**Introduction & Purpose**

The goal of this project is to develop a methodology for assessing the vulnerability of marine habitats to climate change on the northwestern shelf of the U.S. Bight. This will be a risk assessment of the marine habitats in this region, which is a complex and dynamic system influenced by various factors. The focus will be on the impacts of climate change on marine habitats, and the potential for adaptation and management.

**Habitat Gini Delineation**

- Over half (47%) of the total area is comprised of marine habitats. Not all habitats are equally vulnerable to the impacts of climate change, and certain areas within each habitat are more vulnerable than others.
- The intertidal and subtidal zones comprise approximately 73% of the total area of each habitat, respectively.
- Most salt marsh habitat is located in the northern part of the study area, while eelgrass is more abundant in the southern part.
- Most of the habitats (97%) are located within 30 km of the coast, indicating a high degree of connectivity between land and sea.

**Climate Change Vulnerability Assessment**

- Qualitative scores were given for the metrics of vulnerability for each climate-threat interaction. This assessment was performed on current and future climate (‘default’ climate change) scenarios.
- The study area was not considered to be vulnerable to the impacts of climate change on marine habitats.
- Sensitivity and adaptive capacity relies on the current state of each environment, which can change in response to climate change or other stressors.

**Vulnerability Scoring Framework**

A simple qualitative scale (1 = low, 2 = medium, 3 = high) was used to represent the level of vulnerability for each habitat grouping. Values were assigned for each stressor and possible combination between stressors. For each stressor, vulnerability rankings are as follows:

1. Sea-Level Rise (SLR)
2. Ocean Addiction (OC)
3. Temperature Change
4. Salinity Change

**Major Findings**

- SLR is likely the most significant climate-related stressor or CUS (cumulative vulnerability score).
- Results for combined stressor vulnerability show that shellfish beds and the most vulnerable portion of the CUS is likely the northernmost area. The CUS is highly exposed to all stressors except OA and moderately sensitive to all stressors.
- HPSA is possibly the most vulnerable habitat considering SLR and OA are the near-simultaneous stressors. This is likely due to the presence of sensitive species and habitats that are particularly vulnerable to temperature changes, such as shellfish and other invertebrates.

**Combined Climate Change Stressor Vulnerability scores and ranking of habitats at CUS. Red and orange colors represent the highest risk of vulnerability for cumulative stressor groups, while green and blue represent the lowest.