Applying SEEA EEA to Marine and Coastal Areas: Long Island Bays

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Overview

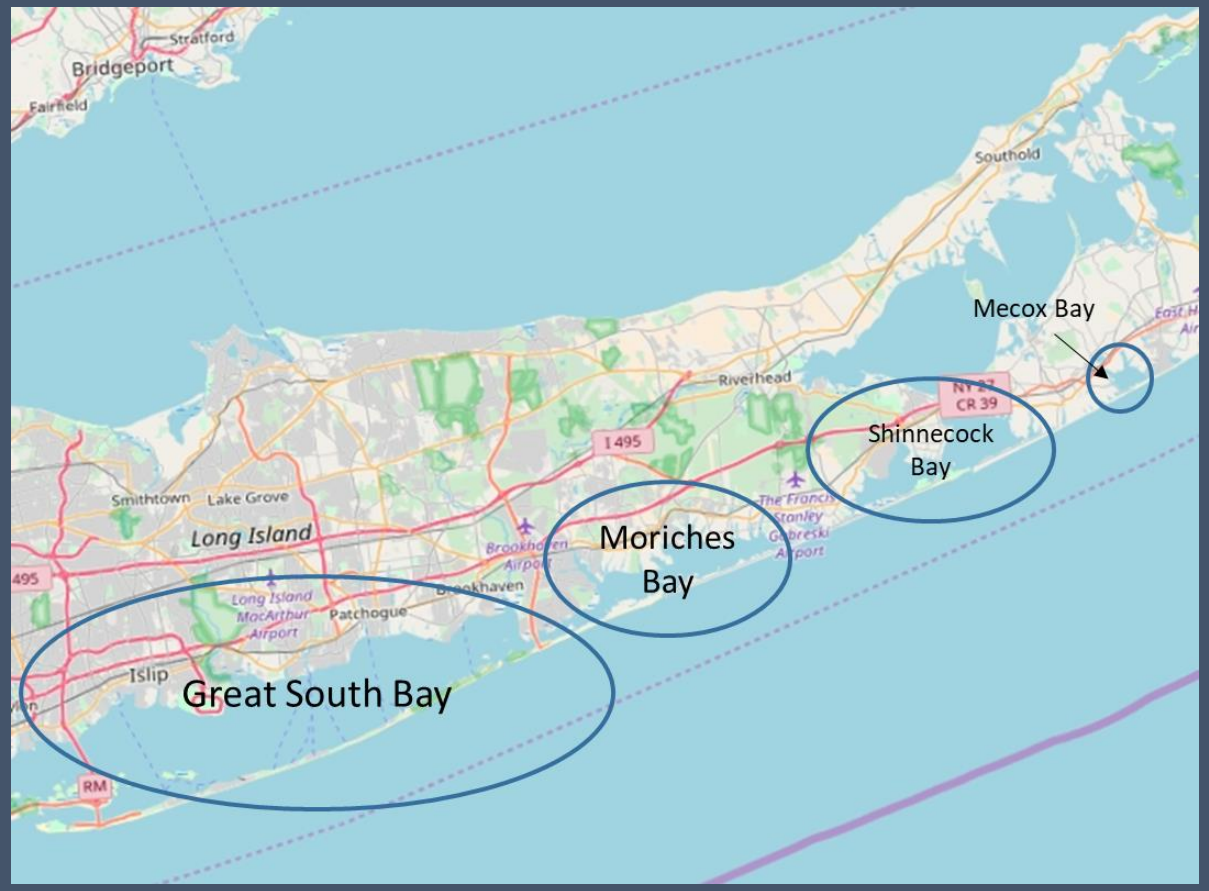
- EEA and marine context
- Application to Long Island bays
- Future research directions

Challenges of Coastal/Marine Context

- How to define EAU?
  - Administrative/watershed boundaries for terrestrial
  - Use policy-relevant areas? Bioregions?
- Interconnections across EAUs
  - Mobility of species and tracking of species
  - Nursery habitat vs where feed vs where harvested
  - Nutrient and water fluxes
- Mapping/data limitations for LCEUs
  - Aquatic habitats not as well mapped as terrestrial

