



Planting ~~Paving~~ a way forward for blue carbon in Maryland

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10/13/2023



MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

What's going on in Maryland?



Maryland Commission on Climate Change Recommendation on Blue Carbon (2021)

Maryland has included Blue Carbon in the 2020 GHG Inventory

2022 Conservation Finance Act includes blue carbon focus

2021/22 Maryland Blue Carbon Webinar Series

Ecological Effects of Sea Level Rise (EESLR) Project and Blue Carbon Story Map

Blue Carbon Feasibility Study with The Nature Conservancy

US Climate Alliance funded study by Duke University on Blue Carbon/Ecosystem Services (Mid-Atlantic)

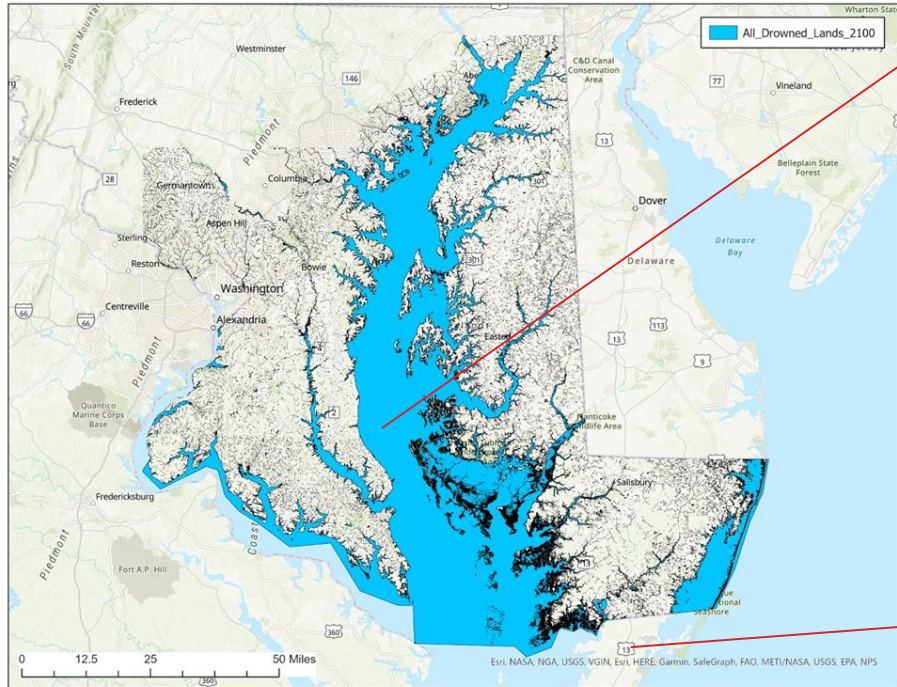
Smithsonian Environmental Research Center Coastal Carbon Research Coordination Network (National)

MD changes Blue Carbon Inventory Approach



- Calculated the area of estuarine wetlands in each salinity regime of the Maryland portion of the Chesapeake Bay/Coastal Bays.
- Applied a rate of carbon sequestration specific to Maryland's coastal wetlands
- Applied methane emission rates specific to the salinity regime of Maryland's coastal wetlands
- Included the carbon sink and methane emissions associated with Submerged Aquatic Vegetation
- Total 302,046 Mg CO₂e per year in 2020, ~18% higher than National Inventory (Silvestrum study for EPA, 2020)
- **GhG Inventory methods have been released ([Link](#))**

Lands Drowned Under 4.3 ft of SLR by 2100 (High Scenario)



