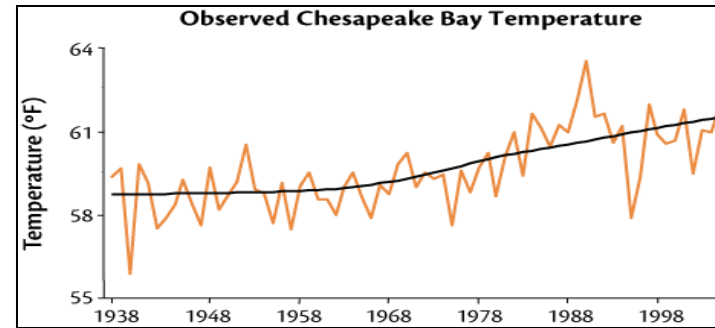


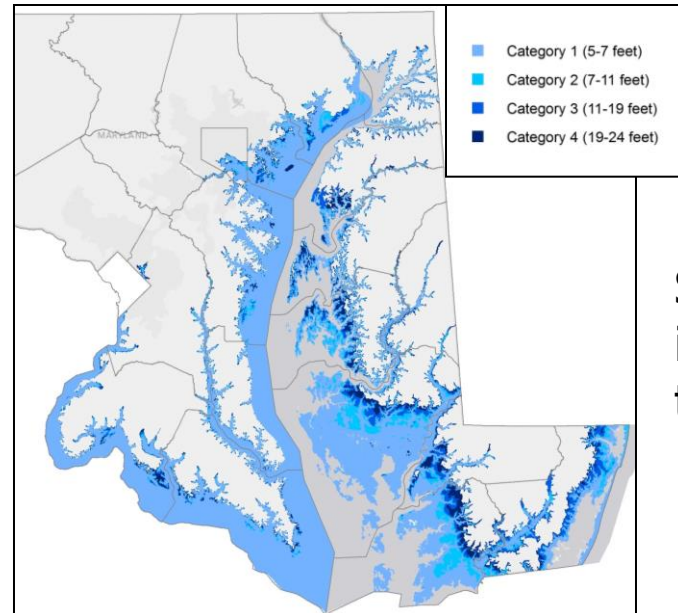
Enhancing Maryland's Resiliency
through Conservation:
Data to Decision Making

Climate Change in Maryland



Chesapeake Bay has warmed by more than 2°F.

Sea level has risen approximately one-foot in the last century.



Storm Surge inundation throughout the state

Building Resilience to Climate Change Policy



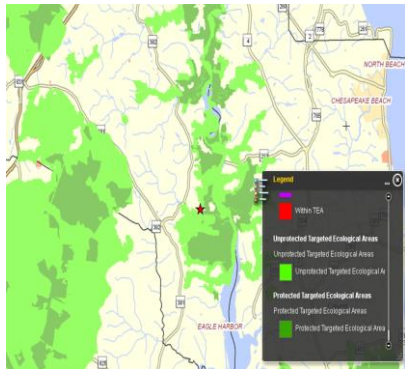
DNR shall proactively seek the protection of lands that enhance the resilience of bay, aquatic and terrestrial ecosystems.

- 1) Identify landscape or site-level characteristics that support ecosystem resilience, limitations on future use of the site and opportunities to increase resiliency and/or mitigate adverse impacts.
- 2) Assess land acquisitions for potential impacts of climate change and sea level rise.

Program Open Space: Targeting Land Conservation



“TEAs” for
Targeting



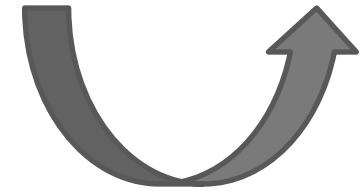
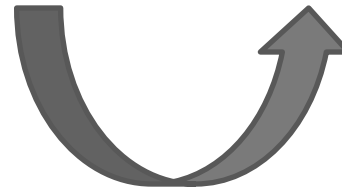
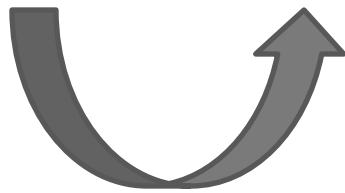
Ecological Scorecard