Application to Long Island Coastal Bays

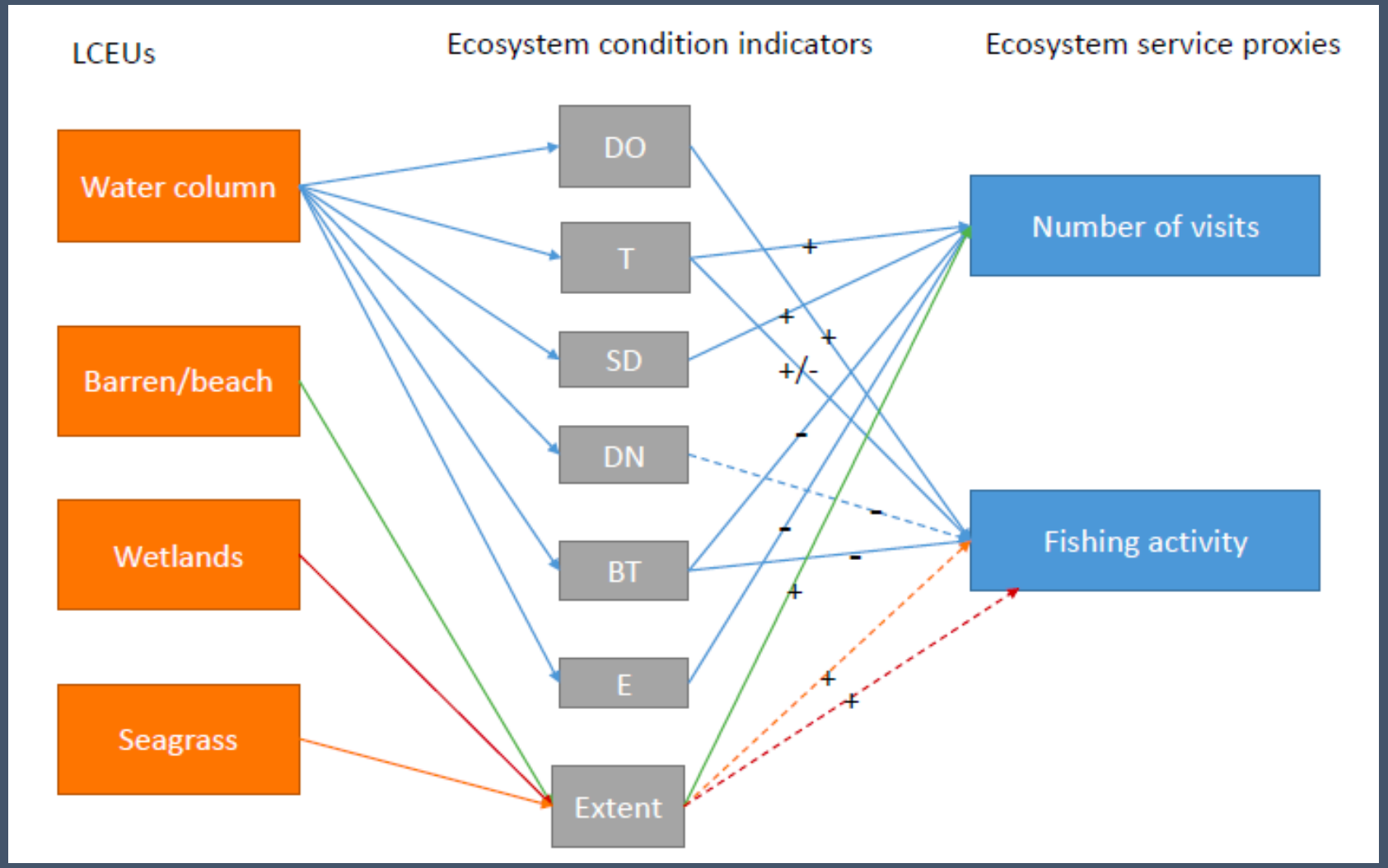
- Focus on prioritized ecosystem services and associated benefits



