Integrated Vulnerability Assessment in the Chesapeake Bay

Creating Priorities for Coastal Flooding Adaptation

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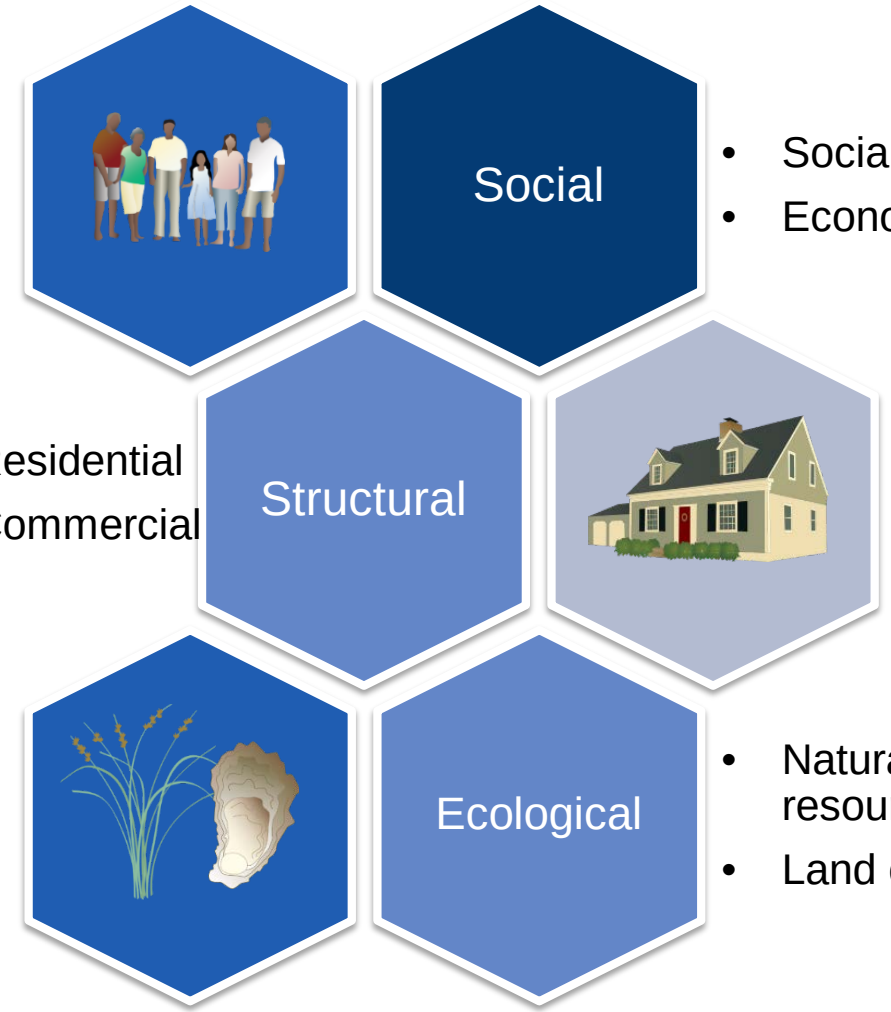
Introduction to the Project

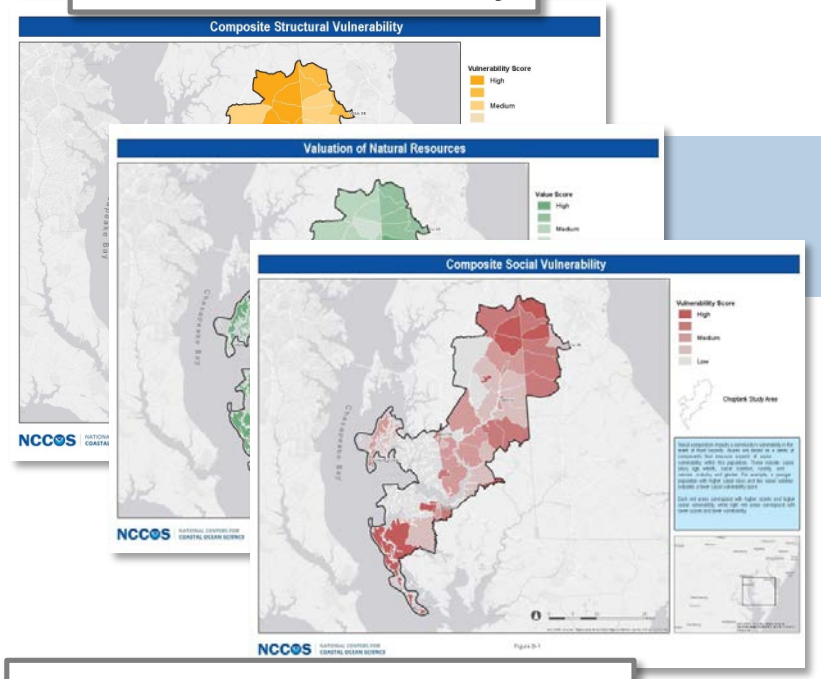
Goal: assess the climate change vulnerabilities of the social, structural, and ecological systems

Purpose: science-based information to help identify adaptation areas for coastal flooding risks for more resilient communities

