

Tools for Protecting Coastal Wetlands

A Watershed Academy Webcast
Celebrating American Wetlands Month



Tuesday, May 4, 2010
1:00pm – 3:00pm Eastern

Dr. Bill O. Wilen, U.S. Fish and Wildlife Service

Danielle Bamford, The Baldwin Group/NOAA Coastal Services Center

Marcia Berman, Virginia Institute of Marine Science, Center for Coastal Resources Management

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Guide to Our Webcasts – For Technical Support click the “**Help**” button

- **To Ask a Question** – Type your question in the text box located in the lower left-hand corner of your screen and click on the “Submit Question” button
- **To Answer Poll Question** – Click on the radio button to the left of your choice and click submit. Do not type your answer in the “Ask a Question” box
- **To See Closed Captioning** – Turn your pop-up blocker off and click on the “closed captioning” button
- **To Complete the Survey** – Click the “Enlarge Slides” button and fill out the survey in the window
- **To Obtain a Certificate** – Watch 1 hour and 30 minutes of the Webcast and then click “Download Certificate.” If you are in a room with multiple attendees please wait until the last slide to obtain the URL to customize your own certificates

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Tools for Protecting Coastal Wetlands

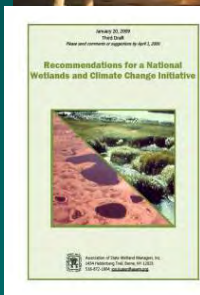
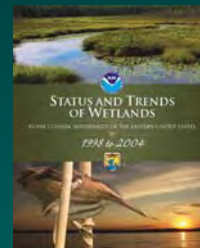


Photo courtesy of Ed Lewandowski, Director, Delaware Inland Bays NEP

Clay Miller
Environmental Protection Specialist
Wetlands Division, U.S. EPA

Importance of Emphasizing Coastal Wetlands

- From 1998-2004, coastal wetlands in Eastern U.S. *lost an average of 59,000 acres annually* (NOAA, FWS Status and Trends Report)
- Coastal wetlands provide *economic benefits* and their destruction can result in economic losses
- Increasing evidence of the threats posed by *sea level rise and climate change* and the benefits of coastal wetland protection (ASWM National Wetlands and Climate Change Initiative)



Definitions of Coastal Wetlands and Loss

Coastal Wetlands =

Those wetlands (tidal and fresh) within a HUC 8 watershed that are adjacent to and drain to the Atlantic, Pacific, or Gulf of Mexico

Coastal Wetland Loss =

A decline in the areal extent or ecological integrity of wetlands in the HUC 8 watershed



Photo courtesy of Nancy Laurson,
U.S. EPA Oceans and Coastal
Protection Division

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Coastal Wetlands Initiative

- Formed by EPA in recognition of importance of coastal wetlands
- 2 Pronged Approach
 - Federal Inter-Agency Workgroup
 - EPA Coastal Wetland Review Team
 - Examining loss in selected watersheds by gathering available data and direct input from on-the-ground stakeholders
- Goals of the Coastal Wetland Initiative:
 - Improve understanding of:
 - Functions and values of coastal wetlands
 - Factors contributing to loss in specific geographic areas
 - Identify and disseminate tools, strategies, policies and information to protect and restore coastal wetland resources

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Coastal Wetland Initiative Key Findings To Date: Stressors on Coastal Wetlands

- Direct and indirect impacts contributing to loss and degradation
- Immediate impacts
 - Development
 - Residential and commercial
 - Agriculture and forestry
 - Coastal erosion
 - Hydrologic alterations
- Future impacts
 - Climate change and sea level rise



Photo courtesy of Amie Howell,
U.S. EPA Region 3

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Tools and Strategies for Coastal Wetland Protection

- Important considerations:
 - Planning with understanding of both near-term and long-term stressors
 - Collaboration and partnerships
- Webcast will provide examples of web-based tools that can help decision-makers plan for better coastal wetland protection



Photos courtesy of Arleen O'Donnell,
Eastern Research Group

Webcast Speakers

- Dr. Bill O. Wilen (U.S. Fish and Wildlife Service)
 - Sea Level Affecting Marshes Model (SLAMM)
- Danielle Bamford (NOAA's Coastal Services Center)
 - Habitat Priority Planner
- Marcia Berman (VIMS Center for Coastal Resources Management)
 - Geospatial Management Tools for Local Governments

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Sea Level Affecting Marshes Model SLAMM

Don't get "slammed" by sea-level rise

*Dr. Bill O. Wilen, Chair, Wetlands
Subcommittee of the Federal Geographic
Data Committee, for the National
Wetlands Inventory, in the U.S. Fish and
Wildlife Service*

Chincoteague NWR,
Virginia

What I am not going to talk about

- **Sea-level Rise**
- **IPCC reports**
- **How active tectonics and melting glaciers will impact sea levels.**
- **How eustatic sea levels are adjusted to local conditions.**
- **The science behind tide data and datums**
- **and a lot of other things**

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I will tell you

- **About SLAMM (Sea level Affecting Marshes Model)**
- **How SLAMM is geoenabled through the Internet**
- **How to get your hands on the SLAMM model**
- **The basics of how it works**
- **How the SLAMM outputs are viewable over the Internet using SLAMM View**
- **Live demo of SLAMM View**

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My Goal

- **Peak your interest in SLAMM so you :**

Download the technical documentation.

Download the model and sample data. Change the inputs and see what happens.

Post your questions and feedback to the SLAMM Forum.

HELP us move SLAMM to the next level

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Sea Level Affecting Marsh Model (SLAMM)

- **Developed in mid-1980s by
Dr. Dick Park, Eco Modeling**
- **Next generation developer
Mr. Jonathon Clough, Warren Pinnacle**
- **Coastal Marsh Ecologist
Dr. Chris Craft, Indiana University**
- **Developer of SLAMM-View
Dr. Jeff Ehman, Image Matters**

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National Wetlands Inventory

Google: FWS Wetlands

For access to: Wetlands Mapper, data downloads, Web Mapping Service, Google Earth application to view wetlands

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SLAMM-View Portal

Google: FWS SLAMM

For access to the portal hosted by the FWS, Chesapeake Bay Field Office

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FWS, Chesapeake Bay Field Office

The screenshot shows the 'Sea Level Rise Affecting Marshes Model' (SLAMM) website. The header includes the U.S. Fish & Wildlife Service logo and the title 'Sea Level Rise Affecting Marshes Model'. A search bar is located below the header. The left sidebar contains a navigation menu with categories such as 'Getting Started', 'CHESAPEAKE BAY FIELD OFFICE', 'WELCOME', 'WILDLIFE & HABITATS', and 'WHAT WE DO FOR YOU'. The main content area features the title 'SLAMM' and a paragraph explaining that the U.S. Fish and Wildlife Service has released a new user-friendly internet tool. To the right of the text is a map of the Chesapeake Bay region with labels for Delaware Bay, Maryland Shore, Blackwater National Wildlife Refuge, Tangier Sound, Virginia's Eastern Shore, Upper Tidewater Region, and Lower Tidewater Region. The bottom of the page contains a paragraph about the SLAMM model's capabilities and the science it is based on.

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SLAMM

Google: SLAMM

For access to: SLAMM Model, Technical Documentation, Overview, PowerPoint, User Forum, Bibliography, and more.

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SLAMM View

NEWS FLASH

SLAMM-view now presents two types of predictions from studies of sea-level rise on coastal wetlands: "regional" and "site-specific". Up to this point in time, only SLAMM output from regional simulations have been available: for the Chesapeake, Georgia / South Carolina, and Puget Sound / Northwest Coast study regions. Recently, site-specific results for the Chincoteague National Wildlife Refuge and surrounding area have been made available through SLAMM-view. Note that although the entire Chincoteague study site lies within the Chesapeake study region, the results from the site-specific study originate from completely separate model runs. We anticipate additional site-specific results to be available later this year. To see the new Chincoteague results, go to <http://www.slamview.org/chincoteagueVW/>.

BACKGROUND

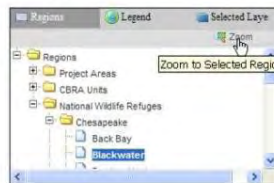
Efficiently and effectively presenting the large volume of geospatially-referenced, gridded data output from the Sea Level Affects Marshes Model (SLAMM) for each sea-level rise (SLR) scenario time-series is a challenge. For most studies, an output file is produced for each of 5 different dates in a time-series (i.e., Base Year, 2025, 2050, 2075, and 2100) for each different scenario of sea level rise (e.g., IPCC A1B Mean, IPCC A1B Max, and 1m). When examining these outputs, interested parties logically most often want to view two types of combinations of these 15 different data layers: "same scenario, different date," and "same date, different scenario", which in sum result in 45 unique pairs of simulation output.

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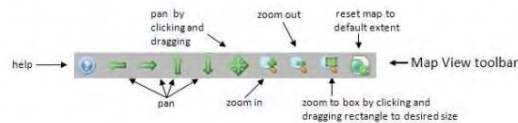
Tutorial

2) Zoom to your area of interest using the Regions View, and then Pan and Zoom using the Map Tools in the Map View header.

1. Click to highlight a Project Area, Coastal Barrier Resources Act (CBRA) Unit, or National Wildlife Refuge.
2. Zoom to the selected region of interest by clicking on the Zoom button, as shown below:



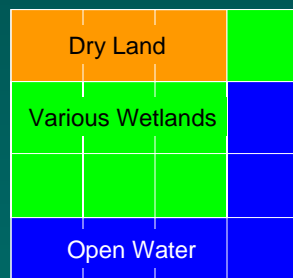
3. Then Pan and Zoom by clicking to "depress" the tool button of choice to activate the tool, then use the tool. Note that a tool stays active until you deactivate it or activate another tool.