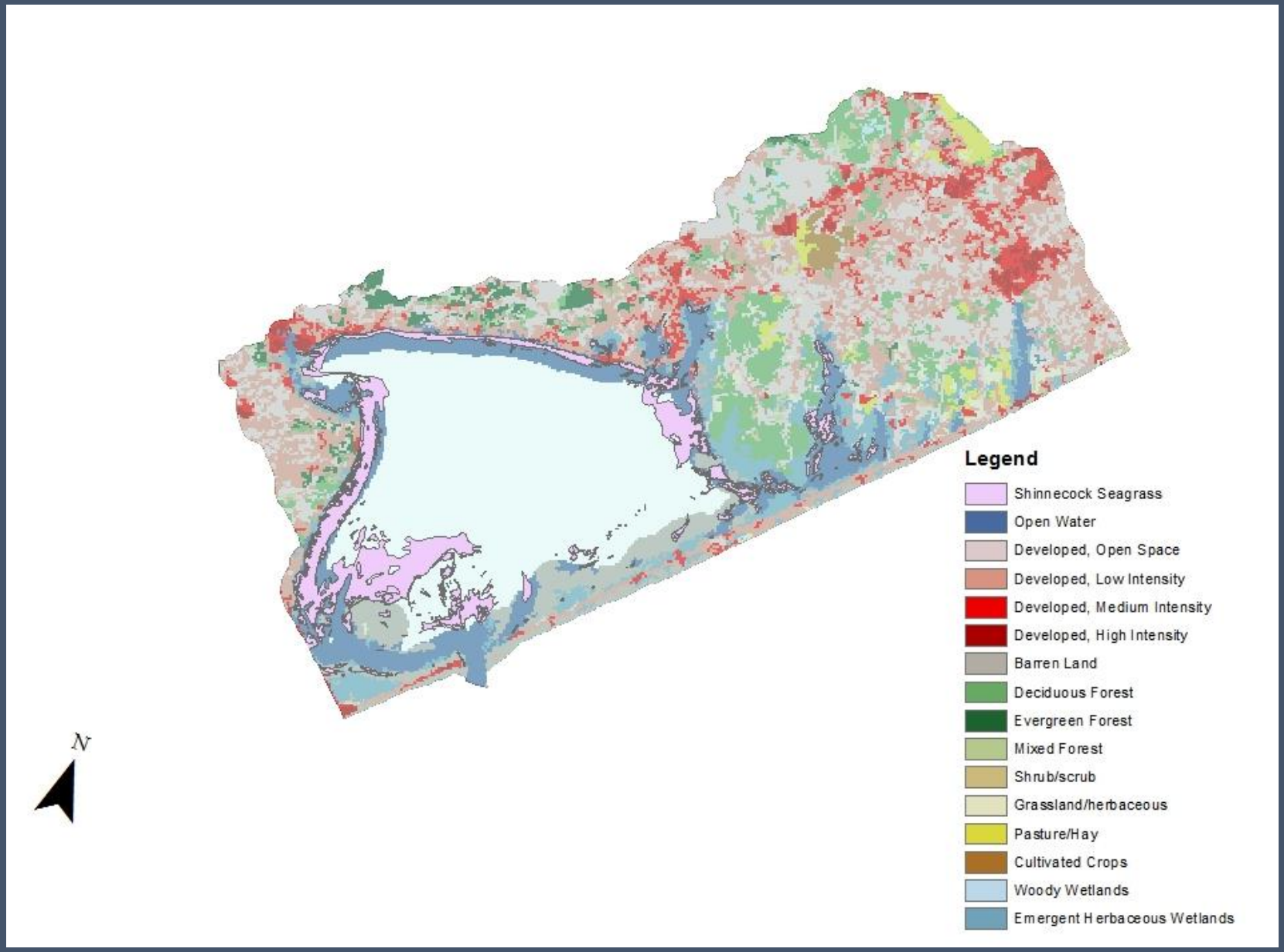
Ecosystem Accounting Units

- Joint consideration of terrestrial and marine assets as EAU
  - 12-digit HUCs incorporate watershed and waterbody
  - Provide boundary for delineating imports to/exports from system
- Mapping data sources
  - Land cover – NLCD USGS
  - Wetland – National Wetland Inventory
  - Seagrass – Nature Conservancy
  - Water column data – Suffolk County Department of Health

