4 Captain Sinclair

(Excerpt from "Living Shoreline Sea Level Resiliency: Performance and Adaptive Management of Existing Sites" report)

4.1 Site Background

Figure 4-1-1. Location of the living shoreline at Captain Sinclair's Recreational Area.

Captain Sinclair Landing Recreational Area (CSRA) is located near the mouth of the Severn River in Gloucester County, VA (Figure 4-1-1). In 2013, almost 100 acres of property was gifted to the Middle Peninsula Chesapeake Bay Public Access Authority (MPCBPAA). The Middle Peninsula Planning District Commission (MPPDC) partnered to the Public Access Authority to develop a management framework for the property. The MPPDC also partnered with the Shoreline Studies Program at VIMS and received a NFWF Small Watershed grant in order to accomplish the Shoreline Management Plan for the property as well develop a living shoreline demonstration site and educational outreach program.

CSRA is set within the low lying landscape that surrounds the Mobjack Bay. The tidal shoreline is eroding marsh dominated by *Spartina patens* and black needle rush (Figure 4-1-2). Significant shore recession has occurred in front of the main house which has erosion rates of about 0.6 ft/yr. The tide range is 2.5 feet at the mouth of the Severn River. The project was designed to address shoreline erosion along the project coast. There is a fetch to the west of about 2.5 miles and the southwest of 1.8 miles, low medium energy exposure. The upper elevation of sand fill was set at +3.0 ft MLW and extends on a 10:1 slope to about mean tide level at the back of the proposed stone sills. Once established the project will provide an erosion-control marsh fringe. A new pier recently was built along the shoreline.

Figure 4-1-2. Conditions at Captain Sinclair before the project. Photo: Shoreline Studies Program, 1 April 2015.

The sills at CSRA were installed in the winter of 2016. The project consists of 4 rock sill segments and 3 gaps or bays (Figure 4-1-3). The sills are 42 ft, 55 ft, 106 ft, and 77 ft in length, respectively. Bay A is 15 ft wide and allows for the old pier while Bay B is 25 ft wide and allows for the new pier as well as a beach for kayaks and canoes. Bay C is 10 ft wide. The openings allow for habitat diversity and more ingress and egress for marine fauna. The rock structures are low because the existing eroding marsh is low (Figure 4-1-4). The sand fill intersects the sill structures at the "standard" mean tide level and grades up to a +3 across the marsh scarp. The entire system had to stay relatively

close to shore to avoid the nearshore SAV beds.

The site was planted in the spring of 2016, and due to subgrade adjustment, the *S. patens* planting was concentrated on the nearfield washover (Figure 4-1-5A). After one year the planging were very much intact (Figure 4-1-5B), and by 2018 had grown into a full width system (Figure 4-1-5C). The rock sill provides a hard substrate for oyster growth along the lower tide zone (Figure 4-1-5D).

Site surveys show the main change is in backshore elevation (Figures 4-1-6 and 4-1-7). The backshore berm has increased in height and apparently not at the expense of the lower beach face. It appears that elevation changes are due mostly to vertical growth of the high marsh, *S. patens*, along the entire length of the project. An increase of almost one foot at profile 250. This bodes well for future adaptation to SLR.

