

Valuation of the Ecosystem Services Provided by Oak Bluffs' Public Coastal Resources

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Purpose of Economic Valuation

- Value of ecosystem services often overlooked in management decisions
- Value estimates help:
 - Justify conservation efforts and budgets
 - Prioritize conservation efforts
 - Communicate importance of resources with general public



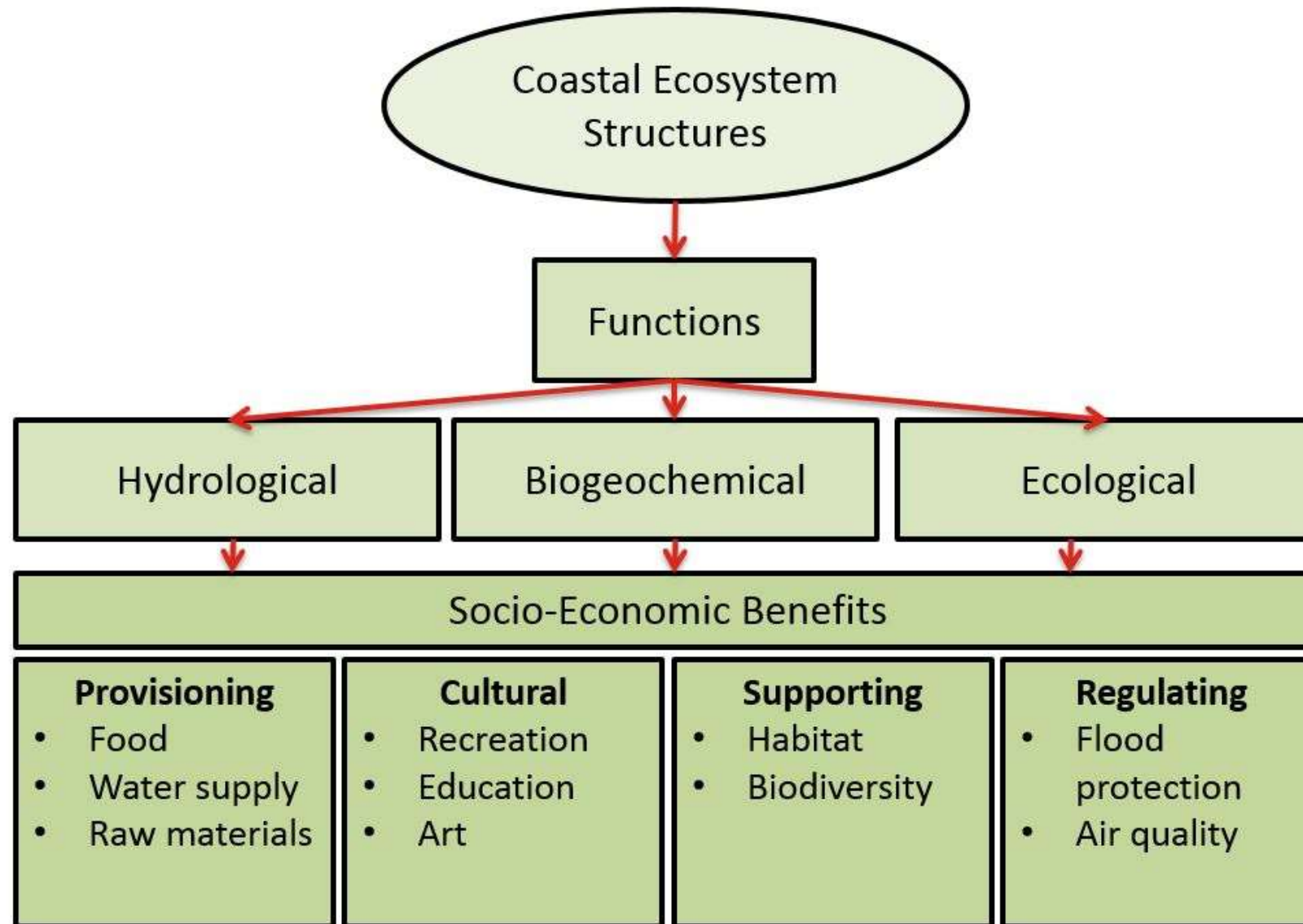
Photo: Liz Durkee

Public Coastal Resources



Photos: Liz Durkee

Ecosystem Goods and Services



Provisioning Services

Provisioning Service	Valuation Type	Valuation Components
Commercial Shellfishing	\$	Shellfishing licenses, commercial catch, flow-on impacts
Commercial fishing	●	Finfish landings; Wetland contributions to finfish populations covered in Supporting Services
Aquaculture	●	Cottage City Oysters: two-acre offshore oyster farm in Oak Bluffs off the Eastville Beach coast
Kelp Farming	●	Dan and Greg Martino (Cottage City Oysters)

● = Qualitatively described service
 \$ = Quantified and monetized service



Photo: Sam Moore



Photo: Mark Lovewell



Photo: Tim Johnson

Provisioning Services Values

- **Shellfish license revenue: \$5,950 in 2016**
- **Commercial catch: 599 bushels of bay scallops, 278 bushels of quahogs, and 12 bushels of soft-shell clams (\$138,448 in 2016)**
- **Flow-on Impacts: \$332,275 in 2016**
- **Total: \$476,673 in 2016; \$10.5 million (2016-2050)**

Key Sources:

David Grunden, Shellfish Constable
Abt Associates (2016)



Photo: Liz Durkee

Cultural Services

Cultural Service	Valuation Type	Valuation Components
Recreation	\$	Beach use, fishing, shellfishing, boating, wildlife viewing, biking
Fishing Tournaments	•	Oak Bluffs Bluewater Classic, Martha's Vineyard Striped Bass and Bluefish Derby, Annual Kids Fishing Derby
Local Art	•	Art galleries in Oak Bluffs; coastal-inspired art
Festivals	•	Harborfest, Midsummer Faerie Festival, etc.
Education Events	•	Massachusetts Audubon Felix Neck Wildlife Sanctuary, Sailing Camp Park
Cultural Landmarks	•	East Chop Lighthouse, Ocean Park Bandstand