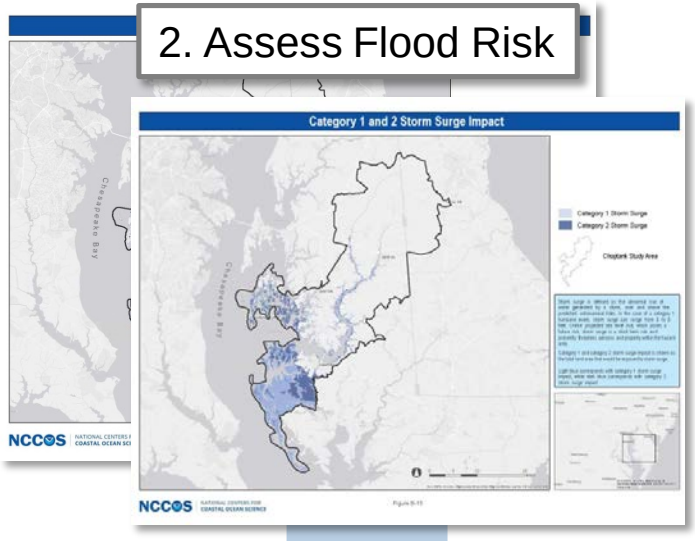


Integrated Vulnerability Assessment Framework

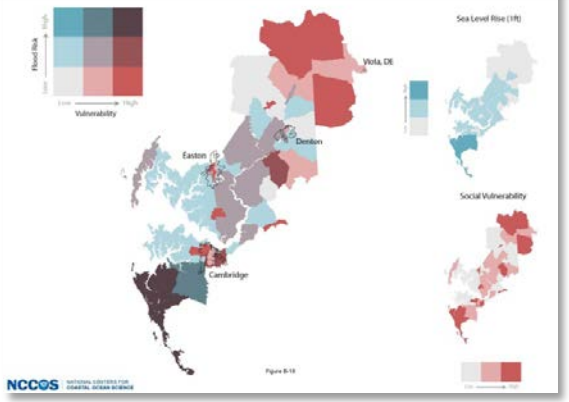
1. Assess Vulnerability



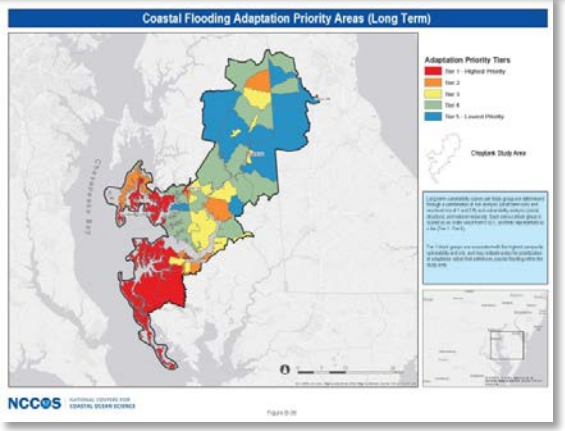
2. Assess Flood Risk



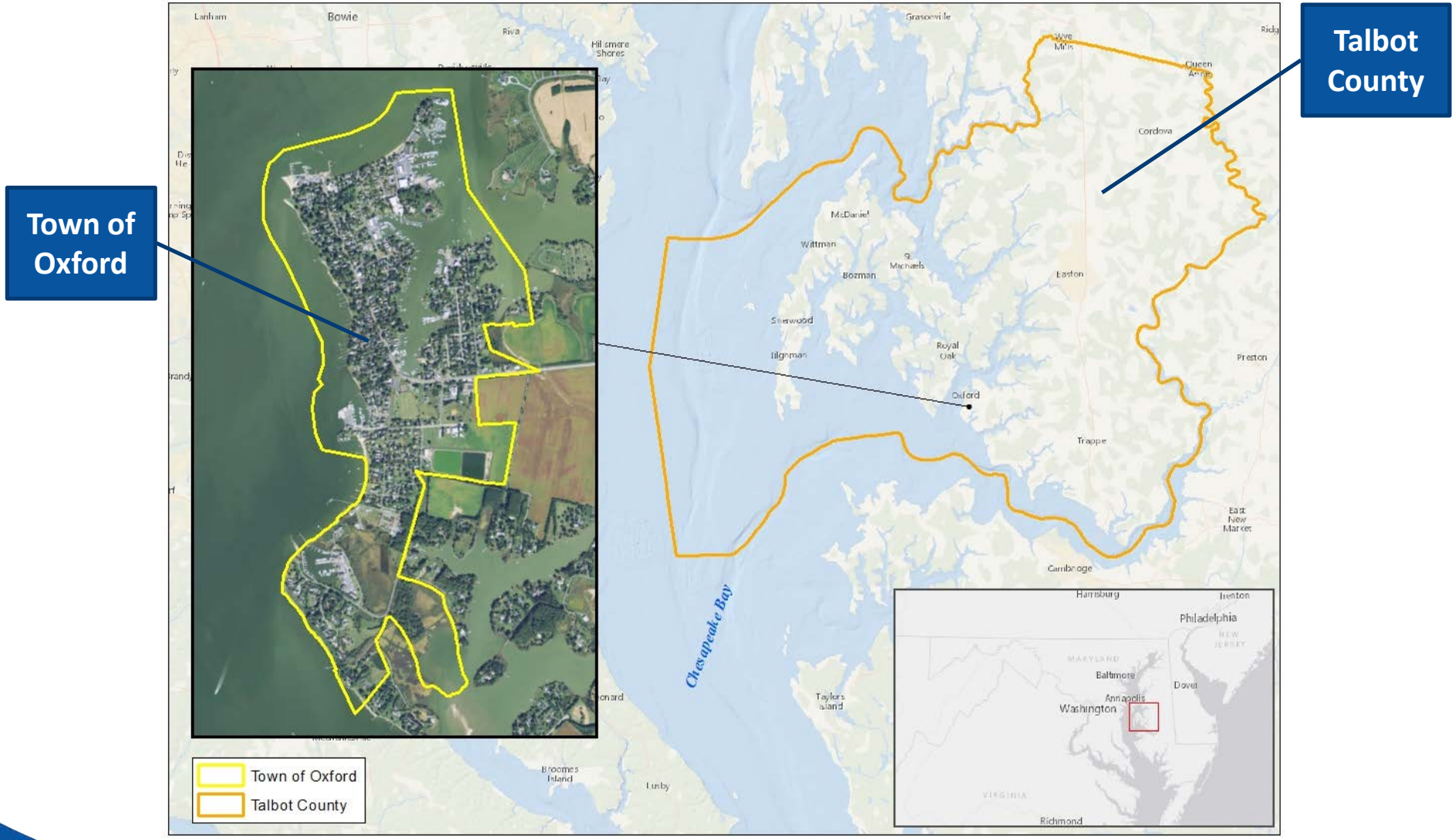
3. Intersect Flood Risk and Vulnerability