Conceptual Map



Shinnecock Bay – Land and Aquatic Cover



Condition Indicators within EAU by Identified Habitat Areas

LCEU	Extent (km2)	Characteristics of ecosystem condition					
Year: 2006		Physical/Chemical				Biological	
		DO (mg/l)	T (°C)	S (ft)	DN (mg/l)	BT (cells/ml)	E** (MPN/100 ml)
Water column	310	9.8	9.4	5.2	.33	1,945	29
Barren land (Beach)	23.8	N/A	N/A	N/A	N/A	N/A	N/A
Wetlands	50	U	U	U	U	U	U
Seagrass*	67.4	U	U	U	U	U	U

Food for thought: Can we skip this step if we have better data on the physical ecosystem service flows and end benefits than on the condition measure?

Ecosystem Condition Across Time Periods

	Characteristics of Ecosystem Condition				
	DO (mg/l)	T (°C)	S (ft)	BT (cells/ml)	E (MPN/100 ml)
Opening condition	9.8	9.4	5.2	1,945	29
Improvements in condition			.5		8
Improvements due to natural activity			?		?
Improvements due to human activity			?		?
Reductions in condition	1.3			82,329	
Reductions due to extraction and harvest	?			?	
Reductions due to ongoing human activity	?			?	
Catastrophic losses due to human activity	?			?	
Catastrophic losses due to natural activity	?			?	
Closing condition	8.5	14*	5.7	84,274	21

- What is driving the condition changes? Management actions?

Linking to Economic Production Accounts: Recreation and Fisheries Benefits

- Consumption of recreation often directed toward discrete space by infrastructure investments
  - Estimate flows to economic units/sectors within defined terrestrial EAU
- Much data where landings occur not necessarily where fish caught
  - VTR, SHAs in NY

Type of service	End of 2006 Accounting Period	End of 2011 Accounting Period
Provisioning services		
Shellfishing (bushels landed)*	12,169	21,501
Cultural Services		
Beach visitation (number of visits)**	772,803	1,125,800

*Totals across all study bays
**Represents data from a single park

Conclusions

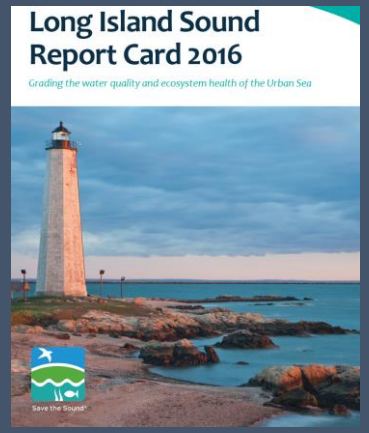
- Data limitations impede fine-scale analysis and population of tables
  - Lack (at least within the US) of regularly scheduled mapping of many marine habitats
- Simultaneously track large scale water column data and nursery/refuge habitat extent (e.g., wetland, seagrass)
- Monitor shifts in ecosystem-associated economic accounts
  - Tourism accounts
  - Fisheries accounts
- Allows development of relationship between shifting habitats, conditions, and economic activity

Future Research Questions

- What are relevant time steps for analysis given indicator of interest?
  - Condition measures vary on different time scales
  - Levels during a given season or max/min may be more relevant than beginning/end of time period
  - Lagged condition indicators
- What is level of detail needed for policy decisions?
  - Who are the end users?
  - GDP estimates become awkward at small scales but many ecosystem decisions are made on a small and project scale
  - What to we lose as we scale up?
- Role for ecological marine units approach? Species associations? Predictions of habitat types from accessible physical and chemical data?
- Link to industry and product classification (ENOW, NESCS)

Role of EEA and Other Assessment Approaches

- Report cards
- Integrated assessment plans
- How to supplement/complement/synergize?



Questions?

- Contact information

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