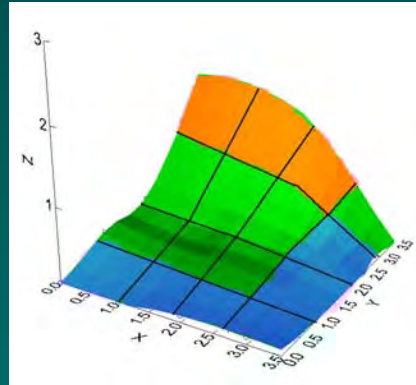
20

Conceptual Model

- 30m x 30m cells with elevation, slope, aspect, wetland type
- Cell size can be variable but many DEMs have 30 m resolution
 - Cells will track movement of multiple land-type categories



2D Representation



3D Representation

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Five Primary Processes Modeled

- Inundation
- Accretion
- Erosion
- Overwash
- Saturation

SLAMM 6 added

Salinity Module

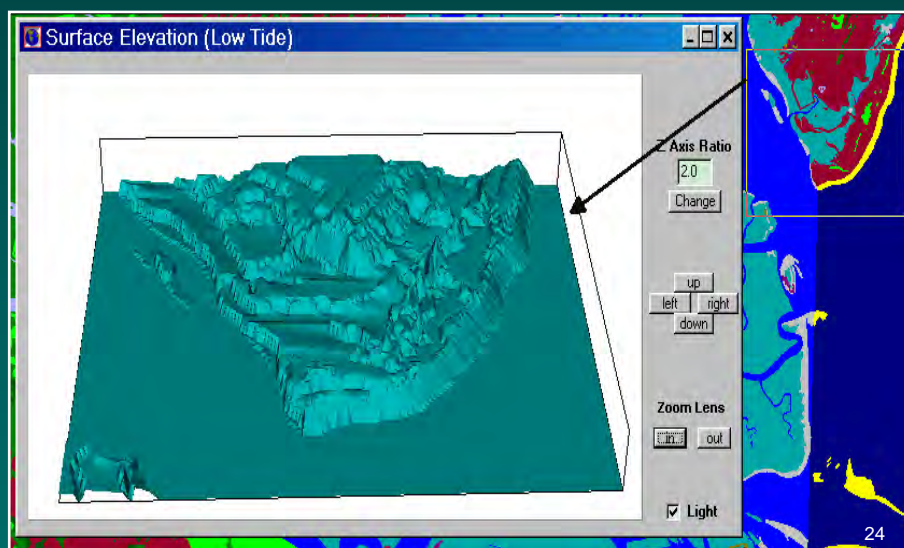
22

How SLAMM processes wetlands elevations

- The front edge of each wetland type is assigned a minimum elevation, specific to the wetland category that it falls into.
- The back edge of each wetland type is given the maximum elevation for that category.
- The slope and elevations of the intermediate cells are interpolated between these two points.
- The real life wetlands integrate the tides, accretion, salinity, freshwater inflows, and factors we don't understand.

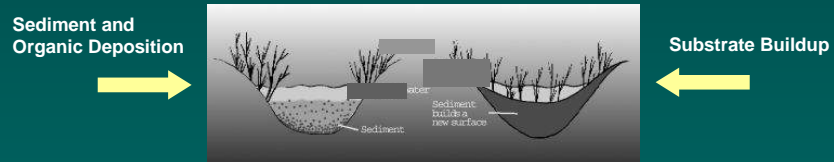
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SLAMM 3-D Graphing Tool



Critical Local Influences

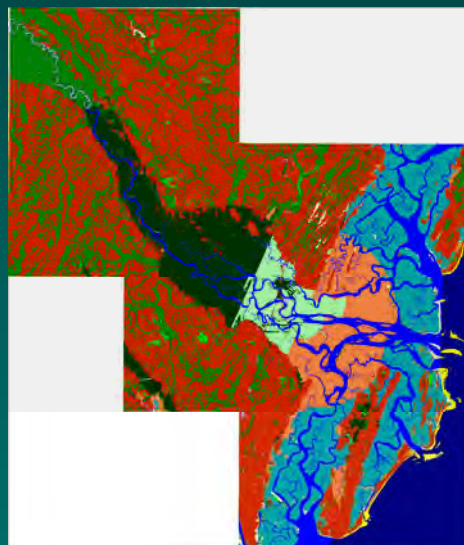
- Accretion is the buildup of organic and inorganic matter on the marsh surface



- Response of vegetation to sea-level rise
- Freshwater inflow
- Movement of the salt wedge

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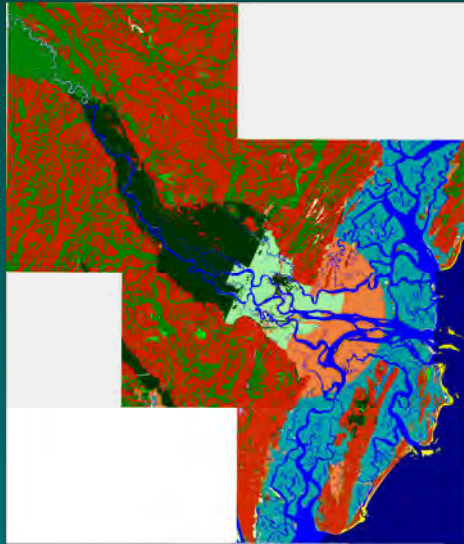
Altamaha River GA



Year 1983

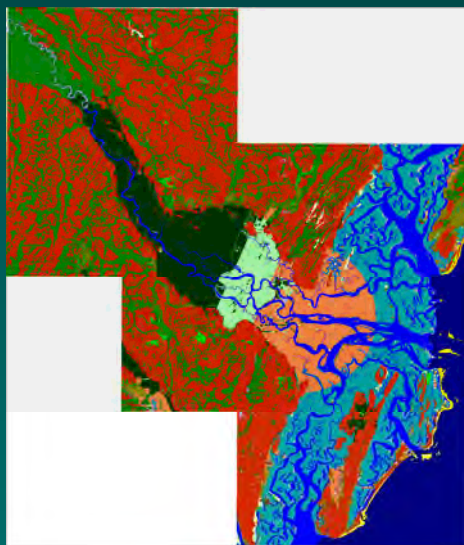
26

Altamaha River GA



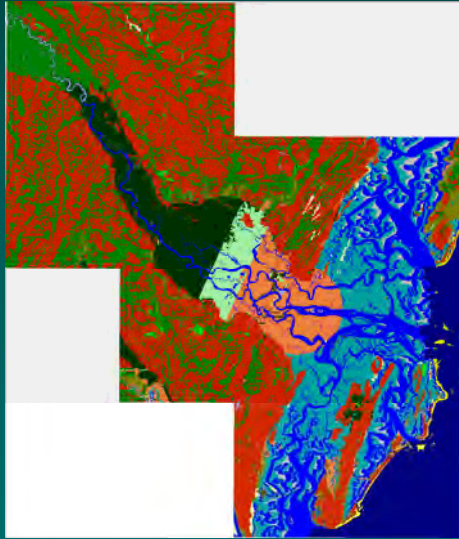
Year 2025

Altamaha River GA



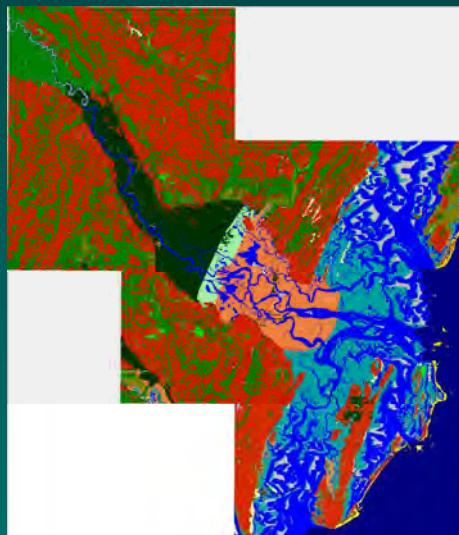
Year 2050

Altamaha River GA



Year 2075

Altamaha River GA



Year 2100

Why is FWS involved? 174 Coastal Refuges

- It allows us to be in compliance with DOI Secretarial Order 3289: *“consider and analyze potential climate change impacts... when developing multi-year management plans.”*
- The results of SLAMM simulations are being included in Refuge (CCPs) Comprehensive Conservation Plans.

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Relative Vulnerability

SLAMM provides policymakers with valuable information as to which sites are more vulnerable than others to sea-level rise and is a useful tool in assessing priorities when finances are limited.

For:

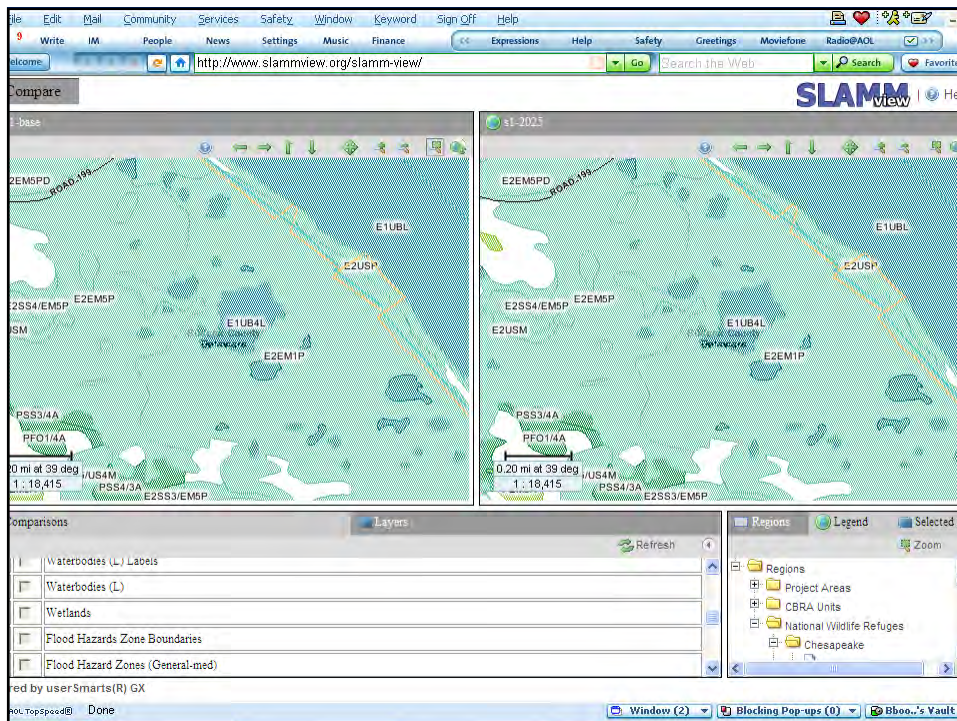
- Land acquisition
- Wetland restoration projects
- Species management

