An Ecological Characterization of the Stellwagen Bank National Marine Sanctuary Region

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Introduction: *Gulf of Maine & SBNMS*
Methods: *Biogeographic Assessments*

GIS & RS Data

- Imagery
- Human Stressors
- Bottom Type
- Bathymetry
- Oceanography
- Species Distributions (many layers)

Spatial Products
Methods: Abiotic Spatio-Temporal Data

STATIC VARIABLES

- Bathymetry
- Slope
- Substrate
- Distance to Features

DYNAMIC VARIABLES

- Chlorophyll a
- Turbidity
- Sea Surface Temp.
- Seasonal Water Stratification
Methods: *Biotic Spatio-Temporal Data*

**PREY ABUNDANCES**
- Atlantic Mackerel
- Northern Sand Lance
- Zooplankton

**CETACEAN ABUNDANCES**
- Mysticeti (Baleen Whales)
- Atlantic White-Sided Dolphin
- Northern Atlantic Right Whales
Methods: Data Integration
# MARS Cost of Omission: Humpback Whales

## Spring

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cost of omission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance 100 m isobath</td>
<td>0.218</td>
</tr>
<tr>
<td>Distance to shelfbreak</td>
<td>0.149</td>
</tr>
<tr>
<td>Distance to shore</td>
<td>0.144</td>
</tr>
<tr>
<td>Mean depth</td>
<td>0.124</td>
</tr>
<tr>
<td>Fish abundance (all species)</td>
<td>0.117</td>
</tr>
<tr>
<td>Chlorophyll a concentration</td>
<td>0.116</td>
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</tbody>
</table>

## Summer

<table>
<thead>
<tr>
<th>Variable</th>
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</thead>
<tbody>
<tr>
<td>Distance 100 m isobath</td>
<td>0.414</td>
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<tr>
<td>Sea surface temperature</td>
<td>0.195</td>
</tr>
<tr>
<td>Distance to shelfbreak</td>
<td>0.191</td>
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<tr>
<td>Mean stratification</td>
<td>0.189</td>
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<tr>
<td>Distance to shore</td>
<td>0.181</td>
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<tr>
<td>C. finmarchicus abundance</td>
<td>0.179</td>
</tr>
<tr>
<td>Mean depth</td>
<td>0.179</td>
</tr>
</tbody>
</table>
Results: Humpback Whale

Spring

Summer
Conclusion: *Models for Decision Support*

Understanding species’ habitat relationships to develop management tools.
Acknowledgements:
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For the full report, please navigate to:
http://ccma.nos.noaa.gov/products/biogeography/stellwagen/welcome.html