Property: Turnell LLC	County: Charles Map / Parcel: Multi	Final Score: 116
In Targeted Ecological Area? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Step #1: Ecological Value Ranking (100 points possible)		
A. Landscape Score		
I. Overall Landscape Score (10 points possible for each of the following categories - total 40 points)		
a. Green Infrastructure	9.3	
b. Rare Species	2	
c. Aquatic Life - Tidal or Non-Tidal	4	
d. Forests Important for Water Quality Protection	6	
Subtotal Overall Landscape Value Score:		21.3
II. Targeted Ecological Area (TEA) Bonus		
+20 points if more than 50 acres in a TEA or 25% in a TEA		
B. Parcel Score (10 points possible for each of the following categories - total 40 points)		20
a. Green Infrastructure	9.3	
b. Rare Species	2	
c. Aquatic Life - Tidal or Non-Tidal	4	
d. Forests Important for Water Quality Protection	6.3	
Subtotal (Parcel Value Score):		25.3
Step #1 Total - Ecological Value Score: 68.4		
Step #2: Special Adjustment for Multiple Benefit Ranking (20 points possible)		
A. Recreation Score (0 - 5, or 10 points)		
B. Historic or Cultural Value (0 or 5 points)		
C. Inholding or Adjacency (0 or 5 points)		
Step #2 Total - Multiple Benefit Score:		15
Step #3: Habitat Maintenance or Restoration Values Ranking (0/2 x Step 1 points possible)		
A. If the parcel requires proactive management to maintain habitat, OR provides a restoration opportunity, then multiply Step #1 total by 0.1.		
B. If more than 5 acres of a designated Climate Change Adaptation Area falls within the parcel, then multiply Step #1 total by 0.1.		
Step #3 Total - Habitat Maintenance or Restoration Value Score:		6.8
Subtotal of Steps #1, #2, and #3:		
Step #3 Total - Habitat Maintenance or Restoration Value Score:		15.2
Step #4: Management and Operations Ranking (Yes, No, or Undetermined)		
A. Parcel owned by DNR & parcel management is possible. Proceed with acquisition.		
B. No known or reliable committed process for managing the parcel. STOP don't acquire.		
Step #5: Consistency with Local Land Protection (0 to 2 x Step 1 points possible)		
Amount of protected land acres within one mile of parcel:		
Step #5 Total - Consistency with Local Land Protection:		15.4
Total of Steps 1 to 5 - FINAL SCORE		116.5