4. Prioritize Adaptation Areas

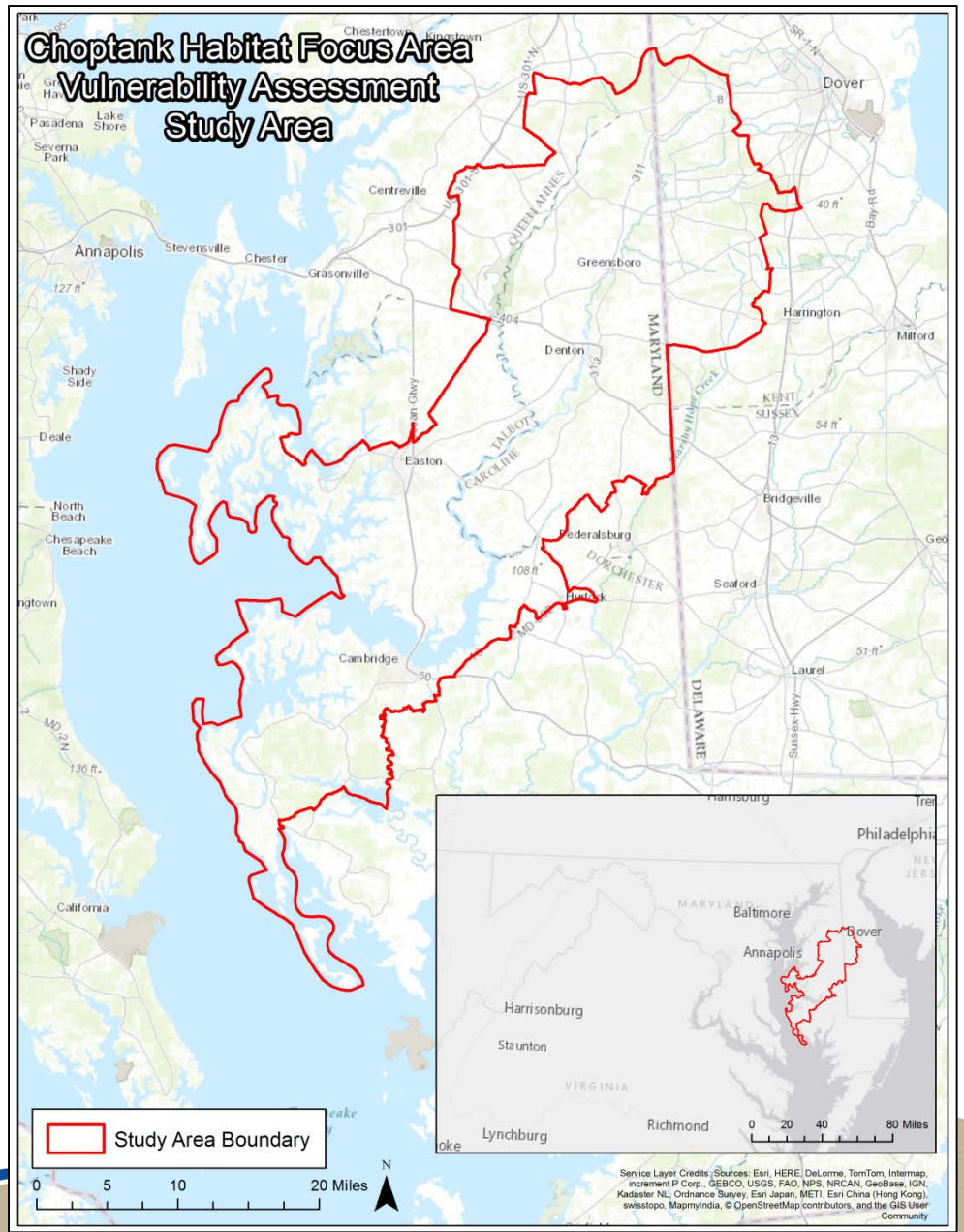


Site 1: Town of Oxford and Talbot County, MD



Site 2: Choptank Habitat Focus Area, MD & DE

- Extension to larger Chesapeake Bay area
- NOAA designated Habitat Focus Areas
  - Protect and manage deteriorating natural habitats
- Watershed-level management



