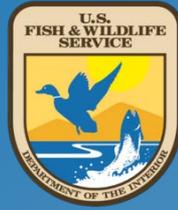


The Nature
Conservancy



Protecting nature. Preserving life.™



NOAA Coastal Services Center
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

Identifying Coastal Habitats for Conservation Under Sea Level Rise Scenarios

Neil Jordan – The Nature Conservancy
Tera Baird – U.S. Fish & Wildlife
March 2011





Partnership for Land Protection

Winyah Bay Task Force

USFW, Waccamaw National Wildlife Refuge

North Inlet and Winyah Bay National
Estuarine Research Reserve

South Carolina Department of Natural
Resources

TNC, South Carolina Field Office

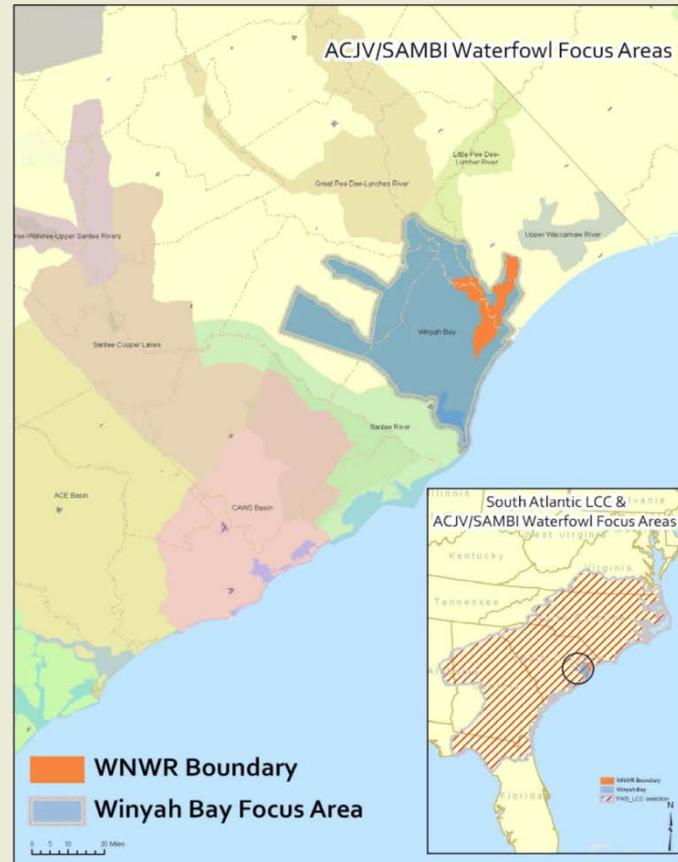
Ducks Unlimited

Lowcountry Open Land Trust

Pee Dee Land Trust



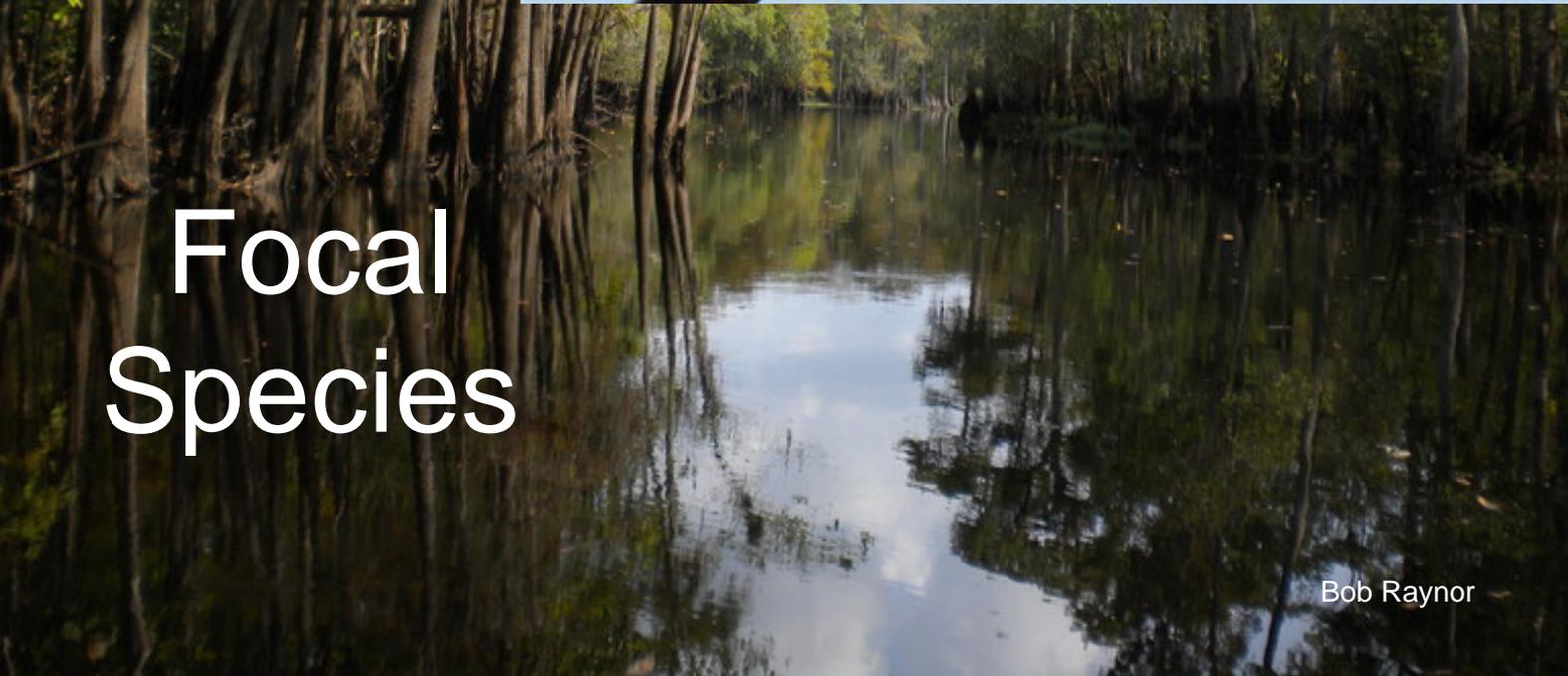
The Landscape: Winyah Bay Task Force Area