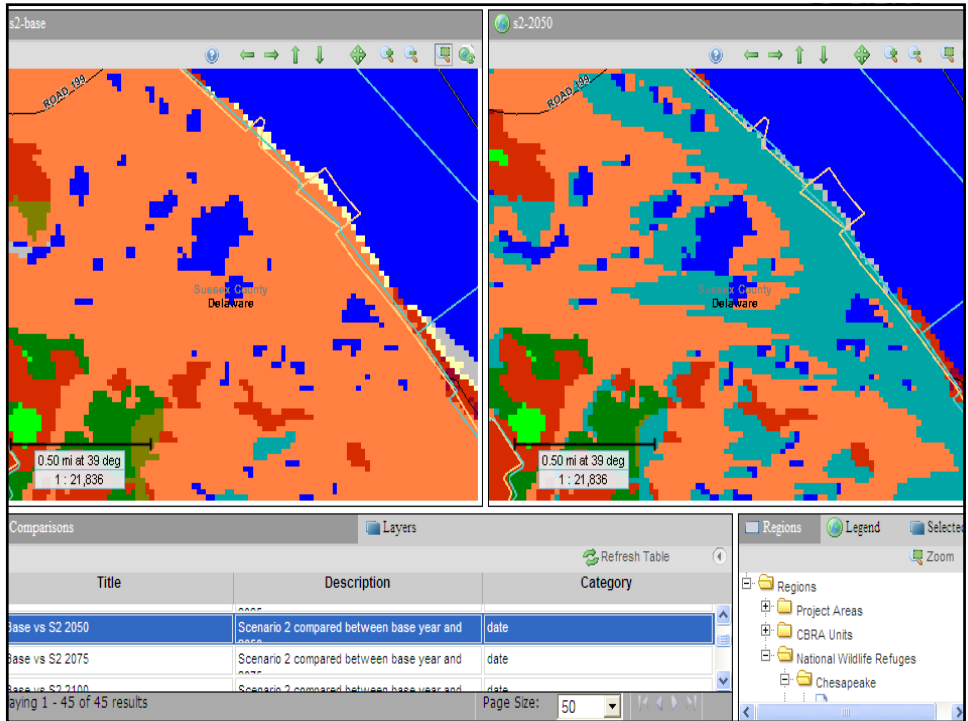
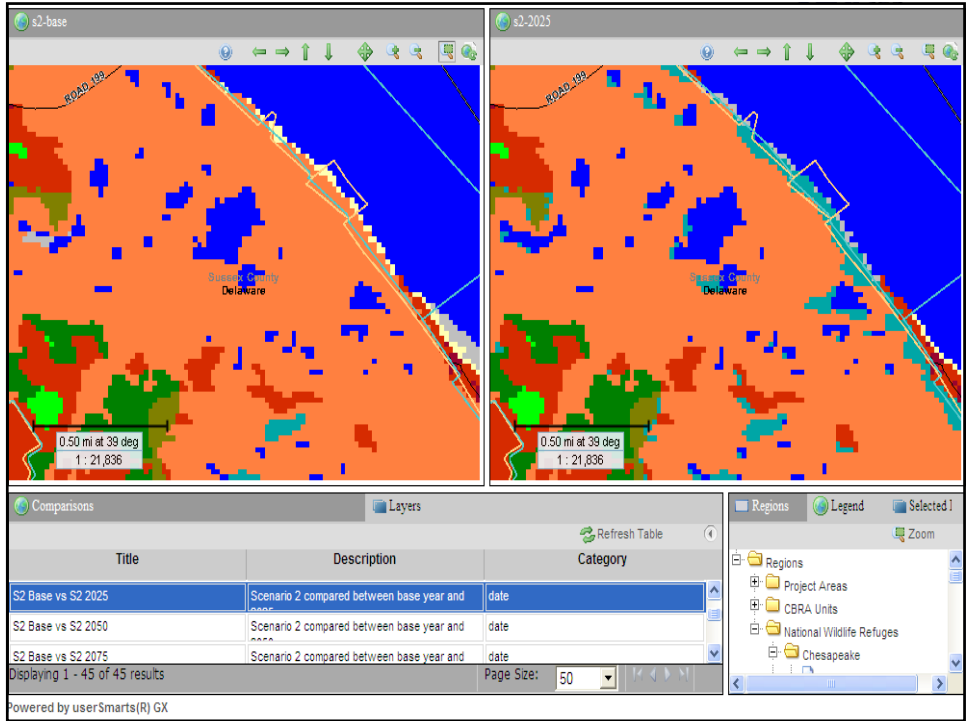
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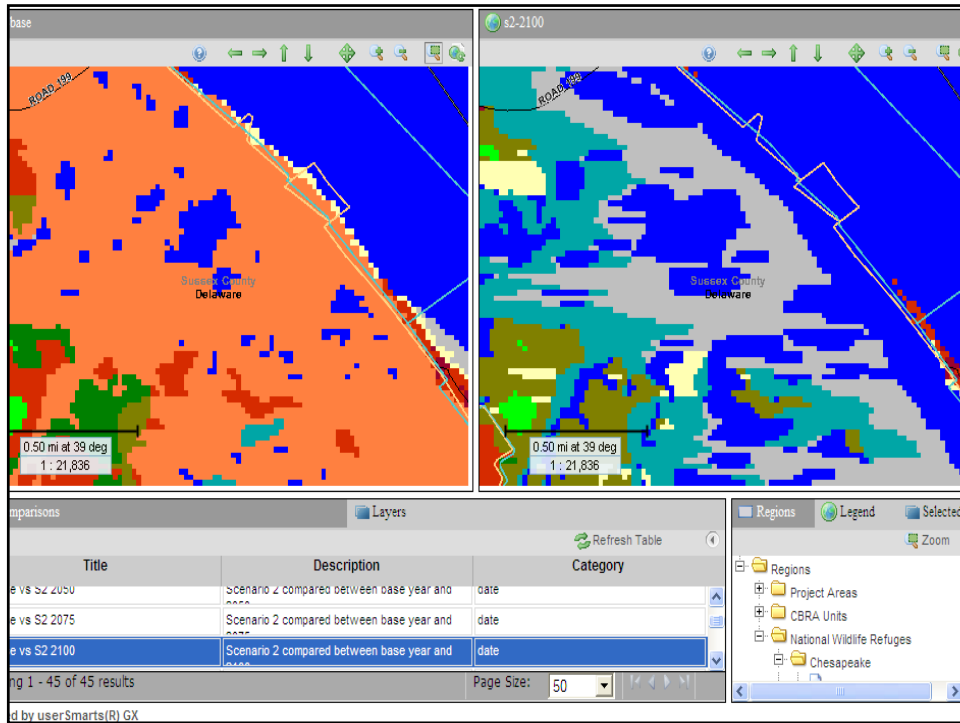
Why SLAMM?

- Because SLAMM runs on existing data available over the Internet and the model is available to the public.
- It is possible to produce comparative analysis over large areas relatively inexpensively.
- Areas like Chesapeake Bay, Puget Sound, the combined coasts of South Carolina and Georgia cost **tens** of thousands, not **hundreds** of thousand of dollars.

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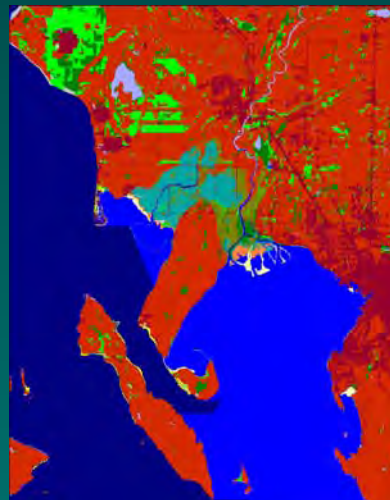
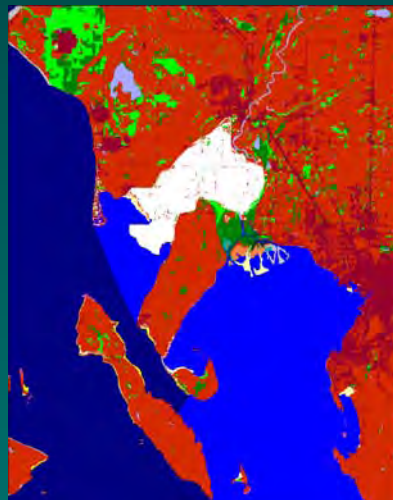




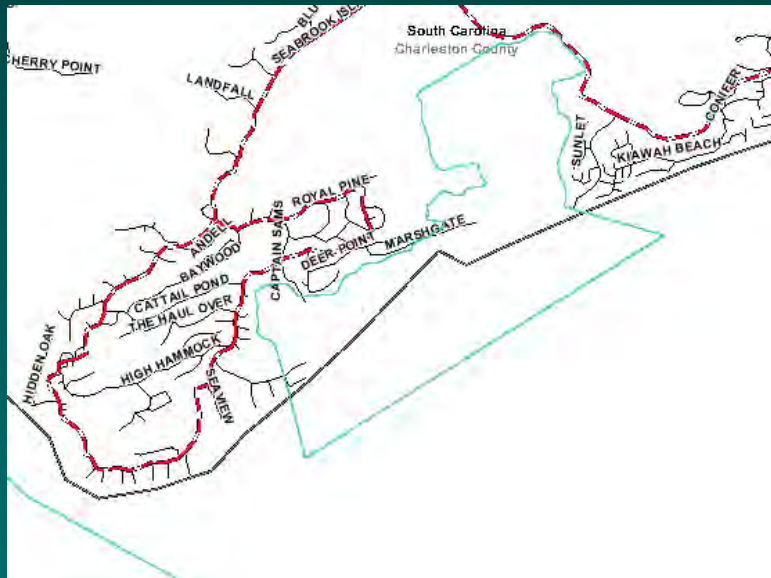
Nooksack Delta, Lummi Bay, and Bellingham Bay

Importance of Dikes (White)