Interdisciplinary
Review



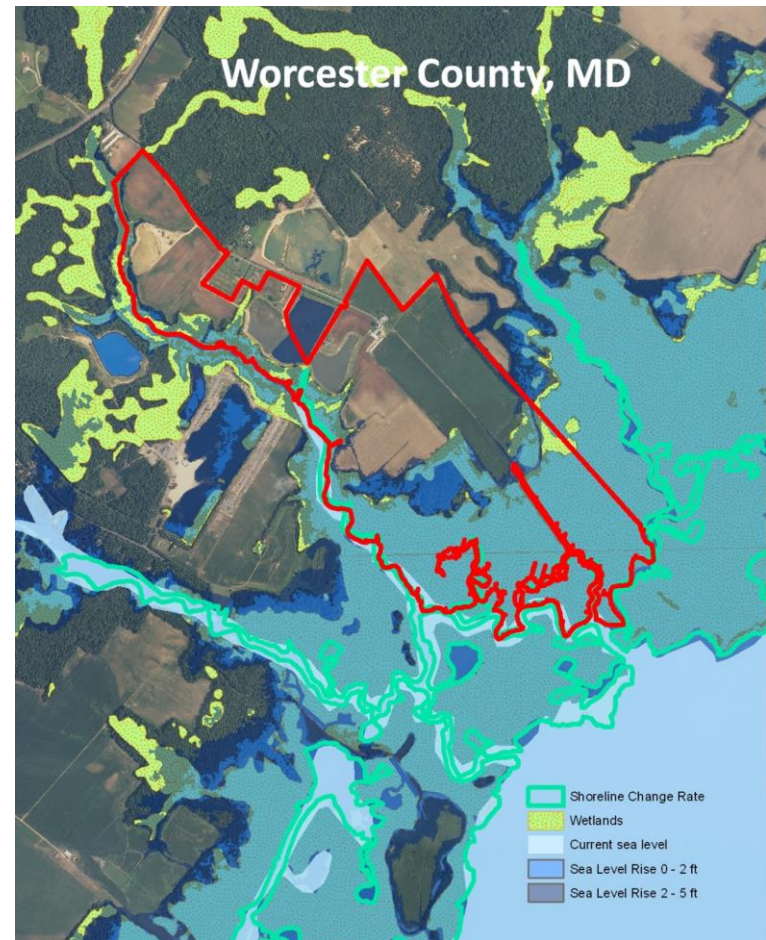
BPW
Approval



Climate Considerations in targeting

1) Remove areas subject to sea-level inundation within 0-2 ft elevation

2) Include areas important for habitat resilience to climate change



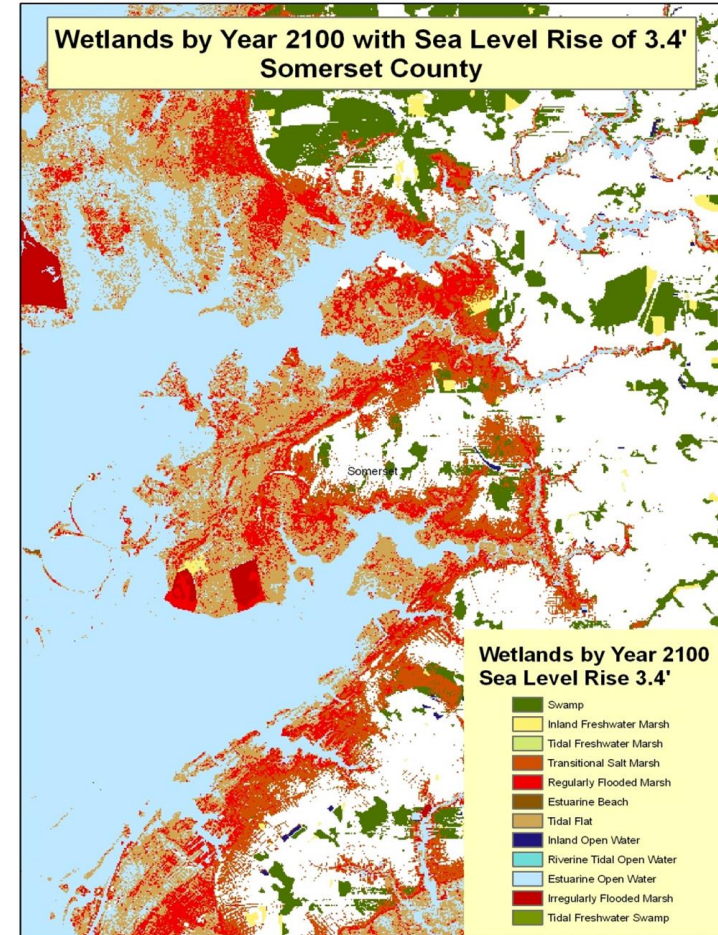
Wetland Adaptation Areas

1st - GIS based Sea-Level Affecting Marshes Model (SLAMM) was run for 2050 and 2100 sea-level rise scenarios.

- SLAMM uses elevation, accumulation of sediments, wetland accretion and erosion rates, and sea level rise to predictively model long-term wetland and shoreline change.

2nd - Using the SLAMM model outcome, additional geospatial analysis was conducted to identify priority conservation areas.

