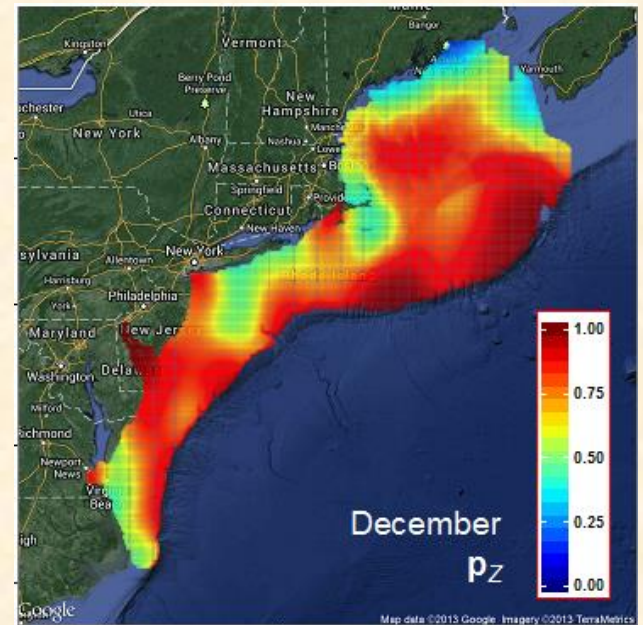
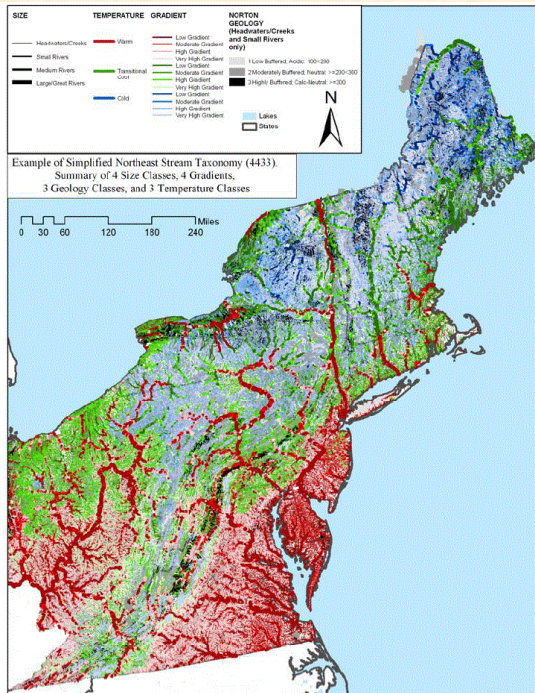


