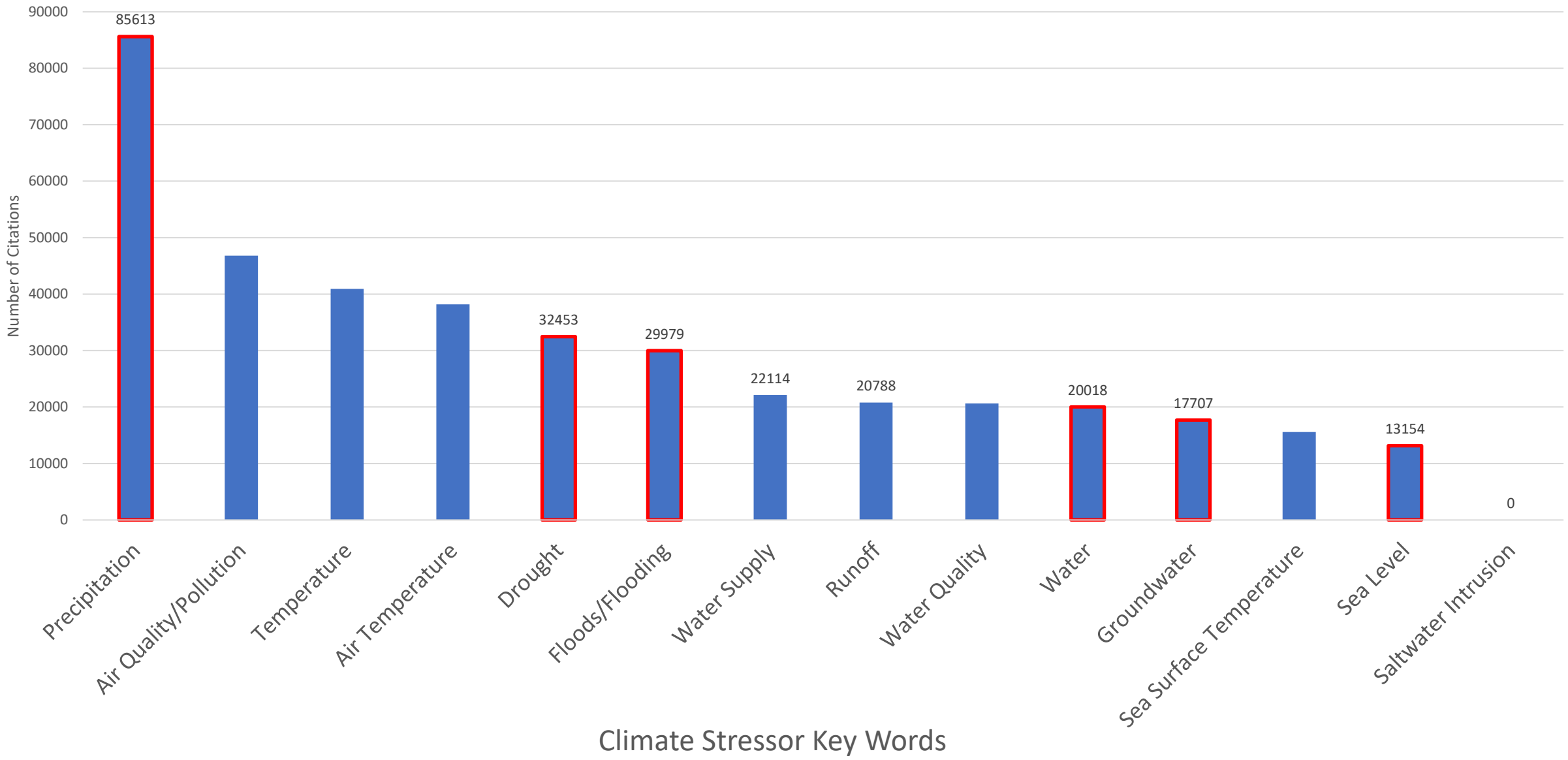
Hauer et al. 2020. Migration Induced by Sea Level Rise could Reshape the U.S. Population Landscape

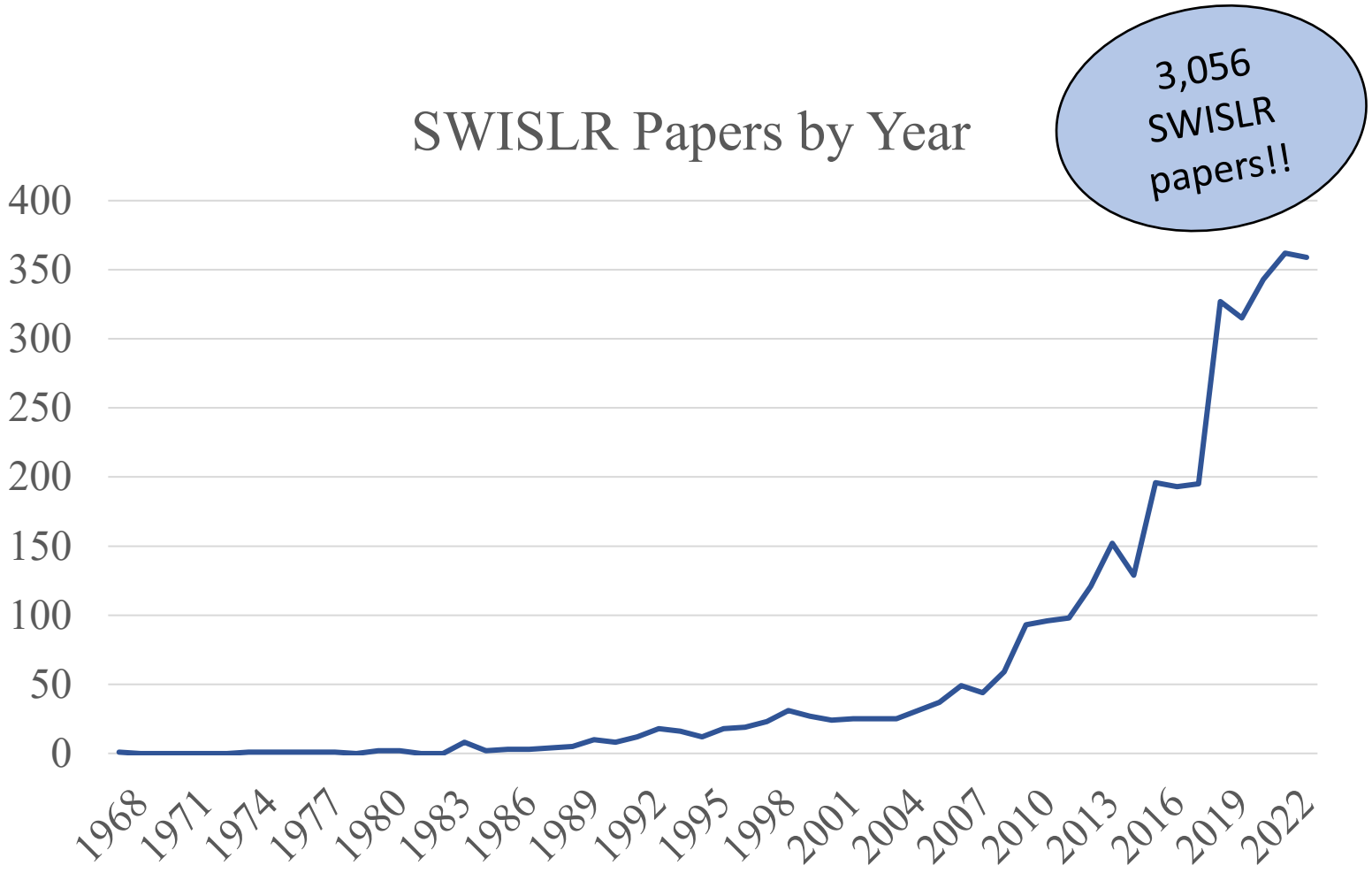
Casualties of climate change in the Alligator River National Wildlife Refuge. (Carolyn Van Houten/The Washington Post)

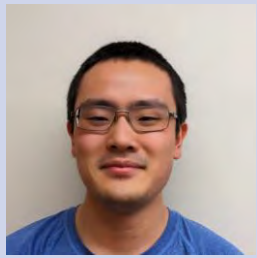
Climate Change Scopus Papers



Climate Change Scopus Papers








QR CODE for MAP of some SWISLR Research:

