NROC
Northeast Regional Ocean Council

Resilient Shorelines Grant Program Project Overview

NROC Fall Meeting – November 5, 2015

Resilient Shorelines Grant Program

- NROC awarded $340,000 from US Fish and Wildlife Service through a cooperative agreement with NA LCC
- $220K+ of that to be competitively bid and awarded as part of a science delivery grant program
- NROC issued an RFP over the summer for the *Advancement of Shared Northeast Priorities for Resilient Shorelines*
- 5 projects were selected for funding

North Atlantic LCC
North Atlantic Landscape Conservation Cooperative

Recipient - Eastern Research Group (ERG)

Overview :

- Create an "explainer" card stack to convey information on living shorelines in cold climates to coastal communities and decision makers
- Leverages ongoing information gathering for NOAA OCM on this topic.
- Additional interviews and focus group.

Product: Explainer card stack on the NROC web site

Budget: $39, 837

NROC POC: Adrianne Harrison, NOAA

Recipient – Warren Pinnacle

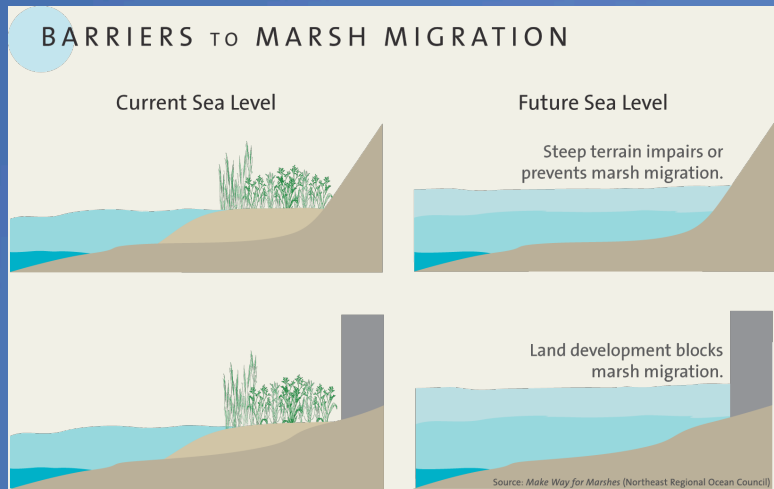
Overview :

- Refine SLAMM projections for Connecticut by accounting for road and infrastructure effects
- Spatial analysis of projections to identify and characterize potential marsh migration pathways
- Reporting and outreach of methods and results

Products: Various GIS maps/data layers for CT; integration of spatial layers to EPA LISS SLAMM web page; technical report of methods and results; recorded webinar.

Budget: $54,600

NROC POC: David Kozak, CT



Recipient – Blue Urchin Consulting

Overview :

- Develop enhancements to the MyCoast suite of tools
- Continue StormReporter for MA and RI
- Access to King Tide for all states

Products:

New enhancements to MyCoast include:

- Habitat/Natural Resource reporter tool
- Mobile apps for location-targeted data gathering and contacting reporters in the field

Budget: $37,500

NROC POC: Julia Knisel, MA

Ron Stelline, 3.9.13
http://mycoast.org/reports/9469

Recipient - RPS Applied Science Associates (ASA)

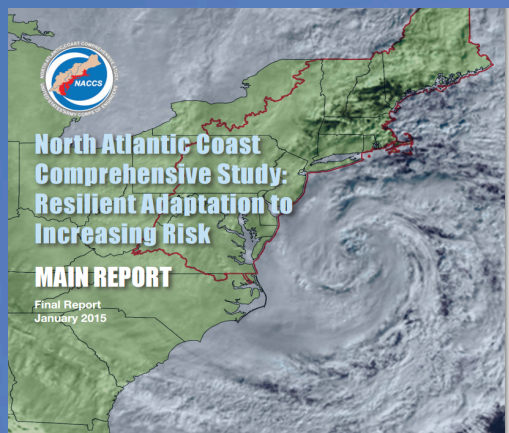
Overview:

- Work with states to achieve better access to North Atlantic Coast Comprehensive Study (NACCS) model data
- Stakeholder meeting and interviews
- Development of database of NACCS model results, to be hosted by NERACOOS

Product: Web services that allow each state to access and display NACCS data within existing state portals/viewers

Budget: $39, 867

NROC POC: Peter Slovinsky, ME



Recipient - Rockingham Planning Commission

Overview:

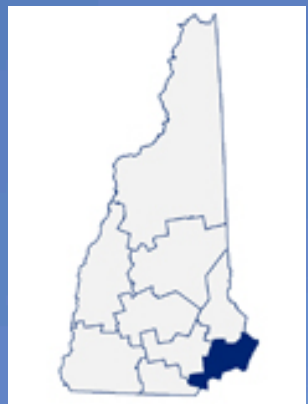
•Provide direct technical planning assistance to municipalities to implement recommended actions identified in the Climate Change Adaptation sections of their Hazard Mitigation Plans.

•Expands upon success of their Tides to Storms Coastal Vulnerability Assessment

Products: Specific products/outcomes TBD, but will likely include: preparing zoning, building code, and/or plan amendments; holding public hearings; community outreach efforts.

Budget: $49,567

NROC POC: Steve Couture, NH




Questions?

Increasing Coastal Community Resiliency in Maine

NROC Meeting, Portsmouth, NH

November 5, 2015

Abbie Sherwin
NOAA Coastal Management Fellow 2015-2017
Maine Coastal Program, Dept. of Agriculture, Conservation and Forestry

Presentation Overview

- Project overview
- Community Resiliency Index
- Community Rating System (CRS)
- Questions

C. Adams, 9/30/2015

Project goal - Increase coastal community resiliency in Maine

Maine Community Resiliency Index

- Self-assessment tool
- Identify vulnerability to coastal flood hazards
- Link to CRS

Community Rating System (CRS)