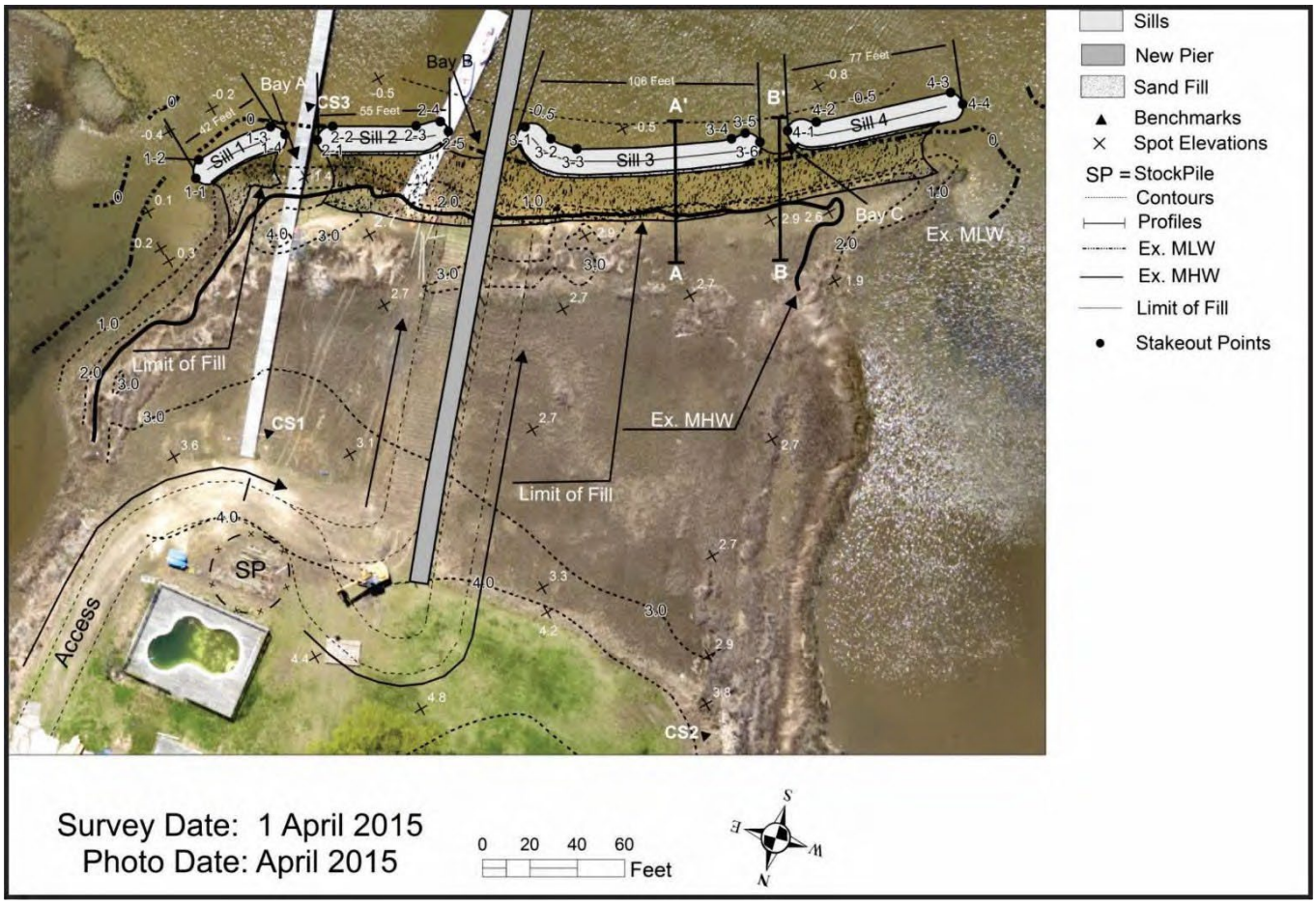

Figure 4-1-3. Living shoreline project design at Captain Sinclair by Shoreline Studies Program, VIMS.