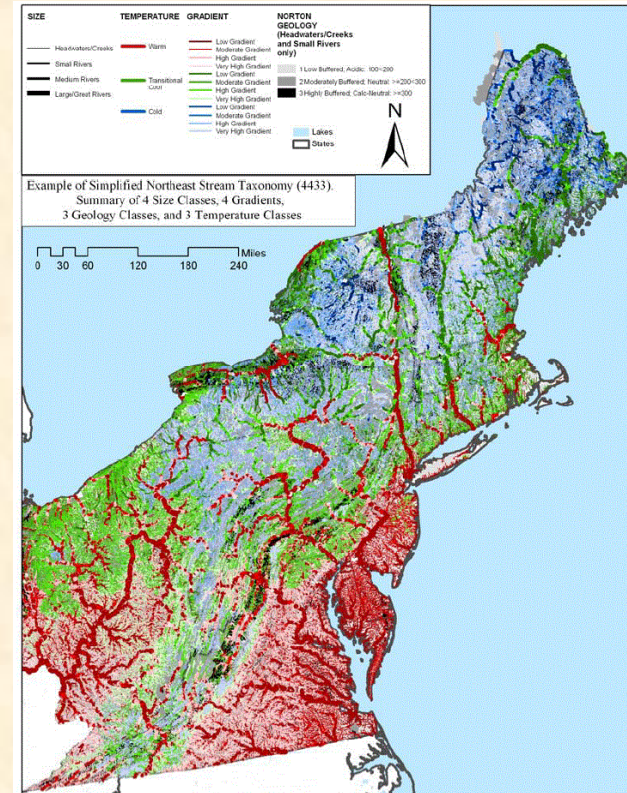
March 10 2015
Status of

North Atlantic LCC Projects



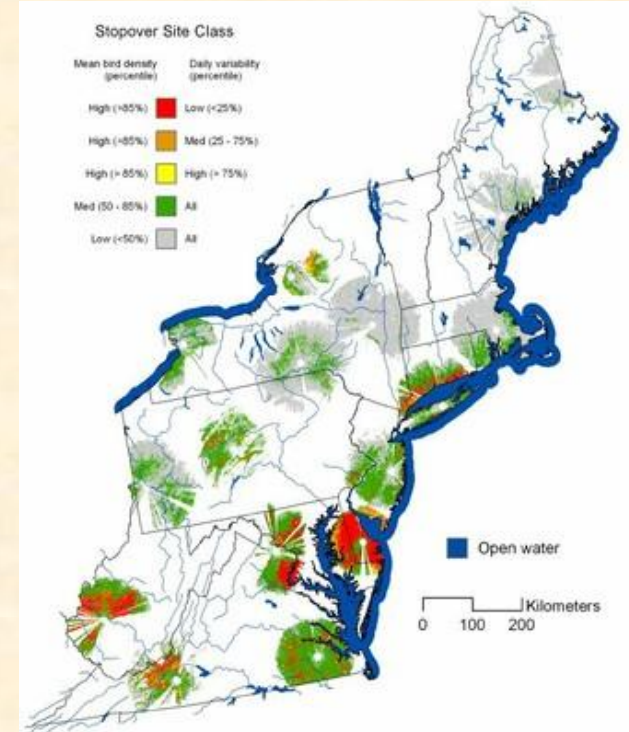
Foundational Mapping: Northeast Aquatic Classification

| | |
|---|---|
| <p>North Atlantic LCC Role</p> | <p>NEAFWA Project; support TNC revisions to streams (tidal component) and lakes</p> |
| <p>Products</p> | <p>Classification of Northeast streams and lakes</p> |
| <p>Available Now</p> | <p>Stream classification including new tidal component + guide; initial lake classification</p> |
| <p>Available within 3-6 months</p> | <p>Enhanced lake classification including lake depth and temperature</p> |
| <p>Intended users</p> | <p>Agencies and NGOs working on state or regional conservation planning</p> |



Foundational Mapping: Important Migratory Landbird Stopover Sites

| | |
|------------------------------------|--|
| North Atlantic LCC Role | Co-sponsoring with USFWS, MD, USGS, U. of DE (lead), VCU, TNC, NASA |
| Products | Improved models of important fall migration stopover sites, based on weather radar and field surveys |
| Available Now | 6 years of analyzed radar data; initial field survey results |
| Available within 3-6 months | |
| Longer Term | Complete report and maps (Dec. 2015) |
| Intended users | Bird conservation managers at regional, state, and local levels |



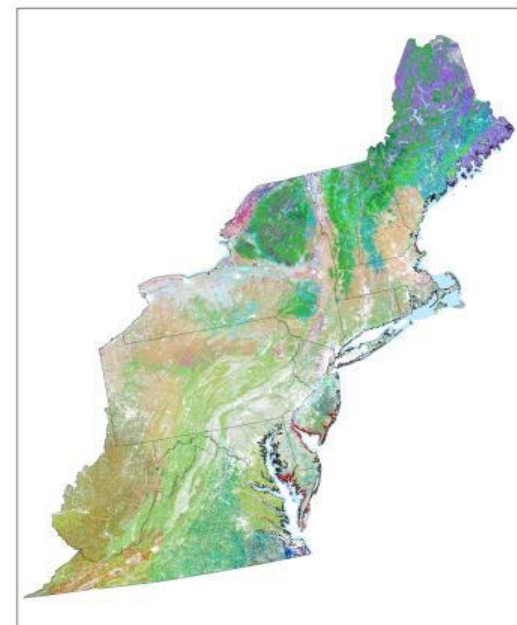
Foundational Mapping: Compilation of Regional Vernal Pool Data