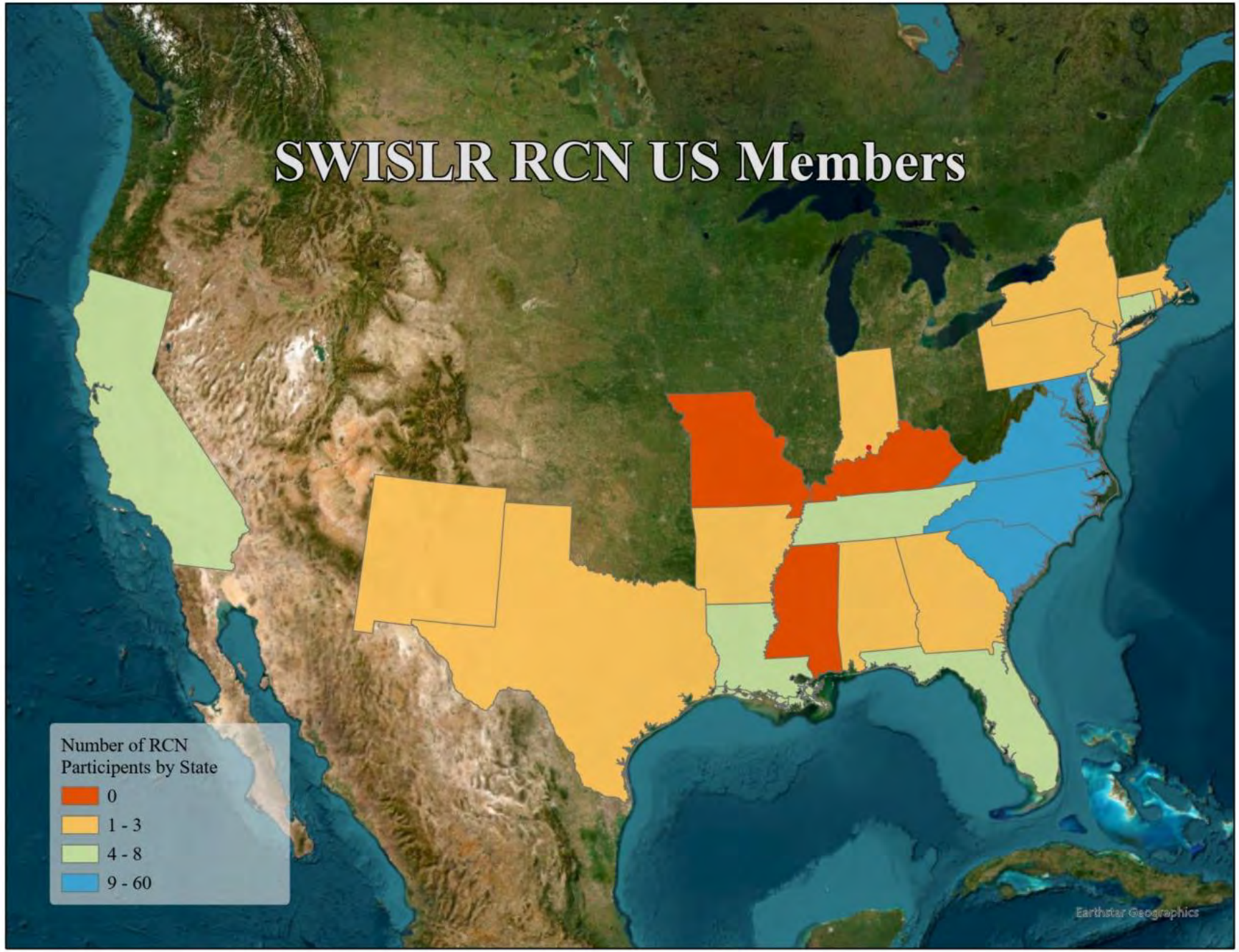
https://tinyurl.com/swislr

So much regional variability with SWISLR

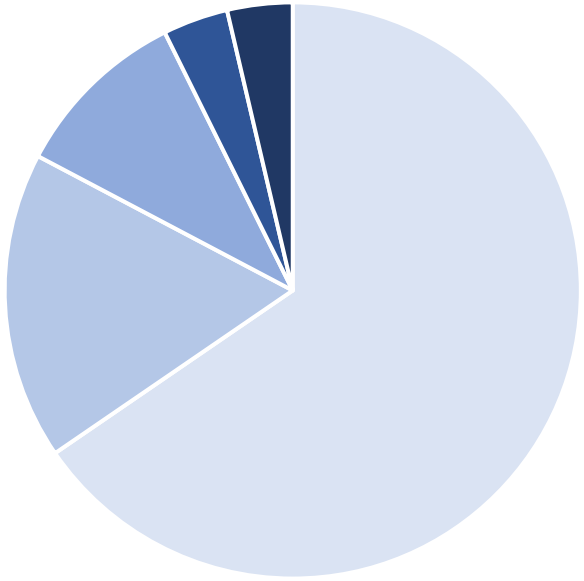
So much regional variability with SWISLR

The SWISLR RCN was created to build a connective intellectual network to expand out capacity to forecast and prepare for SWISLR impacts. The RCN focus on 6 major themes:

1. Who is engaged in decisions about climate risk prevention, climate adaptation and SWISLR mitigation and who is excluded?
2. What proportion of the NACP has recently undergone and is currently vulnerable to significant ecosystem transitions as a result of SWISLR?
3. How are water management and climate change interacting to determine the magnitude, extent, and duration of SWISLR within and across the NACP?
4. What are the consequences of SWISLR for farms and coastal fisheries?
5. How is SWISLR affecting the structure, biodiversity, and function of ecological systems throughout the NACP?
6. How are coastal communities interpreting, responding to and managing for SWISLR impacts and risk?

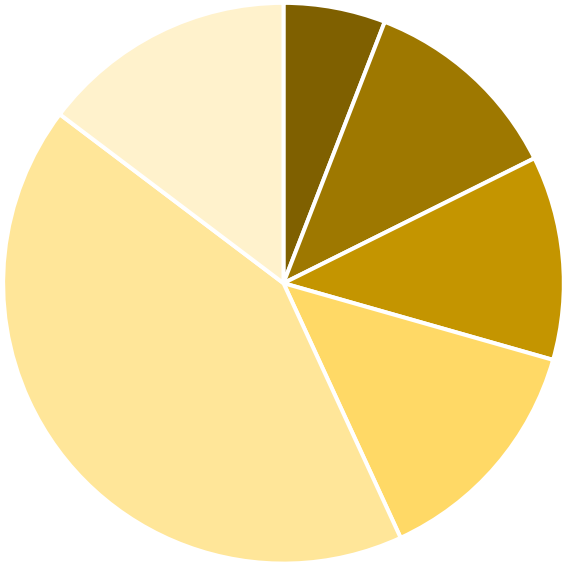

SWISLR RCN US Members
Number of RCN Participents by State
0
1 - 3
4 - 8
9 - 60
Earthstar Geographics

RCN Affiliations



- Academic/ Research Institution
- State/ Federal Agency
- NGO
- Extention
- Community

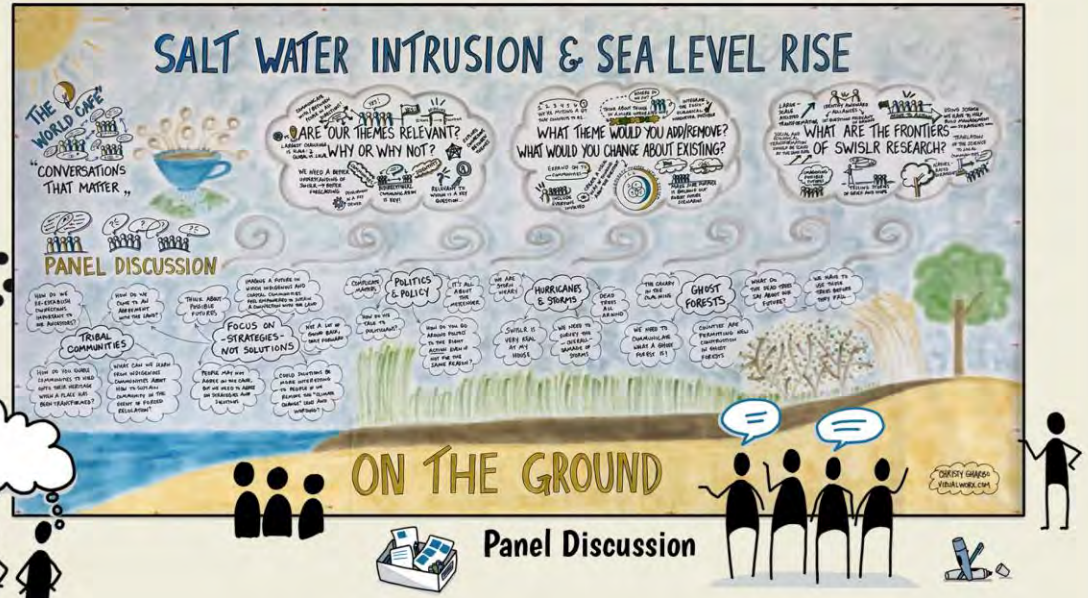
RCN Theme Participants



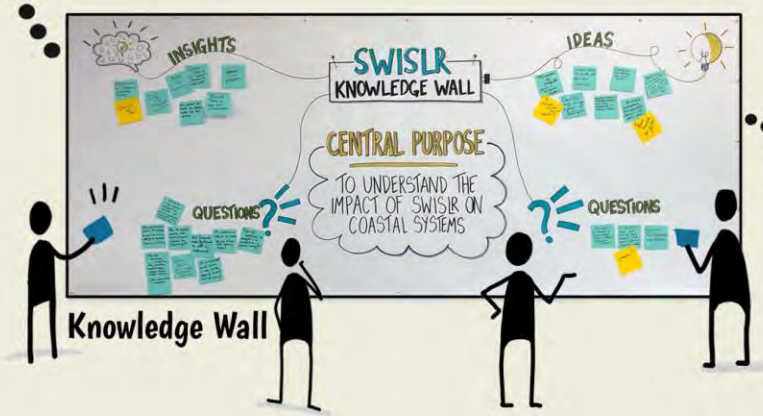
- Theme 1
- Theme 2
- Theme 3
- Theme 4
- Theme 5
- Theme 6