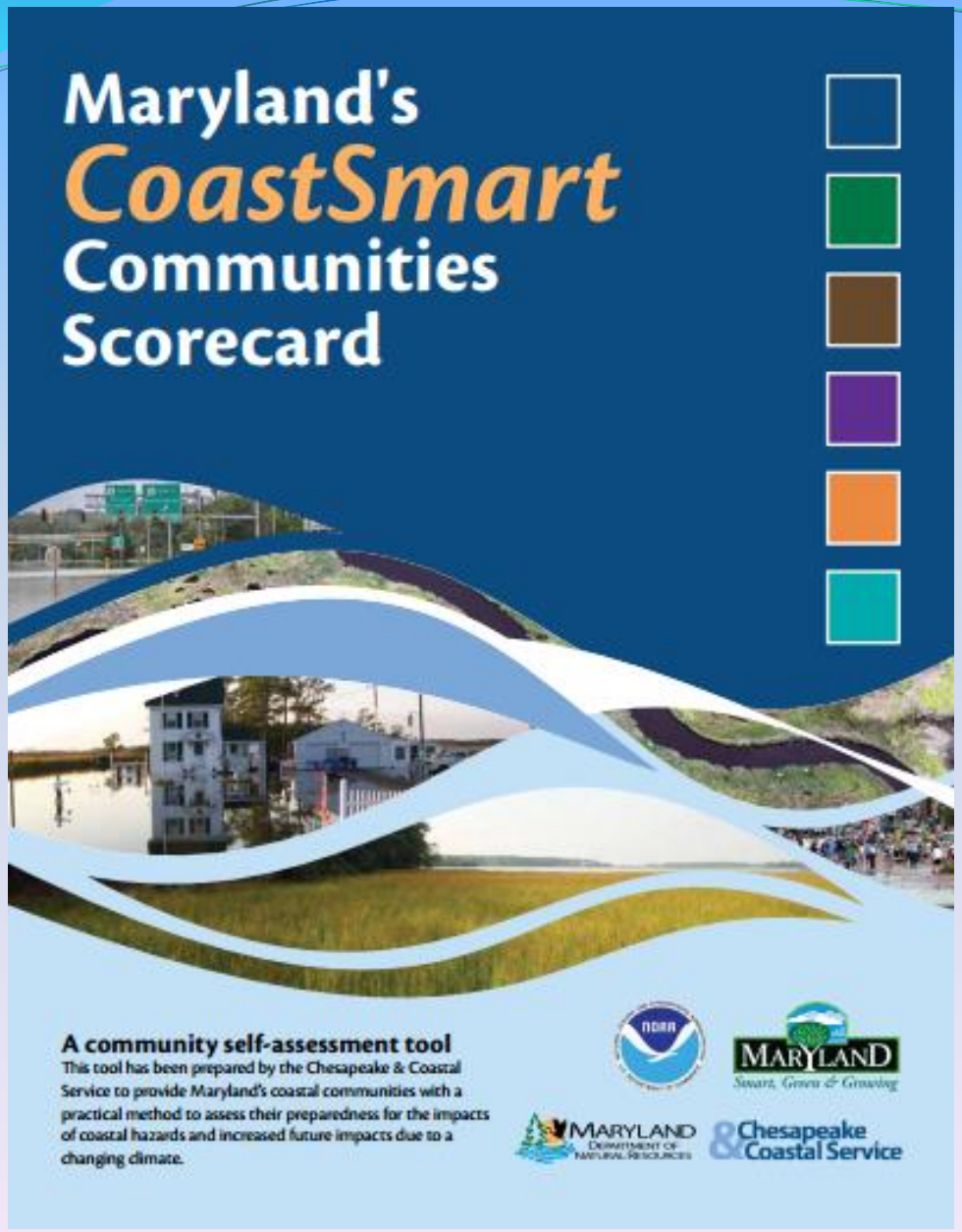
- Increase participation in CRS program
- Improve participating communities' scores

Maine Community Resiliency Index

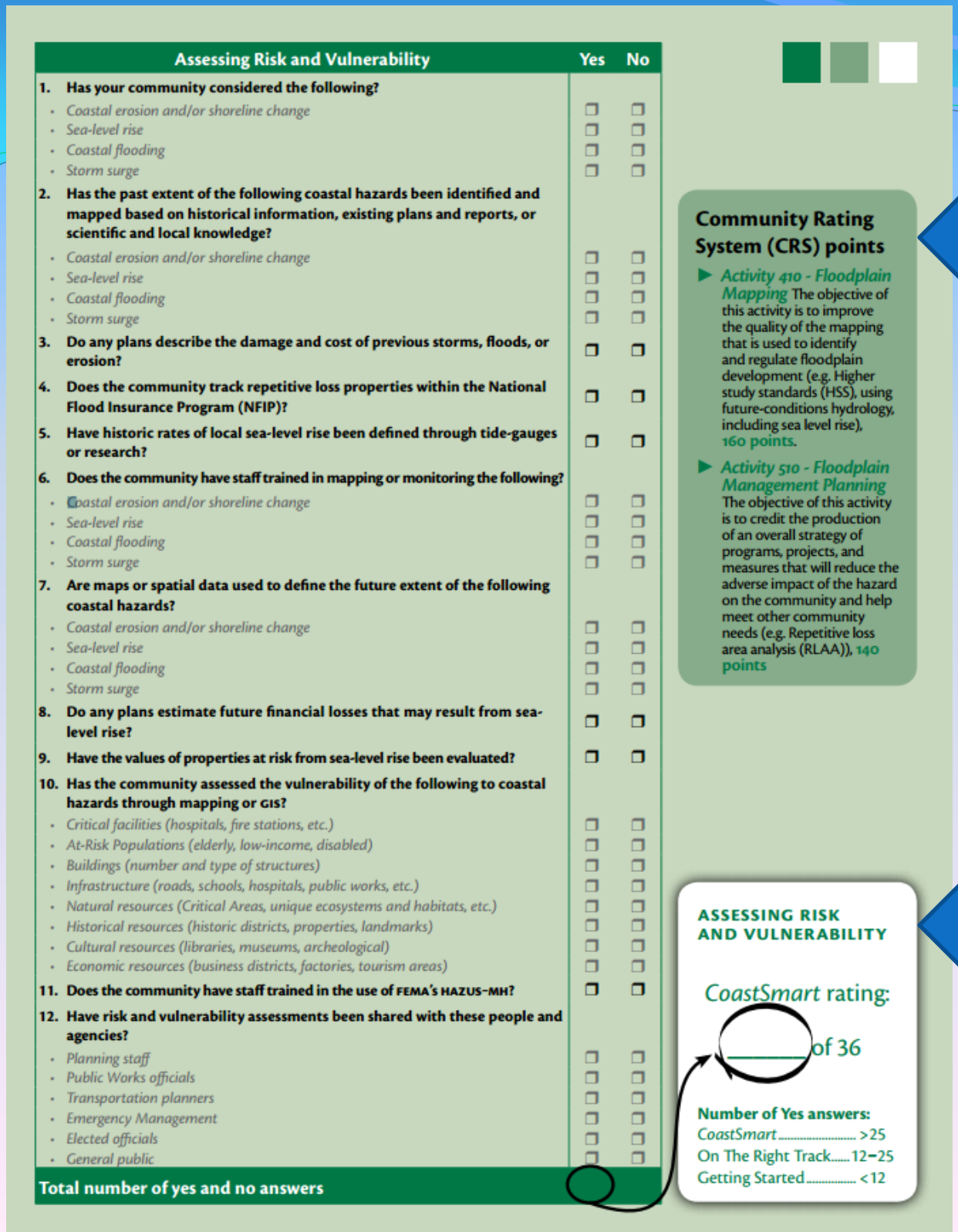
- Simple, community self-assessment tool
  - Identifies data and tools to conduct assessment
  - Provides guidance on how to address vulnerabilities
- Determine level of preparedness for and ability to recover from coastal flood hazards
- Assess resiliency under 3 storm scenarios
  - 100-year storm
  - User-defined scenario
  - Future storm scenario

Resiliency Index: Draft Categories

1. Risk and Vulnerability
2. Critical Infrastructure
3. Critical Facilities
4. Socioeconomic
5. Sociocultural
6. Government / Community Planning
7. Natural Resources



- Simple self-assessment for understanding risk and vulnerability to coastal hazards
- Provides guidance on:
  - Where to start
  - Recommendations and resources
  - Other helpful resources