Winyah Bay's river system, the third largest on the Atlantic Coast, has one of the most extensive and intact wetland complexes in the Southeast.



Focal Species



Kites an Umbrella Species – Who Else Benefits?



© Terry Sobiech

© 2006 Larry Spivey

Spatial Analysis Process

Define Goal → Identify Criteria → Acquire Data → Spatial Analysis → Results

- 1. Define goals**
- 2. Identify criteria**
- 3. Acquire data**
- 4. Perform spatial analysis**
- 5. Examine results**



Define Goals

Goal: Plan for habitat and species protection as sea level rises

- 1) Develop locally relevant marsh migration predictions
 - Sea Level Affecting Marshes Model (SLAMM) revised by NOAA
- 2) Identify key habitats for protection as sea level rises
 - Habitat Priority Planner (HPP)



The Habitats

We Need to Protect in the Winyah Bay Landscape

- Freshwater forested wetland (Kite nesting habitat)
- Freshwater emergent wetland (Kite foraging habitat)
- Isolated wetlands
- Maritime Forest
- Long-leaf Pine Forest





The Conservation Challenge with Climate Change

Long range habitat planning in a rapidly changing environment will be critical and challenging

- Drought, wildfires
- Unpredictable weather patterns
- Invasive species
- **Salt water intrusion, habitat loss**



Salt Water Intrusion and Habitat Loss

Freshwater forested wetlands going, going...



Wetland habitat transitioning from freshwater forested wetland to brackish marsh

Salt Water Intrusion and Habitat Loss

Freshwater forested wetlands gone...

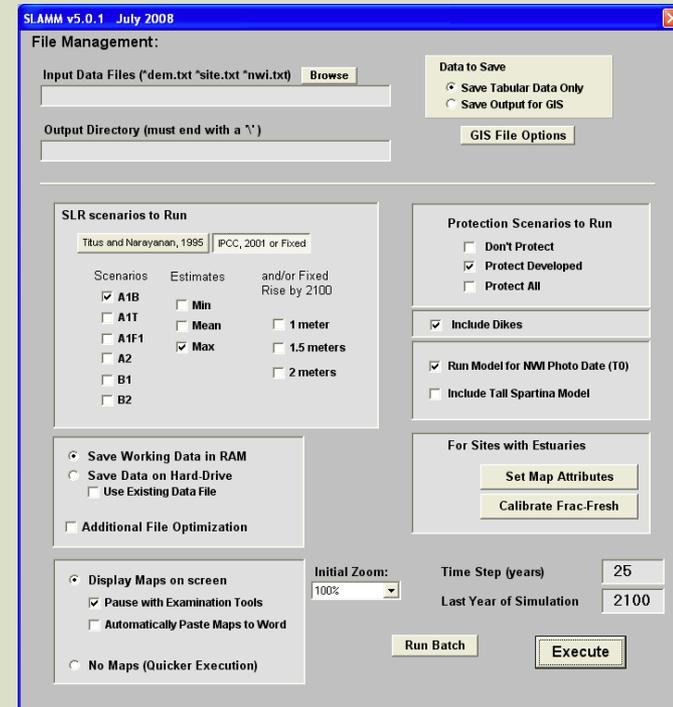


Sea-level Affecting Marshes Model

Used SLAMM version 5
Version 6 now available
(allows for more
customization)