Year 2100 (IPCC A1B Mean), No Dikes

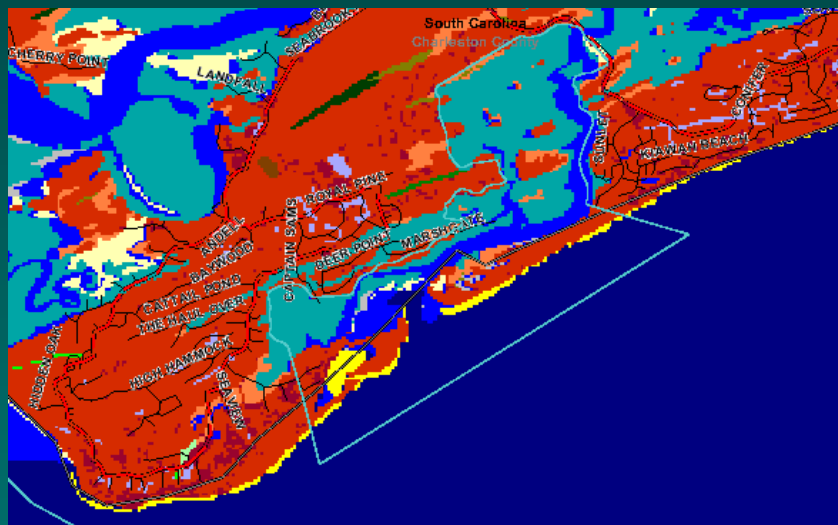


Captain Sam's Inlet, SC



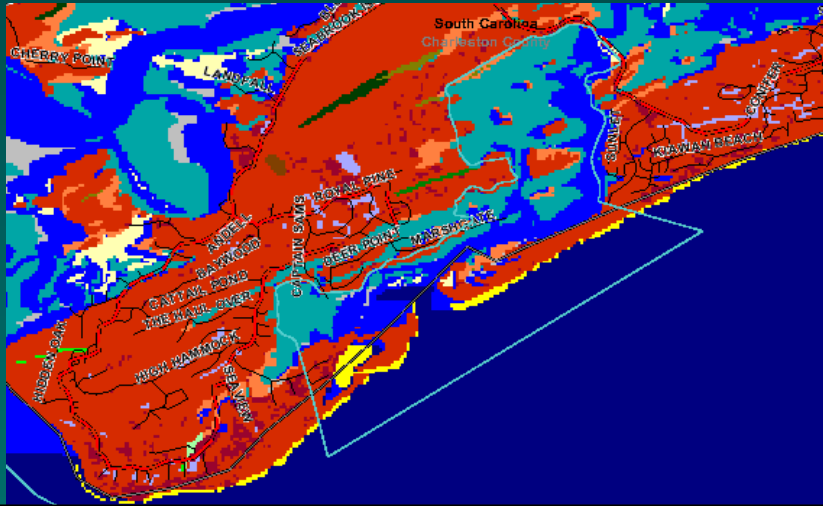
39

Captain Sam's Inlet, SC 2025

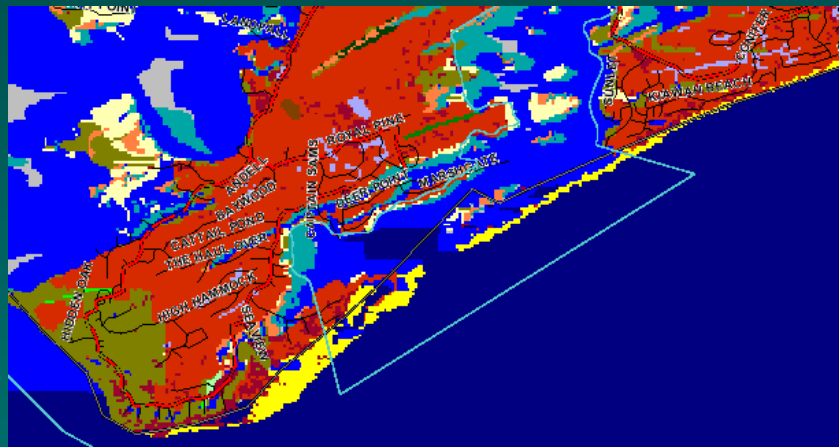


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Captain Sam's Inlet, SC 2050



Captain Sam's Inlet, SC 2100

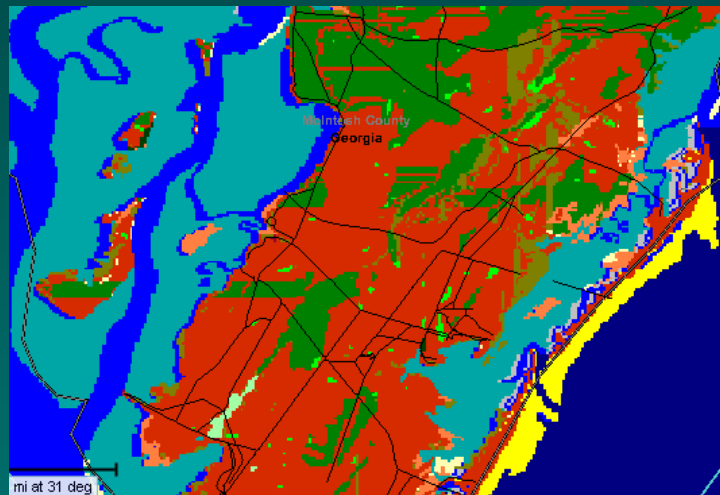


Saturation

- **Migration** of coastal wetlands onto adjacent uplands as a response to rising groundwater tables.
- Existing fresh groundwater floats on deeper brackish groundwater. As sea level rises, the level of brackish groundwater rises, pushing fresh groundwater to the surface of the soil -- creating favorable conditions for wetlands **migration (colonization)**.

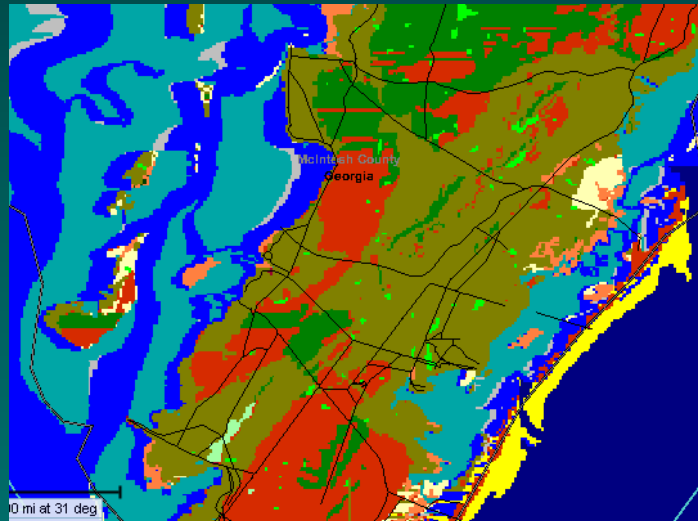
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Blackbeard Island NWR, GA 2025



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Blackbeard Island NWR, GA 2050



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Contributors

Too numerous to mention

- Everyone who makes their SLAMM related data available to others.
- Everyone who comments on the SLAMM Forum.
- Everyone who has provided constructive criticism.

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Upgrades within SLAMM 6

- **Funded through a grant administered by (and with the assistance of) The Nature Conservancy.**
- **Command line addition funded by the University of Florida.**
- **Additional refinements were funded by Industrial Economics under contract to the US Environmental Protection agency.**
- **Bill Wilen of the National Wetlands Inventory (NWI) who carefully examined all of the NWI to SLAMM code linkages.**

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How can you help?

- **Get your accretion data and your SLAMM simulations posted on the Internet.**
- **Help build the scientific foundation upon which SLAMM 7, 8, or 9 will be built.**
- **After you have reduced your carbon footprint, apply your talents to move SLAMM down the road.**

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Questions?

*Post your questions and feedback to
the SLAMM Forum*

To

<http://warrenpinnacle.com/SLAMMFORUM/>

OR

Google: SLAMM

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Habitat Priority Planner

Danielle Bamford

www.csc.noaa.gov/digitalcoast/tools/hpp/index.html



NOAA Coastal Services Center
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

Habitat Priority Planner At a Glance

- Decision support tool guiding management action for the following purposes:

- Conservation
- Land use
- Restoration

- Wizard design
- Intermediate GIS users
- Designed for interactive use with stakeholders



NOAA Coastal Services Center
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

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Tool Requirements

Software Requirements

- ArcGIS 9.3 or 9.2 (with current Service Pack)
- Spatial Analyst

Data Requirements

- Landcover layer (Raster or Vector)
<http://csc.noaa.gov/digitalcoast/data/index.html>
- Site - specific data sets (optional)



NOAA Coastal Services Center
LINKING PEOPLE, INFORMATION, AND TECHNOLOGY

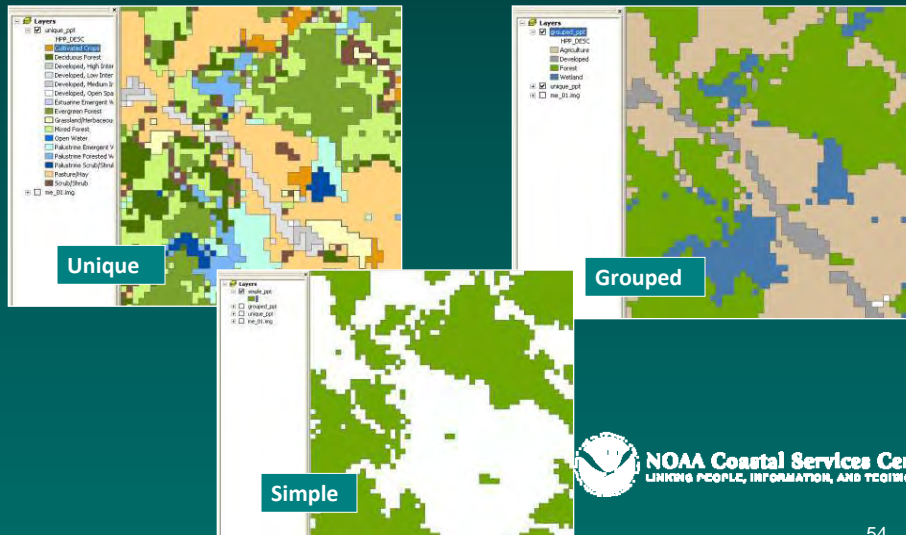
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Habitat Priority Planner