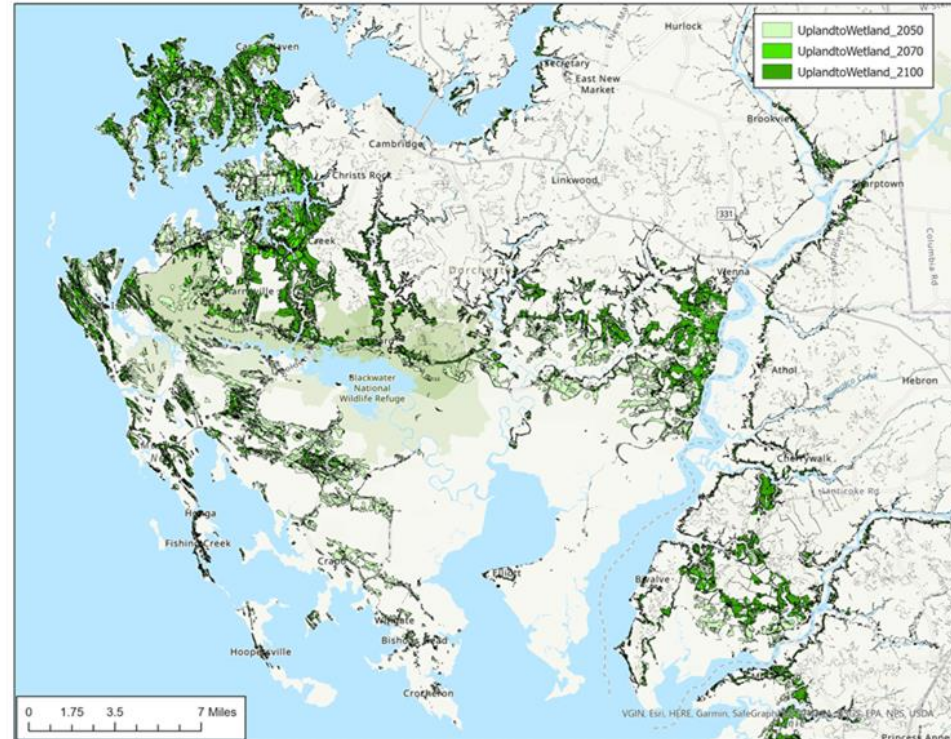
Over 100,000 acres projected to be impacted by 2100
10.5 million Mg of stored C lost by 2100
4.8 million Mg lost in mid SLR scenario

Increase in the blue carbon sink: science based targeting for conservation and restoration



Conservation: DNR has a new Coastal Resilience Easement program targeting lands that are projected to become wetlands in the future

Restoration: We are utilizing SLAMM results and the USGS Unvegetated to Vegetated Ratio (UVVR) to target wetlands for restoration



Partnering with TNC and ESA for a feasibility assessment in 2023



- DNR & TNC collaborated extensively starting in 2021 to assess the state of the science and develop list of MD projects with potential
- Contract with ESA to conduct feasibility study
 - Blue carbon and resilience related feasibility assessments

