

COASTAL PROCESSES SPECIALIST
WOODS HOLE SEA GRANT | CAPE COD COOPERATIVE EXTENSION
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March 07, 2022

TO: West Tisbury Conservation Commission
CC: George Sourati (Sourati Engineering Group)
FROM: Greg Berman, Coastal Processes Specialist (WHSG & CCCE)
RE: Site visit to Makonikey, West Tisbury, MA – 03/04/2022



Background: Since the inception of the coastal processes position established within WHSG & CCCE, on-site and remote technical assistance on coastal processes has been and continues to be an on-going, effective technical information communication and dissemination tool. Technical assistance relating to coastal processes, shoreline change, erosion control alternatives, coastal landform delineation, potential effects of various human activities on coastal landforms, coastal floodplains, coastal hazards and hazard mitigation analyses, and dune restoration techniques provided in the field and remotely will continue to be provided on an as-needed basis. Site visits generally address site-specific coastal processes or coastal hazards related issues. Follow-up unbiased, written technical alternatives analyses are generally provided.

Site Details: This report focuses on the property of, and land immediately surrounding, the Makonikey Stairs in West Tisbury (Figure 1). The site is located on an eroding coastal bank on the Vineyard Sound shoreline of Marthas Vineyard. The upland area (including parking lot) slopes landward, away from the top of the bank. This indicates that surface runoff may not be a major contributor to the erosion. The existing wooden stairway to access the beach was destroyed by erosion and there is a current proposal (Sourati Engineering Group site plans dated 01/17/2022 and revised 02/16/2022) to install a new adjustable stair system. The Conservation Commission Board Administrator, for the town of West Tisbury requested a 3rd party review to examine the proposed stairs for potential impacts to the coastal bank and beach. It should be noted that this review is only for the potential impacts to the coastal resource areas. Longevity/durability of the stairs as well as any human safety impacts are not a part of this report.

A series of photographs was taken during a site visit on 03/04/2022. Photograph 1 shows the coastal bank that is eroding and providing sediment to the beach at the site. The bank appears to have undergone recent collapse. A large portion of the vegetated bank, including some trees, has slumped down the face of the bank and deposited material on the beach. The slumping of the coastal bank at the site has compromised the wooden stairway system to access the beach. While it was not observed during the site visit, it was shared during the site visit that groundwater seeps out of the coastal bank near the elevation of the beach. It was speculated that this seep may have created instability in the bank and lead to the collapse. Photograph 2 shows the coastal bank, to the south of the destroyed stairs, has eroded and much of the bank is unvegetated save for the sections of bank that have slid down relatively intact. The proposed location (Photograph 3) for the new stairs is also in an area that has experienced erosion, but not quite as severe as the rest of the bank.

That Massachusetts Shoreline Change Project indicates a long term erosion rate of 0.72' per year. However, this estimate is not very useful as the long term uncertainty is quite high (+/- 0.85' per year), with the short term rate too uncertain to even quantify. This bank is likely characterized by long periods of relatively slow erosion, punctuated by large bank collapse events such as the one that just occurred.

After Makonikey, the group examined a nearby site in Menemsha, that had a stair system similar to the one proposed (see image to the right). The stair system was secured with adjustable 2" poles, with segments of the system removable. For example, the proposed system is to have the lowest segment removed during the winter to prevent storm damage. While the stairs are opaque, the proposed height (18"+) off the bank and the spacing appears to allow sufficient light to the underlying bank. While there is no substantial vegetation currently on the coastal bank at Makonikey, this system appears to provide space for vegetation to establish itself underneath the stairs. The installation company has indicated that *"If the stairs ever need to be serviced, i.e., bank washed away, reconfiguration, sand coverage, we can work up a yearly service plan to keep the stair system maintained and accessible."* A monitoring and maintenance plan is likely important, as it could lead to extended lifespan of the stairs, as well as less frequent/intensive activity on the bank if the entire system were to fall.