Assessing Risk and Vulnerability	Yes	No
1. Has your community considered the following?		
• *Coastal erosion and/or shoreline change*	❒	❒
• *Sea-level rise*	❒	❒
• *Coastal flooding*	❒	❒
• *Storm surge*	❒	❒
2. Has the past extent of the following coastal hazards been identified and mapped based on historical information, existing plans and reports, or scientific and local knowledge?		
• *Coastal erosion and/or shoreline change*	❒	❒
• *Sea-level rise*	❒	❒
• *Coastal flooding*	❒	❒
• *Storm surge*	❒	❒
3. Do any plans describe the damage and cost of previous storms, floods, or erosion?	❒	❒
4. Does the community track repetitive loss properties within the National Flood Insurance Program (NFIP)?	❒	❒
5. Have historic rates of local sea-level rise been defined through tide-gauges or research?	❒	❒
6. Does the community have staff trained in mapping or monitoring the following?		
• *Coastal erosion and/or shoreline change*	❒	❒
• *Sea-level rise*	❒	❒
• *Coastal flooding*	❒	❒
• *Storm surge*	❒	❒
7. Are maps or spatial data used to define the future extent of the following coastal hazards?		
• *Coastal erosion and/or shoreline change*	❒	❒
• *Sea-level rise*	❒	❒
• *Coastal flooding*	❒	❒
• *Storm surge*	❒	❒
8. Do any plans estimate future financial losses that may result from sea-level rise?	❒	❒
9. Have the values of properties at risk from sea-level rise been evaluated?	❒	❒
10. Has the community assessed the vulnerability of the following to coastal hazards through mapping or GIS?		
• *Critical facilities (hospitals, fire stations, etc.)*	❒	❒
• *At-Risk Populations (elderly, low-income, disabled)*	❒	❒
• *Buildings (number and type of structures)*	❒	❒
• *Infrastructure (roads, schools, hospitals, public works, etc.)*	❒	❒
• *Natural resources (Critical Areas, unique ecosystems and habitats, etc.)*	❒	❒
• *Historical resources (historic districts, properties, landmarks)*	❒	❒
• *Cultural resources (libraries, museums, archeological)*	❒	❒
• *Economic resources (business districts, factories, tourism areas)*	❒	❒
11. Does the community have staff trained in the use of FEMA's HAZUS-MH?	❒	❒
12. Have risk and vulnerability assessments been shared with these people and agencies?		
• *Planning staff*	❒	❒
• *Public Works officials*	❒	❒
• *Transportation planners*	❒	❒
• *Emergency Management*	❒	❒
• *Elected officials*	❒	❒
• *General public*	❒	❒
Total number of yes and no answers		

Community Rating System (CRS) points

- *Activity 410 - Floodplain Mapping* The objective of this activity is to improve the quality of the mapping that is used to identify and regulate floodplain development (e.g. Higher study standards (HSS), using future-conditions hydrology, including sea level rise), 160 points.
- *Activity 510 - Floodplain Management Planning* The objective of this activity is to credit the production of an overall strategy of programs, projects, and measures that will reduce the adverse impact of the hazard on the community and help meet other community needs (e.g. Repetitive loss area analysis (RLAA)), 140 points

ASSESSING RISK AND VULNERABILITY

CoastSmart rating: _____ of 36

Number of Yes answers:

CoastSmart ..... >25
On The Right Track..... 12–25
Getting Started ..... <12

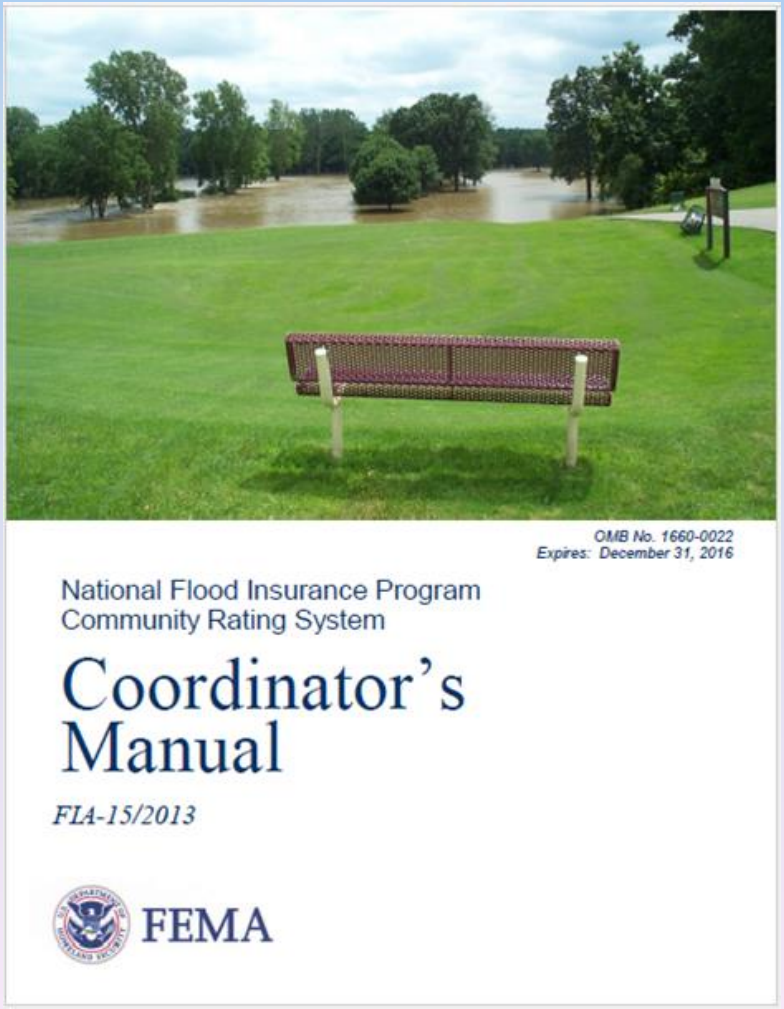
"CRS Points" boxes identify examples of CRS creditable activities and point values associated with elements of the Scorecard

Tiered scoring system indicating preparedness level in each assessment category

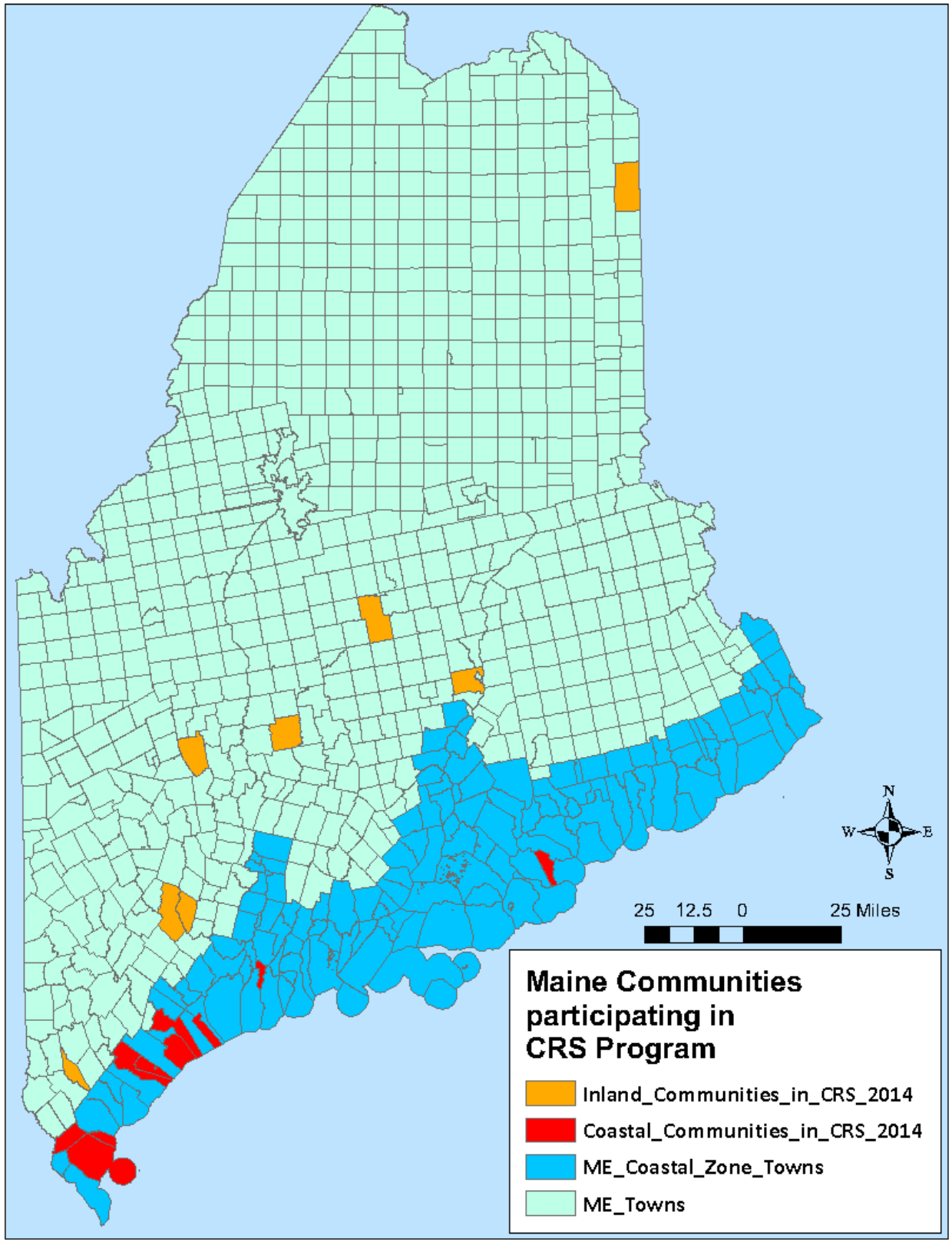
Community Rating System (CRS)