Methods & Analysis

Identified vulnerabilities

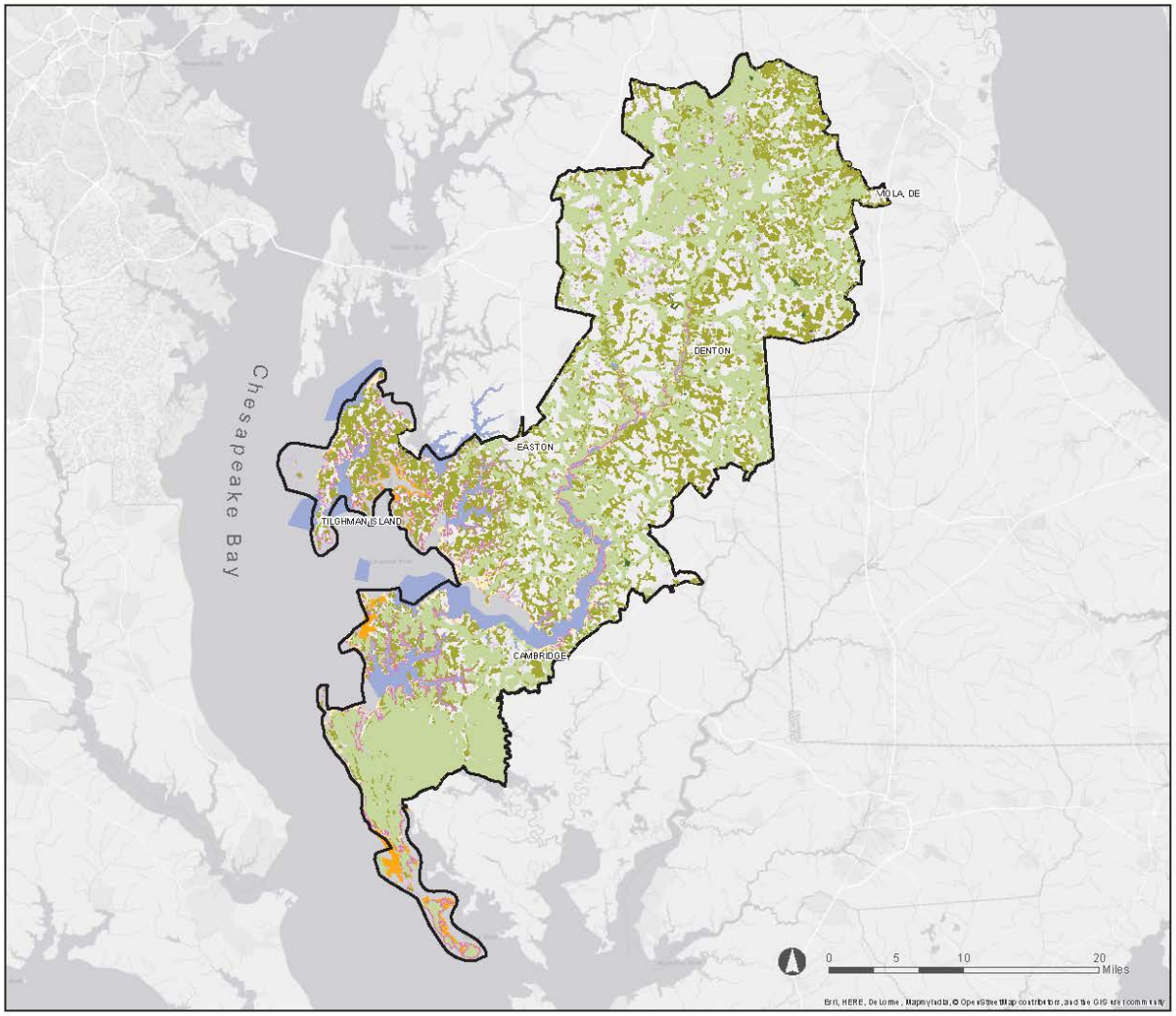
- Social vulnerability
- Structural vulnerability
- Natural resource vulnerability (measured via potential loss of highly valued resources)

Identified flood risks

- Sea level rise
- Hurricane storm surge
- Stormwater flooding

Results & Outcomes

Distribution of Natural Resources



- Beaches
- Marsh Buffer
- Forested Areas
- Forest Conservation Easements
- Green Infrastructure
- Oyster Sanctuaries
- Wetlands
- Submerged Aquatic Vegetation

Choptank Study Area

This map displays the distribution of natural resources and their spatial extent throughout the Choptank HFA. In total, eight natural resources are displayed: wetlands, beaches, marsh, green infrastructure, submerged aquatic vegetation, oyster sanctuaries, forested areas, and forest conservation easements.

