

# 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

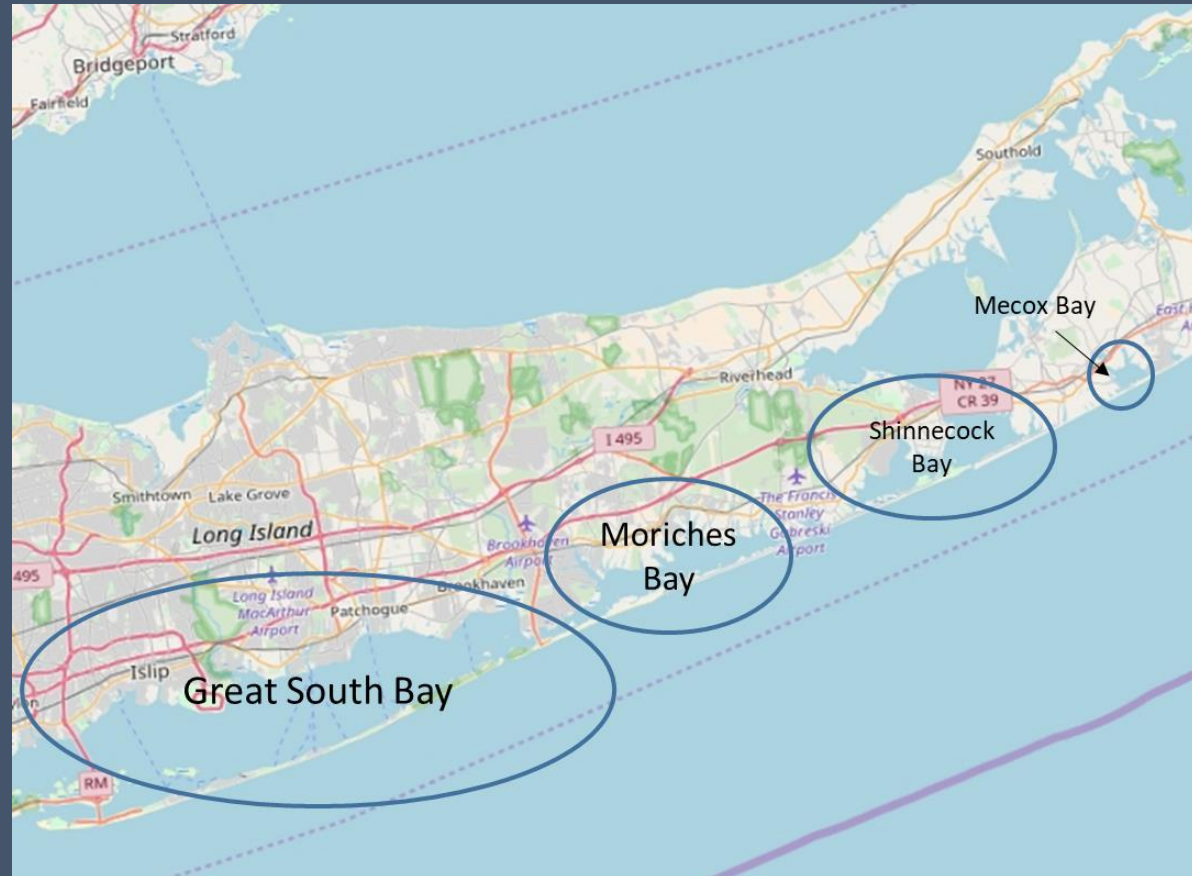
# Challenges of Coastal/Marine Context



- 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

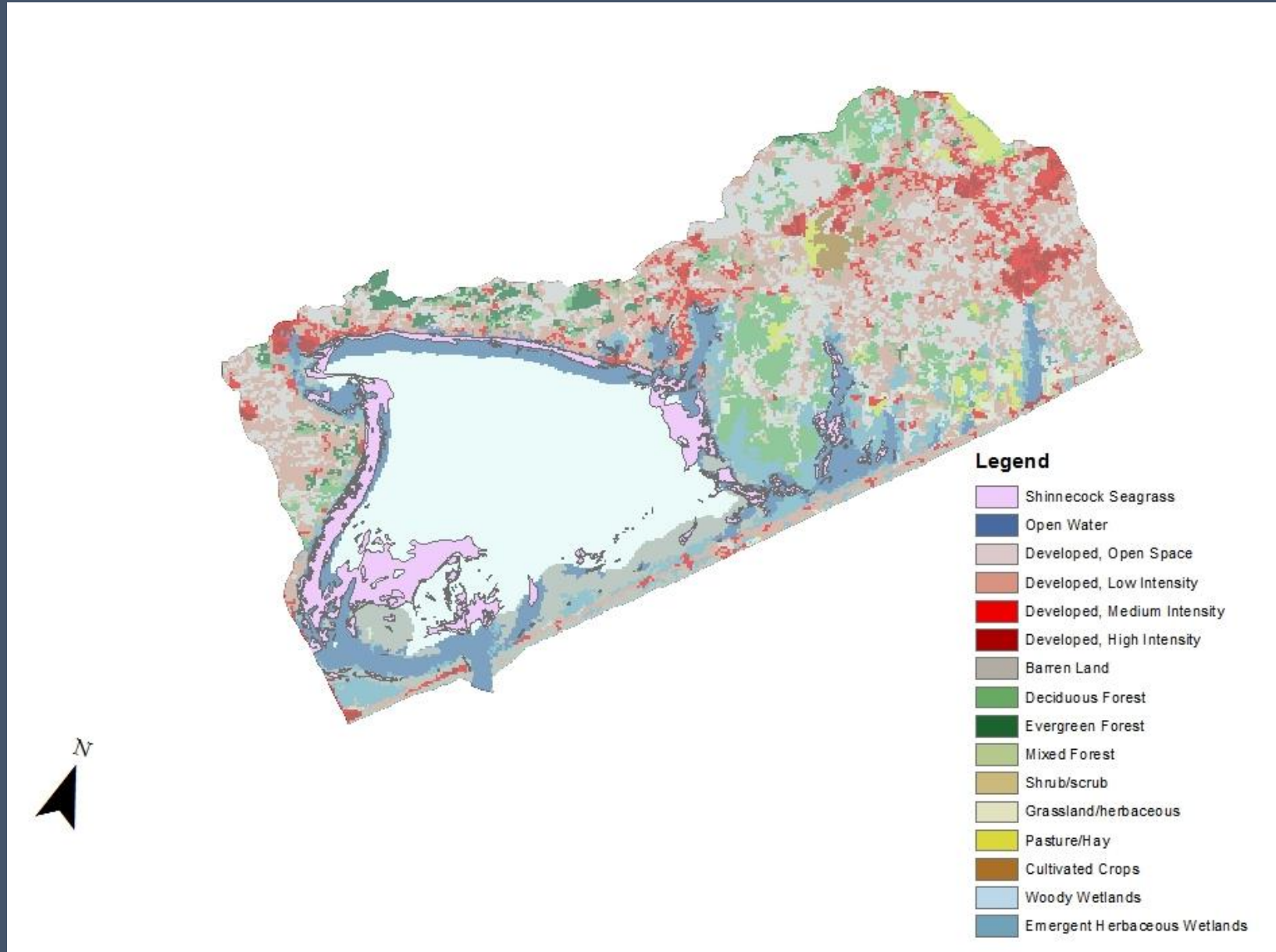


# Ecosystem Accounting Units

- 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



# Shinnecock Bay – Land and Aquatic Cover



# Condition Indicators within EAU by Identified Habitat Areas

LCEU	Extent (km <sup>2</sup> )	Characteristics of ecosystem condition					
		Physical/Chemical				Biological	
Year: 2006		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)
<b>Opening condition</b>	9.8	9.4	5.2	1,945	29
<b>Improvements in condition</b>			.5		8
<b>Improvements due to natural activity</b>			?		?
<b>Improvements due to human activity</b>			?		?
<b>Reductions in condition</b>	1.3			82,329	
<b>Reductions due to extraction and harvest</b>	?			?	
<b>Reductions due to ongoing human activity</b>	?			?	
<b>Catastrophic losses due to human activity</b>	?			?	
<b>Catastrophic losses due to natural activity</b>	?			?	
<b>Closing condition</b>	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
<b>Provisioning services</b>		
Shellfishing (bushels landed)*	12,169	21,501
<b>Cultural Services</b>		
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 do we lose as we scale up?
- Role for ESRI ecological marine units approach? Species associations? Predictions of habitat types from accessible physical and chemical data?
- Link to industry and product classification (ENOW, NESCS)



# Questions?

- Contact information

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