Local analysis conducted by
NOAA Coastal Services
Center

<http://www.csc.noaa.gov/digitalcoast/tools/slammm/index.html>



SLAMM Inputs

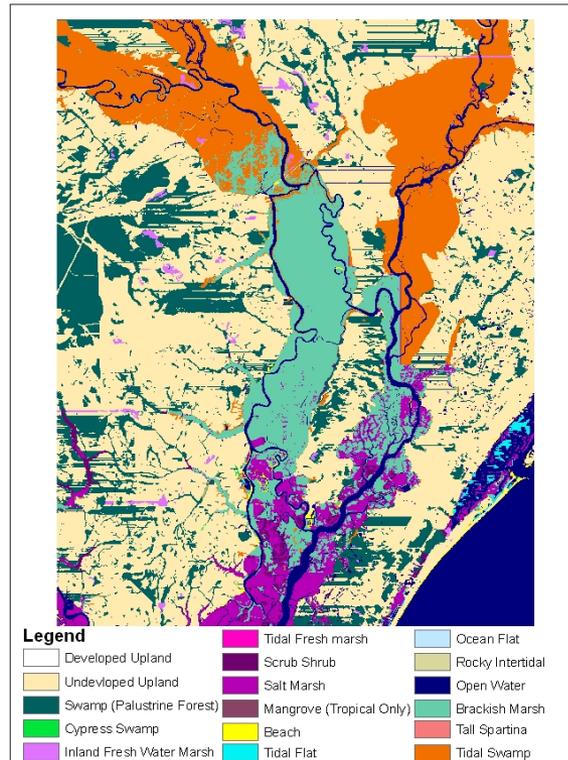
Inputs	Regional	Local
Habitat data	NWI – National Classification	NWI: site-specific reclassification
Elevation	National Elevation Dataset (30m)	High resolution lidar
Tide Erosion Accretion	Regional (Southeast)	Local



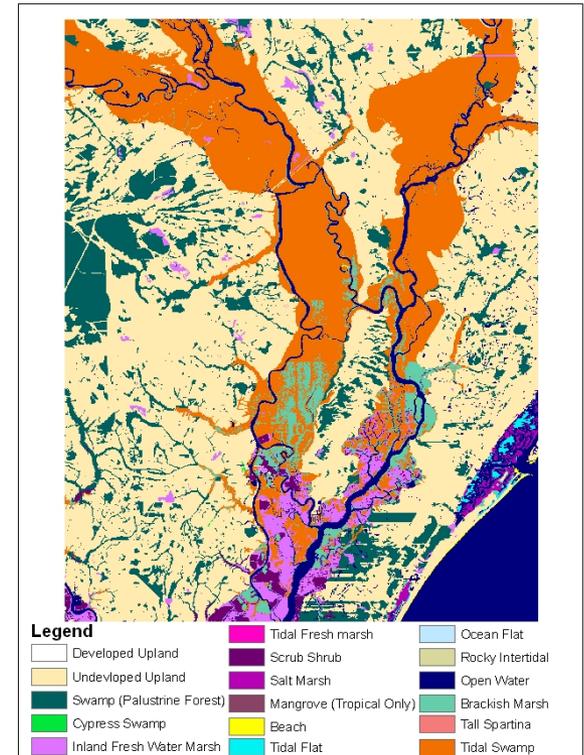
Regional vs. Local Inputs: 2025



Regional



Local



Habitat Priority Planner

Decision support tool

- Conservation
- Land use
- Restoration

Interactive use with stakeholders

The screenshot shows the web interface for the Habitat Priority Planner. At the top, it features the 'DIGITAL COAST' logo and 'NOAA Coastal Services Center' text. Navigation links include 'Home', 'Data', 'Tools', 'Training', 'Approaches', and 'In Action'. A search bar is located on the right. Below the navigation is a 'Tools' section with 'Habitat Priority Planner' as the selected tool, with the NOAA Coastal Services Center logo underneath. A breadcrumb trail shows 'Overview' as the active page, followed by 'Requirements', 'In Action', 'Training', 'Support', and 'Get It Now'. The main content area includes an 'Overview' section with a paragraph describing the tool's purpose in habitat conservation, restoration, and land use planning. To the right, a 'Features' section lists key capabilities: inventorying specific habitat or land-use types, assessing target habitat or land-use type conditions with a pre-packaged spatial analysis metrics process, analyzing 'what if' scenarios such as the impact of new development or how restoration might change overall habitat function, and getting people involved through a fast, interactive environment. At the bottom of the features list, it states that the tool creates maps, reports, and data tables to enhance communication and the decision-making process. A screenshot of the software's graphical user interface is shown, featuring a map with a data overlay and a 'Data Explorer' window with a table and a bar chart.