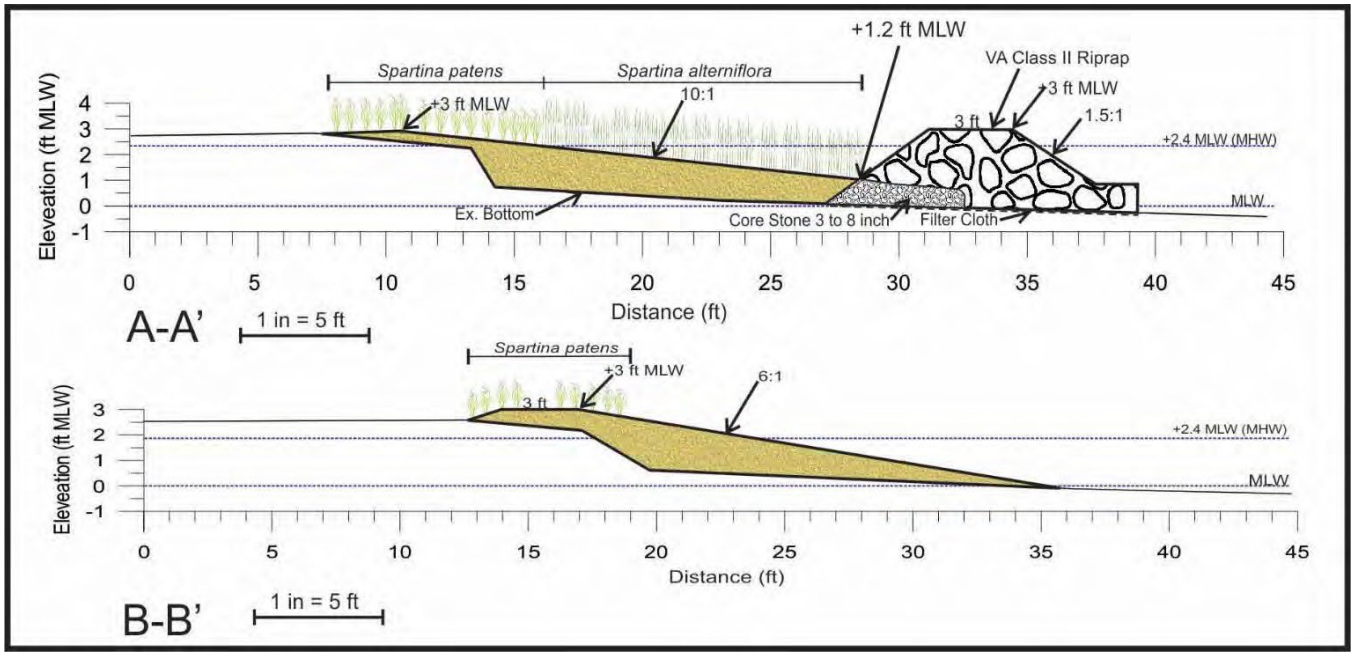

Figure 4-1-4. Typical cross-sections for the Captain Sinclair living shoreline project by Shoreline Studies Program, VIMS.