Market project development

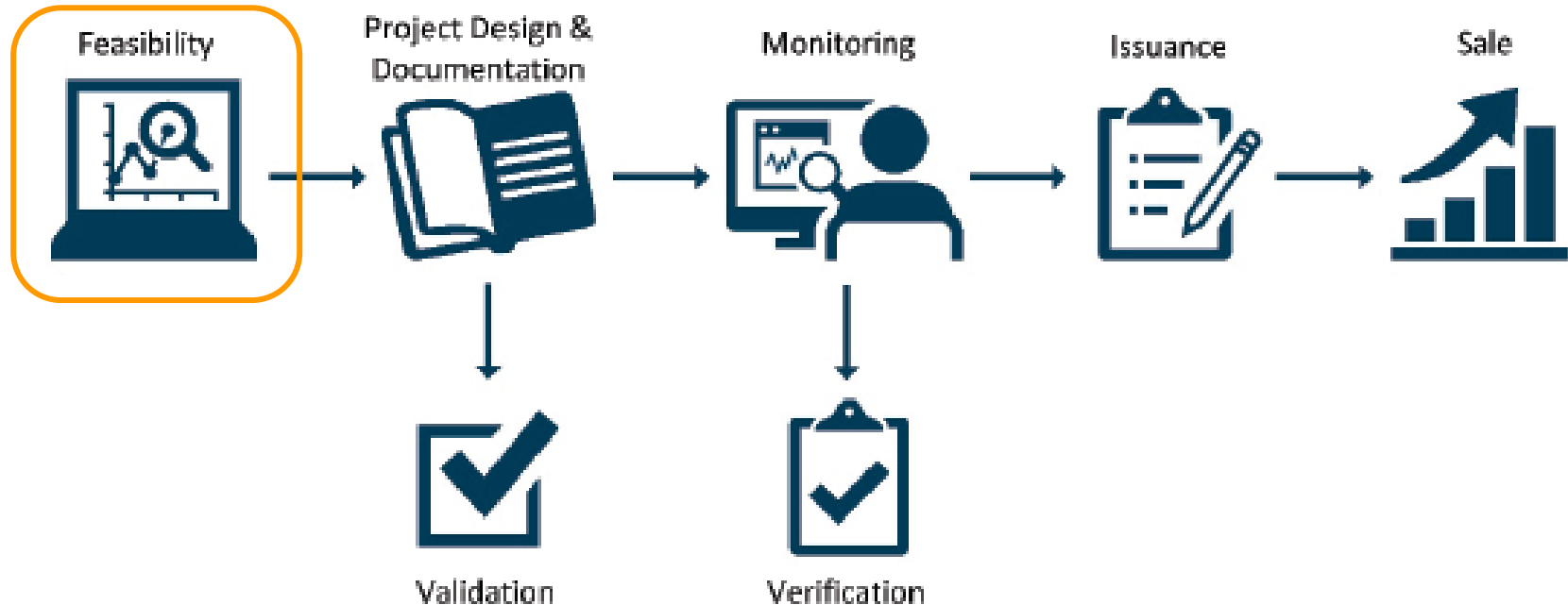


Figure 1-1. Market Project Development Process



Conservation
Finance Act
22

Blue carbon
feasibility study
February 2023

Blue carbon
feasibility study
finishes Nov 23



Potential Blue
Carbon
Project 23-24

MDs blue carbon projects focused on marshes and coastal wetlands



Mangroves



Flickr- mzagerp

Seagrass



NOAA

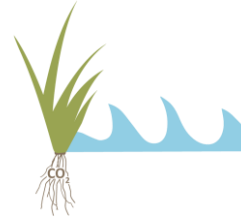
Marsh/coastal wetlands



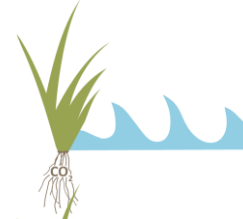
Dylan Taillie

Five projects selected

Marsh restoration via dredging



Marsh restoration via upland sediment



Marsh migration corridors/protection



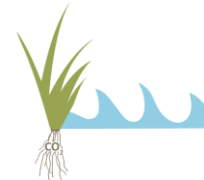
Marsh creation in Baltimore City