www.csc.noaa.gov/hpp



Software Requirements

**ESRI's ArcGIS 9x. Coming soon –
Arc10**

Spatial Analyst

Data Requirements

Raster or Vector base data

Site-specific data sets (optional)



Acquire Data

SLAMM

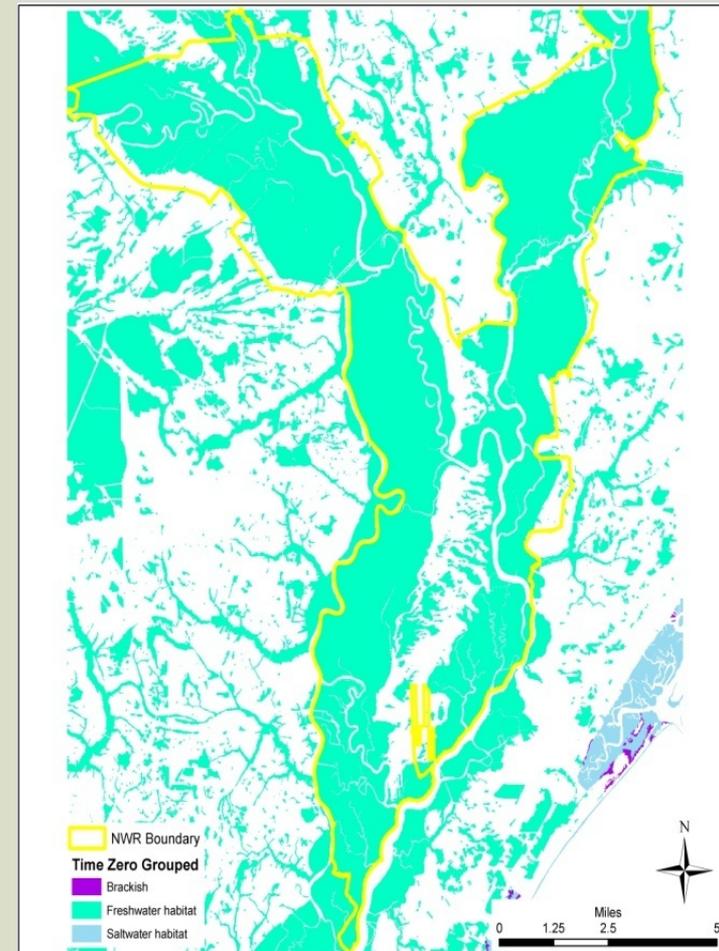
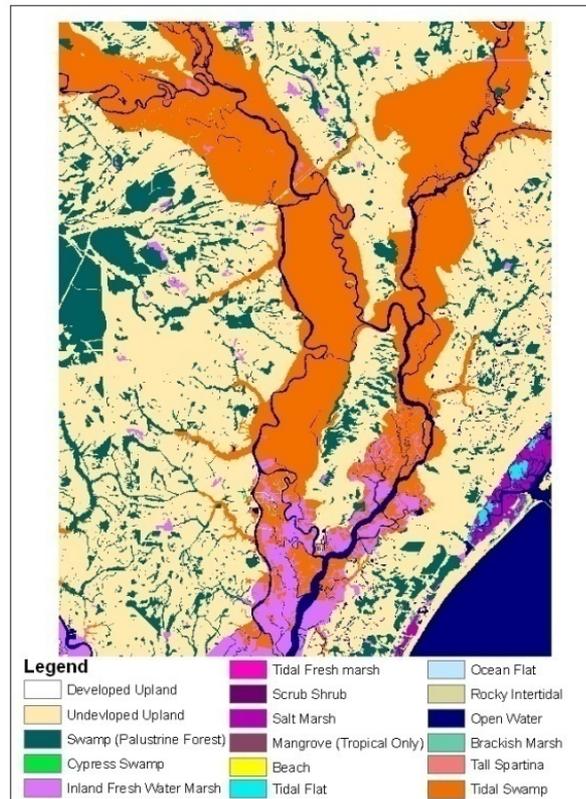
- Habitat
- Elevation
- Rates