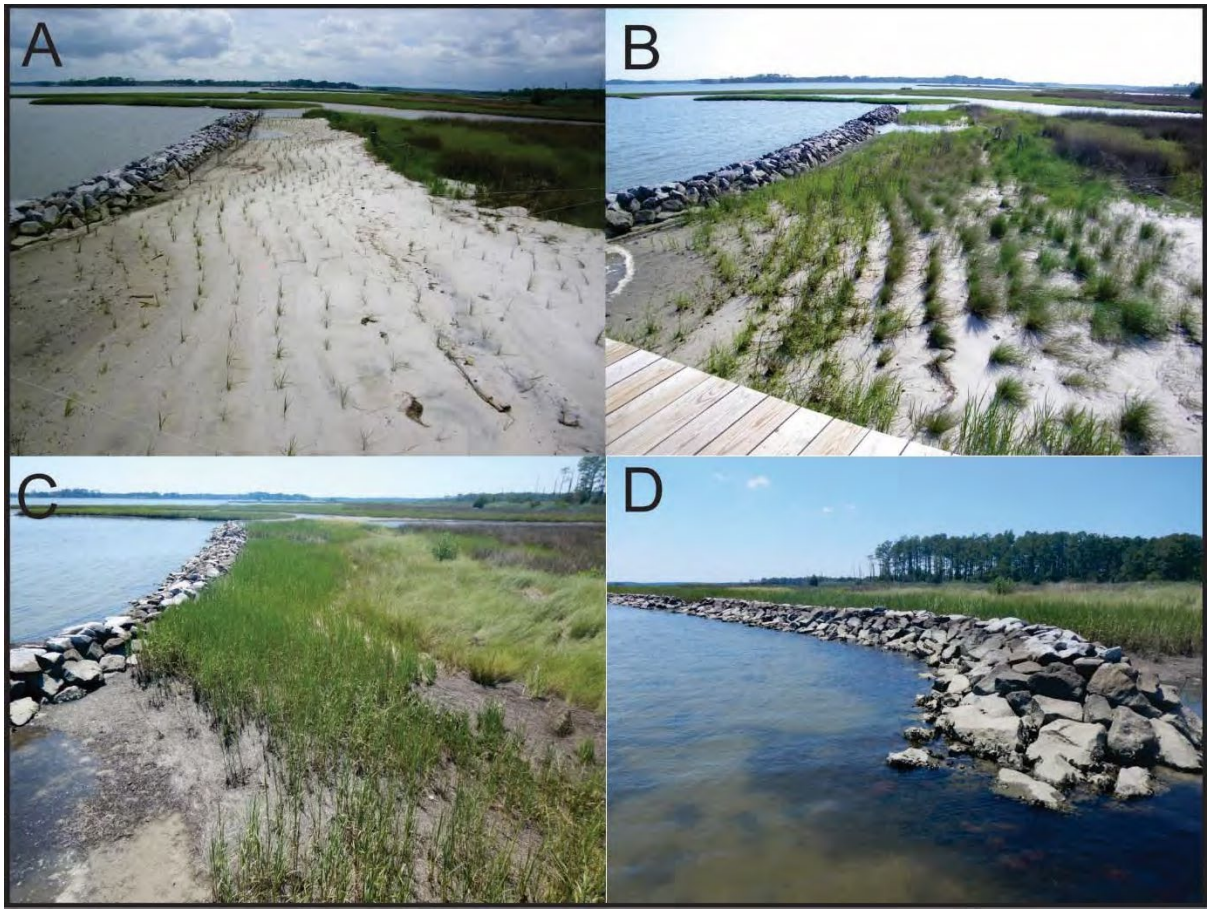

Figure 4-1-5. Photos of Captain Sinclair A) Just planted, 2 June 2016; B) One year post planting, 10 May 2017; C) Two years post-planting, 10 July 2018; D) Oysters line the rock sill shown at low water, 10 July 2018. Photo credit: Shoreline Studies Program.