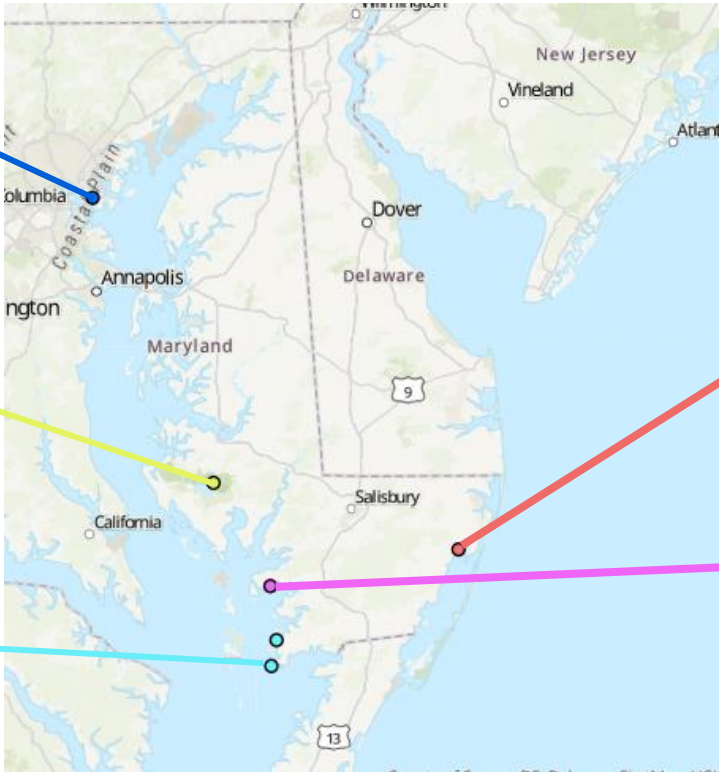
Marsh/island restoration



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Project locations



Blue Carbon Feasibility Study



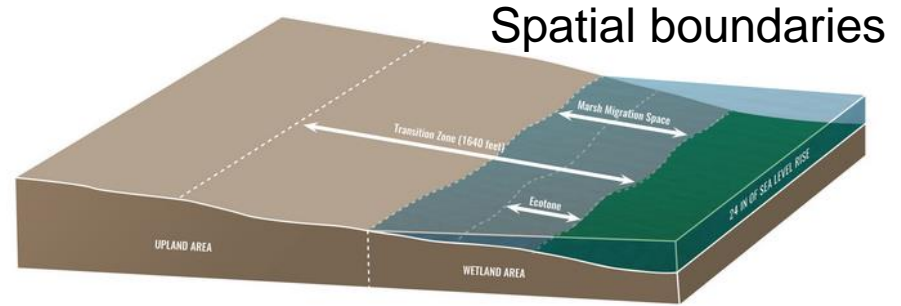
Process:

1. Technical feasibility (Carbon and resilience)
2. Financial feasibility (B/C analysis, TNC financial analysis tool, future carbon price)
3. Social considerations (co-benefits for people)
4. Organizational feasibility (ownership, teams)
5. Landscape feasibility

Technical feasibility: carbon crediting methodology



- Determine project boundaries
 - Habitat boundaries
 - Sea-level rise migration space
 - Project permanence



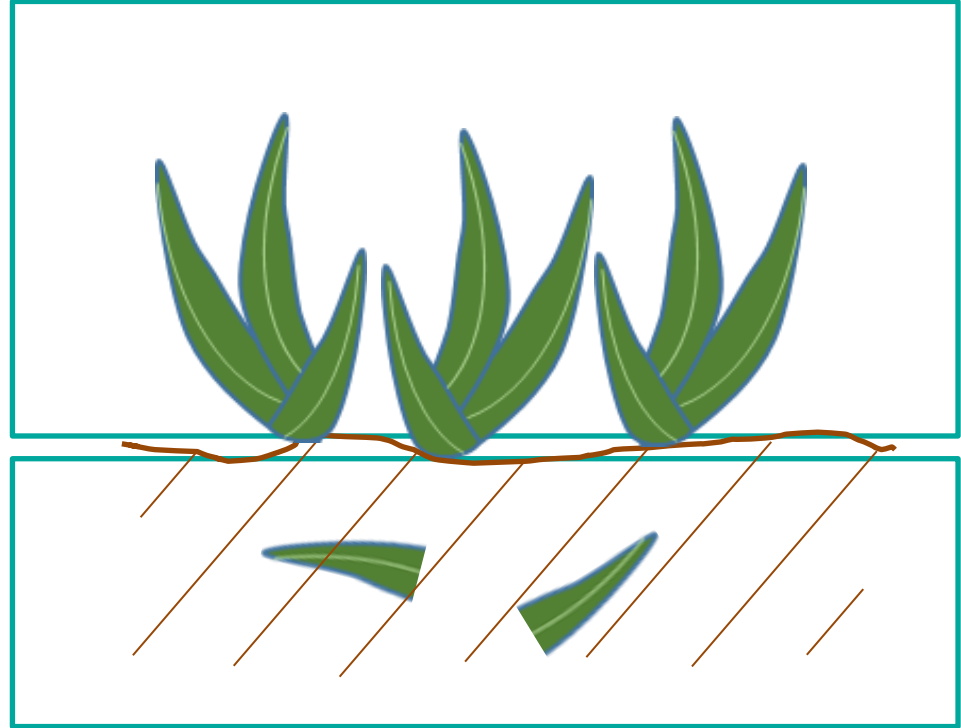
Disturbance of
wetland soils
and/ or
hydrology
releases
carbon