| | |
|------------------------------------|---|
| North Atlantic LCC Role | Sponsoring project by Vermont Center for Ecostudies and UVM (initiated Jan. 2014) |
| Products | Regional GIS dataset of locations of potential or documented vernal pools; methods for remote sensing location of pools |
| Available Now | Unified database structure |
| Available within 3-6 months | Remote sensing demonstrations |
| Longer Term | Complete report and dataset on NALCC Conservation Planning Atlas (Dec. 2015) |
| Intended users | Organizations concerned with amphibian, reptile, and vernal pool reptile conservation |



Foundational Mapping: Northeast Terrestrial Habitat Map

| | |
|---|--|
| North Atlantic LCC Role | Support revising NEAFWA-sponsored project by TNC and UMass |
| Products | Classified terrestrial habitat map |
| Available Now | Virginia revisions (2012) March 2014: UMass enhancements to reflect roads, streams, 2006 development, and revised coastal NWI |
| Available within 3-6 months | Expansion to Canadian portion of LCC (2015) |
| Intended users | Many organizations involved in conservation planning & design; Canadian and trans-boundary partners |
| Connections to other projects/products | Foundational dataset for <i>Designing Sustainable Landscapes</i> |



Foundational Mapping: Coastal and Marine Ecological Classification

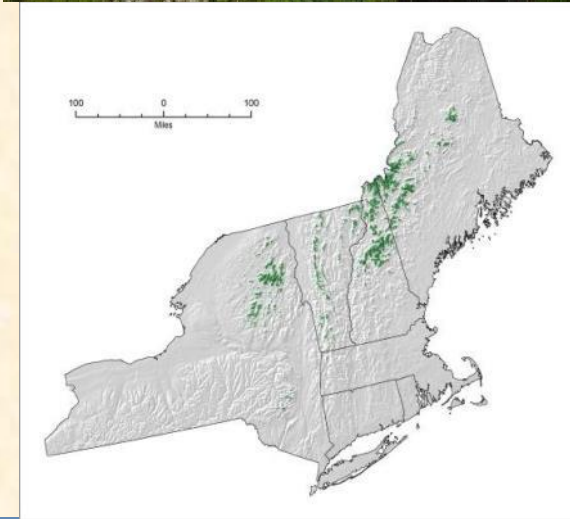
| | |
|--------------------------------|---|
| North Atlantic LCC Role | Sponsoring project by TNC, Mass. DFG, and URI; coordination with NROC |
| Products | Report, crosswalk and maps testing the classification at 3 spatial scales |
| Available Now | Peer-reviewed final report; spreadsheet with crosswalks; CMECS maps with habitats classified at the regional subregional, and local scales. |
| Longer Term/next steps | Include crosswalks and mapping of North Atlantic with NROC, MARCO, and Regional Planning Bodies; additional mapping? |
| Intended users | NROC, MARCO, state & fed agencies that are mapping, environmental managers |



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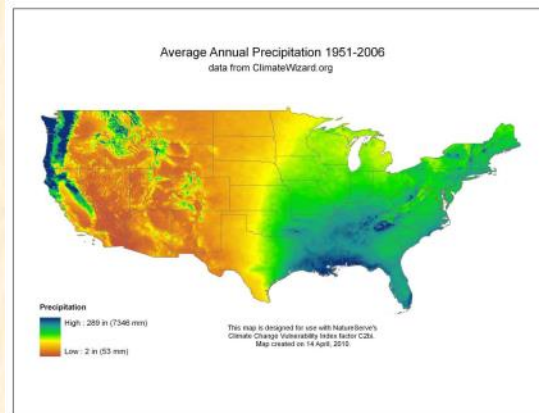
Vulnerability Assessments: Habitat Vulnerability to Climate Change

| | |
|---|---|
| North Atlantic LCC Role | Completing NEAFWA-sponsored project by Manomet/NWF |
| Products | 3 reports: terrestrial/wetland; cold water; and coastal habitats |
| Available Now | Reports completed; northeast climate database (neclimateus.org) developed in collaboration with NOAA and other partners |
| Intended Users | State and regional level managers |
| Connections to other projects/products | State Wildlife Action Plans, regional adaptation plans |