SWISLR Summer Camp

May 23-25, 2023 | Camp Don Lee | Arapahoe, NC

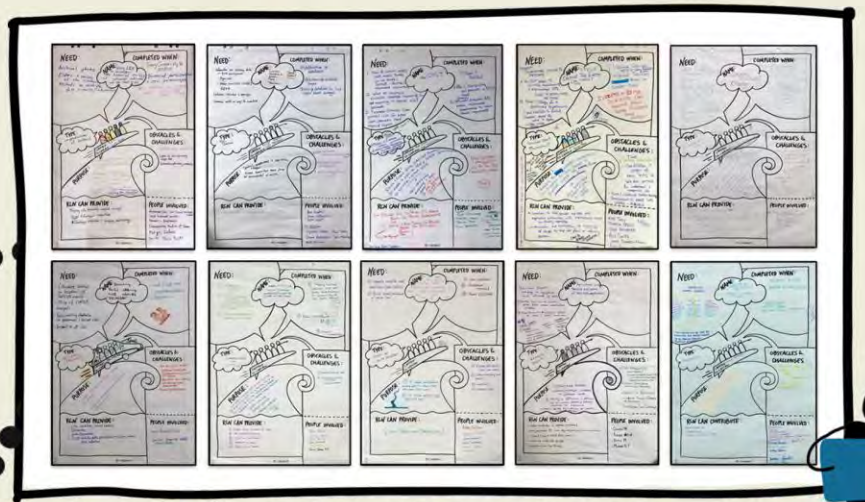


Panel Discussion



Knowledge Wall

saltwater intrusion & sea level rise
SWISLR
research coordination network



Project Work and Project Presentations

vizualworx.com

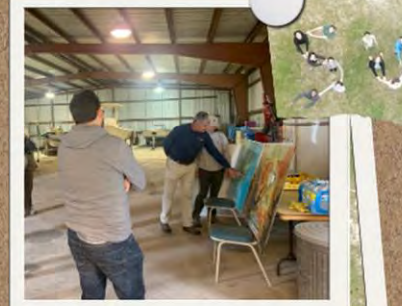
SWISLR

Summer Camp

May 23-25, 2023

Camp Don Lee

Arapahoe, NC



SWISLR

saltwater intrusion & sea level rise

research coordination network

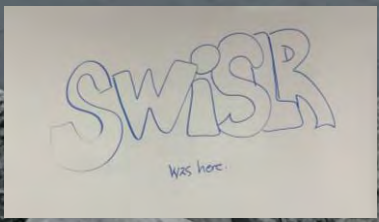
What do those dead trees say about our future?

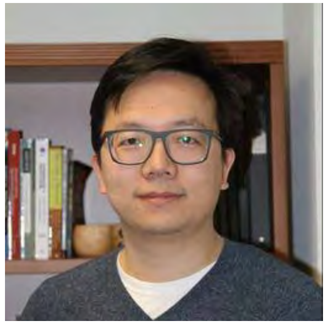
www.swislr.org

@swislr_rcn

swislr_rcn@duke.edu

Thank you!
&
Let's Talk about SWISLR!

















FIU





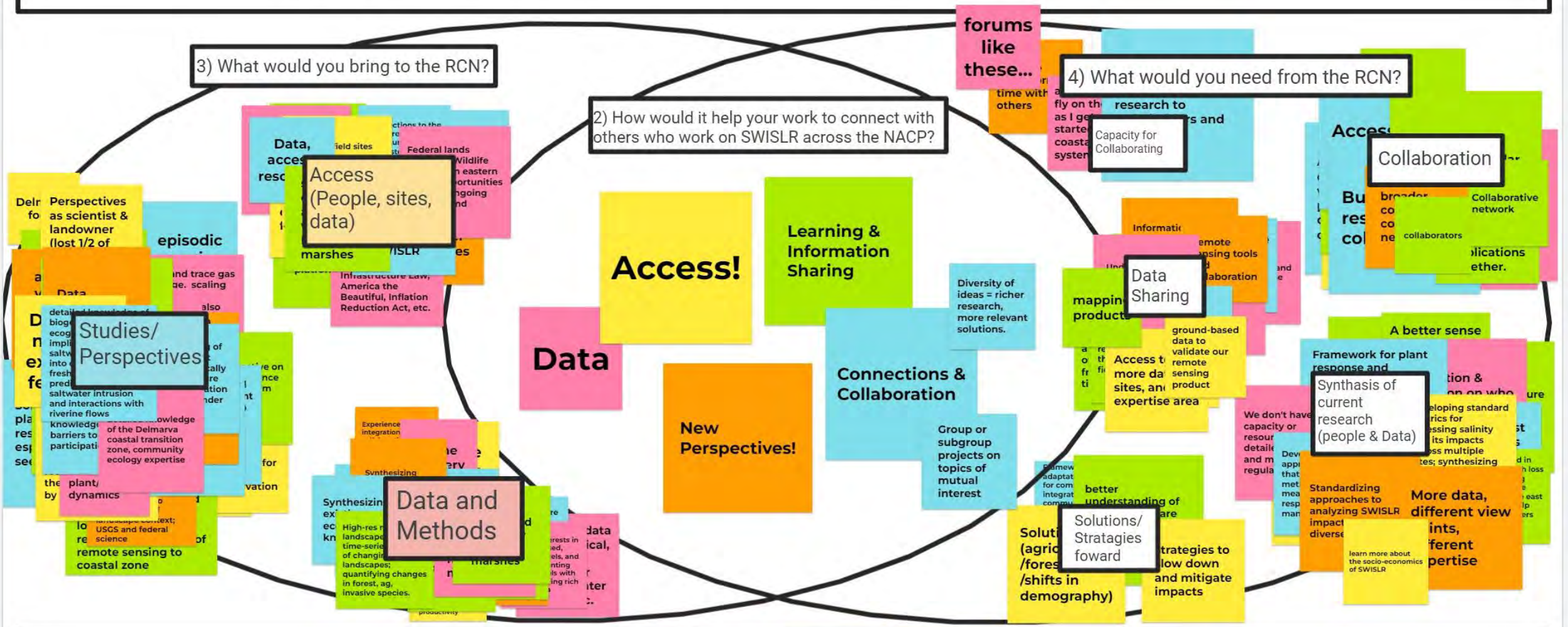




Breakout Group 14

1) Pick a stickynote color and make a legend in this box:

Name, email address, what brought you to today's webinar?



5) What should this RCN prioritize within SWISLR research?

- ensuring that we have a lot of diverse partners in and out of academia
- Make sure that we are doing research that benefits communities and pushes towards solutions
- Identifying connections between data sources and providing a platform for more effective collaboration and data availability
- Understand everyone's role to better understand who is at the table.
- Effective communication about SWISLR that welcomes engagement collaboration from people from all political persuasions
- mentoring network for early career folks or those new to field
- Wholistic systems thinking regarding the causes, consequences, and management implications

The Town of Nags Head

Estuarine Shoreline Management Plan

TOWN OF NAGS HEAD

Biohabitats
SOUTHEAST ATLANTIC BIOREGION

MOFFATT & NICHOL


The State of North Carolina
Jockey's Ridge State Park
10 Residential
3 Unknown
1 Vacant Land (Private)
1 Secondary Improvement
Town of Nags Head/The Nature Conservancy
Nags Head Woods Preserve
2 Recreation
68 Residential
3 Property owners association
1 County of Dare
2 Secondary Improvement
1 Vacant Land (Dare County)
2 Vacant Land (Nags Head)
10 Vacant Land (Private)
3 Recreation
1 Retail
1 Restaurant
1 Condo (undeveloped)
3 Recreation
2 Retail
62 Residential
2 Hotel, Motel, Cottage
2 Multi-Use
10 Secondary Improvement
14 Vacant Land (Private)
2 Restaurant

How did this project come about??

- 2016 - NC Sea Grant VCAPS Project
- 2018 - Identified in Policy via the Town Comprehensive Plan Rewrite
- 2020 - Identified as a strategy in the Hazard Mitigation Plan
- Board of Commissioners Support via CIP
- 2020 Grant Application NFWF

Estuarine Shoreline Management Plan Project GOALS

- Identify priority sites and strategies to protect the estuarine shoreline
- Build public awareness of estuarine shoreline loss and its causes and consequences
- Describe legal and permitting barriers and pathways to implementation
- Preserve recreational access to the sound

Project Elements

- Public Input
- Public Education
- Project Partners
- Engineering & Modeling
- Site Selection
- Site-specific Design Solutions
- Visualization & Final Plan
- Legal & Permitting Analysis
- Implementation

Project Elements

Public Input and Public Education

- Public Survey of the Wider Community
- Local Advisory Committee – 5 total meetings
- Public Meeting/Workshop to collect feedback
- Webpage and Social media
- Stakeholder interviews

Project Elements

Partners!