HPP

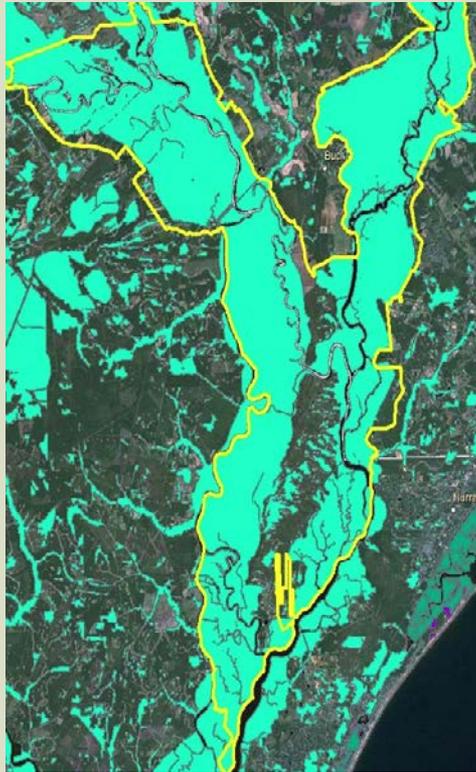
- Base Data
GAP land cover data
- Supporting Data
SLAMM outputs, kite nests, kite observations