Vulnerability Assessments: Species Vulnerability to Climate Change

| | |
|------------------------------------|---|
| North Atlantic LCC Role | Supporting assessment by NatureServe using Climate Change Vulnerability Index (CCVI) |
| Products | Report on vulnerability of 64 high regional concern, representative, and foundational species |
| Available Now | Draft report (in peer review) |
| Available within 3-6 months | Final report |
| Intended users | Environmental managers, scientists |



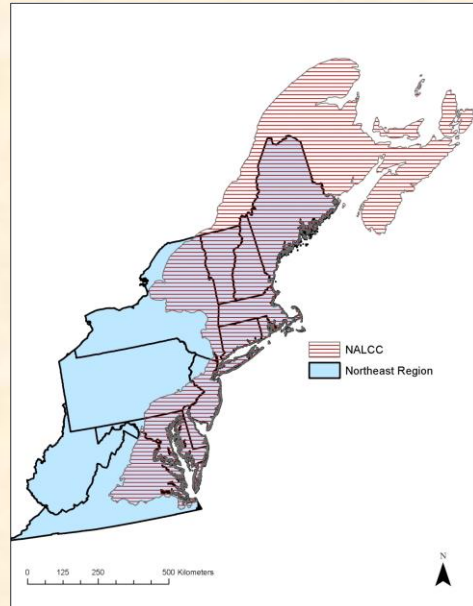
Conservation Design: Piping Plovers and Sea-level Rise

| | |
|---|--|
| North Atlantic LCC Role | Sponsoring project by Virginia Tech with USGS |
| Products | Assessment of impact to Piping Plover from SLR and recommendations for habitat conservation/management |
| Available Now | Published model linking coastal processes, beach response and beach habitat, second report includes hindcast-based prediction nesting suitability impacted by SLR and beach management actions |
| Longer Term/next steps | Expand model to wider geography through Hurricane Sandy Beach Resiliency Project; predict impacts from wider range of SLR and other management actions |
| Intended Users | Beach managers, shorebird community |
| Connections to other projects/products | Hurricane Sandy beach resiliency project including iPlover |



Conservation Design: *Designing Sustainable Landscapes*

| | |
|------------------------------------|--|
| North Atlantic LCC Role | Sponsoring project led by UMass Amherst |
| Products | Extensive spatial datasets, current and future species capability and ecological integrity, decision support tool for landscape design |
| Available Now | Many spatial datasets for entire Northeast |
| Available within 3-6 months | <ul style="list-style-type: none"> • Additional regional spatial data • Regional models for 30 rep. species • Pilot design effort in CT River watershed |
| Longer Term | Work will enhance coastal components and use of tools by partners; pilot regional design is proposed |
| Intended Users | State natural resource and planning agencies |



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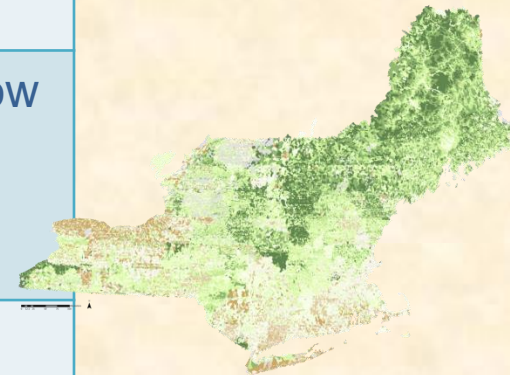
Conservation Design: Aquatic and Coastal Decision Support Tool

| | |
|---|---|
| North Atlantic LCC Role | Sponsoring project with Atlantic Coastal Fish Habitat Partnership, led by Downstream Strategies |
| Products | Aquatic and coastal species models and decision support tools |
| Available Now | Pilot models for brook trout in the Chesapeake Bay watershed and for winter flounder |
| Available within 3-6 months | Decision support tools for restoration and conservation available on-line for brook trout (Chesapeake Bay), winter flounder (Long Island Sound), and river herring (coastal rivers) |
| Intended users | Watershed planning, natural resource management agencies, fisheries managers |
| Connections to other projects/products | Forecasting changes in aquatic systems and resilience of brook trout |