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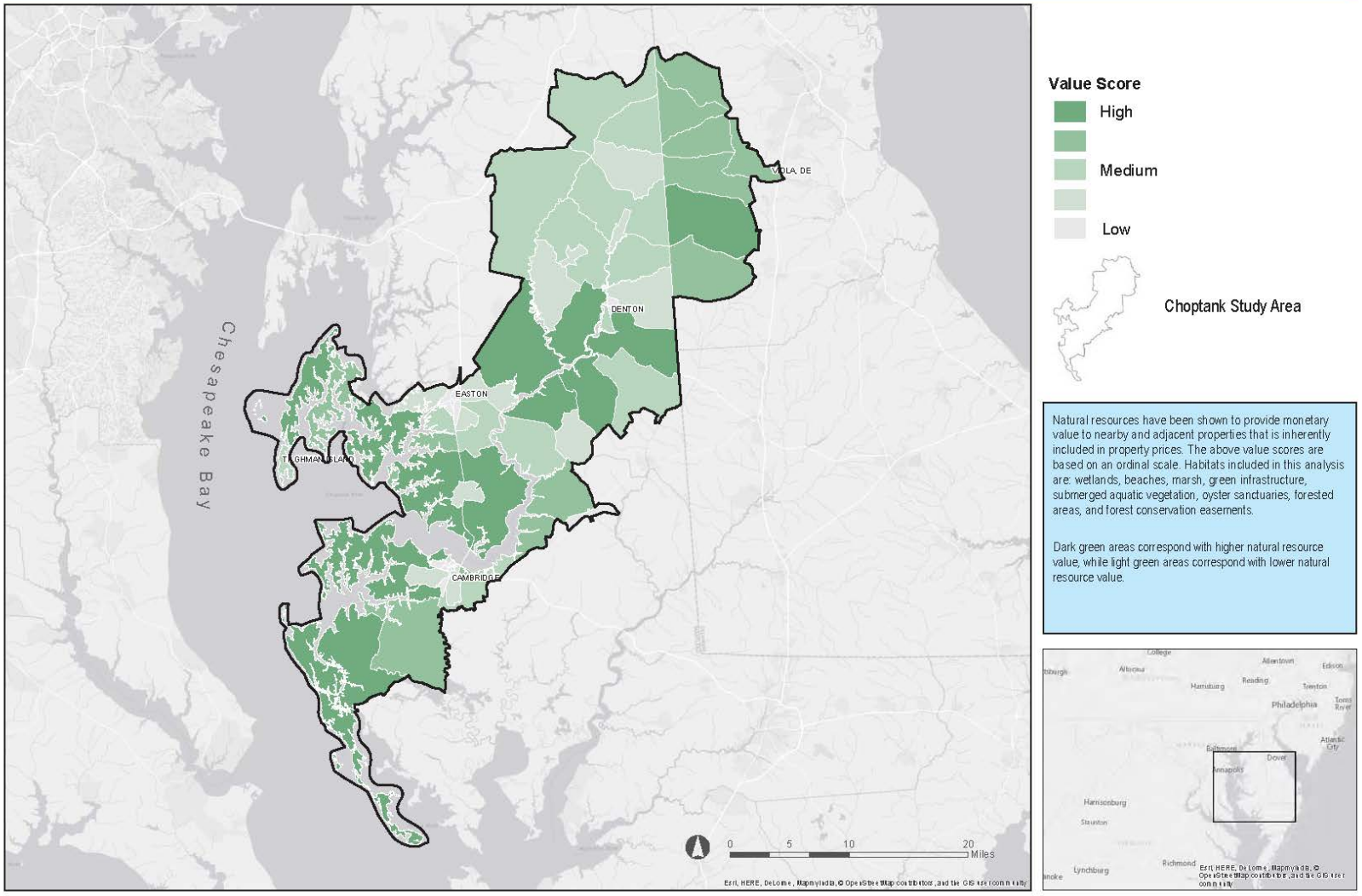
Figure B-12

Results & Outcomes

Valuation of Natural Resources



Natural resources have been shown to provide monetary value to nearby and adjacent properties that is inherently included in property prices. The above value scores are based on an ordinal scale. Habitats included in this analysis are: wetlands, beaches, marsh, green infrastructure, submerged aquatic vegetation, oyster sanctuaries, forested areas, and forest conservation easements.

Dark green areas correspond with higher natural resource value, while light green areas correspond with lower natural resource value.