Temporal scales
Project
permanence



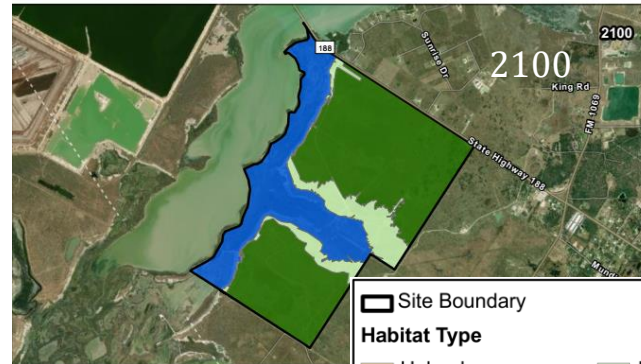
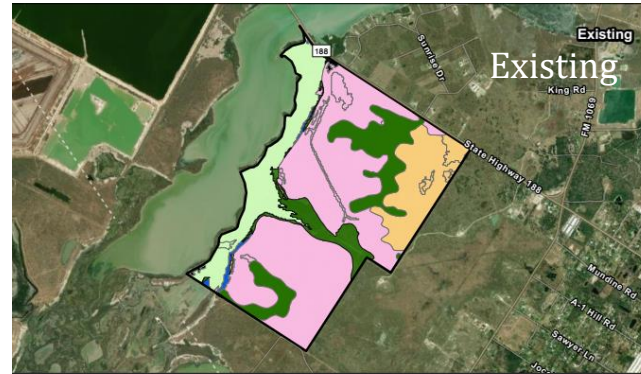
Technical feasibility: carbon crediting methodology

- Determine project boundaries
 - Habitat boundaries
 - Sea-level rise migration space
 - Project permanence
- Determine carbon stocks
 - Aboveground
 - Belowground



Technical feasibility: carbon crediting methodology

- Determine project boundaries
 - Habitat boundaries
 - Sea-level rise migration space
 - Project permanence
- Determine carbon stocks
 - Aboveground
 - Belowground
- Determine baseline scenario
 - How will habitats change in the future without the project?
- Compare to project scenario
 - Project permanence



Financial feasibility (conduct cost/benefit analysis)



- Conduct benefit/cost analysis
 - Base projections using TNC financial analysis tool
 - Estimate benefits of GHG reduction (based on ESA technical analysis)
 - Estimate engineering cost
- Examine key assumptions
 - Sensitivity analysis
 - How does future carbon price impact revenue stream