- Step 1: Classify habitats
- Step 2: Analyze habitats
- Step 3: Explore data

Step 1 - Classify Your Habitats customize your landcover



Step 2 - Habitat Analysis Optional Analyses

Landscape Analyses

Habitat Quality

- Size
- Perimeter-area ratio
- Core area

Habitat Connectivity

- Proximity
- Nearest neighbor

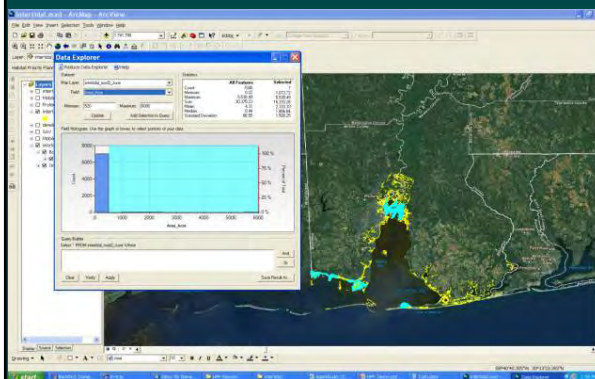
Custom Analyses

Relational Analyses

- Count
- Distance to
- Presence or absence
- Polygon overlay
- Linear distance within



Step 3 – Data Explorer intuitive data exploration



- Graph-based selections
- Easy query building
- Quick analysis
- Transparent decision-making



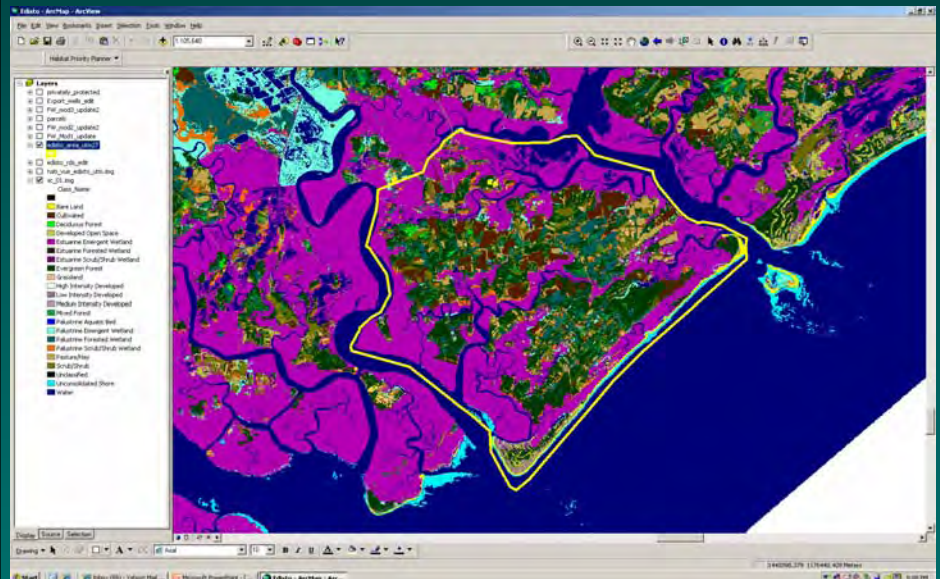
Step 3 – Data Explorer Example

Goal: Identify and conserve **large** patches of **freshwater wetlands** that impact drinking **water wells** and can be linked with **protected lands**



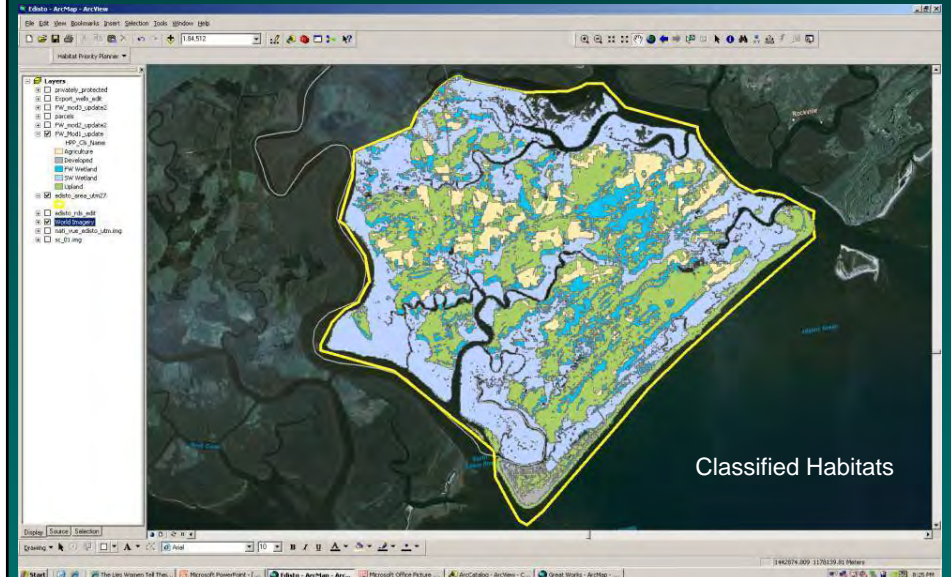
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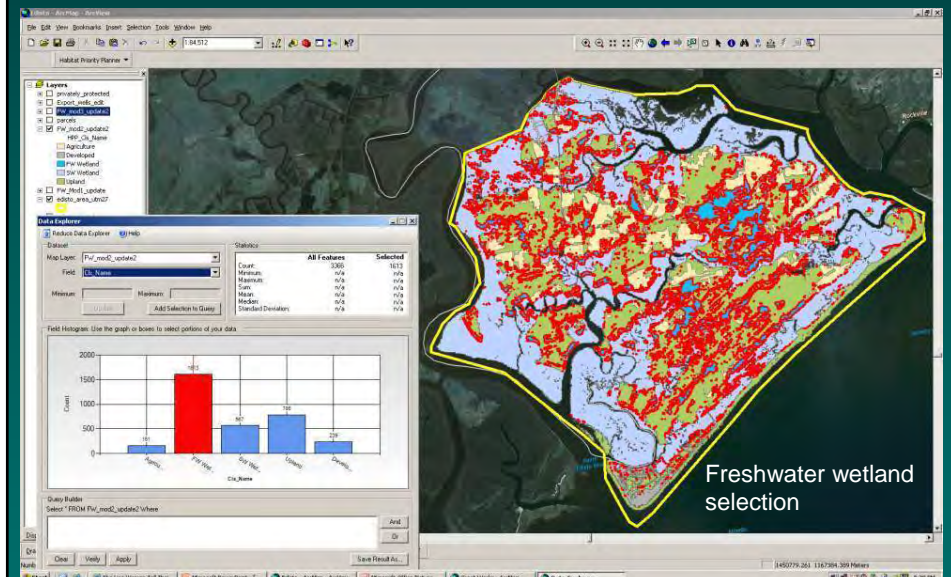
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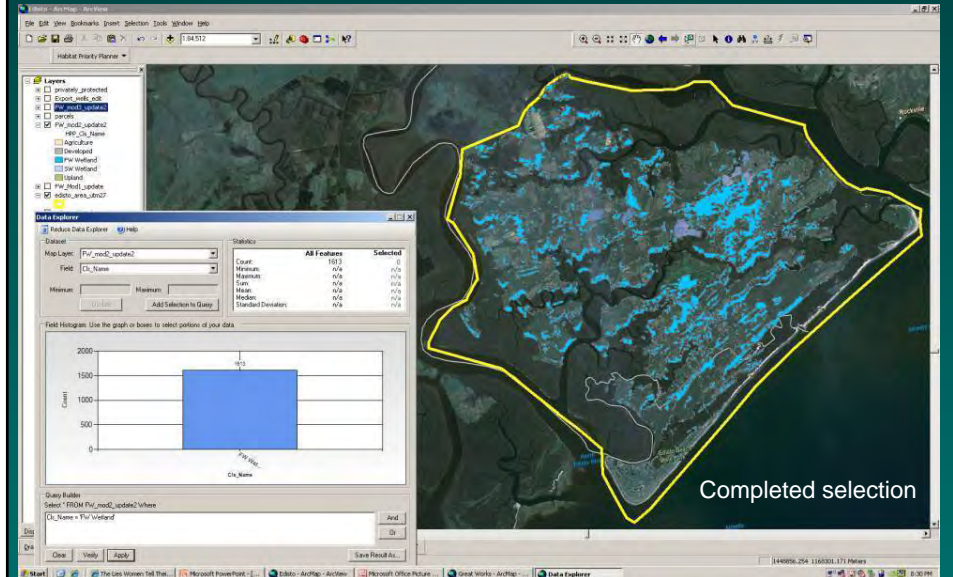
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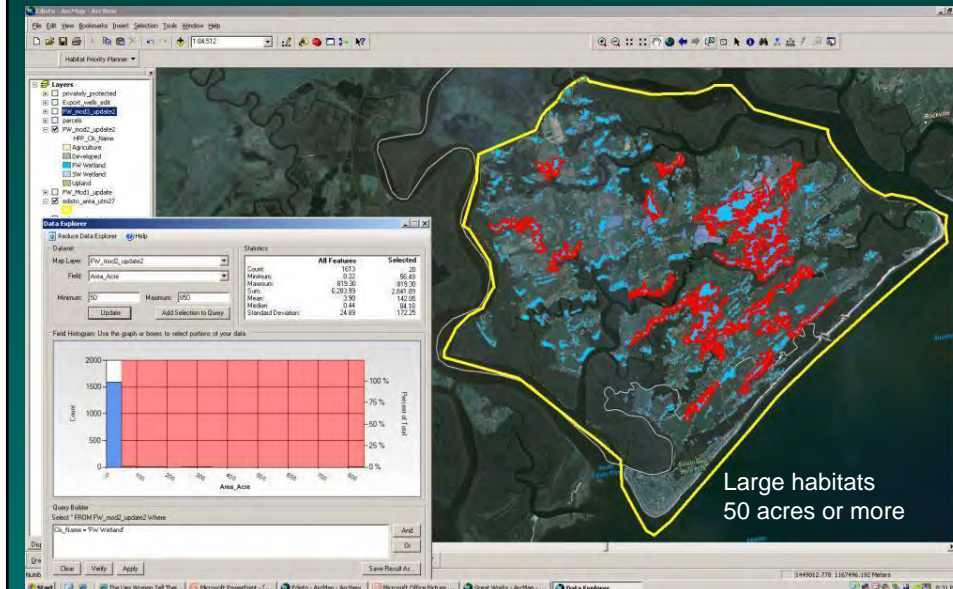
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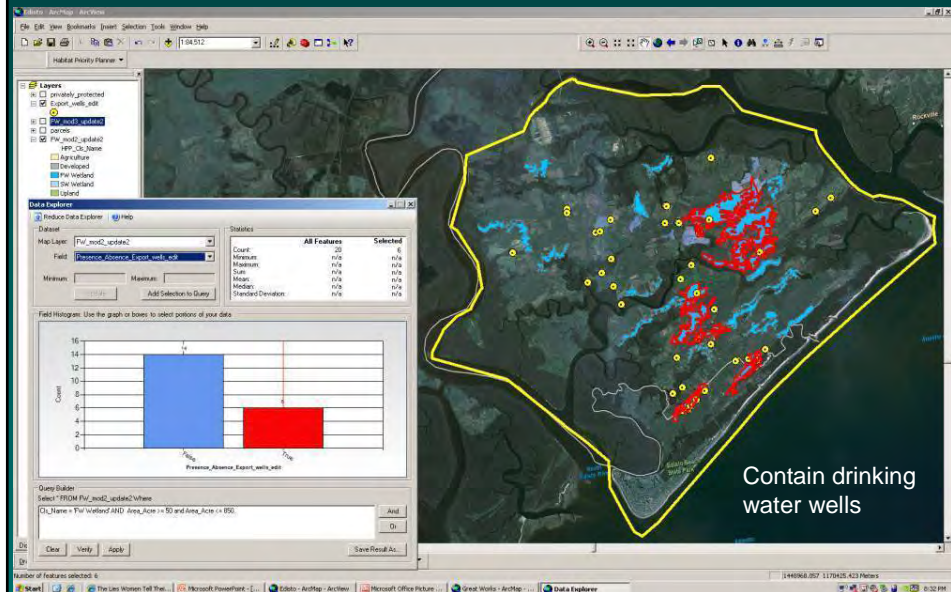
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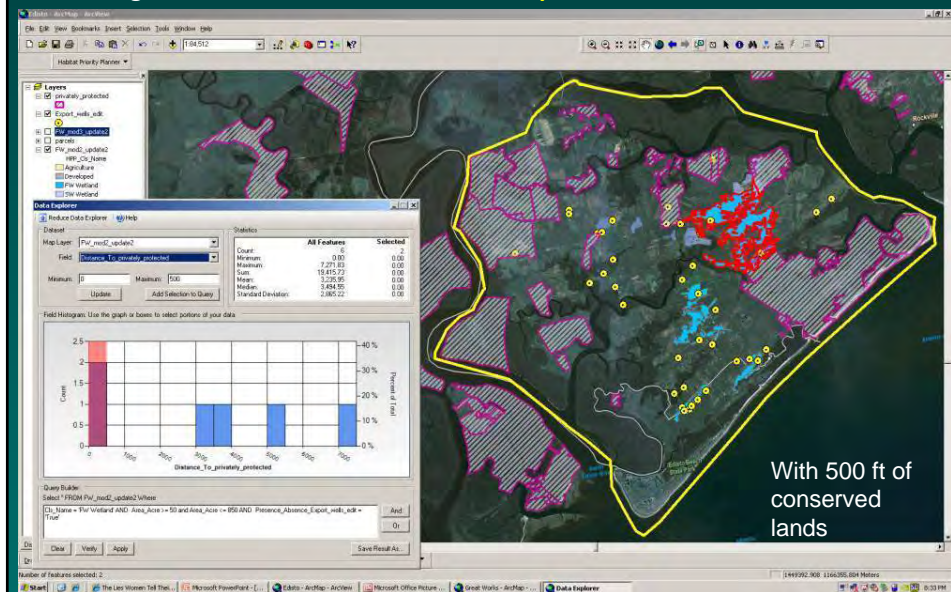
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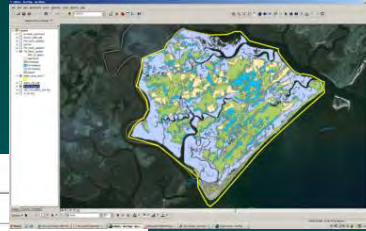
Step 3 – Data Explorer Example