• = Qualitatively described service \$ = Quantified and monetized service		

Cultural Services Values

- **Annualized values:**
 - Non-market value: \$21.1 - \$55.8 million
 - Direct expenditures: \$31.4 million
 - Flow-on impacts: \$80.0 million
- **Total: \$132.4 - \$167.2 million annually; \$4.5 - \$5.7 billion (2016-2050)**

Key Sources:

Martha's Vineyard Commission (2006, 2011)

NOAA (2012)

MA Division of Marine Fisheries (2017)



Photos: Tim Johnson (top), Ralph Steward (bottom)

Supporting Services

Supporting Service	Valuation Type	Valuation Components
Coastal Wetland Habitat	\$	Willingness to pay to protect coastal wetland habitat
Seagrass Habitat	\$	Willingness to pay to protect seagrass habitat
Beaches and Sand Dunes	•	Wildlife habitat
Threatened and Endangered Species	•	Piping plover, roseate tern, northern gama-grass
<ul style="list-style-type: none"> • = Qualitatively described service \$ = Quantified and monetized service 		



Photo: Friends of Sengekontacket



Photo: Lanny McDowell



Photo: Lanny McDowell

Supporting Services Values

- Applied annual household values for wetland and seagrass habitat to the number of households in Dukes County, MA
- Annualized values:
 - Coastal Wetland: \$26,360 - \$27,853
 - Eelgrass: \$27,412
- Total: \$53,772 - \$55,265 annually;
\$1.8 - \$1.9 million (2016-2050)



Photo: Liz Durkee

Key Sources:

Johnston et al. (2002)

Bauer et al. (2004)

Regulating Services

Regulating Service	Valuation Type	Valuation Components
Carbon Sequestration	\$	Carbon sequestration from forests, grasslands, and eelgrass
Carbon Storage	\$	Carbon storage from trees
Air Pollution Removal	\$	NO ₂ , O ₃ , PM _{2.5} , and SO ₂ removal from trees
Oyster Carbon Sequestration	\$	Carbon sequestration from oyster fishery
Shellfish Nitrogen Removal	\$	Nitrogen Sequestration from the Oyster and Quahog Fisheries
Storm Protection and Erosion Control	\$	Improvements in property value from reduced flood risk
<ul style="list-style-type: none"> ● = Qualitatively described service \$ = Quantified and monetized service 		