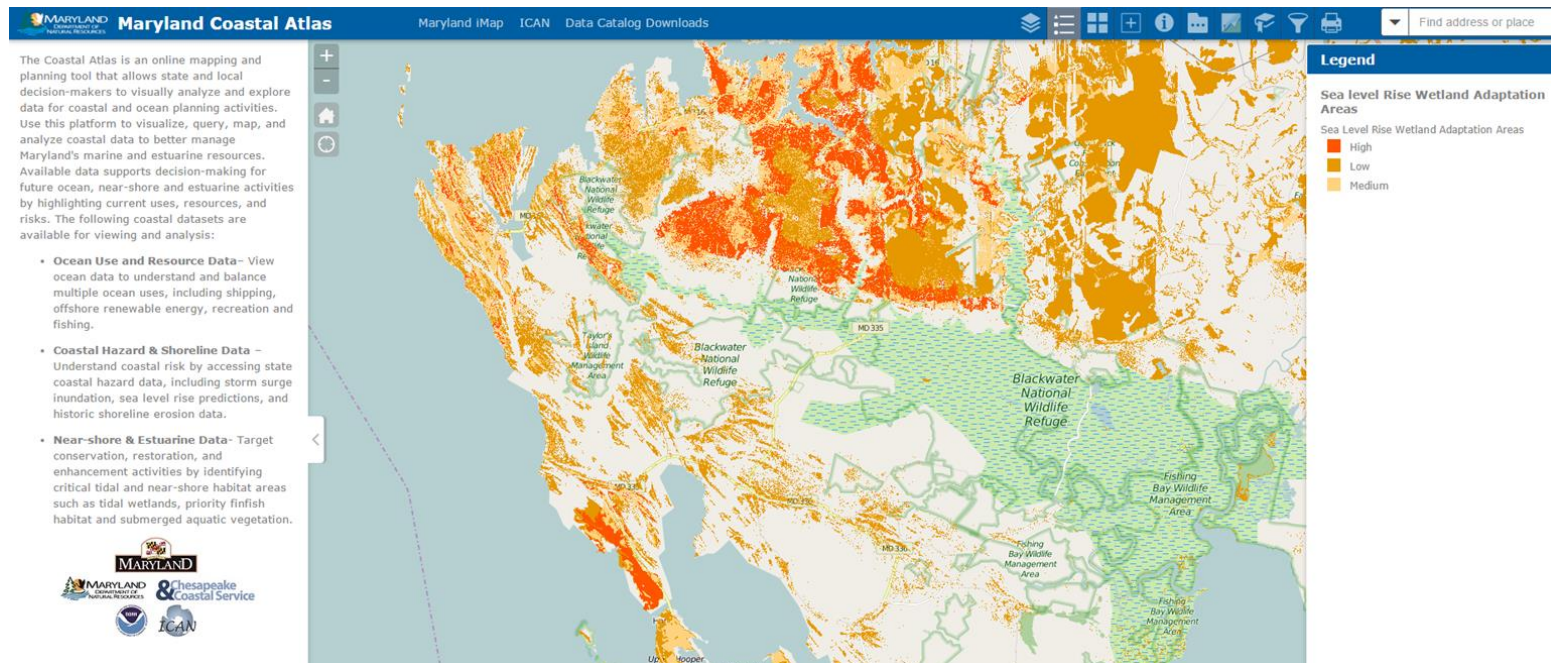
- Additional GIS analysis targeted key habitat features from the SLAMM year 2100 results including large continuous wetland areas, wetland diversity, new wetland areas, breeding marsh-dependent birds, and all future wetland areas by year 2100.
- Priority was given to areas that align with existing non-wetland hydric soils and Maryland's Green and Blue Infrastructure Assessments.



Wetland Adaptation Areas

3rd – The final outcome was a range of low, medium and high priority areas called Maryland’s Wetland Adaptation Areas (WAA).