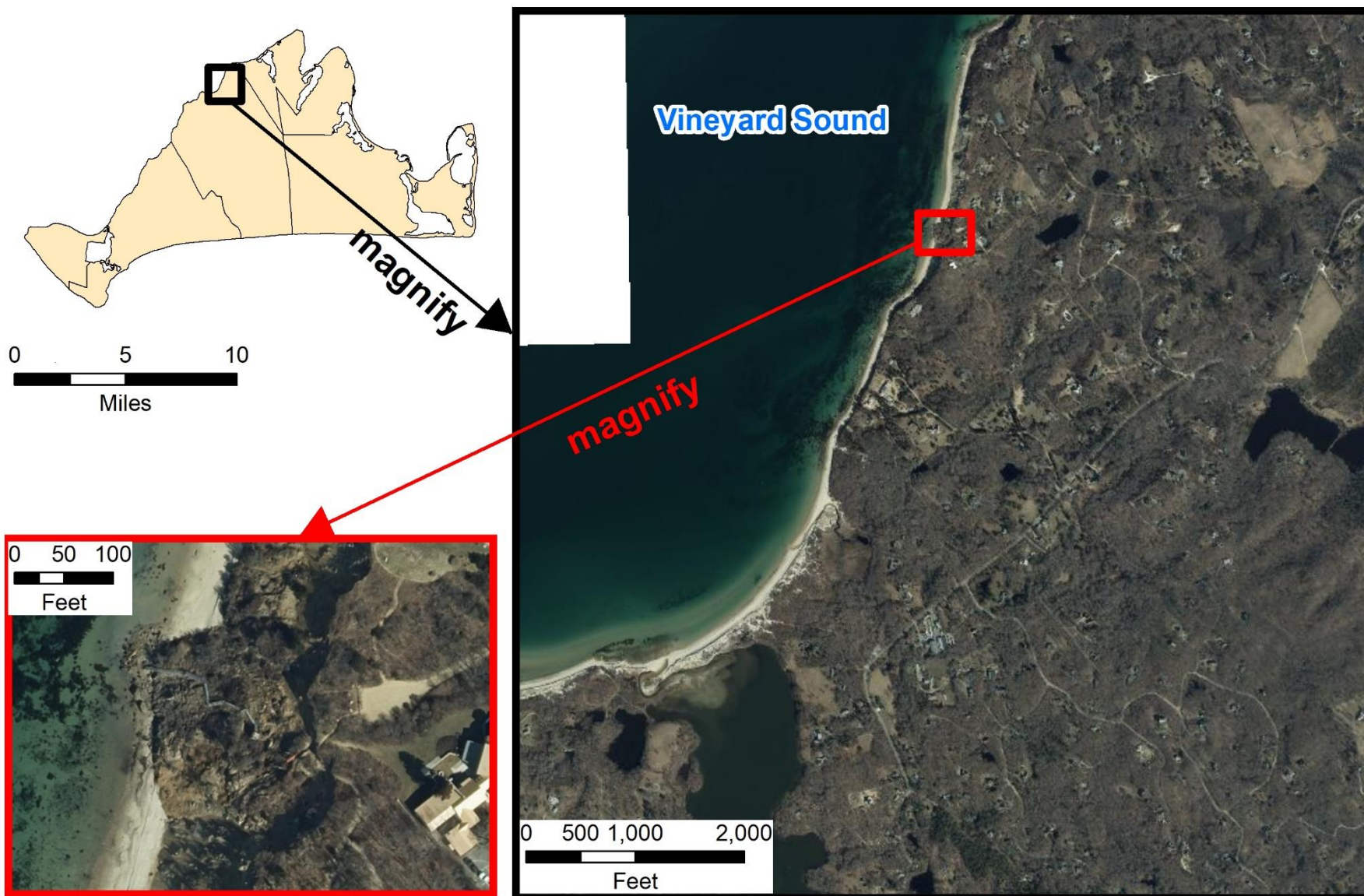


The platform at the top of the stairs is proposed to be 10'x12'. While a platform half this size would suffice to service the stairs, it was explained at the site that this is a location where people tend to congregate. If foot traffic is concentrated at the ground near the top of the bank, it may lead to vegetation loss and surface runoff issues for the coastal bank. With these concerns in mind, it might be better for the coastal bank if foot traffic is concentrated on a raised platform.

Aspects Of The Project To Consider:

- While the proposed site does not appear to be entirely stable, it is likely the most stable area on this property.
- The adjustable stair system appears to be designed to have minimal impact to the coastal bank and beach.
- Surface runoff does not appear to have been an impact in the past. However, the area leading to, and under, the stairs should be examined periodically after installation.
- A well designed monitoring and maintenance plan could lead to extended lifespan of the stairs, as well as less frequent/intensive activity on the bank if the stair system were to collapse.

Figure 1. Location of site.



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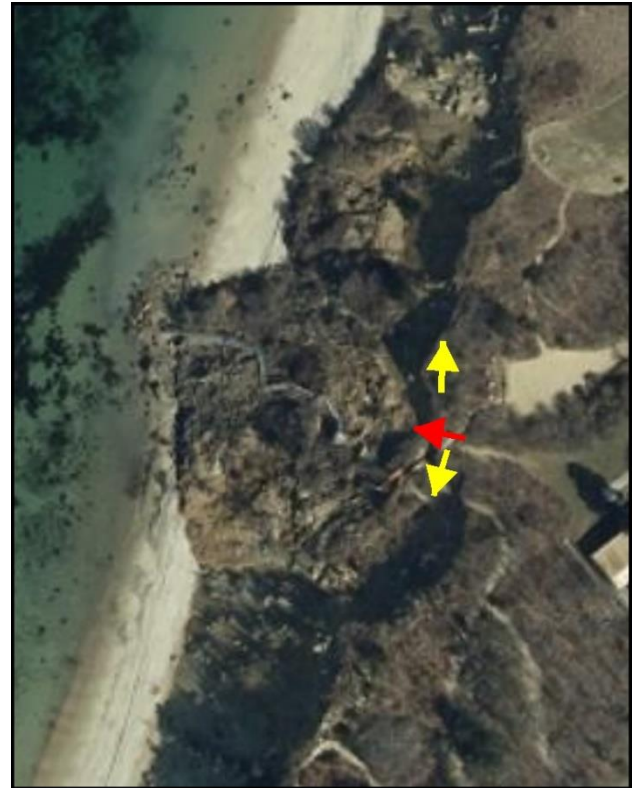
Makonikey Stairs

West Tisbury, Dukes County, Massachusetts

Notes
Airphotos: 2021 MassGIS
Horizontal Datum: NAD 1983
Projection: StatePlane MA Islands



The red arrow on the image to the right indicates the location and direction of the photograph at the bottom of this page, and the other photographs in the series are indicated in yellow.



Photograph 1. Slumping of the coastal bank at the site has compromised the wooden stairway system to access the beach.



The red arrow on the image to the right indicates the location and direction of the photograph at the bottom of this page, and the other photographs in the series are indicated in yellow.



Photograph 2. The coastal bank, to the south of the destroyed stairs, has eroded and much of the bank is unvegetated, save for the sections of bank that have slide down relatively intact.



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Photograph 3. The proposed location for the new stairs is also in an area that has experienced erosion, but not quite as severe as the rest of the bank.