- Voluntary NFIP program that offers discounts on flood insurance in exchange for actions that reduce flood risk within a community
- Incentivizes resilience, alleviates increasing flood insurance costs, increases safety, and reduces risk of flooding
- Fosters comprehensive floodplain management (‘No Adverse Impacts’)

CRS Activity Categories



- **Public Information**
  - Newsletters, brochures, presentations, reading flood maps
- **Mapping and Regulations**
  - Open space preservation, stormwater management regulations
- **Flood Damage Reduction**
  - Acquisition/relocation, mitigation, hazard mitigation planning
- **Warning and Response**
  - Flood emergency response and warnings



Participation in the CRS Program

Statewide

17 communities of 889* (2%)

In the Coastal Zone

9 coastal communities of 141* (6%)

NFIP Policies

9,034

**** includes unorganized and unincorporated territories that participate in the NFIP.***

Challenges for the CRS Program in Maine

- **Lack of knowledge** of the program
- The **amount of documentation required** by FEMA to enter the program or maintain annual membership
- **Technical capability and lack of time** or staffing capacity for communities to dedicate to the effort
- **“Unsavory”** municipal and citizen **views of FEMA**

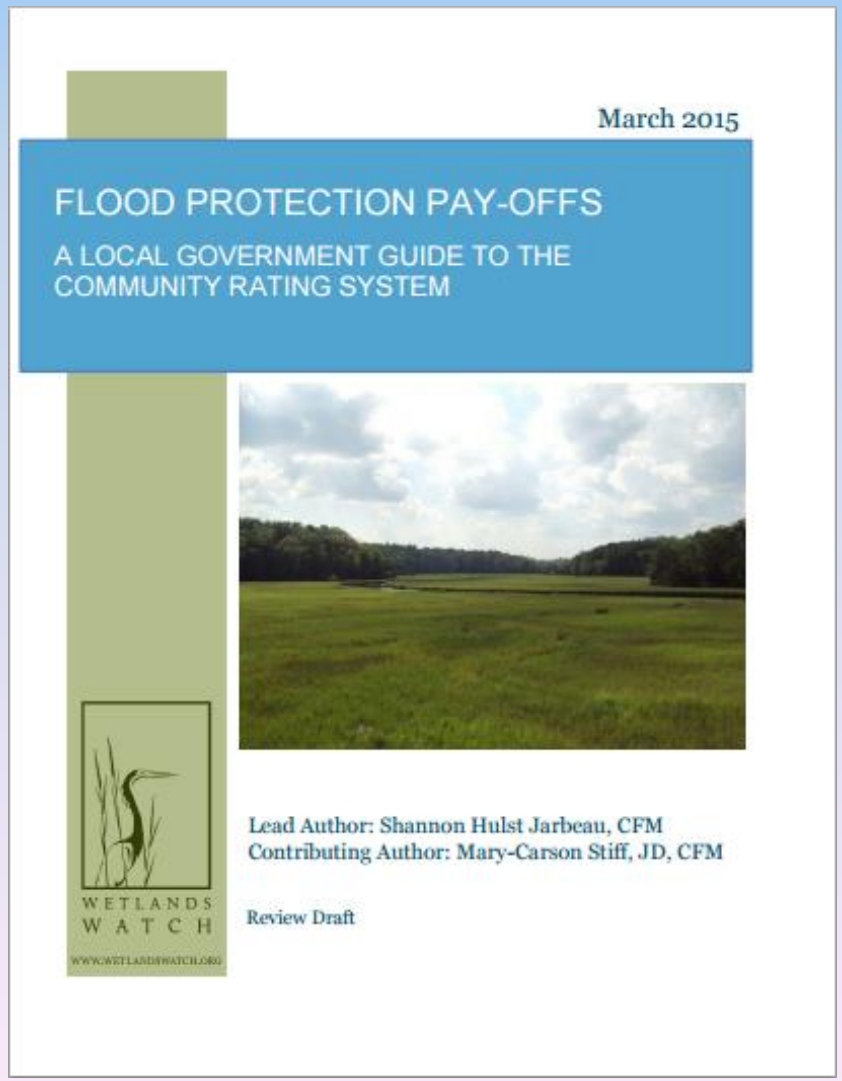
Many communities are already doing things that would help earn points towards CRS but *don't even know it…*

- Shoreland Zoning and open space preservation
- Building codes (but no state standard)
- Outreach Projects and Floodplain Mapping activities
- Comprehensive Planning (certain components)
- Stormwater/MS4 efforts (certain components)

http://www.wetlandswatch.org/WetlandScience/SeaLevelRise/CRSGuide.aspx

Identifying existing CRS creditable activities in Maine

- CRS guide developed by Wetlands Watch for local governments in Virginia to determine what common activities and state programs may receive CRS credit
- Adapt for Maine?



http://www.wetlandswatch.org/WetlandScience/SeaLevelRise/CRSGuide.aspx

Initial Feedback

- Lack of capacity at the municipal level
- Community Resiliency Index has to be packaged as part of a larger program
  - Incentives required
- Misconceptions about FEMA and CRS
- More education and outreach is needed

Recap

- Overarching goal - increase resiliency of Maine's coastal communities
  - Community Resiliency Index
  - CRS
- Project outputs need to be tailored to meet the needs of Maine communities

Thank you!

Questions?

Abbie Sherwin, NOAA Coastal Management Fellow
Maine Coastal Program
Department of Agriculture, Conservation and Forestry
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The Social Indicator Project

Integrating social science into ecosystem management for New Hampshire's estuaries

Simone Barley-Greenfield
New Hampshire Coastal Management Fellow 2015-2017

What are social indicators?

Social indicators are numerical measures that describe the well-being of individuals or communities. They are used to describe and evaluate community well-being in terms of social, economic, and psychological welfare

- NOAA NMFS

Environmental Social Indicators

- Subjective and objective measures
- Incorporate data from stakeholder surveys as well as existing data
- Explore the relationship between ecological restoration and human wellbeing
  - How do humans benefit from natural systems?
  - How does human behavior impact the environment?

Social Indicators in New Hampshire

Goals:

1. Establish a process to integrate social and economic indicators into natural resource management in the Piscataqua Region watershed.