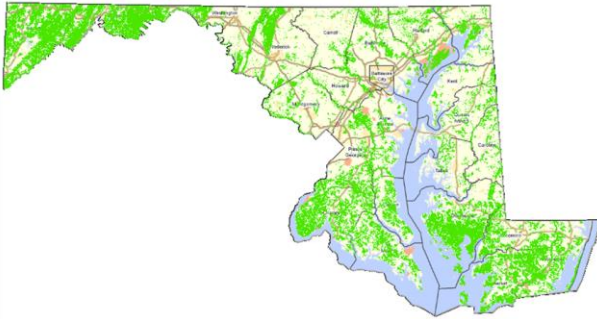
- Top two tiers (medium and high priority areas) of the Wetland Adaptation Areas were selected as the best-of-the-best and added to Maryland’s TEAs.
- 5 acres or more of WAA on a property is now utilized as trigger for Coastal Resilience Easements.



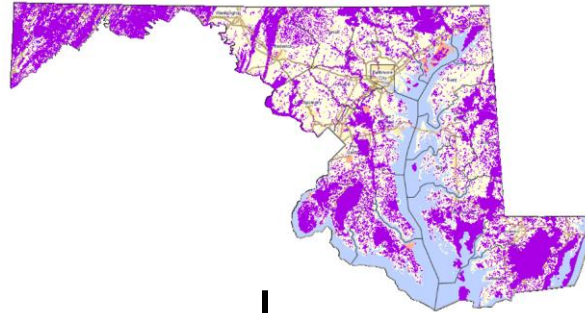
Targeted Ecological Areas Updated



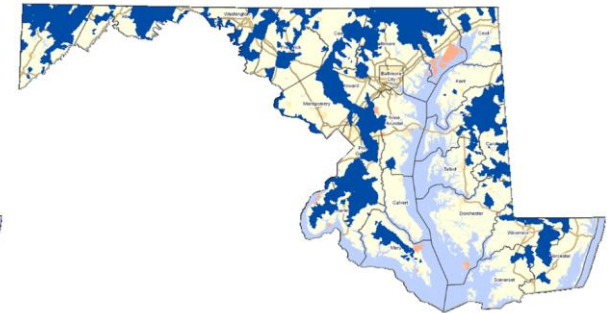
Green Infrastructure
and Important Forests



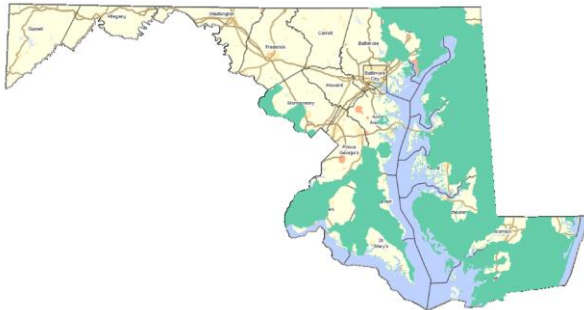
Wildlife and Rare
Species Habitat



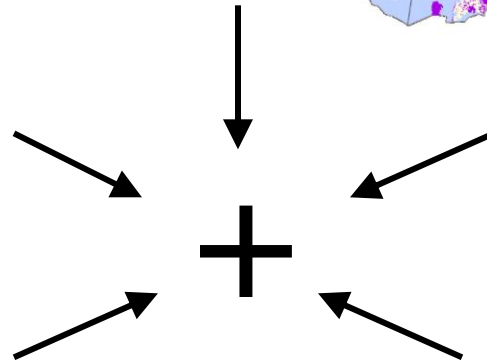
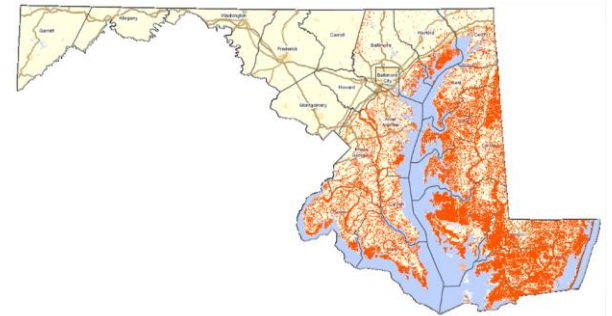
Nontidal Streams and
Fisheries