Results & Outcomes

Composite Social Vulnerability

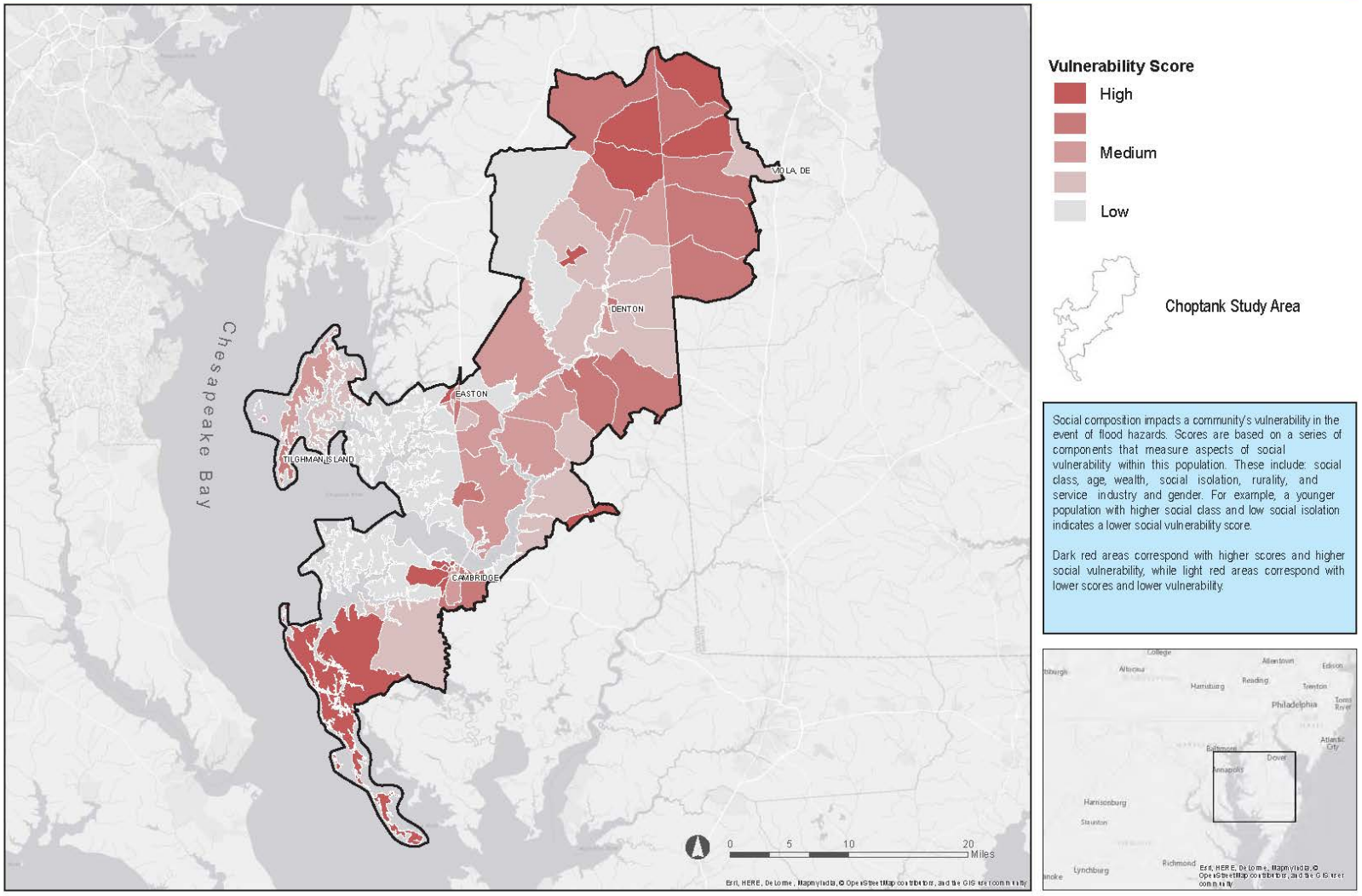


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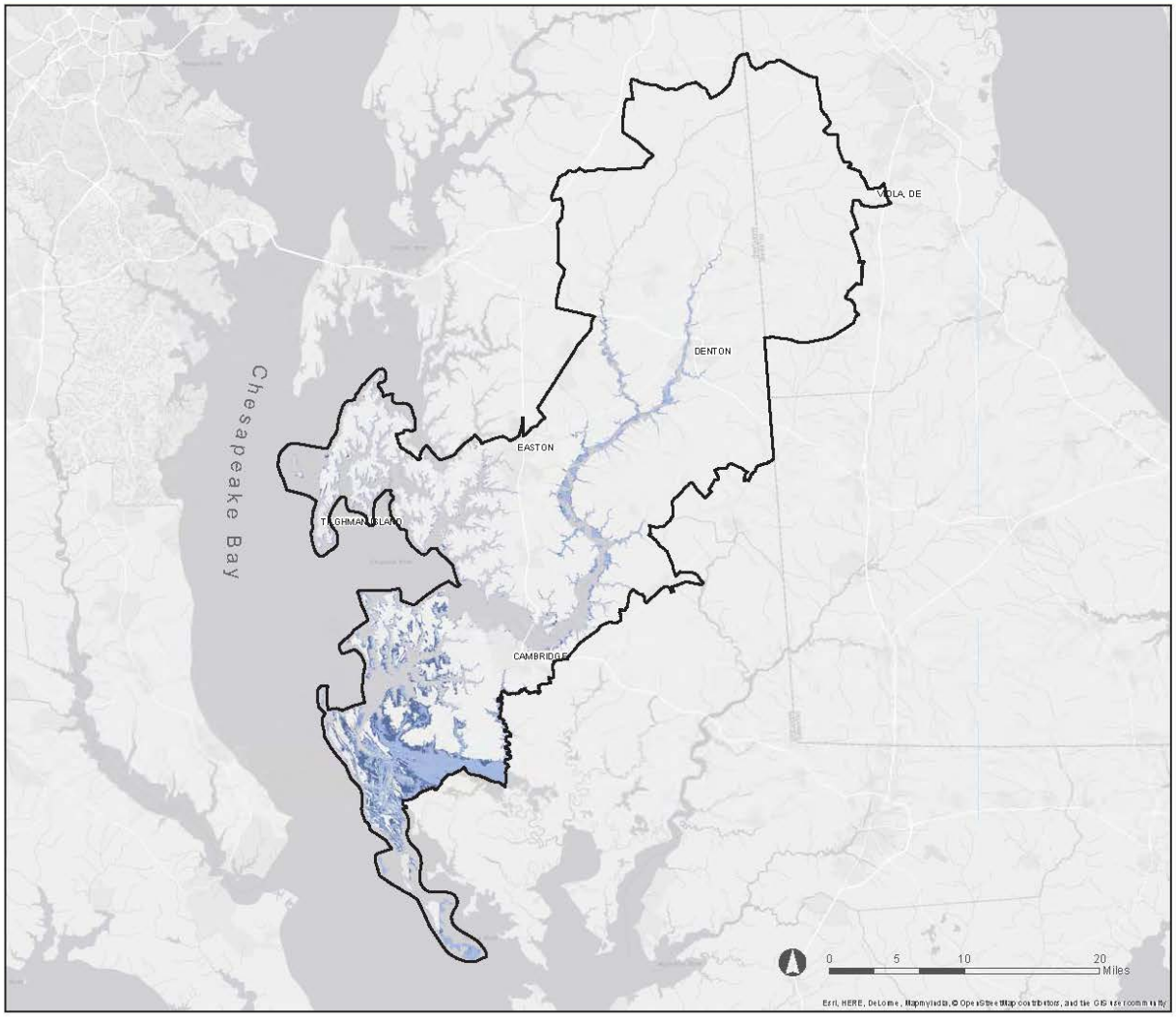
Figure B-1