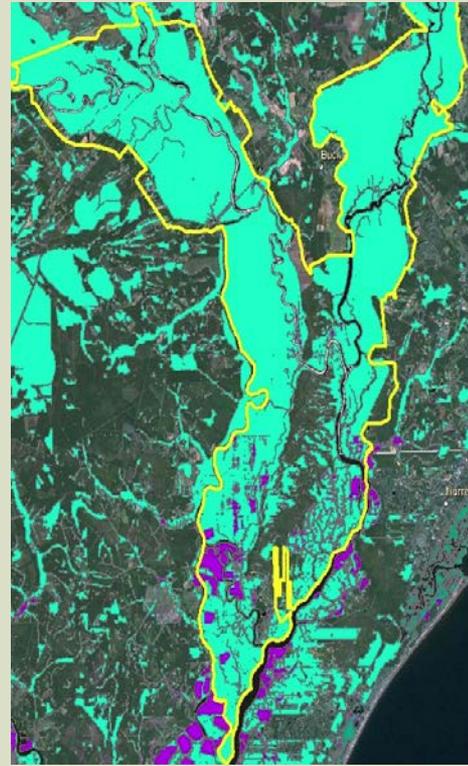
SLAMM: Grouped classification



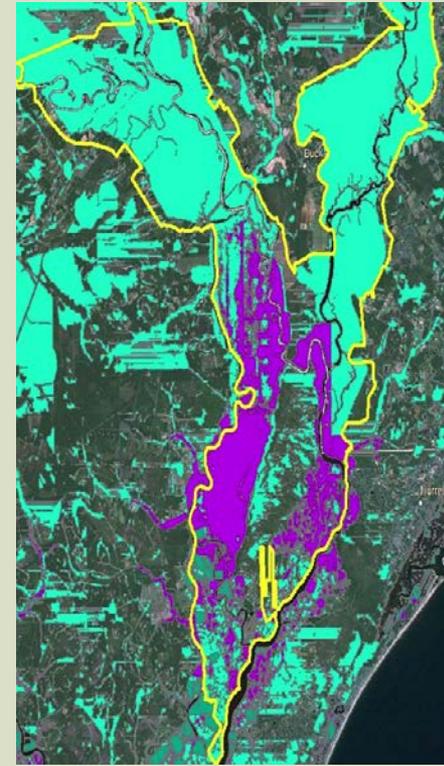
Grouped SLAMM Results for Waccamaw NWR



1994



2025

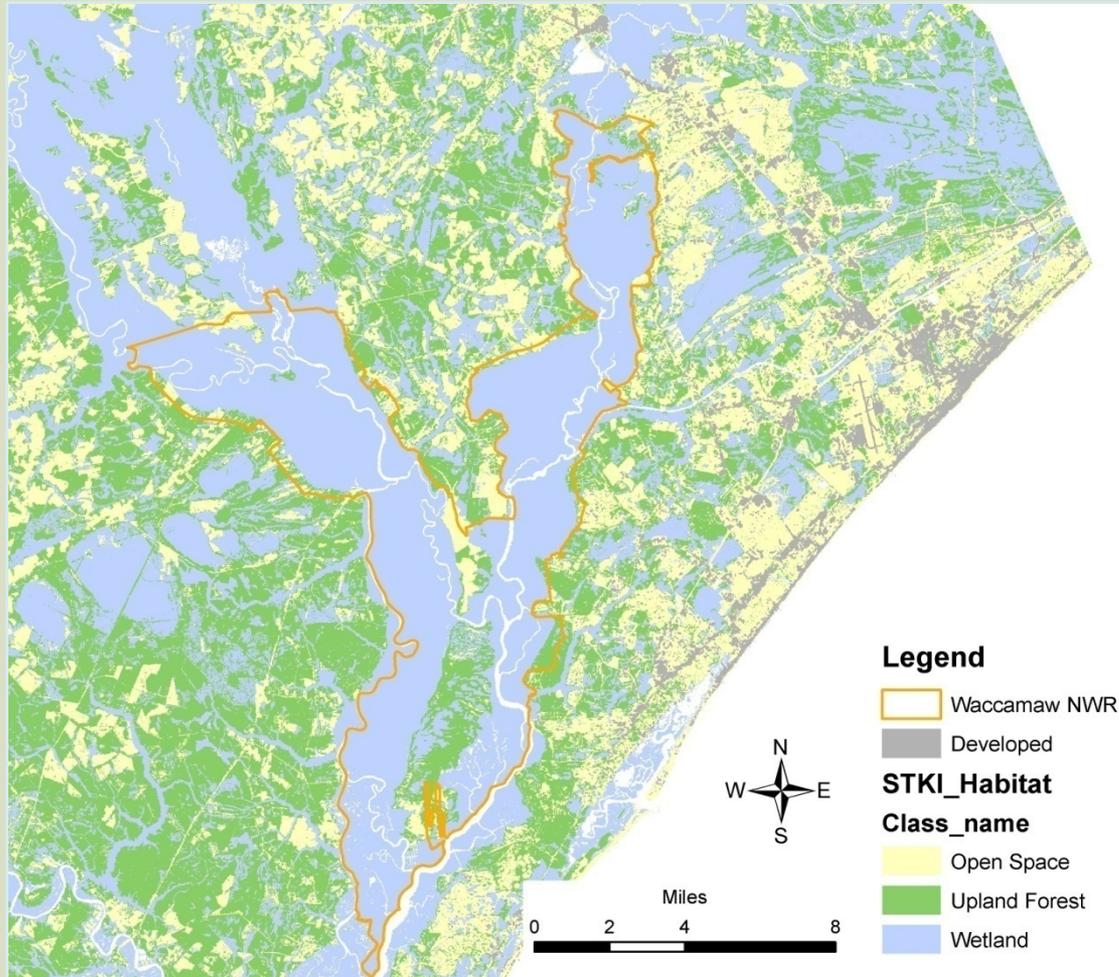


2050

-  Brackish Marsh
-  Freshwater Habitats
-  Waccamaw NWR boundary



GAP: grouped classification

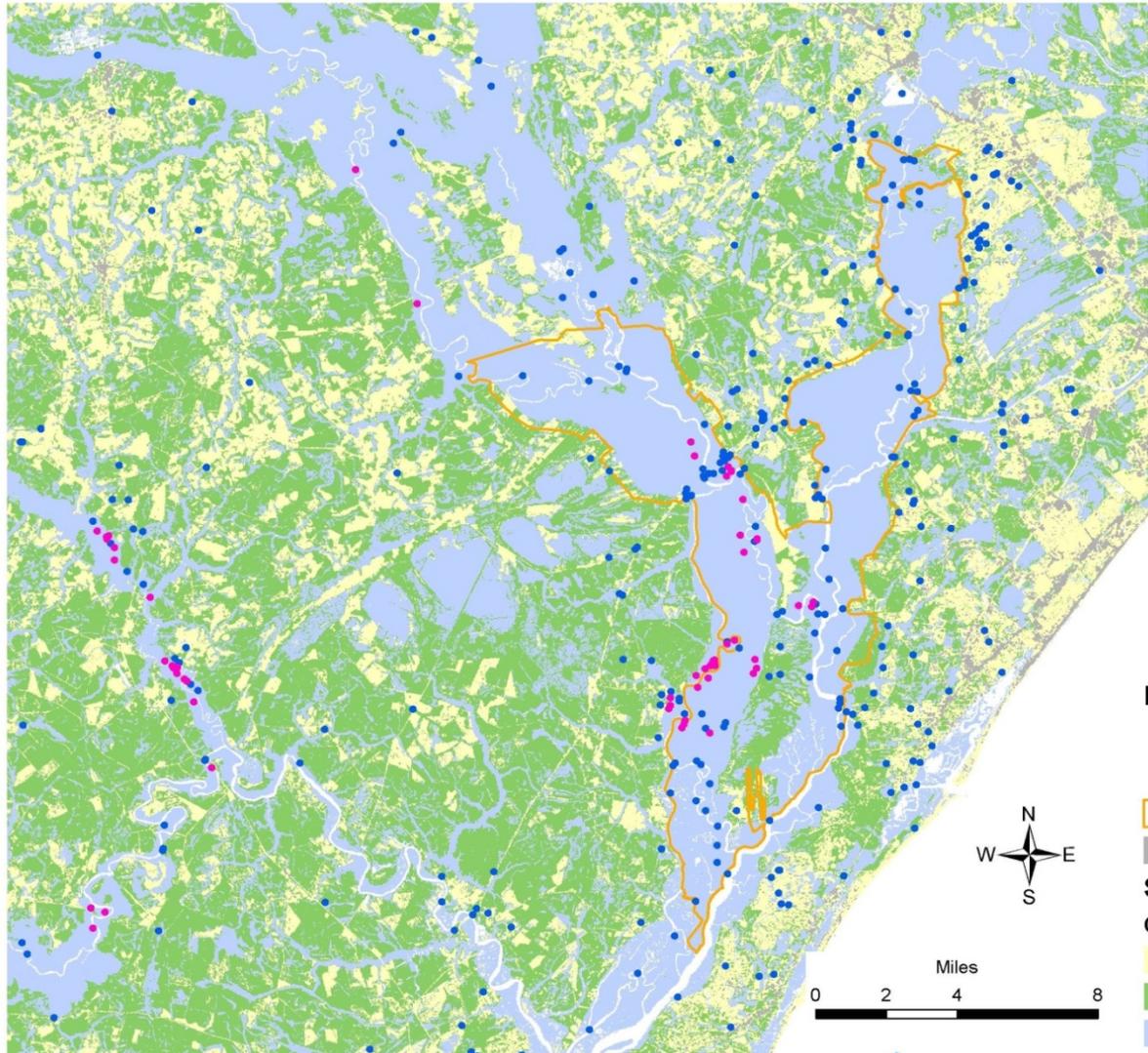


- Grouped:
- Wetland