2. Compile, create, rate, and refine potential social indicators that relate to the values of Great Bay Watershed residents and to the health of coastal and estuarine ecosystems.

Step 1

- **Review existing social indicator data relevant to New Hampshire estuaries**
- The fellow will review existing social indicators measured by government and nongovernmental organizations. A few of the many sources identified include the New Hampshire Coastal Risks and Hazards Commission, NHDES, the New Hampshire Water Sustainability Commission, NOAA Coastal Services Center, NOAA Digital Coast, the Census Bureau, and the US Geological Survey.

Step 2

- **Refine potential social indicators for application to the New Hampshire Coastal Watershed**
- The fellow will employ a data reduction process to filter the social indicators currently being measured to those less redundant and potentially generalizable to Great Bay Watershed.

Step 3

- **Match potential social indicators with Great Bay attributes**
- Using 2014 Water and Watersheds Survey data, the New Hampshire Estuary Spatial Planning Project ecosystem services assessment, and the Puget Sound model, the fellow will develop list of Great Bay Watershed attributes and match indicators.

Step 4 - 6

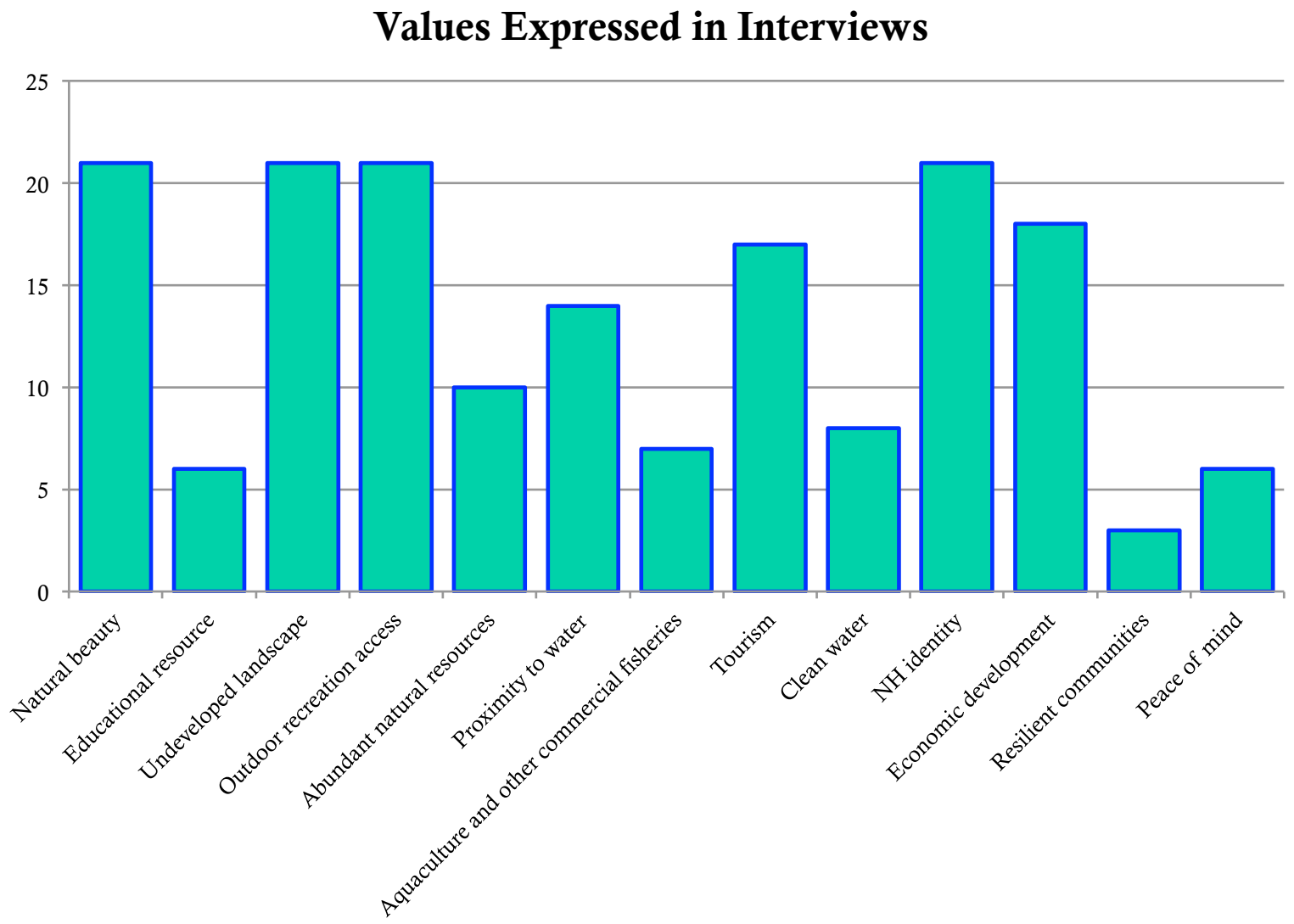
- **Refine and rank indicators**
- Applying the Puget Sound model the fellow will refine and rank potential indicators based on a three-phase process that focuses on four criteria: relevance (how well it represented the issues of the Coastal Watershed), importance (how important the indicator is in relation to other indicators to provide a complete representation of the domain), robustness (how well the indicator measured the intended attribute and domain), and practicality (how feasible data collection will be).

Step 7

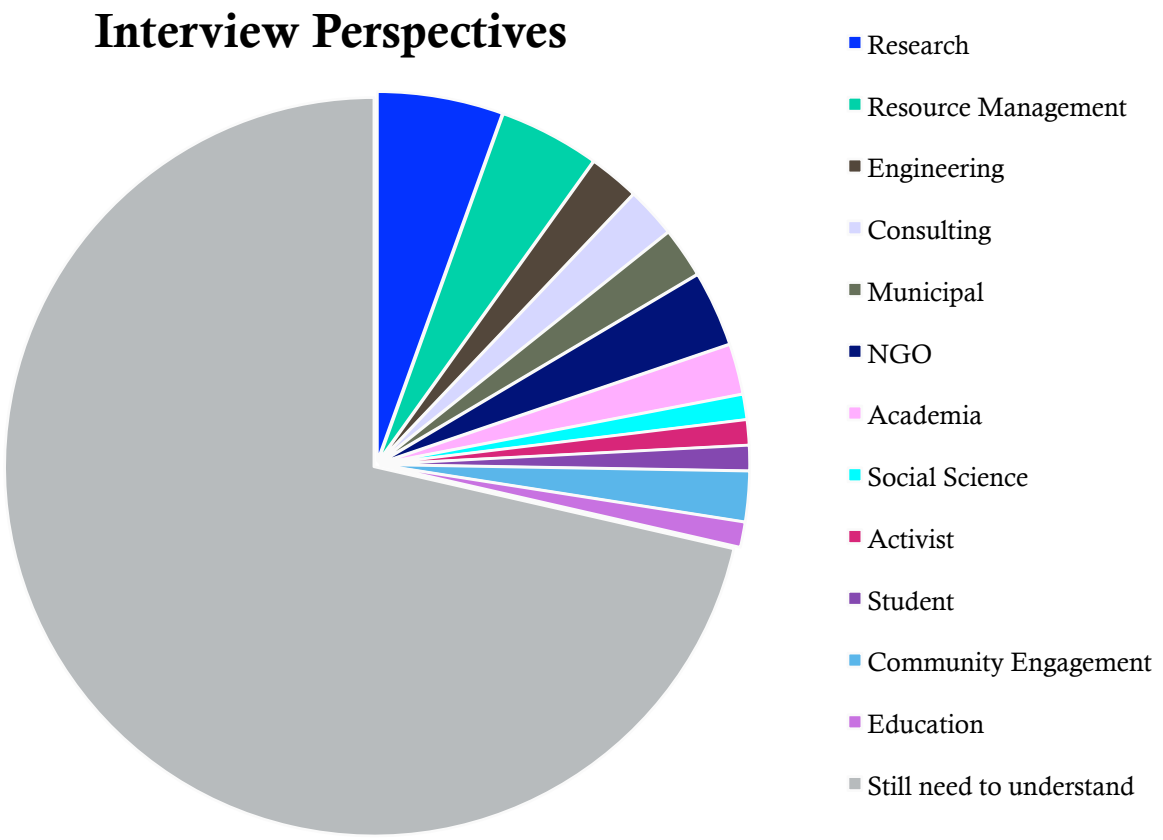
- **Adoption of indicators for monitoring**
- The fellow will initiate a facilitated process to identify the social indicators to be monitored for the subsequent 18 months and included in the 2018 *SOOE,* as well as the social indicators to be monitored in the next three, five, and ten years The fellow will conduct an estimate of the costs for data acquisition.