Tidal Fisheries, Bay and
Coastal Ecosystems



Wetland Adaptation Areas



Ecological Scorecard

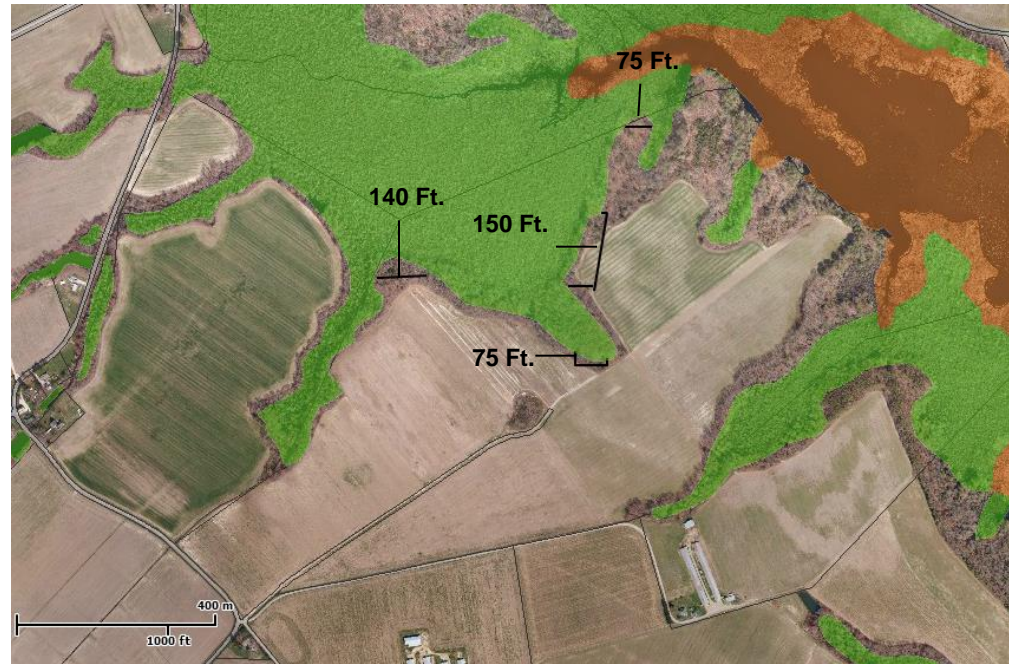


Property: <div style="border: 1px solid red; width: 70px; height: 15px; background-color: #d3d3d3;"></div>	County: Charles	Final Score 116
	Map / Parcel: Multi	
In Targeted Ecological Area? <u>Yes</u>		
Step #1: Ecological Value Ranking (100 points possible)		
A. Landscape Score		
I. Overall Landscape Score (10 points possible for each of the following categories - total 40 points):		
a. Green Infrastructure		9.3
b. Rare Species		2
c. Aquatic Life - Tidal or Non-Tidal		4
d. Forests Important for Water Quality Protection		6
Subtotal (Overall Landscape Value Score):		21.3
II. Targeted Ecological Area (TEA) Bonus (20 points if more than 50 acres is in a TEA or 25% is in a TEA):		
		20
B. Parcel Score (10 points possible for each of the following categories - total 40 points):		
a. Green Infrastructure		8.8
b. Rare Species		9
c. Aquatic Life - Tidal or Non-Tidal		3
d. Forests Important for Water Quality Protection		6.3
Subtotal (Parcel Value Score):		27.1
Step #1 Total - Ecological Value Score:		68.4
Step #2: Special Adjustment for Multiple Benefit Ranking (20 points possible)		
A. Recreation Score (0, 5, or 10 points)		10
B. Historic or Cultural Value (0 or 5 points)		0
C. In-holding or Adjacency (0 or 5 points)		5
Step #2 Total - Multiple Benefit Score:		15
Step #3: Habitat Maintenance or Restoration Values Ranking ([0.2 x Step 1] points possible)		
A. If the parcel requires proactive management to maintain habitat, OR provides a restoration opportunity, then multiply Step #1 total by 0.1.		6.8
B. If more than 5 acres of a designated Climate Change Adaptation Area falls within the parcel, then multiply Step #1 total by 0.1.		6.8
Step #3 Total - Habitat Maintenance or Restoration Value Score:		13.7
Subtotal of Steps #1, #2, and #3:		97.1
Step #4: Management and Operations Ranking (Yes, No, or Undetermined)		
A. Parcel desired by DNR & parcel management is possible - Proceed with acquisition.		Yes
B. No known or reliable committed process for managing the parcel. STOP don't acquire.		
Step #5: Consistency with Local Land Protection ([0.25 x Step 1+2+3] points possible)		
Amount of protected land acres within one mile of parcel: 263		19.4
Total of Steps 1 to 5 - FINAL SCORE		116.5