 - Upland
 - Open Space



HPP MAP

All habitats and Kite nests/sightings



Identify swallow-tailed kite habitat not likely to be impacted by SLR

- Freshwater wetlands
- Close to nest sites

Legend

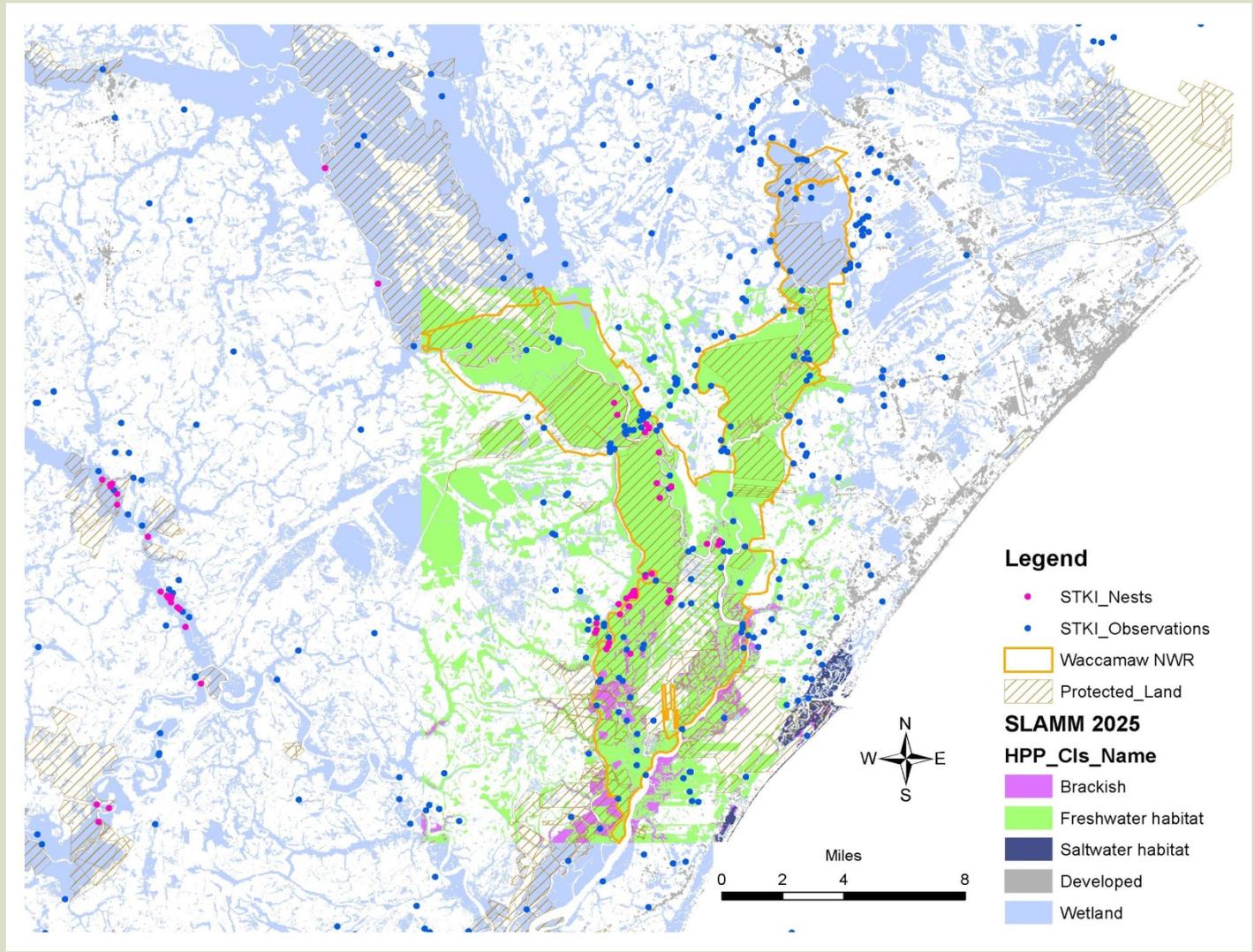
- STKI_Nests
- STKI_Observations
- Waccamaw NWR
- Developed
- STKI_Habitat Class_name**
- Open Space
- Upland Forest
- Wetland