Progress

- Operation Sponge Mode (interviews, literature review)
- Data hunting
- Reviewing interview themes
- Listing potential indicators


Values Expressed in Interviews
25
20
15
10
5
0
Natural beauty
Educational resource
Undeveloped landscape
Outdoor recreation access
Abundant natural resources
Proximity to water
Aquaculture and other commercial fisheries
Tourism
Clean water
NH identity
Economic development
Resilient communities
Peace of mind

Moving Forward



Thank you!

Questions?

Structural Compensation: A Mitigation Policy for Connecticut's Long Island Sound Coastline

NOAA Coastal Management Fellowship Project
with CT DEEP Office of Long Island Sound Programs (OLISP)

Photo courtesy of flickr/Chris Burke

Presented by Ian Yue

Northeast Regional Ocean Council Fall Meeting
Portsmouth, NH
5 November 2015

Connecticut Department of Energy and Environmental Protection

Presentation Roadmap

- Context
- Project Overview
  1. Project Basis
  2. Statutory Authority
  3. Project Objective
- Project Progress
  1. Compensation Design
  2. Next Steps

Context: Coastal Armoring

Shoreline flood and erosion control structures

Context: Connecticut's Coastal Program

1. OLISP is a ***regulatory program***
   - ~40% of staff works on state permitting/ enforcement
   - ~30% of staff assist with municipal permitting
2. A large majority of the CT coastline is already structurally developed *(seawalls, bulkheads, groins, etc.)*

Context: Connecticut's Coastal Program

3. Most of CT's coastline is privately owned *(studies estimate only 20-36% is publicly-owned)*

4. OLISP has no authority to create new policies except through official administrative regulations *(very difficult to pass)* or legislated statutes through the state Coastal Management Act *(somewhat less difficult to pass)*

To implement any new ideas regarding managing shoreline armoring, OLISP has to come up with creative methods that are able to pass into statute by a legislature driven by municipal interests.

Project Basis

- OLISP has a long-standing policy promoting non-structural solutions to shoreline flood and erosion control
- In the wake of Sandy and Irene, there was pressure on and from the Connecticut legislature to facilitate coastal rebuilding and shoreline protection. In turn, the legislature made a number of amendments to the state Coastal Management Act in 2012 and 2013.
- One amendment provides OLISP with the legal foundation for a program of ***mitigation through compensation***, opening the door for a policy of ***no-net-increase in coastal armoring***.

Statutory Authority

To construct a ***shoreline flood and erosion control structure*** in Connecticut state waters (amongst other criteria)…

- … no other ***feasible, less environmentally damaging alternative*** may exist
- … the ***adverse impacts to coastal resources*** of any shorefront alteration are ***minimized***
- … any ***remaining adverse impacts*** of shorefront alteration are compensated/mitigated using all ***reasonable mitigation measures and techniques***

Connecticut General Statutes §22a-92

Statutory Authority

Under Connecticut General Statutes §22a-92(e),

"on-site or off-site removal of existing shoreline flood and erosion control structures from public or private shoreline property to the same or greater extent as the area of shoreline impacted by the proposed structural solution"

is now considered a ***"reasonable mitigation measure [or] technique"***.

Project Objective

Develop a program of **compensation** for **shoreline armoring** under Connecticut's coastal regulatory program so that additional structures — such as seawalls and revetments — would be **offset** by the removal of existing structures, promoting a policy of **no-net-increase in hardened shorelines**.

Project Progress: Compensation Program Design

- Ideal: One-to-one compensation
  - Same type of structure
  - Same shoreline type
  - Same length

Project Progress: Compensation Program Design

- Ideal: One-to-one compensation
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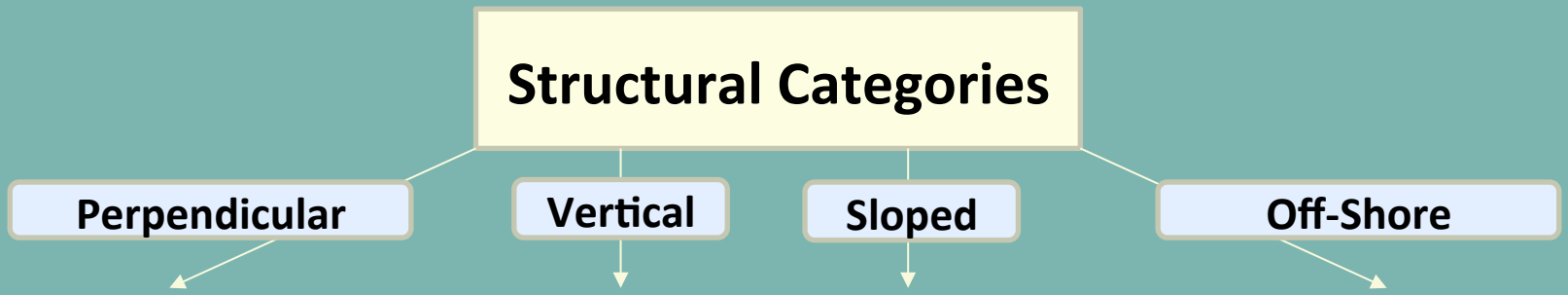
Project Progress: Compensation Program Design

Structural Categories

Project Progress: Compensation Program Design



Project Progress: Compensation Program Design

- **Perpendicular Structures**

  Groins

- **Vertical Structures**

  Gabion wall, levee/dike, bulkhead, seawall

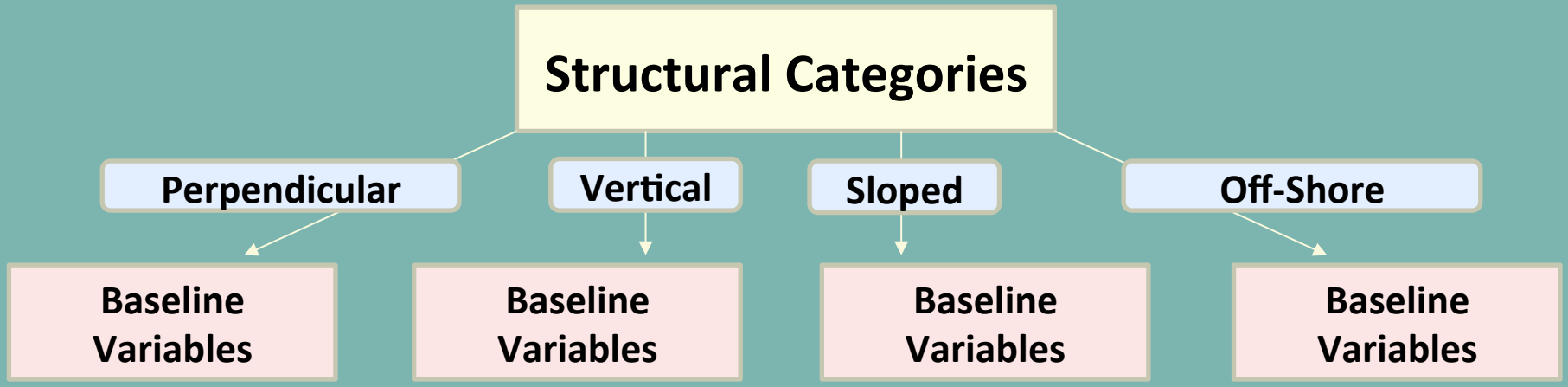
- **Sloped Structures**

  Edging/toe protection, rip rap revetment, paved revetment

- **Offshore Structures**

  Breakwaters, wave attenuators

Project Progress: Compensation Program Design



Project Progress: Compensation Program Design

- Ideal: One-to-one compensation
  - Type of structure
  - Shoreline type
  - Structure length

