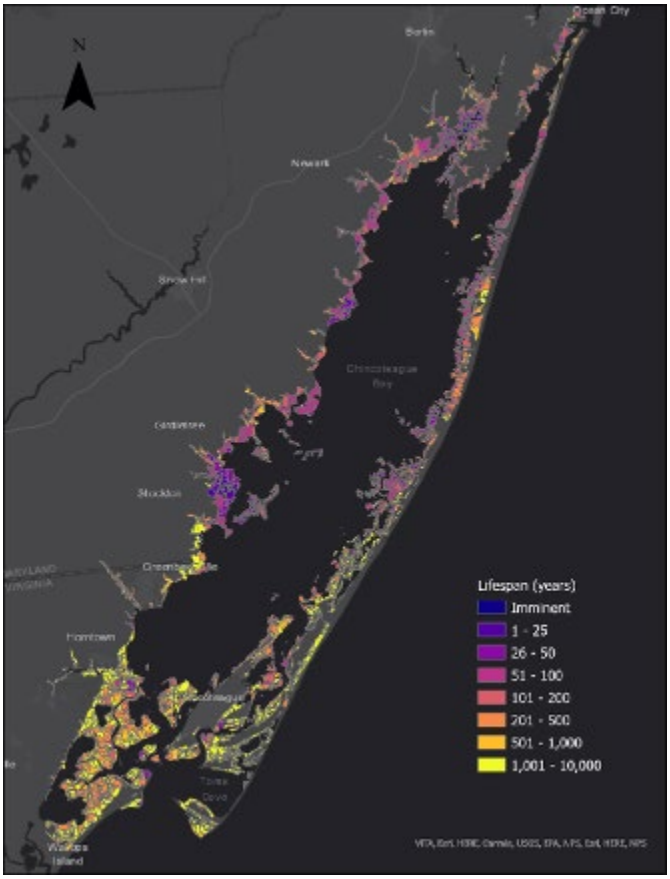
Appendix C. Example Tidal Wetlands Permit Application: Maryland Department of Environment (MDE) application for Coates (Croppers Island).

Background

Tidal salt marshes provide essential fish and wildlife habitat and tremendous economic and social benefits to people. These globally rare habitats provide billions of dollars in storm protection services, and capture and store carbon at rates 10-50 times greater than terrestrial forests. Salt marshes also support 75% of our commercial fish and shellfish harvest and provide habitat for an entire community of tidal marsh specialist fish, birds, and other wildlife. The Saltmarsh Sparrow's entire global population is found only in salt marshes along the Atlantic coast of the United States. Saltmarsh Sparrows have lost more than 85% of their population since the 1990s, primarily due to nest flooding from sea level rise (SLR) and manmade alterations to marshes. Recent models suggest that the Saltmarsh Sparrow could face extinction within the next 50 years if nothing is done to reverse the decline.

Despite the critical value of the salt marsh ecosystem, more than half (Kennish 2001) of salt marsh habitats in the U.S. have been lost or degraded due to centuries of human impacts (Gedan et al. 2008). Approximately 90% of salt marshes from Maine to Virginia are ditched (Tonjes 2013). The result of these vast historical impacts is that SLR impacts are exacerbated in these marshes, causing negative feedback loops that lead to vegetation loss, expansion of open water on the marsh surface, marsh subsidence, saturation of the marsh platform and ultimately, the complete collapse of marsh processes and conversion to shallow open water.



Recent work by USGS clearly emphasizes the impact that human alterations have on marsh lifespan around the Coastal Bays. Despite a similar landscape setting and SLR scenarios, the highly altered marshes of MD have much shorter projected lifespans (shown in purple) compared to the unimpacted and largely intact (shown in yellow) marshes of VA (Ganju 2020). The Lifespan predictions are dire; however, they highlight an element of hope and an urgency for restoration: restoring altered marshes to look and function like unaltered marshes can add thousands of years of marsh lifespan and ecosystem benefits - even in the face of rising seas.

Marshes were mosquito ditched in the 1930s by the Civilian Conservation Corps, altering marsh hydrology and ultimately causing

widespread interior marsh ponding and vegetation die off. For example, at the Croppers Island site, 25% of the formerly vegetated marsh has converted to open water megapools, a trend that is representative of many salt marshes in this geographical area. Although these marshes are degraded, there is still moderate elevation capital to support restoration.