Conservation Design: Forecasting Streams and Brook Trout

| | |
|------------------------------------|--|
| North Atlantic LCC Role | Sponsoring project led by USGS |
| Products | Aquatic data and brook trout, forecasts and decision support tools |
| Available Now | <ul style="list-style-type: none"> • Prototype web tool for stream conditions and climate change • Brook trout occupancy model for New York to Maine |
| Available within 3-6 months | <ul style="list-style-type: none"> • Projections of future stream flow and temperature • Regional brook trout forecasts • Incorporated into CT R. Pilot |
| Longer Term | Incorporate into conservation design; integrate with other brook trout tools (2015) |
| Intended users | Eastern Brook Trout JV partners and other aquatic managers; states |

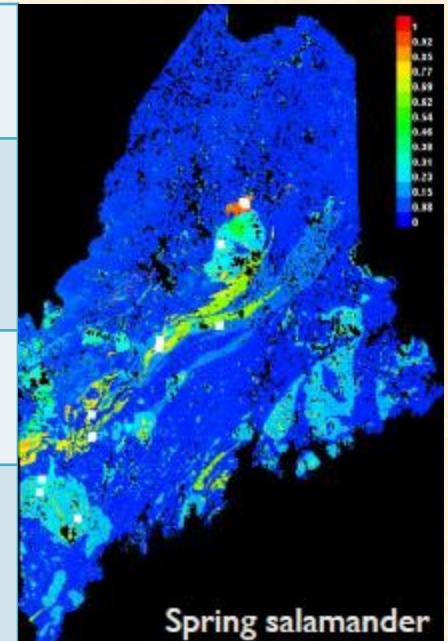


Brook trout probability of occupancy



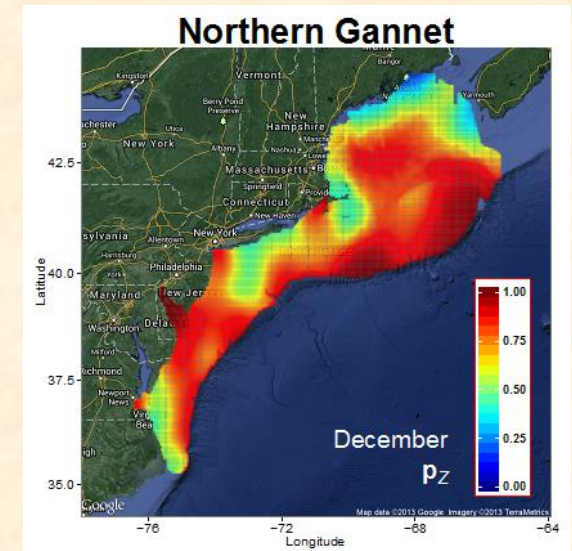
Conservation Design: Priority Amphibian and Reptile Conservation Areas (PARCAs)

| | |
|------------------------------------|--|
| North Atlantic LCC Role | Sponsoring project led by U. of Maine and others |
| Products | Species models for 60+ priority herp. species; report with priority areas identified |
| Available Now | Climate niche models for 61 species |
| Available within 3-6 months | <ul style="list-style-type: none"> • Projected loss of climate envelope for species • C.C. Vulnerability reviews • Pilot PARCAs for Maine |
| Longer Term | Full PARCA report and recommendations (2016) |
| Intended users | Northeast PARC |