- ECU Coastal Studies Institute
- NC Coastal Federation
- The Nature Conservancy
- NC State Parks
- Dare County

Consultant Team

- Biohabitats
- Moffat Nichol

Project Elements

Engineering Analysis

- WEMo – Wave Exposure Model
- Shoreline Erosion
- Shoreline Condition
- Generates wave heights and frequencies for predictable events and exceptional storms

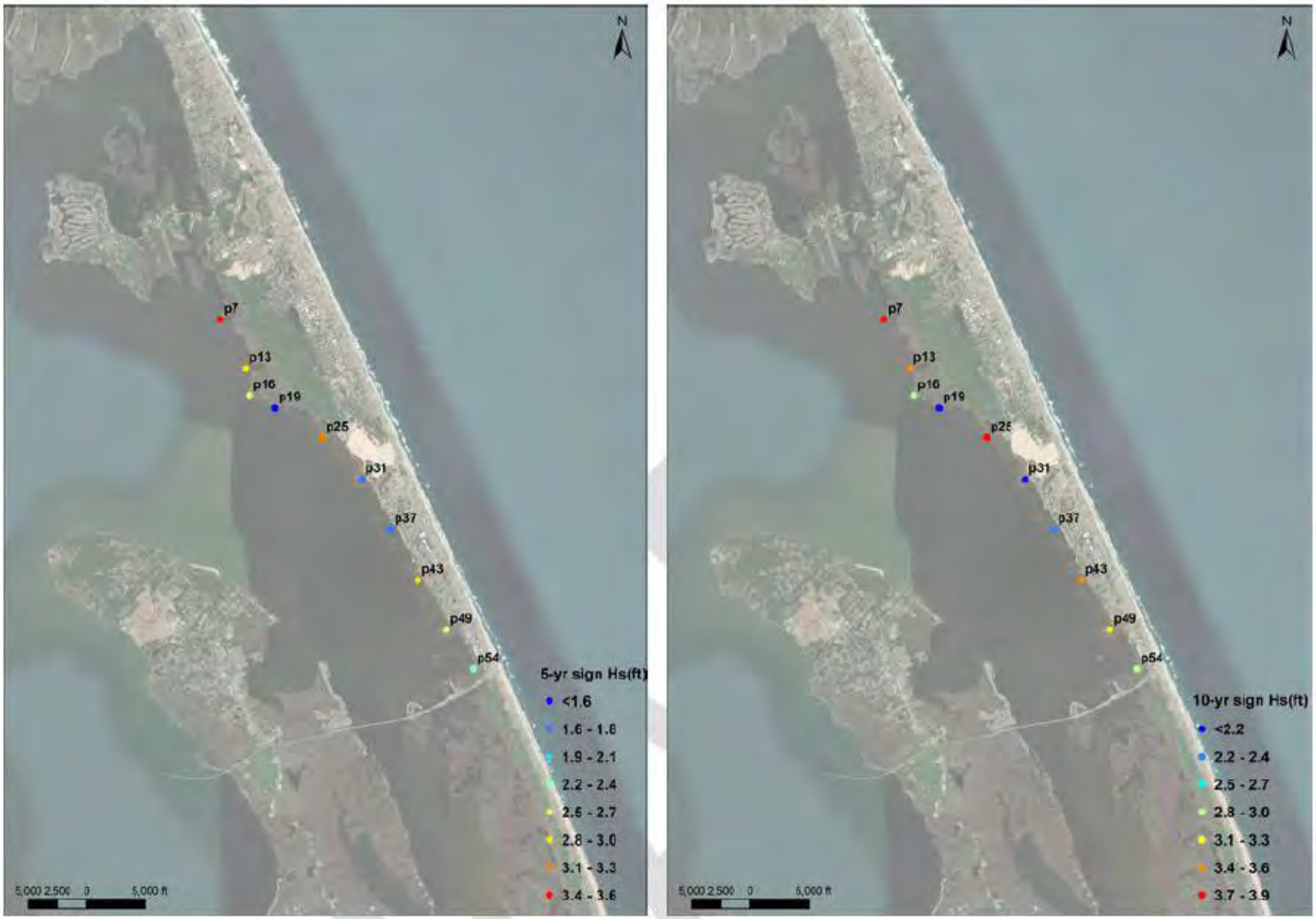
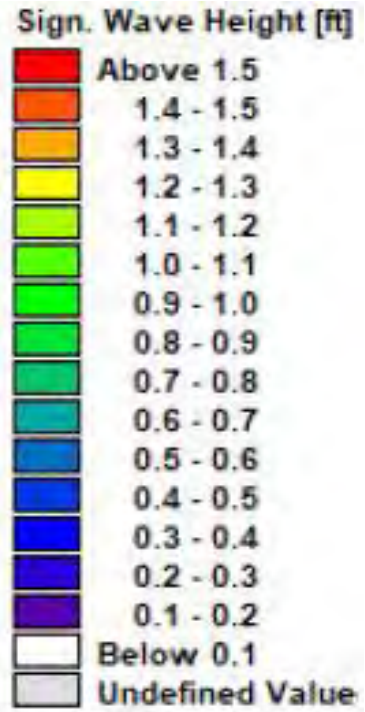


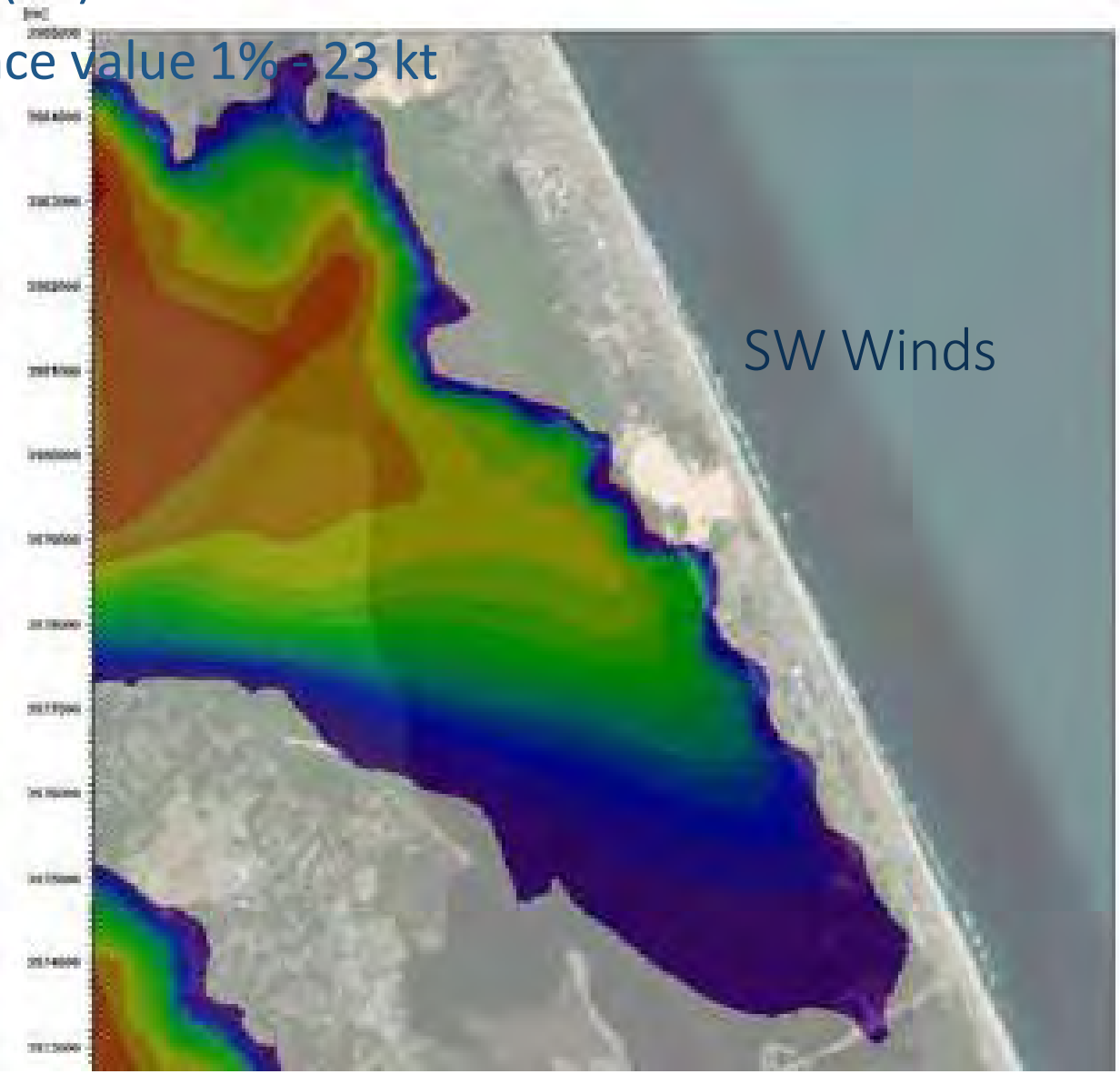
Figure 19: Significant Wave Height (Hs) for 5-year(left) and 10-year(right) return period