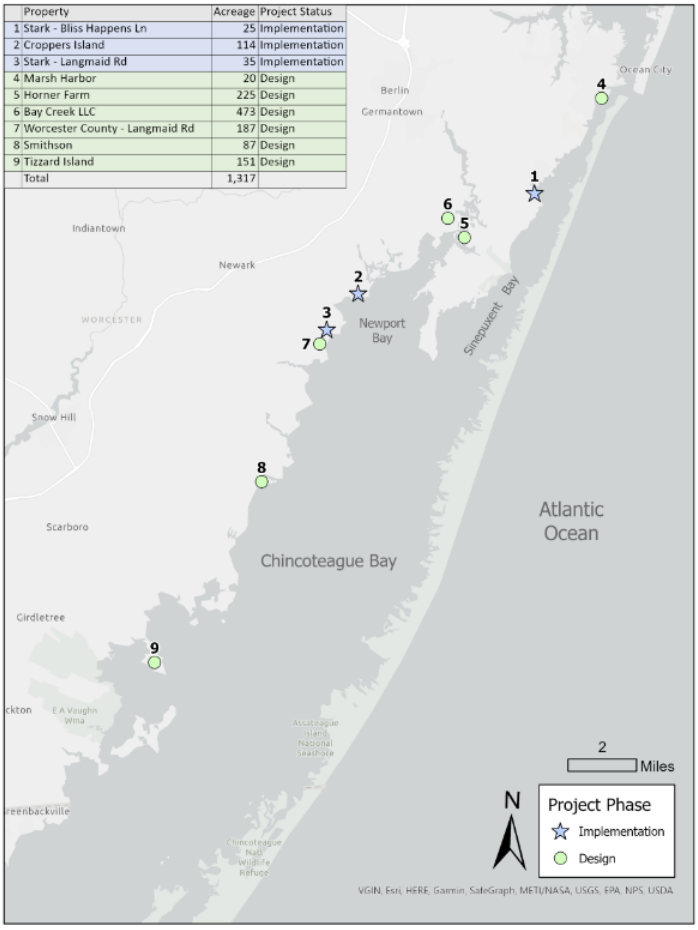
Project Setting

The Maryland Coastal Bays are located on the Atlantic Coast of the Delmarva Peninsula and include portions of Accomack County, Virginia; Sussex County, Delaware; and Worcester County, Maryland. Approximately two-thirds of the Coastal Bays watershed lies within Maryland. The Coastal Bays are a shallow estuarine system that includes Assawoman Bay, Isle of Wight Bay, Sinepuxent Bay, Newport Bay, and Chincoteague Bay. There are approximately 17,000 acres of salt marsh wetlands in the MD portion of the watershed. These marshes are extensively ditched with significant ponding and megapool formation between the ditches. The system is microtidal, with tide ranges never exceeding one foot, which limits mineral sediment delivery and makes it difficult for degraded marshes to accrete quickly enough to offset marsh subsidence and SLR. Like most marshes throughout the Northeast, the Coastal Bays marshes need extensive management to prevent the collapse of marsh function. Restoring natural marsh processes, such as hydrology and marsh surface elevation, is crucial.

Goals

The goal of this project is to build coastal resiliency by reversing historical human impacts and restoring marsh processes. Marsh processes will create habitat for marsh nesting birds, fish, and shellfish, and build salt marsh ecosystem function and services in the predominantly private and rural landscape around Maryland's Coastal Bays. This project represents the first major effort to conduct landscape-scale salt marsh restoration in this rural geography, which is dominated by small family farms and small towns. The area has a severe coastal flood hazard risk (EPA 2022) with both high community exposure and high threat indices (NFWF 2022). It is also an area with above average coastal resiliency scores (Anderson and Barnet 2019) for marsh migration opportunities due to the low slope and high agricultural nature of the landscape, emphasizing the opportunity for long-term persistence of salt marshes in this region and elevating the urgency to restore existing marshes.

	Property	Acreage	Project Status
1	Stark - Bliss Happens Ln	25	Implementation
2	Croppers Island	114	Implementation
3	Stark - Langmaid Rd	35	Implementation
4	Marsh Harbor	20	Design
5	Horner Farm	225	Design
6	Bay Creek LLC	473	Design
7	Worcester County - Langmaid Rd	187	Design
8	Smithson	87	Design
9	Tizzard Island	151	Design
	Total	1,317	



Sites

In total, there are nine proposed future marsh restoration projects comprising of 1,317 acres of degraded tidal salt marsh. The first phase is the

three sites labeled Implementation on the map, with expected construction in the winter of 2024. An additional six sites (pending funding) will be completed in the following years. A tenth project (not shown), Rum Pointe, was constructed in January of 2023 and is being continually monitored. This phased set up allows for monitoring and lessons learned from other projects to feed into later projects. All landowners are enthusiastic about conducting marsh restoration on their lands.

Techniques

Restoration across marsh parcels will be accomplished through the following techniques: (1) installing runnels or natural meandering marsh channels to drain water from megapools and foster marsh grass recolonization; (2) nourishing the marsh with sediment to build elevation; (3) filling ditches, and (4) planting marsh grasses. All techniques have been implemented successfully elsewhere in the Mid-Atlantic. We also intend to test an innovative approach that involves using excavated sediment from farm fields adjacent to the marsh to use as fill. Sediment will also be used to create microtopography for high marsh nesting birds like the Saltmarsh Sparrow. Other sediment sources include dredged material from active projects and sediment stored in upland confined disposal facilities. Several potential sediment sources have been identified and negotiations are ongoing to secure the material.

Croppers Island: This 114-acre parcel in Newport Bay is under conservation easement and is in a priority area for the Saltmarsh Sparrow. The back marsh is extensively ditched and ponded with significant loss of marsh vegetation. A freshwater non-tidal wetland will be constructed in the south end of a crop field on the property and the excavated material used to restore elevation and vegetation to the marsh platform. Tidal channels will be constructed in some parts of the marsh while other ditches will be filled to create a more natural tidal network. This project will include all techniques.

Project Timeline:

Project Type	Year 1: 2023*	Year 2: 2024	Year 3: 2025
Implementation: Croppers Island, Stark Langmaid Rd., Stark Bliss Happens Ln	Complete 100% designs; secure permits; Complete construction SOW and bid documents	Bid out project; construct project; plant marsh grasses; follow-up work	Follow up work; Plant marsh grasses; Monitoring; Report Writing
Design: Worcester Co Langmaid Rd., Smithson,Marsh Harbor, Bay Creek LLC, Horner Farm, Tizzard Island	Complete 100% designs; Submit permits	Apply for implementation funds; Receive permits	

Outreach

Several Community Engagement initiatives will occur, including a volunteer planting, landowner outreach, community events, and school programming. Several community events have already been held, including HOA presentations in 2021 and 2022. Additionally, in March of 2023, two landowner workshops were held in Snow Hill and Berlin libraries and were open to the public.