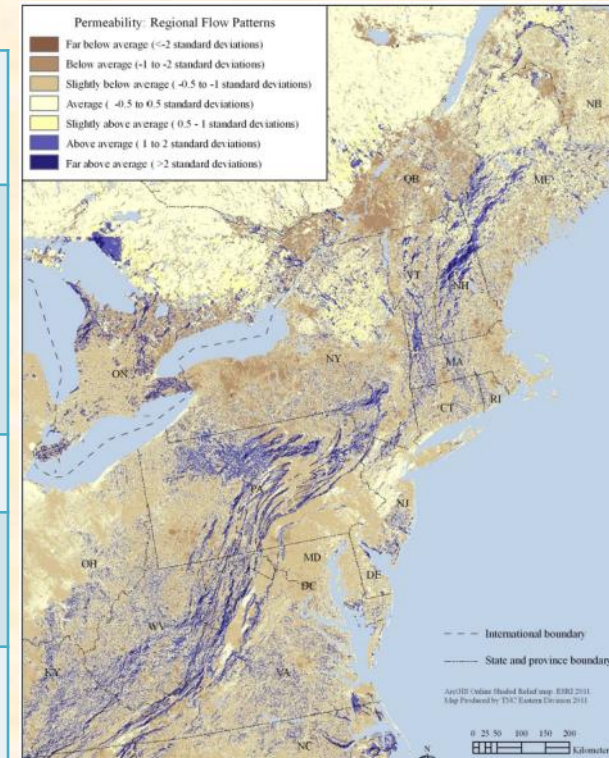
Conservation Design: Marine Bird Mapping and Risk Assessment

| | |
|------------------------------------|---|
| North Atlantic LCC Role | Sponsoring a project by NC State U., NOAA, BRI, CSI/CUNY |
| Products | Mapping of seasonal seabird abundance of 24 species to inform marine planning |
| Available Now | Draft report; initial set of marine bird species maps by species and season |
| Available within 3-6 months | Final report and maps (Spring 2015) |
| Intended Users | Regional ocean planning for wind energy, aquaculture, marine infrastructure |



Conservation Design: Permeable Landscapes for Wildlife

| | |
|------------------------------------|---|
| North Atlantic LCC Role | Sponsoring project by TNC |
| Products | Report and dataset on relative permeability (connectivity) of landscape for wildlife, accounting for climate change |
| Available Now | |
| Available within 3-6 months | Final report and data |
| Intended users | Incorporate into regional, state, and LCC planning efforts for large-scale wildlife connectivity |



Foundational Mapping: Coastal Update to National Wetlands Inventory

| | |
|--------------------------------|---|
| North Atlantic LCC Role | Sponsoring update to NWI for coastal areas |
| Products | Updated wetland mapping in 162 coastal areas in 7 states |
| Available Now | Project is complete (Sept. 2013); data incorporated into Northeast Terrestrial Habitat map by UMass; Results fully integrated into the National Wetlands Inventory online |
| Longer Term/next steps | None anticipated |
| Intended users | Planners, wetland and coastal managers |



Demonstration Project: Integrating Science into Policy: Local Adaptation for Marsh Migration

| | |
|---|---|
| North Atlantic LCC Role | Supporting demonstration project by Maine Inland Fisheries and Wildlife |
| Products | Identification of the most resilient marshes in Maine; incorporation of results in <i>Beginning with Habitat</i> |
| Available Now | Final report, decision support tool |
| Available within 3-6 months | Facilitating local actions to assist marsh migration |
| Intended Users | Local & state planning, conservation groups |
| Connections to other projects/products | Decision support tools for SLR impacts, Hurricane Sandy Marsh Resilience projects, TNC's salt marsh advancement zones |



Conservation Design: Increasing Aquatic Connectivity and Flood Resiliency (LCC + Hurricane Sandy)

| | |
|---|---|
| <p>North Atlantic LCC Role</p> | <p>Sponsoring/coordinating 2 related projects (one funded through Hurricane Sandy) led by UMass Amherst, USFWS, State F&W agencies, TNC, USGS, USFS, Trout Unlimited,</p> |
| <p>Products</p> | <p>Comprehensive, consistent, road-streams crossings database; recommended survey protocols and standards; prioritized surveys; flood resilience models; prioritization to improve fish passage and reduce flood risks;</p> |
| <p>Available Now</p> | |
| <p>Available within 3-6 months</p> | <p>Initial survey protocols for first field season</p> |
| <p>Longer Term</p> | <p>Complete datasets and reports (2016); coordinate with Great Lakes</p> |