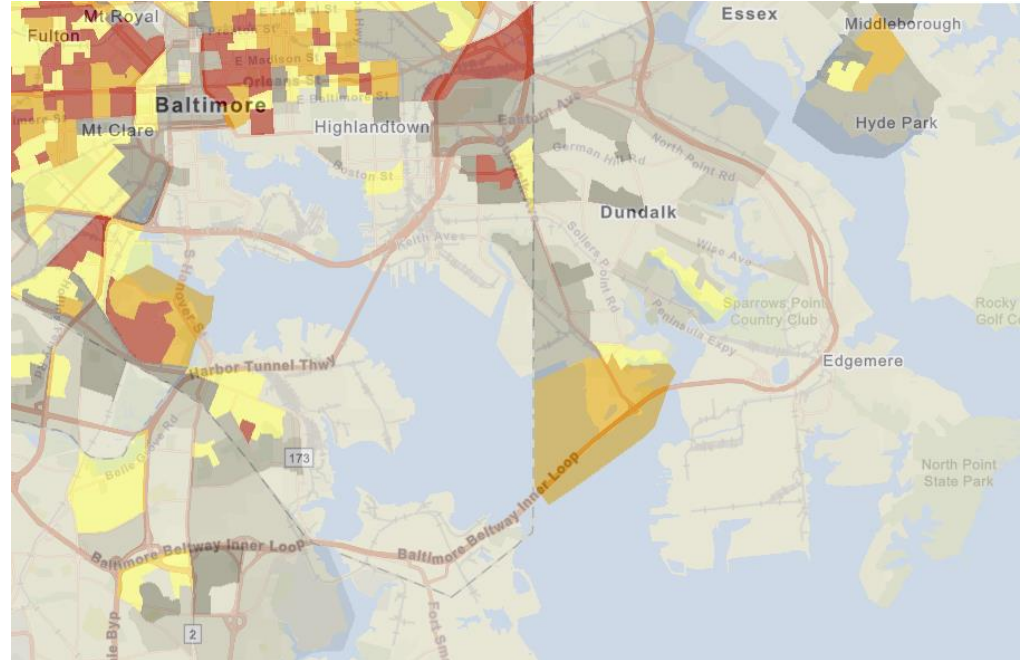
Organizational feasibility

- Who owns the site?
- Who will pay for the project?
- Who will monitor and manage the site?
- How will these organizations collaborate?



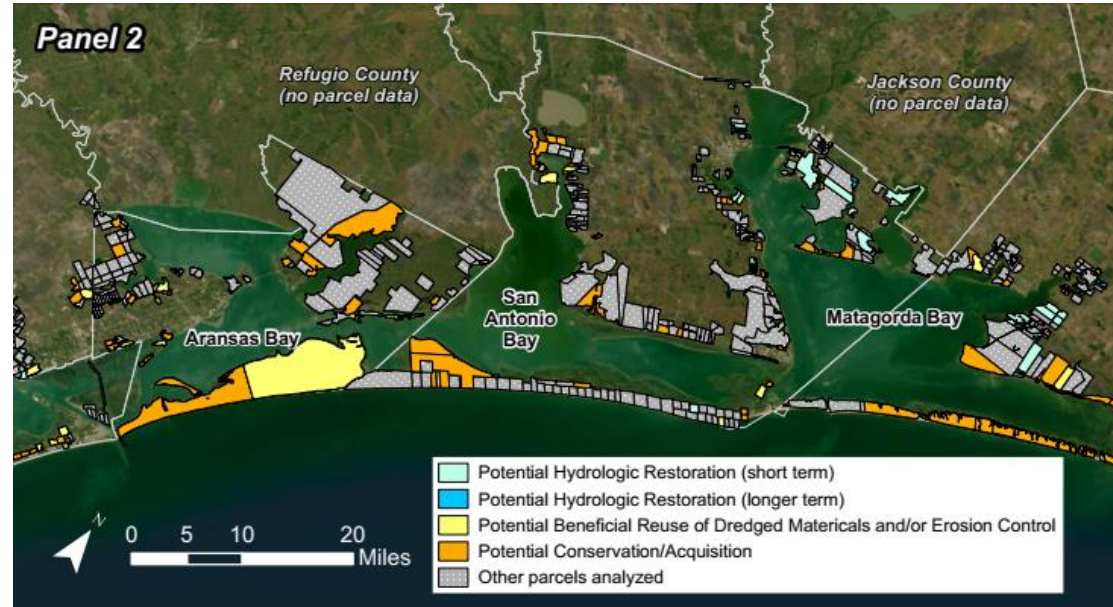
Social considerations

- Coastal flood resilience
- Job creation
- Effects on vulnerable populations
- Other community benefits/challenges



Landscape feasibility

- GIS analysis
- Identify additional sites that could provide similar projects
- Use technical assessment to estimate benefits of additional projects
- “Grouped” projects may provide more bang for the buck



2023 Feasibility Study will inform required Blue Carbon project from CFA



Thank you, questions?



Look forward to update on MD feasibility when released in November 23

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