Coastal Resilience Easement

Easement Provisions:

- Development setbacks in areas subject to sea-level rise inundation by 2050
- Buffers to protect high priority Wetland Adaptation Areas
- Impervious surface limits to reduce runoff and pollution due to increased storm events
- Grantee review of shoreline stabilization projects



Resilience Action Plan



Management Plan Provisions:

- Wetland/hydrologic restoration
- Living shoreline projects
- Invasive species management
- Environmental hazard management and adherence to Coast Smart Construction Codes
- Removal of barriers to wetland migration
- Documentation of vulnerable historic and cultural resources



Living
Shoreline:
Before &
After



Planning Resources - Maryland's Coastal Atlas



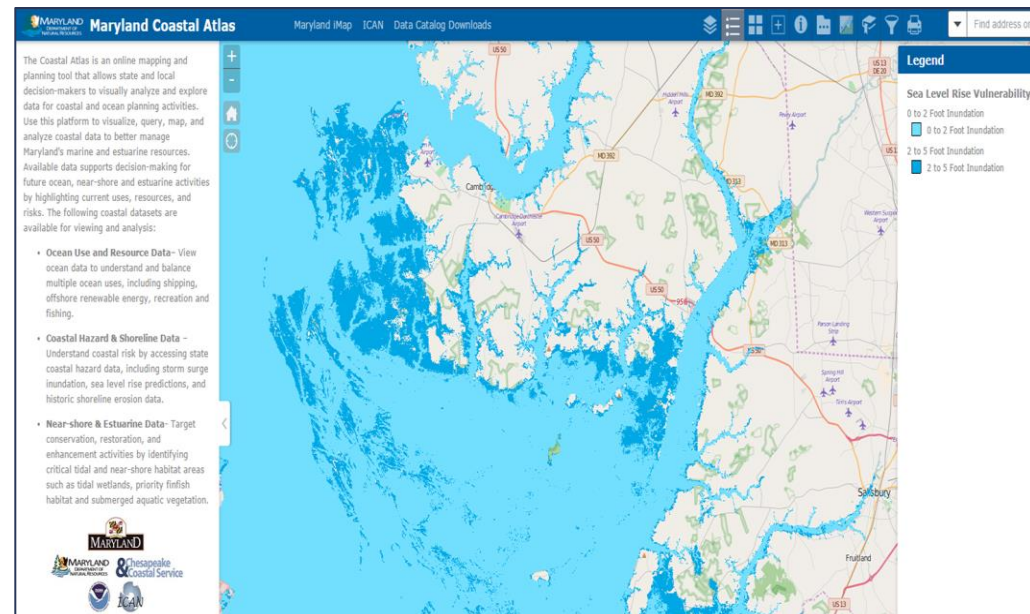
dnr.maryland.gov/ccs/coastalatlus/

Climate Change Data Layers:

- Sea Level Rise Vulnerability
- Storm Surge Areas
- Wetland Adaptation Areas**
- Shoreline Inventory
- Historical Shorelines
- Shoreline Rates of Change
- 100 & 500 Year Floodplains

Coastal Resiliency Data Layers:

- Priority Shoreline Areas
- Shoreline Hazard Index
- Hazard Reduction by Habitat
- Marsh Protection Potential Index
- Community Flood Risk Areas



Thank you!



For Additional Information:

http://dnr.maryland.gov/ccs/Pages/habitats_slr.aspx



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