Regulating Services Values

- **Annualized Values:**
 - Carbon Sequestration: \$7,234
 - Air Pollution Removal: \$1,412
 - Oyster Carbon Sequestration: \$1,737
 - Shellfish Nitrogen Removal: \$2,943
 - Storm Risk Reduction: \$144,746 - \$723,729
- **Total: \$158,072 - \$737,055 annually;
\$3.8 - \$16.6 million (2016-2050)**

Key Sources:

IWG (2016), Mills et al. (2014), Nowak et al. (2014), Fry (2010), Cape Cod Cooperative Extension (2014), Grabowski et al. (2012), Streiner & Loomis (1995), Braden & Johnston (2004), Daniel et al. (2009)



Photo: Jeanna Shepard

Results

Estimated Economic Value of Ecosystem Services Provided by Oak Bluffs' Public Coastal Resources (Millions 2016\$) ¹		
Ecosystem Service	Annualized Value ²	Total Present Value ³ (2016-2050)
Provisioning Services	\$0.48	\$10.51
Cultural Services	\$132.44 - \$167.17	\$4,503.04 - \$5,683.61
Supporting Services	\$0.05 - \$0.06	\$1.83 - \$1.88
Regulating Services	\$0.16 - \$0.74	\$3.77 - \$16.59
Total	\$133.13 - \$168.45	\$4,519.15 - \$5,712.59

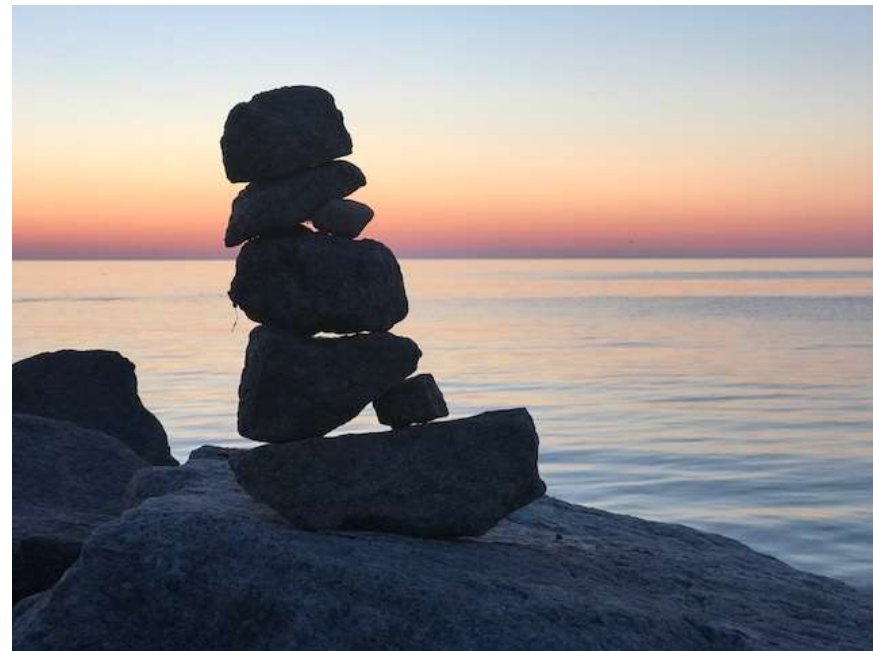
¹ Values exclude services that could not be monetized, including educational opportunities, support of threatened and endangered species, and aquaculture/kelp farming.

² Annualized value is estimated using a 3% discount rate.

³ Total present value is estimated using a 3% discount rate.

Discussion

- Outdoor recreation accounts for a significant portion of the total value of Oak Bluffs' public coastal resources.
- Expenditures from outdoor recreation account for 33% of total estimated expenditures in Oak Bluffs.



Photos: Liz Durkee

Thank you!

Full report available:

“Valuation of the Ecosystem Services Provided by Oak Bluffs’ Public Coastal Resources”