Goal: Identify and conserve **large** patches of **freshwater wetlands** that impact drinking **water wells** and can be linked with **protected lands**



Habitat Priority Planner Outputs

Step 1:
Classified habitats



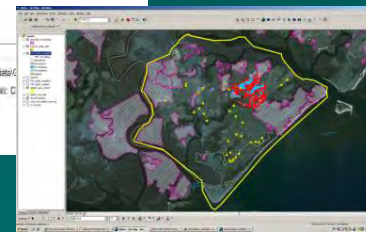
Step 2:
Habitat analysis
results
and report

Habitat Priority Planner
Project Flood

Project Information
Project Name: FVL_mod2
Project Settings File: C:\Program Files\NOAA Coastal Services Center\Habitat Priority Planner\analysis\FVL_mod2.xml
Habitat Layer: ehab_gpod_borders
(X:\habitat_priority_planner\giga_data\ES\io\gch\habitat_gpod_borders)

Analysis Distance Units: feet
Analysis Area Units: acres

Habitat Layer File Properties
Date Created: 4/16/2009 12:53:00 PM
Land Cover Raster: K:\habitat_priority_planner\giga_data\ES\io\gch\habitat_gpod_borders
Value Field: Value Name Static: C
Minimum Patch Size: No
Classification Type: Grouped
Classifications:



Step 3:
Habitats meeting
selection
criteria

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Building the User Community

- **Climate change adaptation**
South Carolina
- **Strategic conservation planning**
Maine, South Carolina, Alabama, Great Lakes
- **Restoration**
Maine, Great Lakes, Washington
- **Land-use planning**
Commonwealth of Northern Mariana Islands (CNMI), Hawaii and South Carolina
- **Water quality management**
Pacific Islands (CNMI), South Carolina



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Large-Scale Conservation Planning Mobile Bay, Alabama



- Resource Management:**
- National Estuaries Program (NEP) led effort
 - Add spatial context
 - Land to sea application
 - Data gap identification



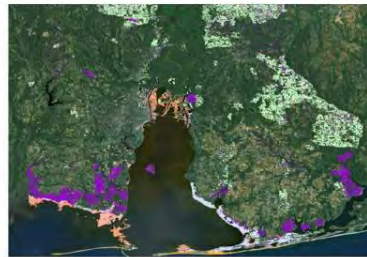
Large-Scale Conservation Planning Mobile Bay, Alabama

Mississippi – Alabama Habitats Tool

Conserve, Restore, Protect

Projects Database Habitat Mapper Help

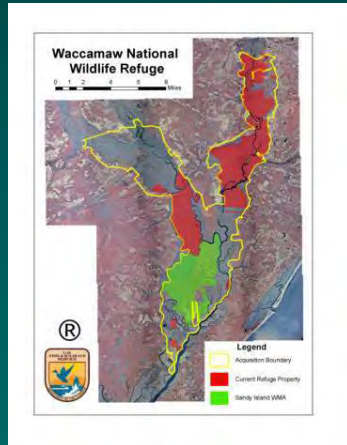
Welcome to the Mississippi-Alabama Habitats Tool! This site provides resources to aid conservation and restoration activities in Mississippi and Alabama, including a Projects Database and a Priority Habitat Mapper. The Projects Database includes information on conservation and restoration projects occurring in the two states. These projects can be visually viewed in the Habitat Mapper, which provides additional conservation planning data for Alabama's Mobile and Baldwin Counties. Included in these data are the priority habitats identified for conservation and restoration that were identified in 2008-2009 by the Mobile Bay National Estuary Program's Coastal Habitats Coordinating Team. Other data sets for further planning purposes include but are not limited to land cover, political boundaries, human uses, and ecological attributes for the two-county area. For more information about the process used to identify priority habitats, a [Prioritization Guide for Coastal Habitat Protection](#) has been prepared that provides an overview of the process used to develop consensus around priority habitat areas. For more information or to comment on this tool, please contact Mobile Bay National Estuary Program at 251-431-6409.



Do you have a login? [Click Here](#) <http://habitats.disl.org/>

U.S. Fish and Wildlife Service (FWS) Waccamaw, South Carolina

22,869 acres



- FWS national mandate to use Sea Level Affecting Marshes Model (SLAMM)
- Managers want site-specific analyses and guidance
- CSC interest in interoperability of HPP and other tool/model outputs



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Climate Change Analyses and HPP

Use climate change data as primary input

Relate other important local data to scenarios

View “before” and “after”—visualize change and loss



Freshwater Tidal Wetlands



Cypress “bone yard” within a brackish marsh



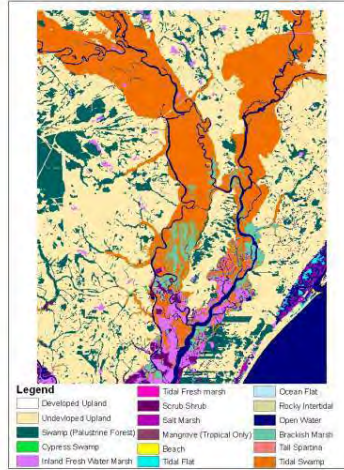
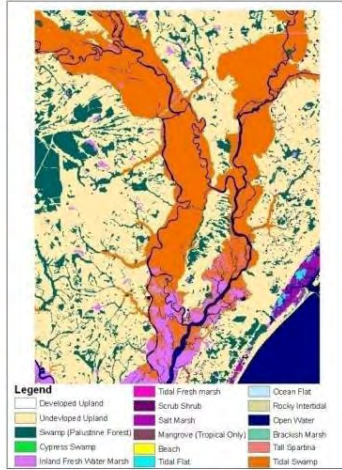
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SLAMM Output for 2025

Initial Condition

Site Specific analysis SLAMM

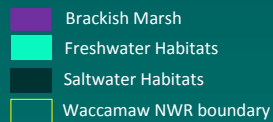
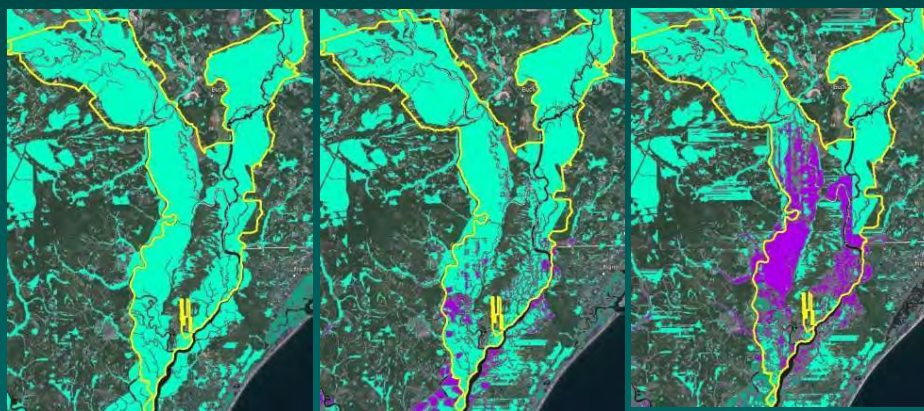