Project Elements

Engineering Analysis

- Significant Wave Height (Hs) for SW wind direction and 10% exceedance value 1% - 23 kt
- Exceedance = the chance a value will be exceeded within a certain time

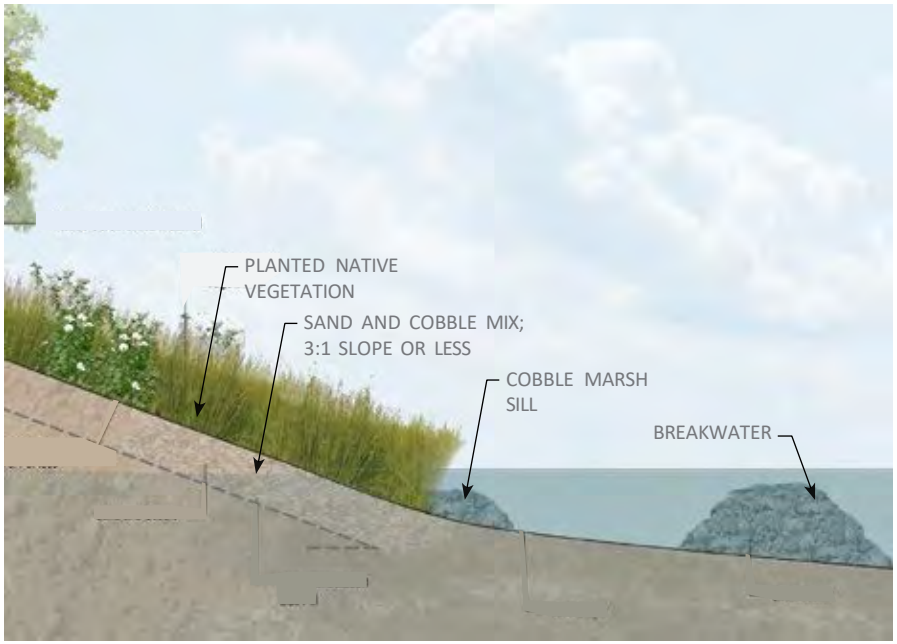




PRELIMINARY PROPOSED TYPOLOGIES

Nags Head Estuarine Management Plan

LIVING SHORELINE WITH BREAKWATER PROTECTION

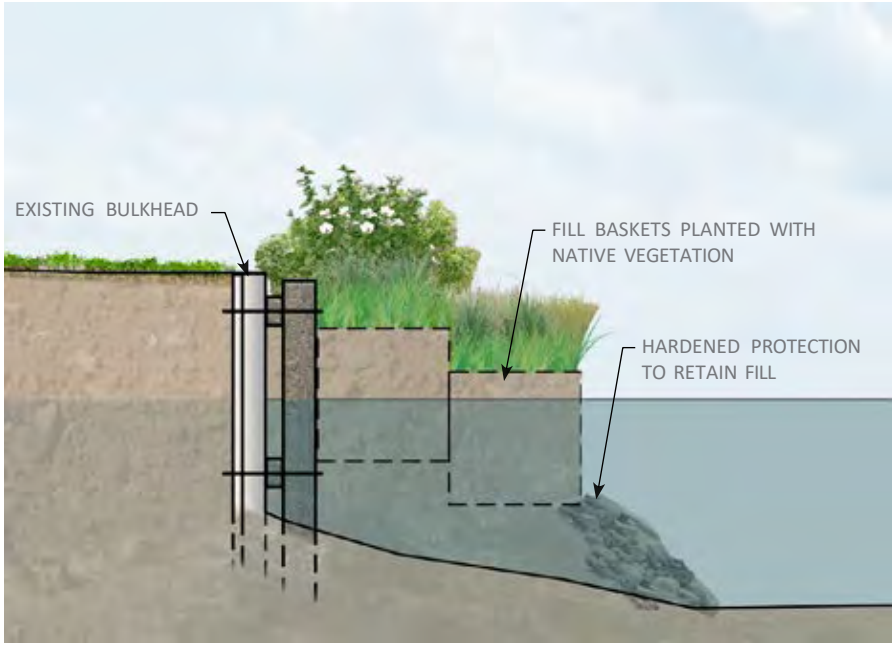


APPROPRIATE EXISTING TYPOLOGIES

- Exposed, Solid Bulkhead Structures with Low Marsh Zone
- Exposed, Failing, Vegetated Banks
- Exposed Salt & Brackish-Water Marshes
- Exposed, Low Banks & Beaches

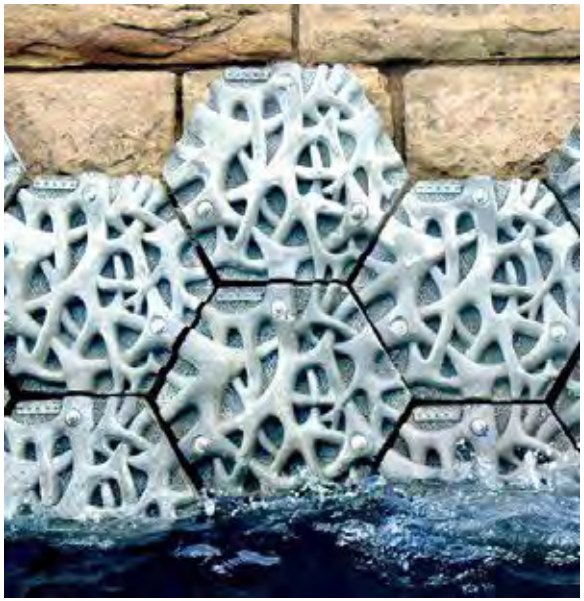
Nags Head Estuarine Management Plan

GREEN BULKHEAD ENHANCEMENTS



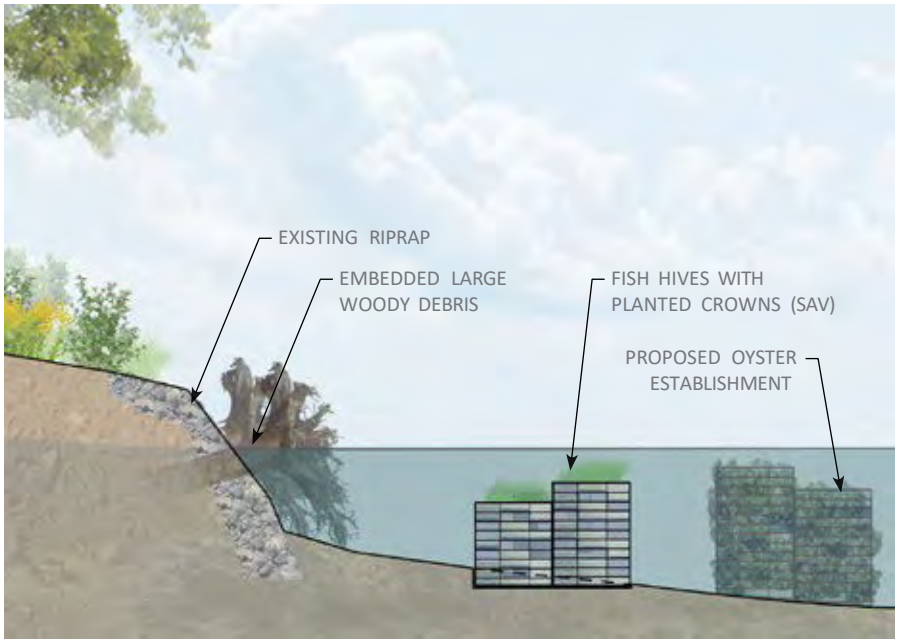
APPROPRIATE EXISTING TYPOLOGIES

- Sheltered, Solid Bulkhead Structures
- Sheltered Riprap
- Sheltered, Vegetative Low Banks
- Sheltered, Scrub-Shrub/Wetlands
- Exposed, Solid Bulkhead Structures
- Exposed Riprap



Nags Head Estuarine Management Plan

EMBEDDED LWD HABITAT & BREAKWATERS

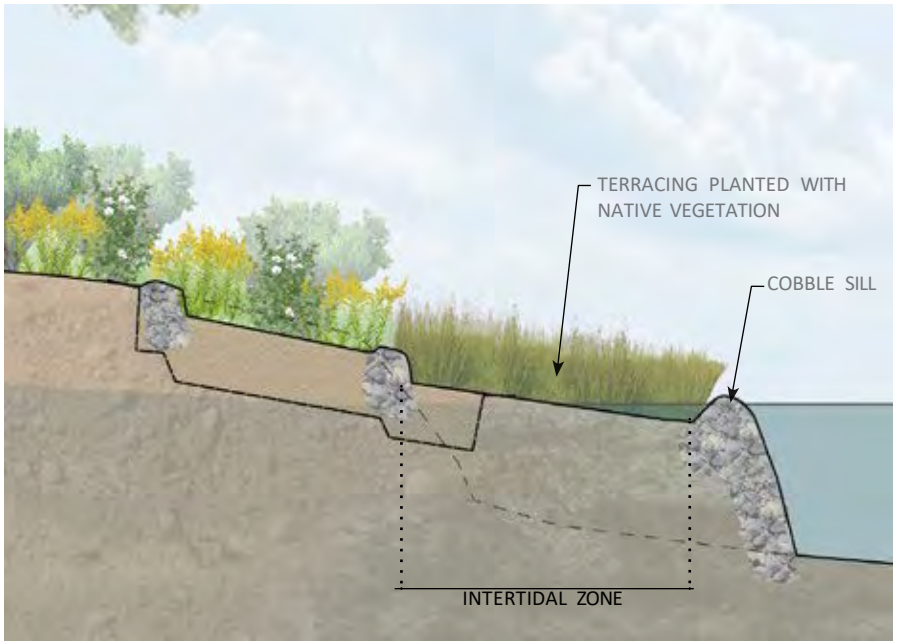


APPROPRIATE EXISTING TYPOLOGIES

- Exposed Riprap
- Exposed, Failing, Vegetated Banks
- Exposed Salt & Brackish-Water Marshes
- Exposed, Low Bank and Beaches