Collaboratively Increasing Resiliency & Improving Standards for Culverts & Road Stream Crossings to Future Floods While Restoring Aquatic Connectivity

- Coordination of regional team; consistent online database, regional protocols for assessing culvert condition and suitability for fish passage, passage assessment criteria
 - UMass, TNC
- Prioritization of road stream crossings for surveys, targeted surveys
 - TNC, UMass, FWS, WMI, states
- Pilot project on vulnerability of road-stream crossings to future floods
 - UMass, NE Climate Science Center
- Training for states, towns
 - Trout Unlimited, FWS





Optimize the allocation of conservation efforts in a spatially explicit manner in order to sustain ecological values of beaches/tidal marshes across the NALCC in the face of storm impacts and sea level rise

Sustainable Conservation of Ecosystem Services (Carbon + Protection of Human Infrastructure+ Rec Measure)

Ensure Persistence of Native Habitats (Pr Persist Beach Complex + Pr Persist Marsh Complex)

Ensure Persistence of Native Species (Δ Suitability Spp Beach + Δ Suitability Spp Marsh)

Predictions Vulnerability of Habitat - Sea level rise + Storm Impacts

Universe of Alternatives (Suites of Actions)
Type of Action, State of Patch, Location of Patch, Time of Implementation

Acquire New Habitat – Future Buffering
(Habitat that could buffer effects, but will need management to transition)

Manage New Habitat - Transition
(Management to get newly acquired habitat to buffer effects)

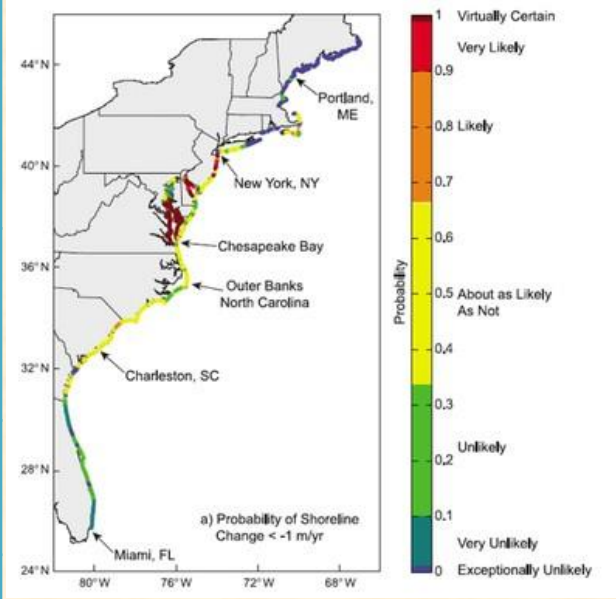
Acquire Existing Habitat
(Maintain high-quality habitat)

Manage Existing - Resiliency
(Management to habitat in conservation status to improve resiliency to effects)

Conservation Design:

Decision Support Tools for Sea-level Rise Impacts

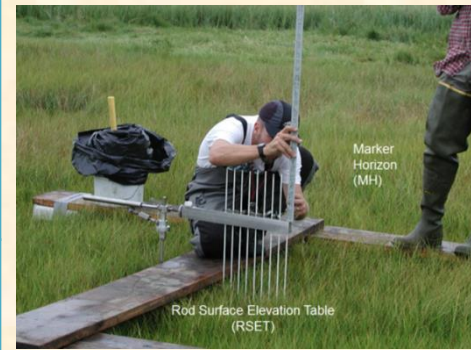
| | |
|---|--|
| <p>North Atlantic LCC Role</p> | <p>NE Climate Science Center project to USGS; LCC facilitated model development through Structured Decision Making; application to conservation design through <i>Designing Sustainable Landscapes</i></p> |
| <p>Products</p> | <p>Final report, Geospatial data on SLR inundation and dynamic response with uncertainty</p> |
| <p>Available Now</p> | <p>Geospatial data on SLR inundation and dynamic response</p> |
| <p>Available within 3-6 months</p> | <p>Initial regional decision model; incorporated into <i>Designing Sustainable Landscapes</i> (ecological integrity and species habitat)</p> |
| <p>Intended Users</p> | <p>Planning, natural resource management agencies, coastal zone agencies and communities</p> |