HPP Wetland Groups

Initial Condition

2025

2050



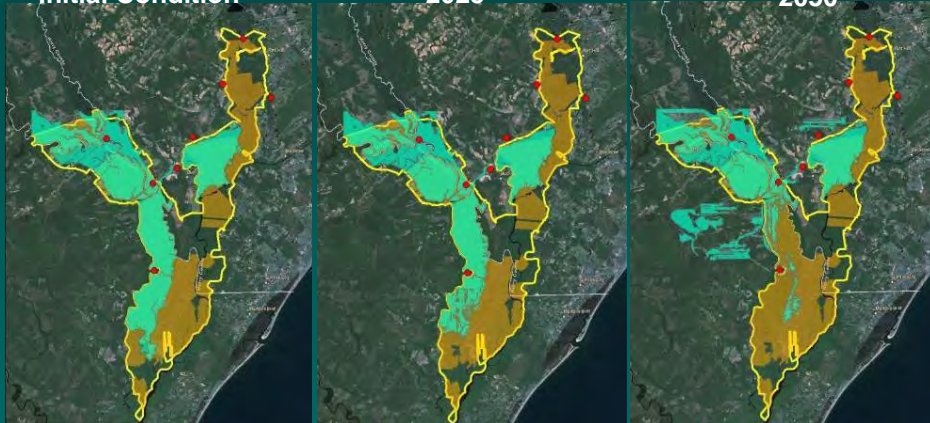
Freshwater Habitat Prioritization

- Freshwater habitats that are protected
- Within one mile of Swallow Tail Kite (SWTK) nest

Initial Condition

2025

2050



Freshwater Marsh
Waccamaw NWR boundary

SWTK Nesting Sites
Conserved Lands



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From the
Habitat Priority Planner Development Team

For More Information:
Download the tool and instructions from
www.csc.noaa.gov/digitalcoast/tools/hpp/index.html

Or contact Danielle.Bamford@noaa.gov



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Comprehensive Coastal Resource Management Plan A Geospatial Toolbox for Local Governments

Marcia Berman
Center for Coastal Resources Management
Virginia Institute of Marine Science

<http://ccrm.vims.edu>



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WHAT IS A COMPREHENSIVE COASTAL RESOURCE MANAGEMENT PLAN (CCRMP)?

- ecosystem based strategy to sustain ecosystem services;
- provides guidance for local governments;
- focused on:
 - riparian lands management
 - tidal lands: wetlands, beaches, and dunes
 - subaqueous lands: SAV, oyster reefs
 - non-tidal wetlands

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COMPONENTS OF A CCRMP

Comprehensive Shoreline Inventory
Wetlands Inventory
Geospatial Shoreline Management Model
Nontidal Wetlands Condition Assessment
Wetlands Mitigation/Restoration Targeting Tool
Climate Change Vulnerability models
Conservation Targeting Tool
Shallow Water Use Conflict Assessment

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COMPONENTS OF A CCRMP

Comprehensive Shoreline Inventory
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Climate Change Vulnerability models
Conservation Targeting Tool
Shallow Water Use Conflict Assessment

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COMPREHENSIVE SHORELINE INVENTORY

- Riparian land use classification
- Bank assessment
- Shoreline characterization



http://ccrm.vims.edu/gis_data_maps/shoreline_inventory

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Shoreline Inventory Reports Wicomico County, MD



Wicomico County, Maryland

Digital Shoreline Situation Report (SSRs) - Description and Disclaimer

DESCRIPTION

The Comprehensive Coastal Inventory Program (CCI) at the Virginia Institute of Marine Science (VIMS) is generating new Shoreline Situation Reports (SSRs) for coastal localities in the state of Maryland. This effort complements a parallel effort in Virginia by the same group. SSRs were developed by VIMS in the 1970s for Virginia and have been the foundation for shoreline management planning in Tidewater Virginia ever since. CCI has developed new protocols for collecting, disseminating, and reporting data relevant to shoreline management issues using state of the art mapping and remote sensing techniques. New SSRs are being generated on a county by county basis for Maryland and Virginia. This series is published entirely in digital format.

The data inventory developed for the Shoreline Situation Reports is based on a three-tiered shoreline assessment approach. In most cases this assessment characterizes conditions that can be observed from a small boat navigating along the shoreline. Hand-held GPS units are used to log features observed. The three tiered shoreline assessment approach divides the shoreline into three regions: 1) the immediate riparian zone, evaluated for land use; 2) the bank, evaluated for height, stability, cover and natural protection; and 3) the shoreline, describing the presence of shoreline structures for shore protection and recreational purposes.

[Maps](#)
[Photos](#)
[Reports](#)
[Metadata](#)
[GIS Data](#)
[Photos](#)

Riparian Land Use

- [Plate 1](#)
- [Plate 2](#)
- [Plate 3](#)
- [Plate 4](#)
- [Plate 5](#)
- [Plate 6](#)
- [Plate 7](#)
- [Plate 8](#)
- [Plate 9](#)
- [Plate 10](#)
- [Plate 11](#)
- [Plate 12](#)
- [Plate 13](#)
- [Plate 14](#)
- [Plate 15](#)
- [Wicomico](#)
- [Plate 16](#)
- [Plate 17](#)
- [Plate 18](#)
- [Plate 19](#)
- [Plate 20](#)
- [Plate 21](#)

Bank and Buffer



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Riparian Land Use



LANCASTER COUNTY

PLATE 6a



Riparian Land Use

Legend

- forest
- scrub-shrub
- grass
- residential
- commercial
- bare
- agriculture



Shoreline Characterization



Legend

- bulkhead
- riprap
- marina
- golf field
- jetty
- breakwater
- boathouse
- pier/wharf
- private boat ramp
- public boat ramp

Geospatial Shoreline Management Model

- Automated science-based decision support tool
- Integrates management across coastal profile
- Returns 11 different options for erosion control

do nothing → living shoreline → traditional



Mathews County, VA Shoreline Management Model

Legend

- Currently defended
- No action needed
- No action needed &/or bank mod. &/or veg. man.
- No action needed &/or upland mod.
- No action needed &/or veg. man.
- Bank mod.
- Bank mod. &/or breakwaters
- Bank mod. &/or breakwaters &/or revetment
- Bank mod. &/or planting w/ biologs
- Bank mod. &/or planting w/ sill
- Bank mod. &/or planting w/ sill &/or upland mod.
- Bank mod. &/or upland mod.
- Beach nourishment
- Planting w/ biologs
- Planting w/ sill
- Breakwaters
- Revetment
- Upland mod. &/or planting w/ sill
- Veg. man. &/or planting w/ biologs
- Veg. man. &/or planting w/ sill



Mathews County, VA Shoreline Management Model

Legend

- Currently defended
- No action needed
- No action needed &/or bank mod. &/or veg. man.
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- Bank mod. &/or planting w/ biologs
- Bank mod. &/or planting w/ sill
- Bank mod. &/or planting w/ sill &/or upland mod.
- Bank mod. &/or upland mod.
- Beach nourishment.
- Planting w/ biologs
- Planting w/ sill
- Breakwaters
- Revetment
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- Veg. man. &/or planting w/ biologs
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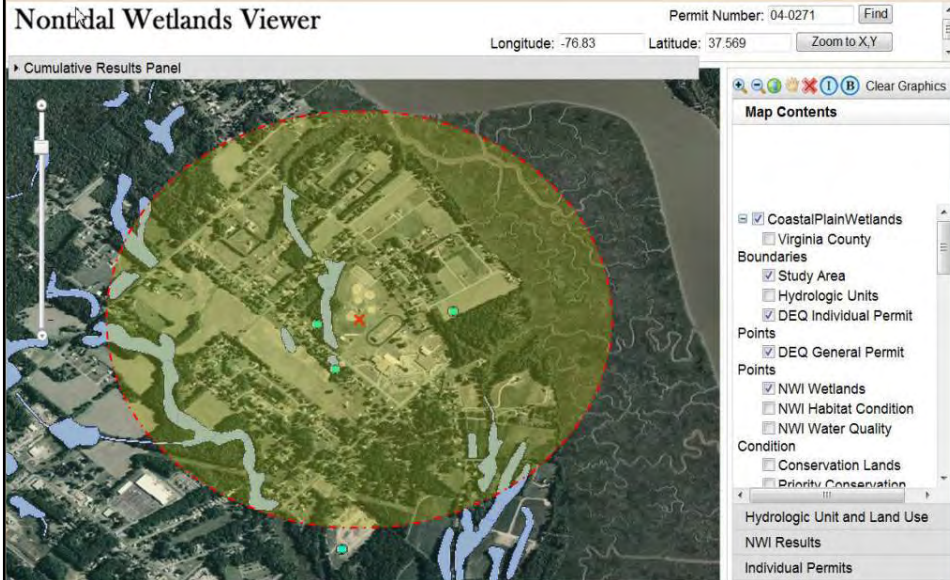


Non-tidal Wetlands Condition Assessment

- Multi-level condition assessment
- Landscape emphasis
- Focused on ecosystem service impacts



Non-tidal Wetlands Condition Assessment



Non-tidal Wetlands Condition Assessment



Non-tidal Wetlands Condition Assessment

Non-tidal Wetlands Viewer Permit Number: 04-0271

Longitude: -76.83 Latitude: 37.569

Cumulative Results Panel

Permit Results:

Permit Number	SPGP Type	Activity Type	Project Description	Date Effective
WP1-02-2070	Activity 1, Category A	Residential	Will develop a subdivision to impact under a 1/10 acre	Jan 24 2003 12:00AM
WP1-02-2071	Activity 1, Category A	Residential	Will develop several lots filling 1/0 acre under the 1984 subdivision rule	Jan 24 2003 12:00AM
WP1-05-0628		Residential	Owner of property constructed a temporary road crossing for logging purposes that he now wants to make a permanent road crossing.	May 11 2005 12:00AM

NWI Results:

The number of NWI nontidal wetlands within this buffer is 18. The mean Habitat Score is 0.38, the mean Potential Habitat Restoration score is 0.57, the mean Water Quality Score is 0.23, and the mean Potential Water Quality Restoration score is 4.04