Nags Head Estuarine Management Plan

RESILIENCY TERRACES

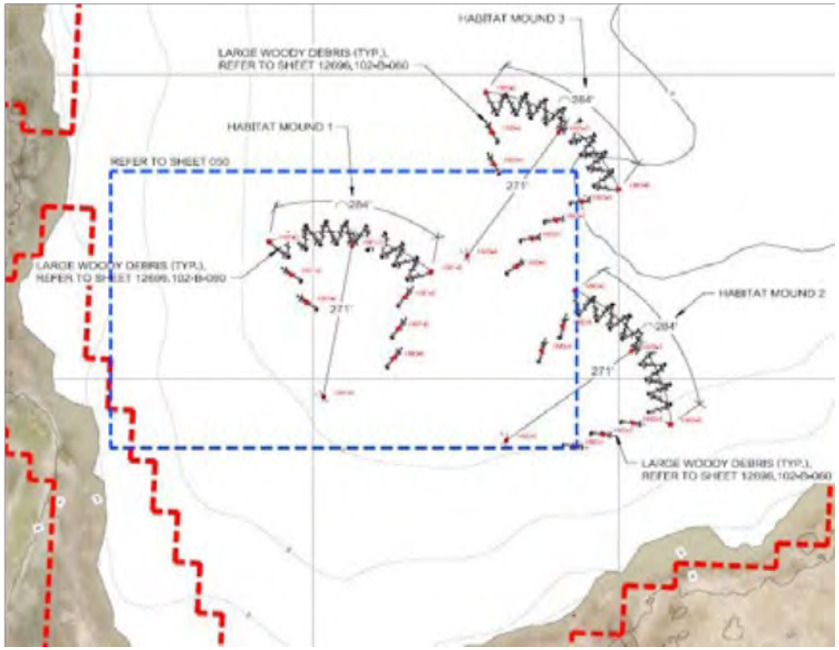


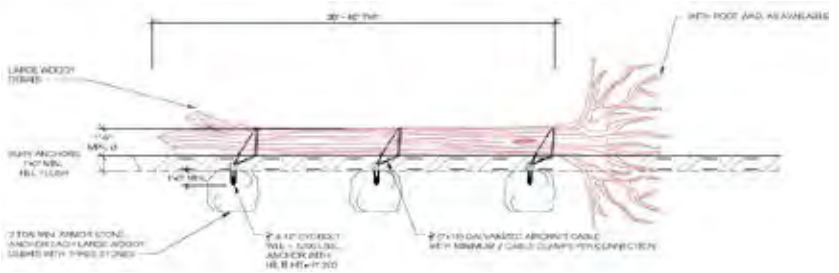
APPROPRIATE EXISTING TYPOLOGIES

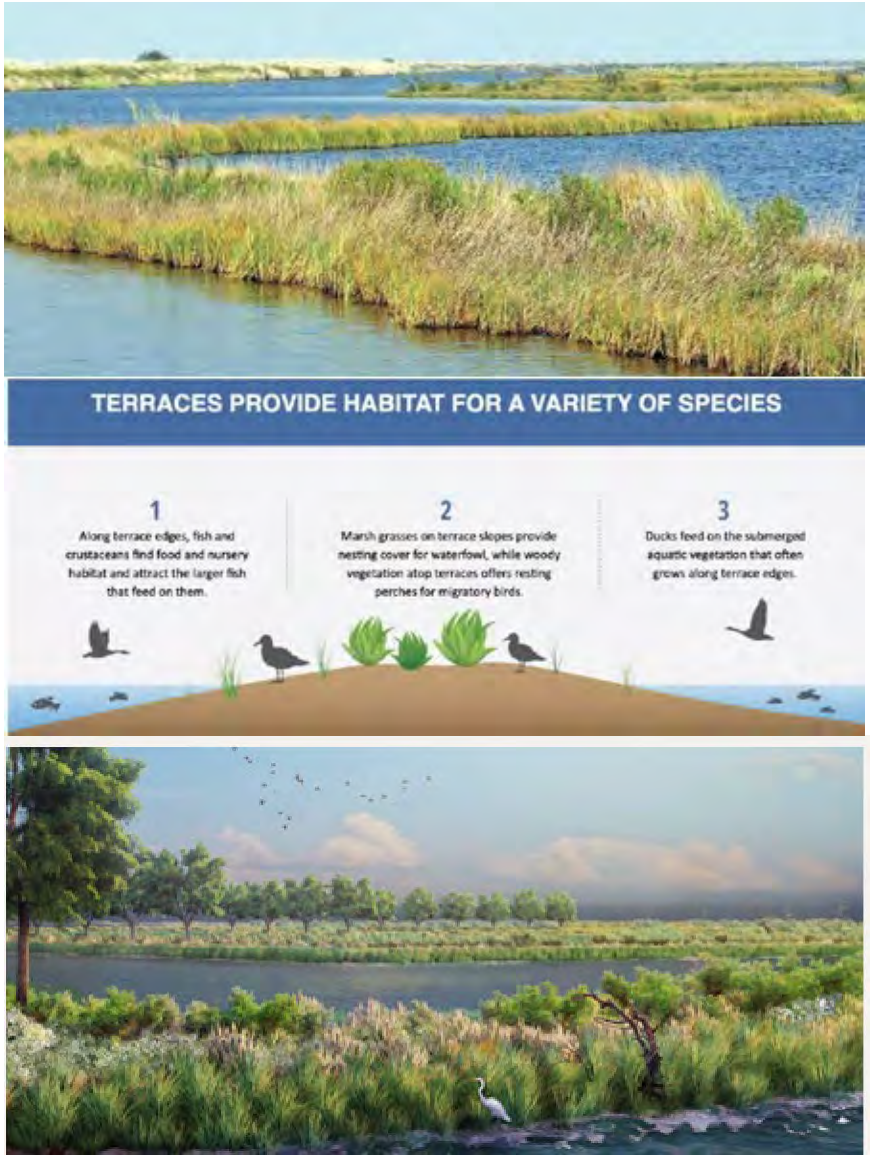
- Exposed Riprap
- Exposed Solid Bulkhead Structures with Low Marsh Zone
- Exposed, Failing, Vegetated Banks
- Exposed Salt & Brackish-Water Marshes
- Exposed Low Bank and Beaches

Nags Head Estuarine Management Plan

OPEN WATER DESIGN STRATEGIES







Images courteous of the City of Virginia Beach & Ducks Unlimited


SITE SELECTION

Nags Head Estuarine Management Plan

SITE SELECTION RATIONALE

OWNERSHIP & ACCESS

Range of Ownership Types

Recreation & Visitor Access

Partnership Potential

EROSION HISTORY

Areas of Concern - Repetitive Loss Areas

Areas of Concern - High Erosion Rates

Enhance Areas of Deposition?