Conservation Design:

Increasing Resiliency of Tidal Marsh Habitats and Species in the Face of Storms & Sea Level Rise

| | |
|------------------------------------|---|
| North Atlantic LCC Role | Coordinating overall project among P.I.s, LCC and CSC partners and P.I.s FWS, USGS, SHARP (Udel, UConn, UMaine, ME DIFW SUNY), USC, UCF, UMass |
| Products | Regional maps and decision support models for tidal marsh restoration and management for habitats and species in the face of storms and SLR; evaluation of the effectiveness of different marsh restoration approaches for increasing resiliency under different conditions |
| Available Now | Pre-restoration and control site results |
| Available within 3-6 months | Consistent monitoring metrics; initial assessments of tidal marsh integrity |
| Longer Term | Complete models and results delivered to partners (2016); initial post restoration results. |



Increasing Resiliency of Tidal Marsh Habitats Habitats and Species in the Face of Storms & SLR

- Develop/refine models for understanding future impacts of sea level rise and storms on tidal marshes and marsh species
 - Geological/physical response (USGS)
 - Marsh community response (USGS, USC, LSU)
 - Wildlife response (SHARP)
- Decision support models and incorporation into decision model framework
 - UMass, USGS, TNC
- High/low marsh mapping
 - SHARP (U Maine)
- Monitoring and assessment of effectiveness of restoration for marsh resiliency
 - USFWS, NPS, SHARP (U Maine, U Conn, U Del, SUNY)
- Delivery of results to partners
 - NROC, MARCO



Conservation Design:

Increasing Resiliency of Beach Habitats and Species in the Face of Storms & Sea Level Rise

North Atlantic LCC Role

Coordinating overall project among P.I.s, LCC and CSC partners and with P.I.s USGS, FWS, Virginia Tech, Rutgers, TCI, Conserve Wildlife NJ, NROC, MARCO

Products

Regional decision support models for coastal beach management and restoration for beach habitats and species (e.g., Piping Plover) in the face of storms and SLR; evaluation of the effectiveness of beach restoration and management

Available Now

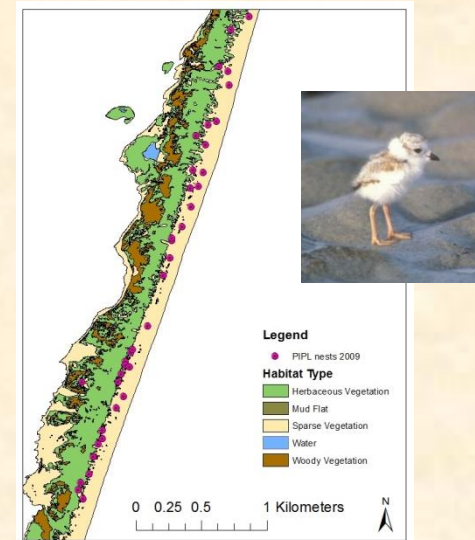
iPlover survey results; Pre-hurricane survey results of inlets and beaches

Available within 3-6 months

Initial post-hurricane beach nesting bird results

Longer Term

Complete models and results delivered to partners (2016);



Increasing Resiliency of Beach Habitats and Species in the Face of Storms & Sea Level Rise

- Expand SLR response/plover model to Region
 - USGS, Virginia Tech
- Collect beach-nesting bird location and habitat data on NWRS and NPs
 - USFWS, NPS, USGS (iPlover)
- Inventory of beach and inlet modifications before and after H.S.
 - Terwilliger Consulting
- Assess effects of beach stabilization projects in NY& NJ on beach habitats and species
 - Virginia Tech, Rutgers, Conserve Wildlife NJ
- Deliver results to partners
 - Rutgers, NROC, MARCO