Attribute	Hectares	Habitat Score	Habitat Stress Level	Habitat Restoration Potential	Water Quality Score	WQ Stress Level	WQ Restoration Potential
PEM1R	1.5	0.2167	Severely Stressed	0.6923	0.325	Somewhat Stressed	2.0769
PFO1/4C	0.3	0.45	Somewhat Stressed	0.4444	0.1	Severely Stressed	6.75
PFO1/SS1A	1.2	0.2333	Severely Stressed	0.8571	0.325	Somewhat Stressed	2.0769
PFO1/SS1C	0.4	0.3333	Severely Stressed	0.45	0.325	Somewhat Stressed	1.3846

Map Contents

- CoastalPlainWetlands
- Virginia County
- Boundaries**
 - Study Area
 - Hydrologic Units
 - DEQ Individual Permit
- Points**
 - DEQ General Permit
- Condition**
 - NWI Wetlands
 - NWI Habitat Condition
 - NWI Water Quality
- Conservation Lands**
 - Priority Conservation
- Hydrologic Unit and Land Use**
- NWI Results**
- Individual Permits**

WETLAND MITIGATION/RESTORATION TARGETING TOOL

- Automated decision support query tool
- Landscape approach to site selection for mitigation
- Model drivers:
 - location of existing wetlands
 - hydrology
 - soils
 - land use

File Edit View Go Bookmarks Tools Window Help

http://rmapr52.wetlan.vims.edu/wetlands/viewer.htm

Hampton Roads Wetlands Mitigation Selection Tool

Layers

Visible Active

- Study area
- Locality names
- Localities
- Hydrology

Legend

- Selected Feat
- Study area
- Locality name
- Localities
- Hydrologic uni
- Hydrologic uni
- Restoration ra
- potential
- moderate
- good
- high

Query/Selection Results - Netscape

Restoration ranking											
Rec	PERIMETER	ID_NUMBER	ATTRIBUTE	WETLAND	HYDRIC	TRINSIDE	LU	STR_CONN	COINC_A	COINC_P	
1	1088.4050833194	82898	U	U	Y	0	ag	Y			Y
2	833.79937230819	86347	U	U	Y	0	ag	Y			Y
3	1159.0276875817	88984	U	U	Y	0	ag	Y			Y
4	1395.8289725027	73387	U	U	Y	0	ag	Y			Y
5	1271.4697371816	76440	U	U	Y	0	ag	Y			Y

[Zoom to these records](#) [Item descriptions](#)

Zoom In 5-10 City of Virginia Beach K42 Excellent

[How to use](#) [Hydrologic unit code descriptions](#) [Contact us](#) Last updated: 12/04/03

Restoration ranking																
METER	ID_NUMBER	ATTRIBUTE	WETLAND	HYDRIC	TRINSIDE	LU	STR_CONN	COINC_A	COINC_P	COINCIDENT	ADJ_WET	CONNECT	COINOUT	STR_CONN2	RESTOR	CONS_L
50833194	82898	U	U	Y	0	ag	Y		Y	Y		cc	Y	Y	excellent	Y

[Item descriptions](#)

Layers

Visible Active

- Study area
- Locality names
- Localities
- Hydrology
- Hydrologic unit codes
- Hydrologic units
- Restoration ranking
- USGS quads

Legend

- Selected Feat
- Study area
- Locality name
- Localities
- Hydrologic uni
- Hydrologic uni
- Restoration ra
- potential
- moderate
- good
- high
- excellent
- Other
- USGS quads

Identify 5-10 City of Virginia Beach K42 Excellent

[How to use](#) [Hydrologic unit code descriptions](#) [Contact us](#) Last updated: 12/04/03

CLIMATE CHANGE VULNERABILITY

- ... PREDICTING SHIFTS IN KEY COASTAL HABITATS
- ... THROUGH MAPS, MODELS, AND INTERACTIVE TOOLS

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Climate Change Vulnerability Models



Shallow-Water and Tidal Wetlands – projected shifts due to sea level rise



Tidal Marsh Vulnerability – risk based on geomorphology and development patterns



Estuarine Beach Vulnerability – risk based on geomorphology and development patterns



Submerged Aquatic Vegetation – projected shifts due to sea level rise and elevated temperatures



Vulnerable Developed Lands – vulnerability to inundation

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Climate Change Vulnerability Models



Shallow-Water and Tidal Wetlands – projected shifts due to sea level rise



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Submerged Aquatic Vegetation – projected shifts due to sea level rise and elevated temperatures



Vulnerable Developed Lands – vulnerability to inundation

Tidal Marsh Vulnerability



High risk marshes = entirely adjacent to hardened shoreline, riparian land development &/or banks > 5 ft

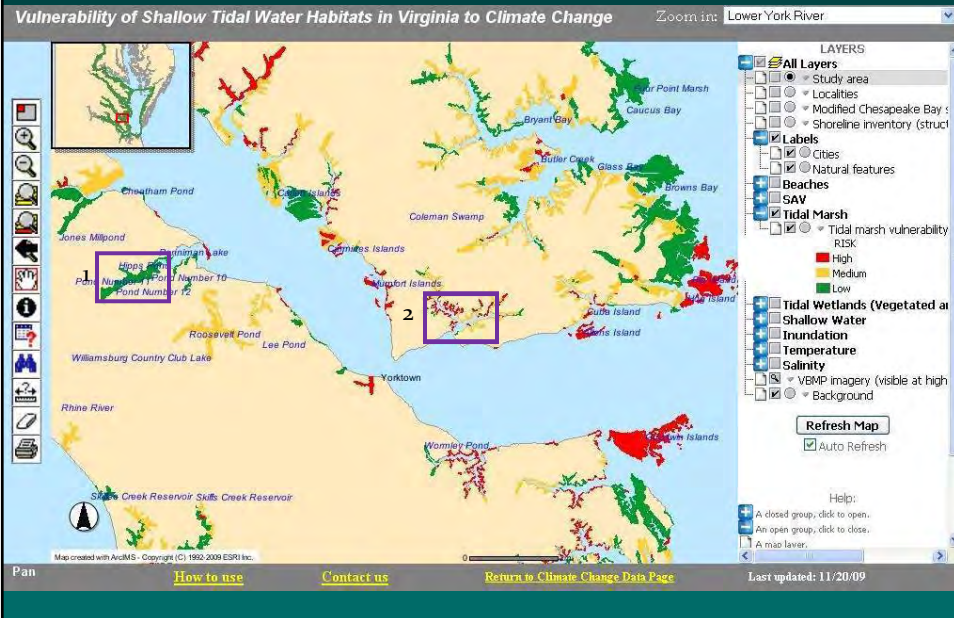
Moderate risk marshes = adjacent to mixed land use conditions (e.g. partial association with shoreline hardening or riparian development)

Low risk marshes* = entirely adjacent to natural lands, a shoreline without structures, & banks < 5ft

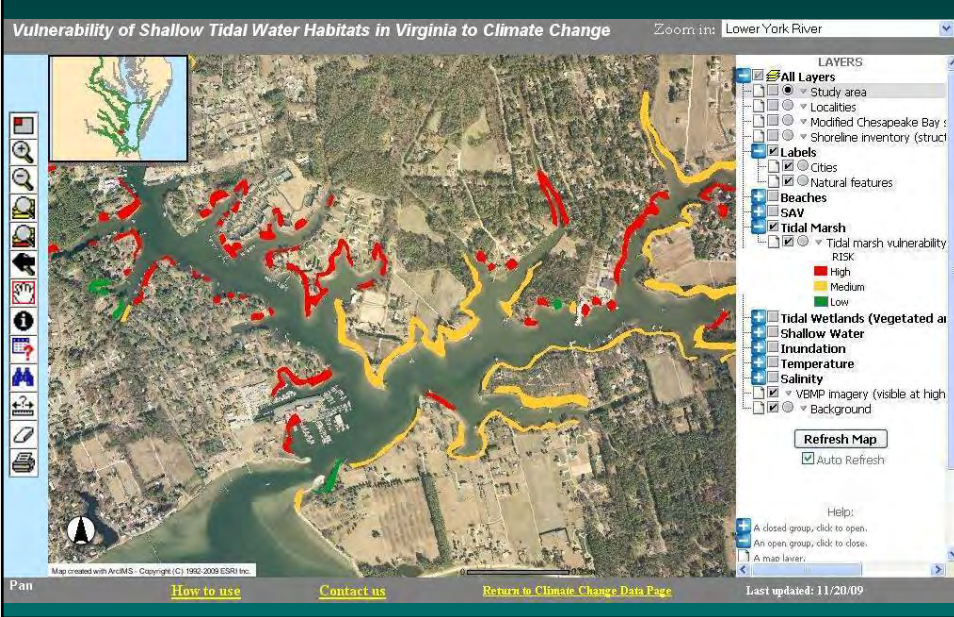
**Represent preservation opportunities*

Based on Tidal Marsh Inventory (1972 -1988; site visits to all tidal marshes)

Interactive Tool: Tidal Marsh Vulnerability



Interactive Tool: Tidal Marsh Vulnerability



PUTTING IT ALL TOGETHER YORK RIVER WATERSHED CCRMP

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Wetlands Inventory
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Shallow Water Use Conflict Assessment

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Questions?

<http://ccrm.vims.edu>



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May is American Wetlands Month!

This May will mark the 20th anniversary of American Wetlands Month, a time when EPA and its partners celebrate the vital importance of wetlands to the Nation.

This year, EPA is focusing on coastal wetlands throughout the month. Visit EPA's AWM Web site to find events in your area.

www.epa.gov/wetlands/awm

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Speaker Contact Information

Dr. Bill O. Wilen, Chair, Wetlands Subcommittee, Federal Geographic Data Committee, National Wetlands Inventory, U.S. Fish and Wildlife Service

bill_wilen@fws.gov

Danielle Bamford, Environmental Scientist, The Baldwin Group, on contract to Coastal Services Center, National Oceanic and Atmospheric Administration

danielle.bamford@noaa.gov

Marcia Berman, Coastal Geologist and Director, Comprehensive Coastal Inventory Program, Center for Coastal Resources Management, Virginia Institute of Marine Science, College of William and Mary

marcia@vims.edu

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Participation Certificate

If you would like to obtain participation certificates for multiple attendees, click the link below:

www.epa.gov/owow/watershed/wacademy/webcasts/pdf/2010_5_4_certificate.pdf

You can type each of the attendees names in and print the certificates