INFRASTRUCTURE PROTECTION

Areas of Concern - Threatened Infrastructure

Proactive Protection of Future Threats

SITE SIZE - PROJECT IMPACT

Larger Continous Site, Larger Project Benefits

Pilot Projects

PROJECT IMPLEMENTATION

Financing & Investment Options

Timelines

Process

Permitting

Nags Head Estuarine Management Plan

SITE SELECTION – 10 Sites

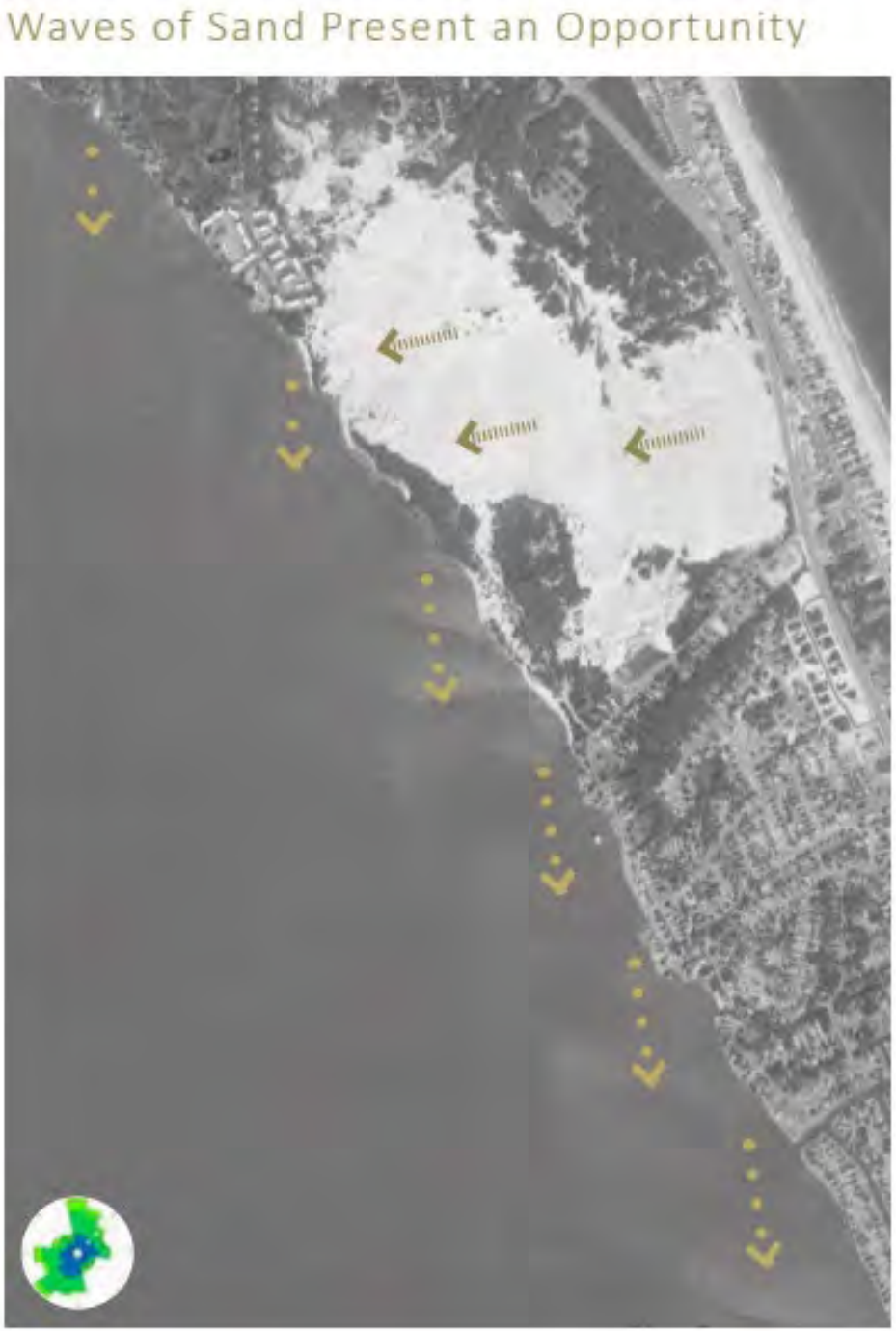

FINAL THREE SITES

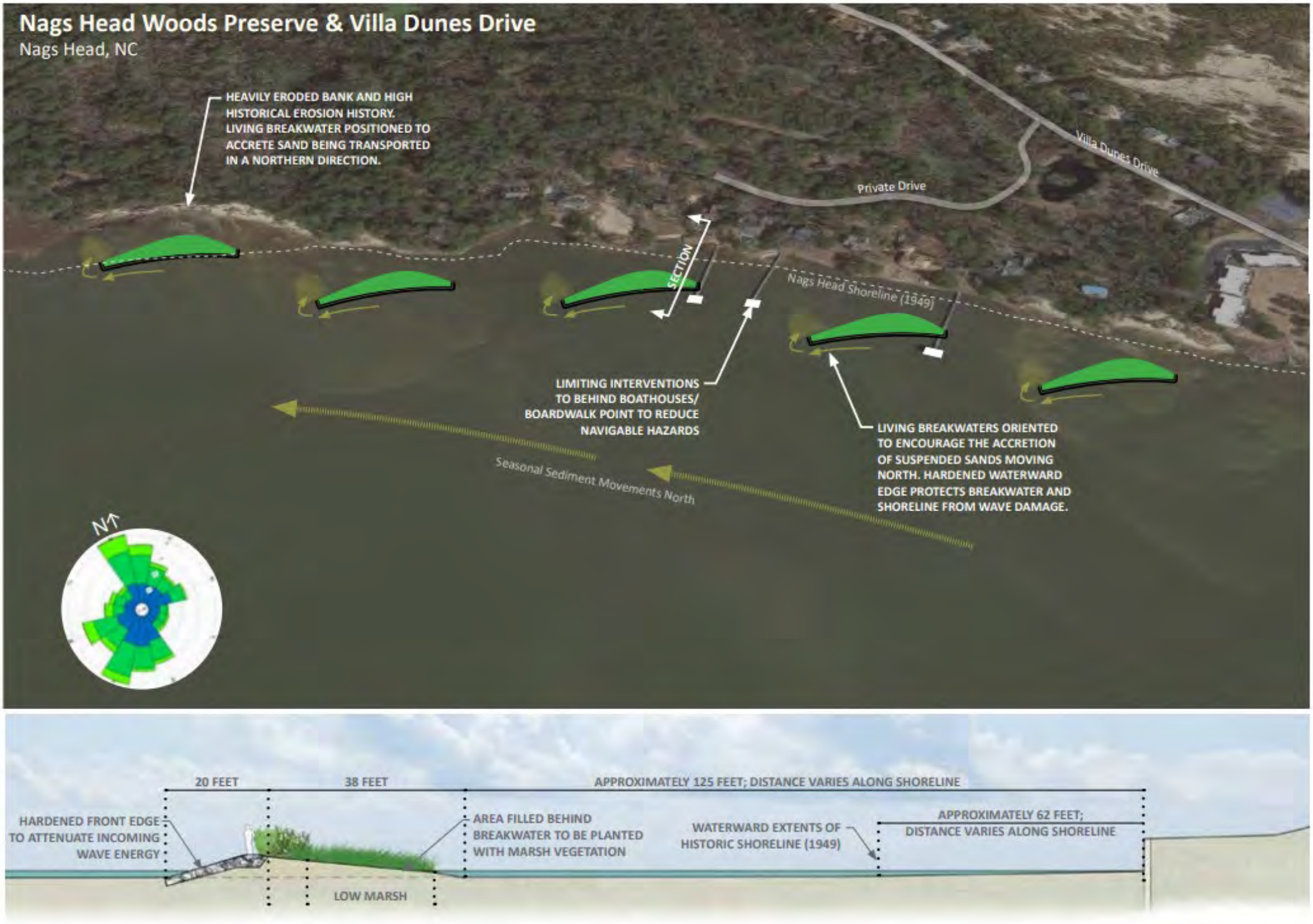
Nags Head Estuarine Management Plan

SITE SELECTION – Final
Three Sites

Nags Head Estuarine Management Plan

SITE SELECTION – Final 3 Sites

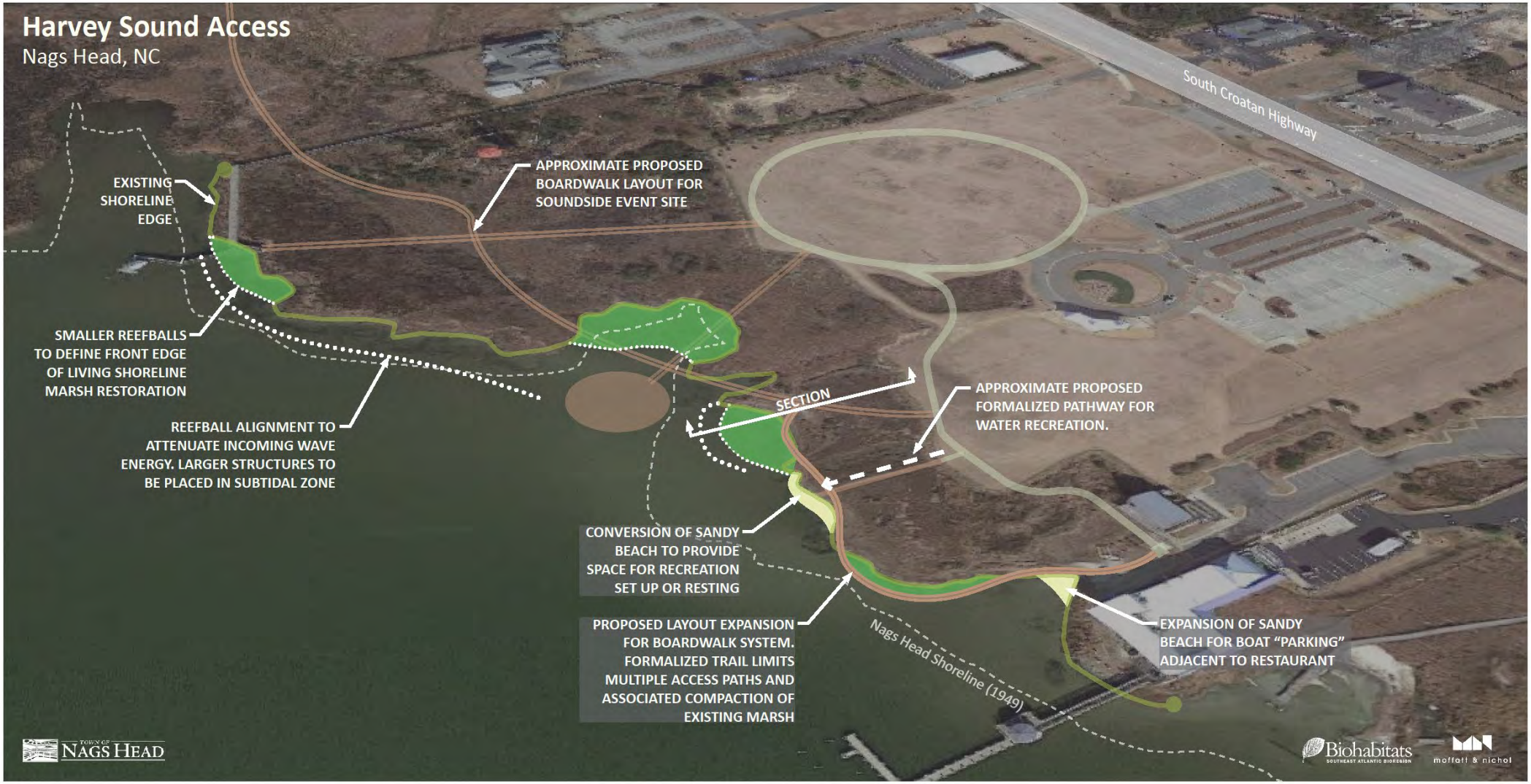


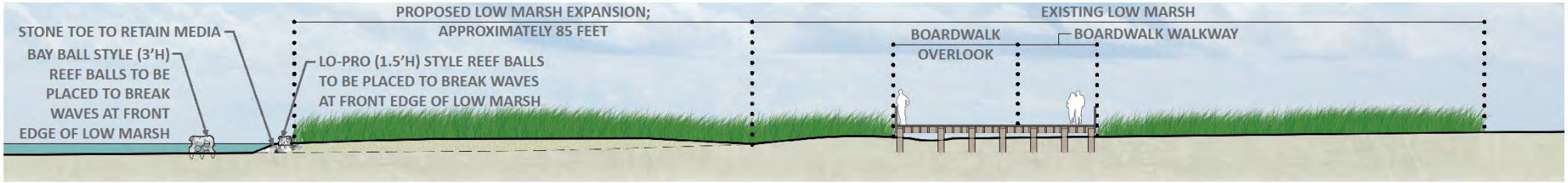

Nags Head Woods Preserve & Villa Dunes Drive
Nags Head, NC
HEAVILY ERODED BANK AND HIGH HISTORICAL EROSION HISTORY. LIVING BREAKWATER POSITIONED TO ACCRETE SAND BEING TRANSPORTED IN A NORTHERN DIRECTION.
Villa Dunes Drive
Private Drive
SECTION
Nags Head Shoreline (1949)
LIMITING INTERVENTIONS TO BEHIND BOATHOUSES/ BOARDWALK POINT TO REDUCE NAVIGABLE HAZARDS
LIVING BREAKWATERS ORIENTED TO ENCOURAGE THE ACCRETION OF SUSPENDED SANDS MOVING NORTH. HARDENED WATERWARD EDGE PROTECTS BREAKWATER AND SHORELINE FROM WAVE DAMAGE.
Seasonal Sediment Movements North
N
20 FEET
38 FEET
APPROXIMATELY 125 FEET; DISTANCE VARIES ALONG SHORELINE
HARDENED FRONT EDGE TO ATTENUATE INCOMING WAVE ENERGY
AREA FILLED BEHIND BREAKWATER TO BE PLANTED WITH MARSH VEGETATION
WATERWARD EXTENTS OF HISTORIC SHORELINE (1949)
APPROXIMATELY 62 FEET; DISTANCE VARIES ALONG SHORELINE
LOW MARSH


West Soundside Road
Nags Head, NC
South Croatan Highway
West Dearing Street
RIPRAP SHORELINE PROTECTION TO BE REUSED AS FRONT EDGE PROTECTION. WIDTH TO INFRASTRUCTURE TO BE EXPANDED TO ESTABLISH TRANSITIONAL HABITAT PROTECTION
West Soundside Road
SECTION
SHORELINE STRETCH WITH HIGHEST EROSIONAL HISTORY. LIVING BREAKWATER ORIENTED TO ACCRETE SAND IN AREA HARDEST HIT BY EROSION.
LIVING BREAKWATERS ORIENTED TO ENCOURAGE THE ACCRETION OF SUSPENDED SANDS MOVING SOUTH. HARDENED WATERWARD EDGE PROTECTS BREAKWATER AND SHORELINE FROM WAVE DAMAGE.
N
Seasonal Sediment Movements South
LARGE SCALE MOVES ADDRESS MULTIPLE PROPERTIES, HOWEVER INDIVIDUAL SITES HAVE TOOLKIT OPTIONS TO ENHANCE THEIR SHORELINE
Nags Head Shoreline (1949)
LIMITING INTERVENTIONS TO BEHIND BOATHOUSES/ BOARDWALK POINT TO REDUCE NAVIGABLE HAZARDS
LOW MARSH
HIGH MARSH
MEADOW PLANTING
WATERWARD EXTENTS OF HISTORIC SHORELINE (1949)
BREAKWATER MARSH TOE TO RETAIN PLANTING MEDIA
EXTENDED SHORELINE EDGE APPROXIMATELY 35 FEET

Harvey Sound Access

Nags Head, NC






PERMITTING ANALYSIS

Nags Head Estuarine Management Plan

SHORELINE STABILIZATION PERMITTING CATEGORIES

GENERAL PERMITS (GP)

- Issued by DCM field staff and are streamlined major permits for routine projects (permit issuance averages 5-14 days)
  - Limited to 30’ past normal high water or 5’ past existing wetlands, whichever is greater
  - Cannot exceed 1’ above normal high water
  - Slope cannot exceed 1.5’ horizontal distance over a 1’ vertical rise
  - Max length 500’ with a 5’ openings every 100’, max base width of 12’
  - Must be marked for navigational purposes
  - Cannot construct over existing SAV or oyster beds
  - No associated backfill

MAJOR PERMITS