HPP MAP

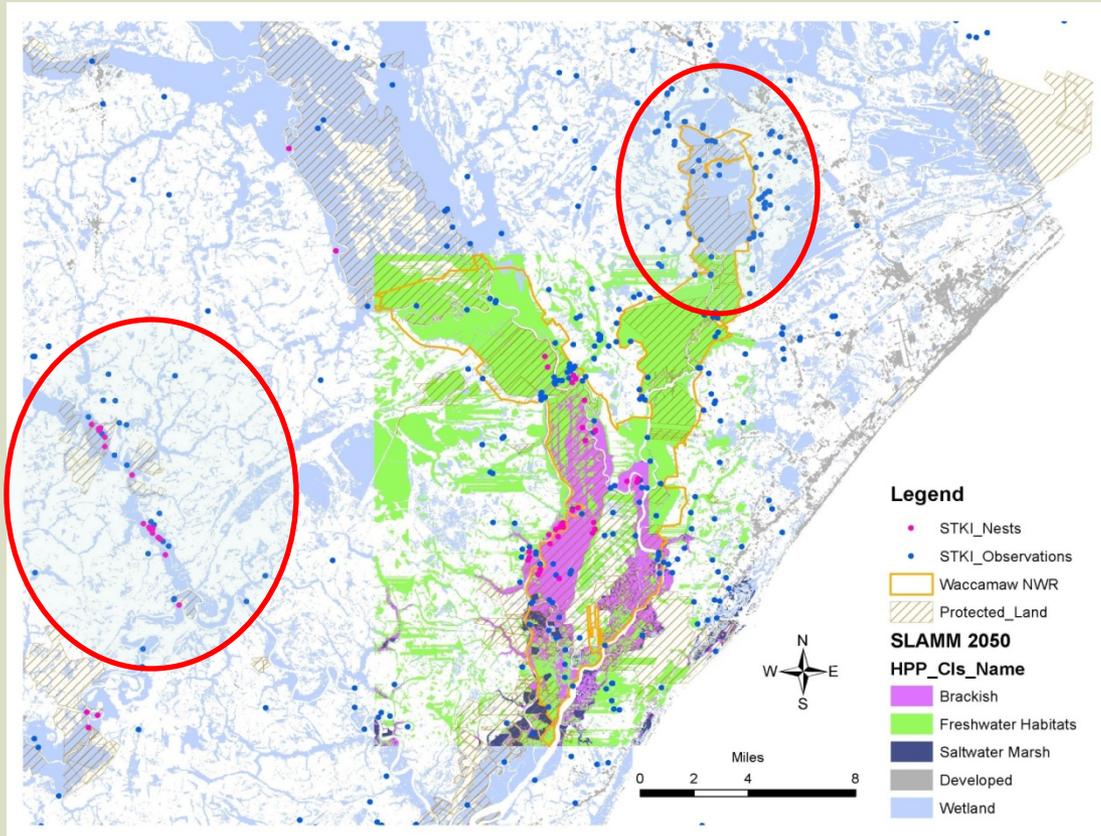
Wetland Habitat, Protected Lands, Kite Nests/Sightings, and 2025 SLAMM Results





HPP MAP

Wetland Habitat, Protected Lands, Kite Nests/Sightings, and 2050 SLAMM Results



Aggregate loss of 14,266 acres of protected forested wetland to brackish marsh

Future freshwater habitats suitable for Kites may be outside current public and private protected lands.

Data Gaps

- Foraging study –habitat use and 2011 GPS locations
- 2002 Landcover data – outdated
- Lidar for Horry County (Refined SLAMM)
- Williamsburg County Parcel Data



What's Next?

- Fill species monitoring data gaps
- Integrate black bear data
- Continue parcel analysis
- Monitor actual habitat changes
- Refuge boundary expansion?





Questions? More info?

For more information on SLAMM and HPP go to

<http://www.csc.noaa.gov/digitalcoast/>

Special thanks to Chrissa Waite and Bethney Ward (NOAA CSC) for project support and guidance