Baseline Variables

Project Progress: Compensation Program Design

- Ideal: One-to-one compensation
  - Type of structure
  - Shoreline type
  - Structure length

Baseline Variables

Assumption: "Levels" within each baseline variable can be ranked on a "spectrum" from "least" to "most" adverse impacts

Project Progress: Compensation Program Design

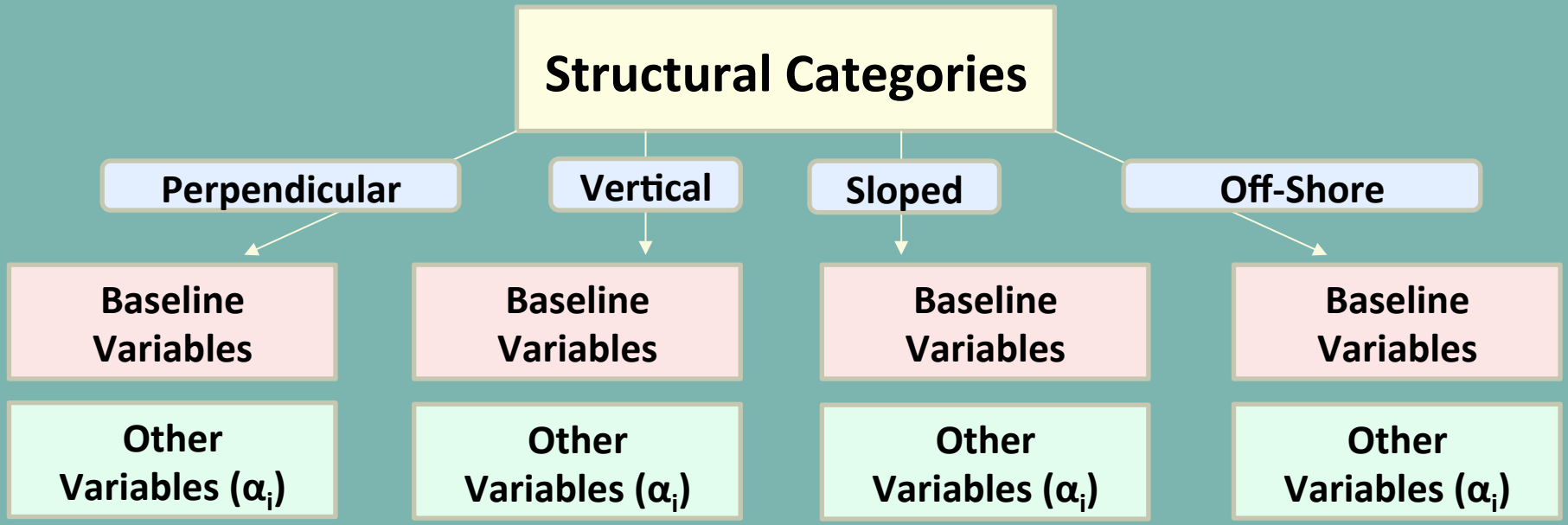
- Ideal: One-to-one compensation
  - Type of structure
  - Shoreline type
  - Structure length

Baseline Variables

Assumption: "Levels" within each baseline variable can be ranked on a "spectrum" from "least" to "most" adverse impacts

Edging/Toe Protection < Paved Revetment
Rocky Shorefronts < Beaches
10 ft structure < 50 ft structure

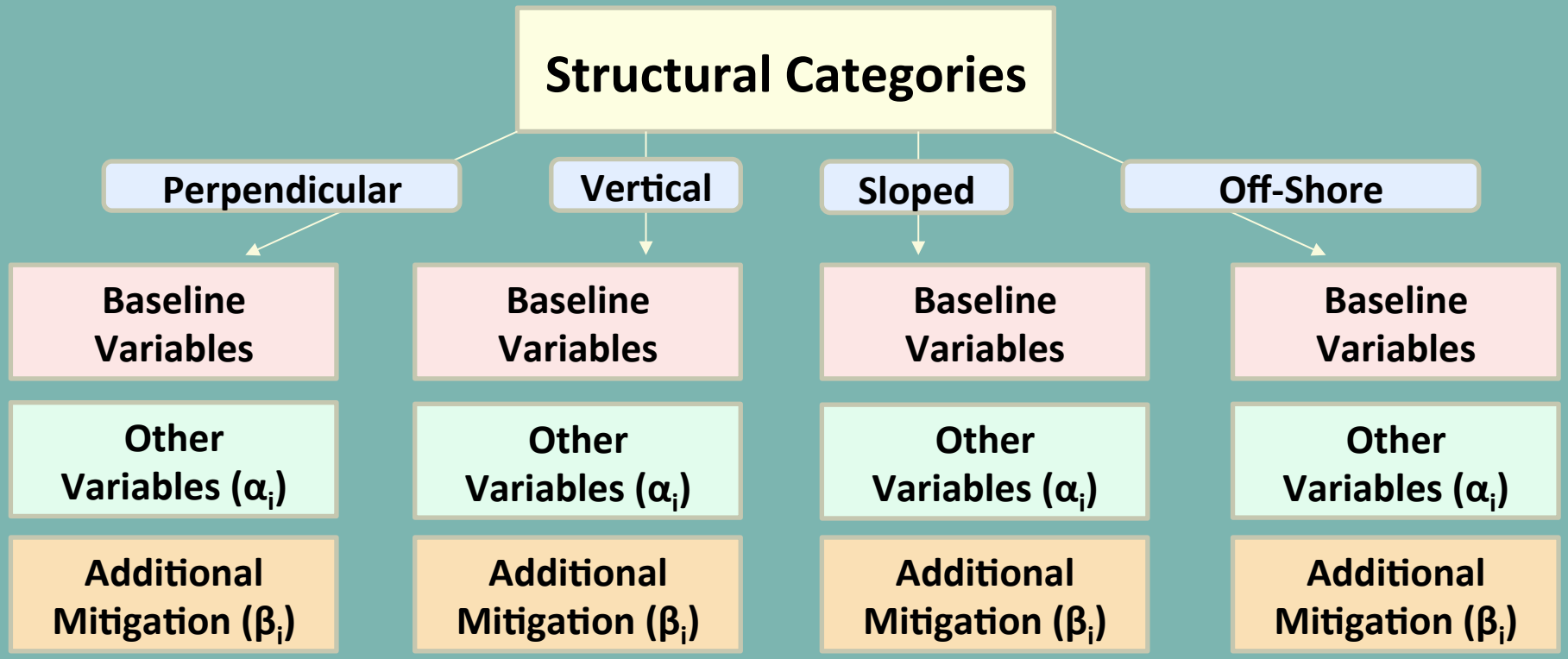
Project Progress: Compensation Program Design