Results & Outcomes

Projected Sea Level Rise of 1 and 2 ft



Sea Level Rise (1 ft)

Sea Level Rise (2 ft)

Choptank Study Area

Projected sea level rise is shown as the amount of the total land area that would be inundated in a sea level rise scenario, at 1 foot and 2 feet above mean high water (MHHW).

Light blue corresponds with 1 ft of projected sea level rise impact, while dark blue corresponds with 2 ft of projected sea level rise impact.

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Figure B-14

Results & Outcomes

Social Vulnerability and Sea Level Rise Risk of 1 ft

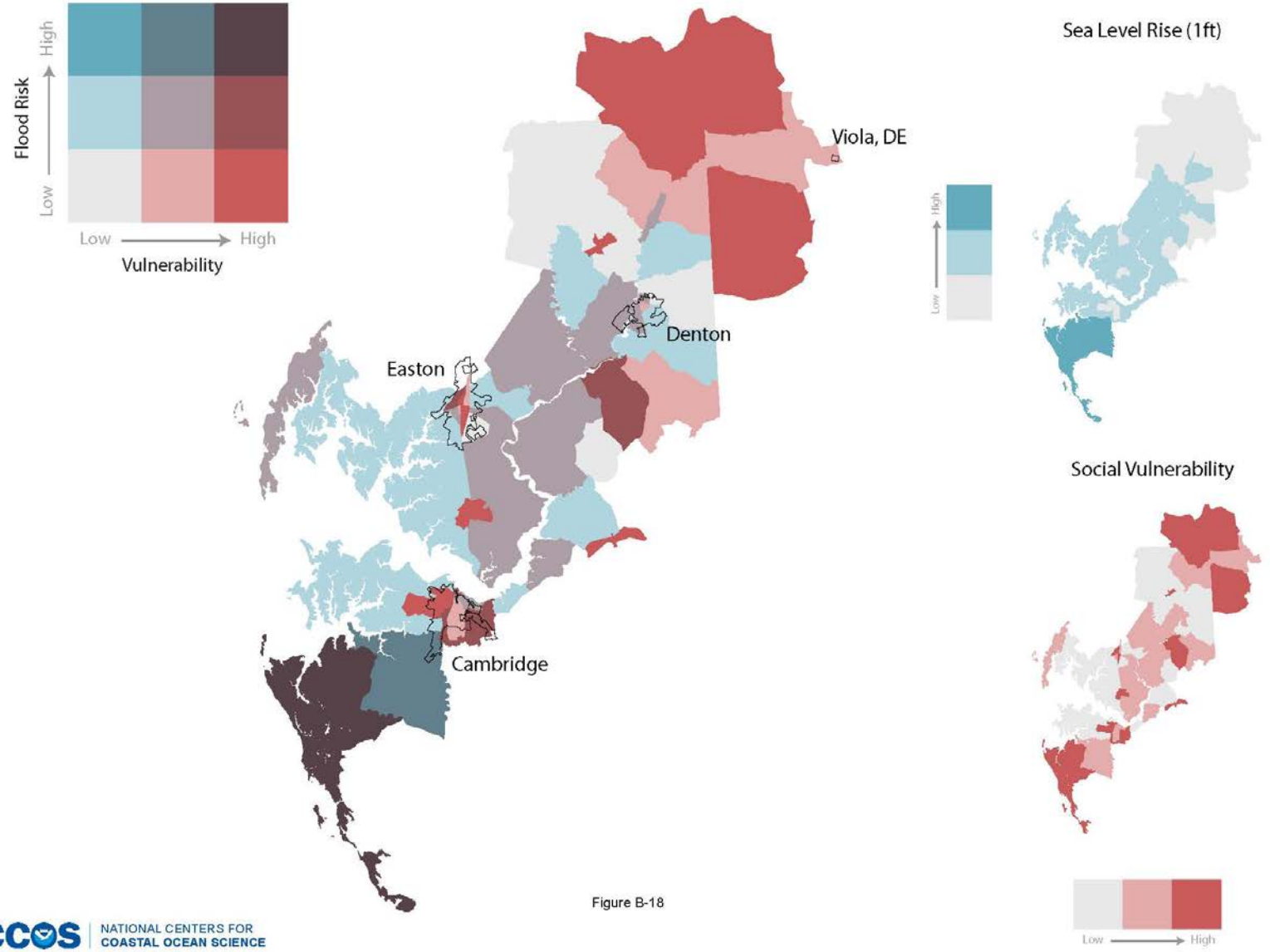

Figure B-18

Results & Outcomes

Coastal Flooding Adaptation Priority Areas (Long Term)