- Reviewed by 10 state & 4 federal agencies and are issued at the Division headquarters (permit issuance averages 75-90 days)

MINOR PERMITS/EXEMPTIONS

- Special circumstances such as maintenance/post- storm repairs, etc.

Nags Head Estuarine Management Plan

Shoreline Management Technique	Additional Information	Permitting*
Living Shorelines	• Allows natural connections between aquatic environment and adjacent upland; preserves tidal exchange, sediment conservation, allows for marsh migration. • Need for public demonstration project so public can access. • Best for medium/low energy shorelines.	**General Permit** o Streamlined permits for routine projects. o Issued by DCM field staff o Permit issuance averages 5-14 days. Examples: riprap revetment for wetland protection, riprap sill for wetland enhancement.
Bulkheads/Sea Wall	• Hard armoring of the shoreline. A wall is created at the upland/marsh or upland/water interface and backfilled to raise upland. • Holds the shoreline, keeping it static and may be good fit for high wave energy. • Can cause erosion on subject and neighboring properties. • Disrupt sediment movement and transport patterns.	**General Permit** o Streamlined permits for routine projects. o Issued by DCM field staff. o Permit issuance averages 5-14 days.
More complex projects that trigger additional permits	• Serves as the application for other state and federal permits. • The dredging and filling of water and/or wetlands fall into this category. • DCM will issue a major permit if the project complies with the CRC's standards for development in AECs, the local CAMA land use plan, and local development regulation.	**Major Permit** o NC DCM CAMA Major Permit. o Permit application reviewed by 10 state and 4 federal agencies, involves DCM and USACE permit coordination. DCM provides coordination with other agencies on behalf of the applicant. o USACE can use their USACE Programmatic General Permit 291 for CAMA Major Permits. Permit issuance averages 75-90 days.

General Permit Application Requirements	Major Permit Application Requirements
o Neighbor notifications o Permit fee ($200)	o Adjacent property owner notifications o Deed (or other legal instrument) o Surveyed and Engineered drawings **NOT** required; can be hand drawn but must be able to clearly photocopy, preferable to scale or with dimensions shown o Top view drawing (site plan) o Cross section drawing o Application forms (MP-1 and MP-2) o Permit fee ($400) (disturbance is less than 1.0 acre)
General Permit Conditions (LS)	Major Permit Conditions
o Limited to 30' past Normal High Water (NHW) or 5' past existing wetlands o Cannot exceed 1' above NHW o Max length 500' with 5' openings every 100', max base width of 12' o Marked for navigational purposes o Cannot construct over existing SAV or Oyster beds o No associated backfill	o Project approval depends on a range of site specific factors including but not limited to; o Submerged Aquatic Vegetation impacts o Bottom type (mud or sand bottom) o Shellfish status o Navigational impacts o Wetland impacts

* Permitting will always consider local site specific conditions that may change through time.

Thank You
Questions?

Town of Nags Head Estuarine Management Plan Website for Updates

TOWN OF NAGS HEAD

Biohabitats
SOUTHEAST ATLANTIC BIOREGION

MOFFATT & NICHOL