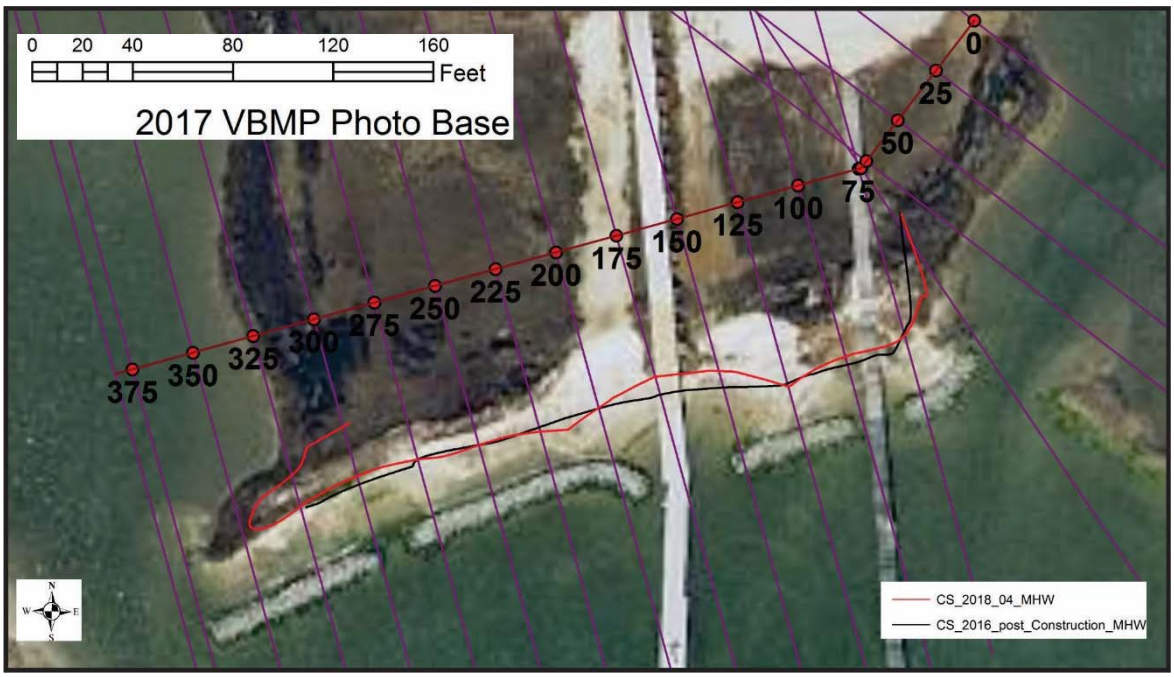

Figure 4-1-6. Basemap for Captain Sinclair showing the profile baseline and the position of mean high water in 2016 and in 2018.

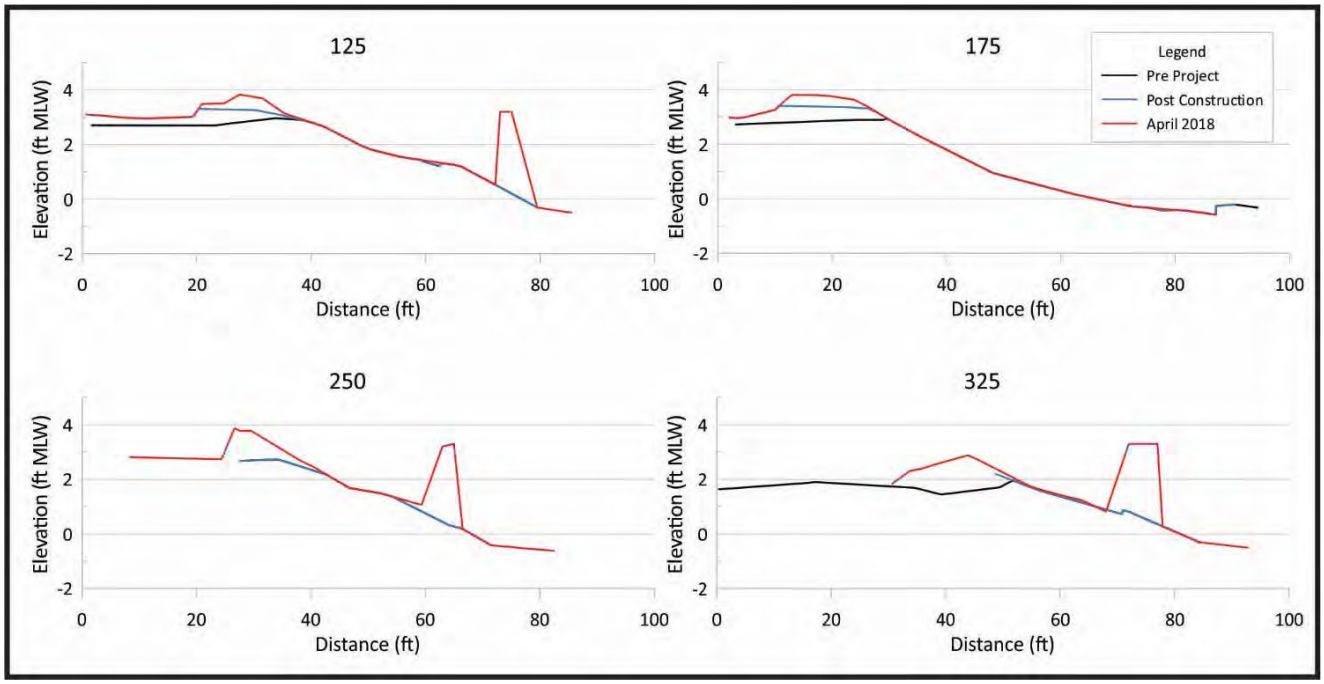

Figure 4-1-7. Cross-sections of survey data for Captain Sinclair.