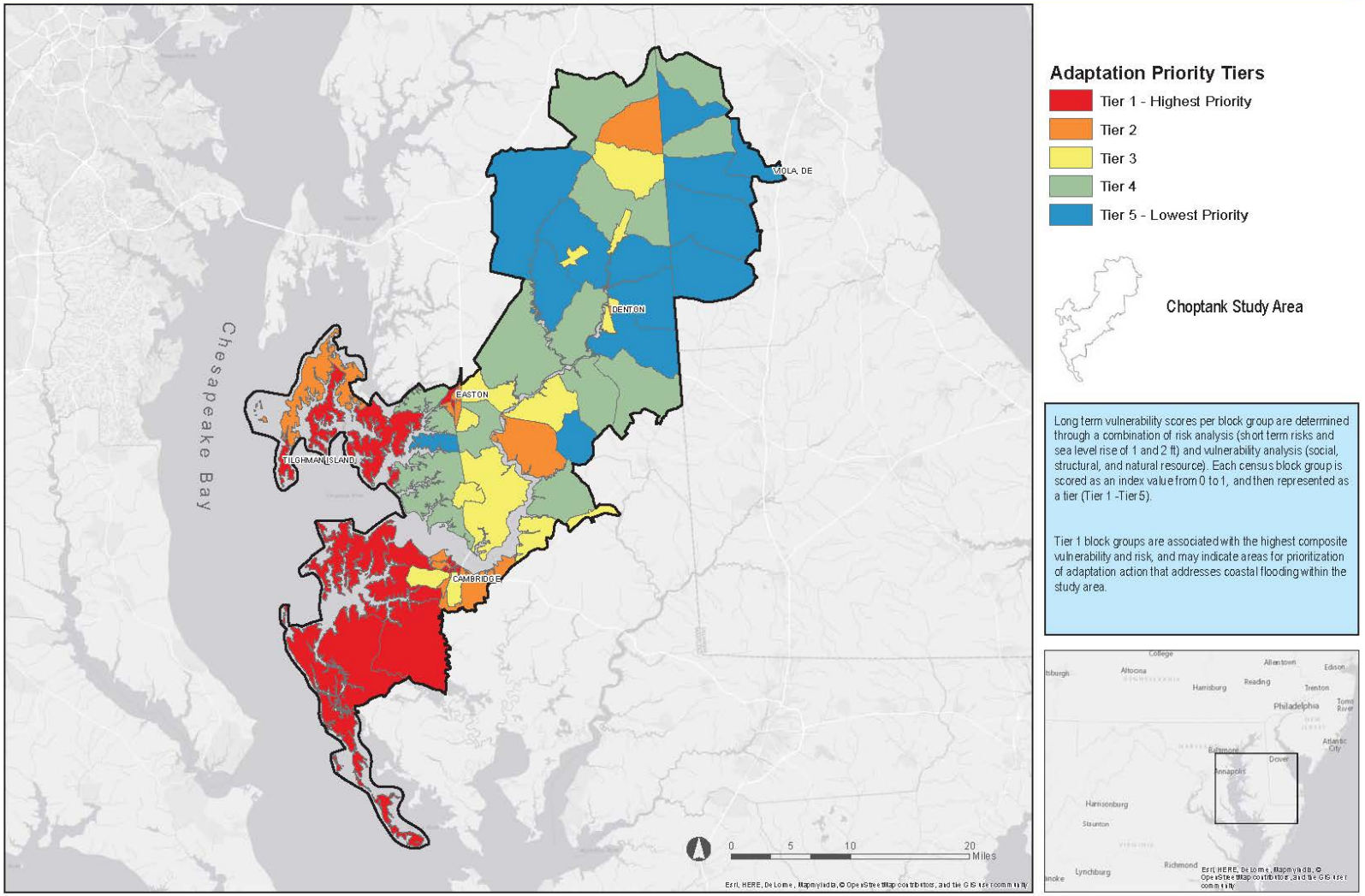

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Figure B-36

Applications

- Support for grant applications to secure funds for adaptation and best management practices
- Inclusion of social factors into county-level hazard mitigation plans
- Incorporation of stormwater flood prone areas layer into local flood risk mappers
- Identify areas that may be co-beneficial for community coastal flooding adaptation as well as habitat restoration

Thank you

NCCOS Project Team

- Chloe Fleming – Coastal Scientist (team lead)
- Seann Regan – Geographer (lead analyst)
- Maria Dillard – Social Scientist
- Matt Gorstein – Economist
- Eric Messick – Geographer
- Anne Blair – Ecologist
- Jarrod Loerzel – Social Scientist
- A.K. Leight – Ecologist

+ Regional, state, and local partners

Sunset on the Tred Avon River at the Cooperative Oxford Laboratory

For more information:

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Project Page:

https://coastalscience.noaa.gov/projects/detail?key=214

Photo credits: Integration and Application Network, University of Maryland Center for Environmental Science; NOAA