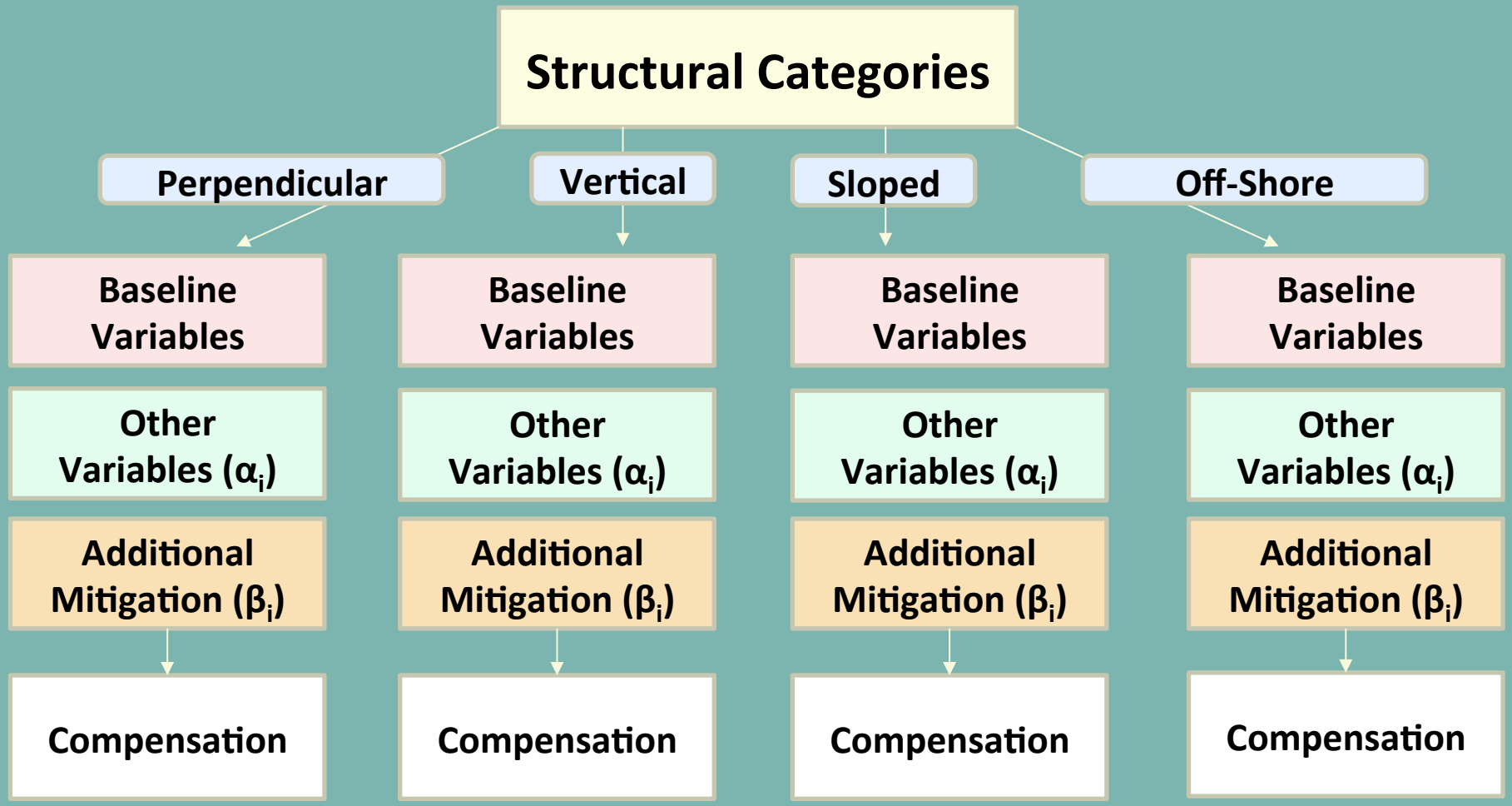
Project Progress: Compensation Program Design

Effect of Shoreline Treatment (α_1)	Public Access and Trust (α_2)	Environment (α_3)
Consistency with adjacent shoreline treatment	Public access impact	Wildlife impact
		Habitat migration under SLR
Structural compromise under SLR	Public trust encroachment	Sand Supply: Loss of littoral support
		Sand Supply: Narrowing/loss of existing sand
		Erosion vulnerability

Project Progress: Compensation Program Design



Project Progress: Compensation Program Design



Compensation Equation

$$[Length_{p,a} \cdot (Structure_{p,a} + Shoreline_{p,a} + \Sigma\alpha_{i,p,a})]$$
$$- [Length_{p,b} \cdot (Structure_{p,b} + Shoreline_{p,b} + \Sigma\alpha_{i,p,b})]$$
$$=$$
$$[Length_{c,b} \cdot (Structure_{c,b} + Shoreline_{c,b} + \Sigma\alpha_{i,c,b})]$$
$$- [Length_{c,a} \cdot (Structure_{c,a} + Shoreline_{c,a} + \Sigma\alpha_{i,c,a})] + \Sigma\beta_i$$

where

p = proposed structure site
c = compensation structure site
a = "after construction" site conditions
b = "before construction" site conditions
α_i = other compensation variables
β_i = additional mitigation

Compensation Equation

$$[Length_{p,a} \cdot (Structure_{p,a} + Shoreline_{p,a} + \Sigma\alpha_{i,p,a})]$$
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Adverse impacts "caused" by the construction of a new structure

where

p = proposed structure site
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Adverse impacts "diminished" by the removal of an existing structure (and any additional mitigation)

Adverse impacts "caused" by the construction of a new structure

where

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$$=$$
$$[Length_{c.b} \cdot (Structure_{c,b} + Shoreline_{c,b} + \Sigma\alpha_{i,c,b})]$$
$$- [Length_{c,a} (Structure_{c,a} + Shoreline_{c,a} + \Sigma\alpha_{i,c,a})] + \Sigma\beta_i$$

where

p = proposed structure site
c = compensation structure site
a = "after construction" site conditions
b = "before construction" site conditions
α_i = other compensation variables
β_i = additional mitigation

Adverse impacts "diminished" by the removal of an existing structure (and any additional mitigation)

Adverse impacts "caused" by the construction of a new structure

Next Steps

- Finalize compensation equation design
- Test the equation with theoretical scenarios
- Train CT permitting staff on how to use the methodology
- Pilot test the methodology

Contact

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Special thanks to:

OFFICE FOR COASTAL MANAGEMENT
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

TRIDEC TECHNOLOGIES

Sea Grant CONNECTICUT

Connecticut Department of Energy and Environmental Protection

Offshore sand investigation language:

The Secretary is authorized to conduct regional geophysical investigations of offshore sand sources to meet coastal resiliency needs. Preference shall be given to those investigations that involve multiple state or local government jurisdictions in order to promote a systems approach to meeting coastal water resources needs. The projects shall include federal and state priorities for coastal storm risk management, ecosystem restoration, recreational beaches, back bays, and related purposes. Any individual projects recommended by these investigations shall be implemented through appropriate authorities. The geophysical investigations shall compliment and not duplicate the offshore investigations of the Bureau of Ocean Energy Management as well as other federal agencies and shall be coordinated with the investigations and mappings of State and local agencies as well as scientific and academic non-governmental organizations.

There is authorized to be appropriated up to $30 million dollars, no more than $3 million of which is authorized to be appropriated annually.