COASTAL PROCESSES AND HAZARDS SPECIALIST REPORT
CAPE COD COOPERATIVE EXTENSION
WOODS HOLE OCEANOGRAPHIC INSTITUTION SEA GRANT
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4 August 2026

TO: Angela Lucky, West Tisbury Conservation Administrator

CC:

FROM: Bryan McCormack, Coastal Processes and Hazards Specialist (WHOISG & CCCE)

RE: Thumb Point Cove

**Summary**

This report focuses on the land surrounding Thumb Point Cove in West Tisbury, MA. The West Tisbury Conservation Administrator has requested a 3rd party review to examine nourishment volumes and relevant coastal processes. Multiple site visits and reports have been conducted by this office for the area to review project proposals and erosion, including in 2013, 2014, and most recently in 2024. For this report, lidar surveys were used to calculate erosional volumes from adjacent areas and compared to what has been placed as nourishment. This comparison found that these volumes are well aligned, suggesting the amount of nourishment being placed is likely appropriate. Impacts from sediment transport are likely due to the flood-dominant regime, and not from a nourishment volume that exceeds the natural erosion rate.

## Site Details

This report focuses on the land surrounding Thumb Point Cove in West Tisbury, MA. The West Tisbury Conservation Administrator has requested a 3rd party review to examine nourishment volumes and relevant coastal processes. No site visit took place for this report. Previous site visits and reports from the coastal processes and hazards specialist took place in 2013, 2014, and 2024. The Commission is encouraged to review these previous reports and they can be provided upon request.

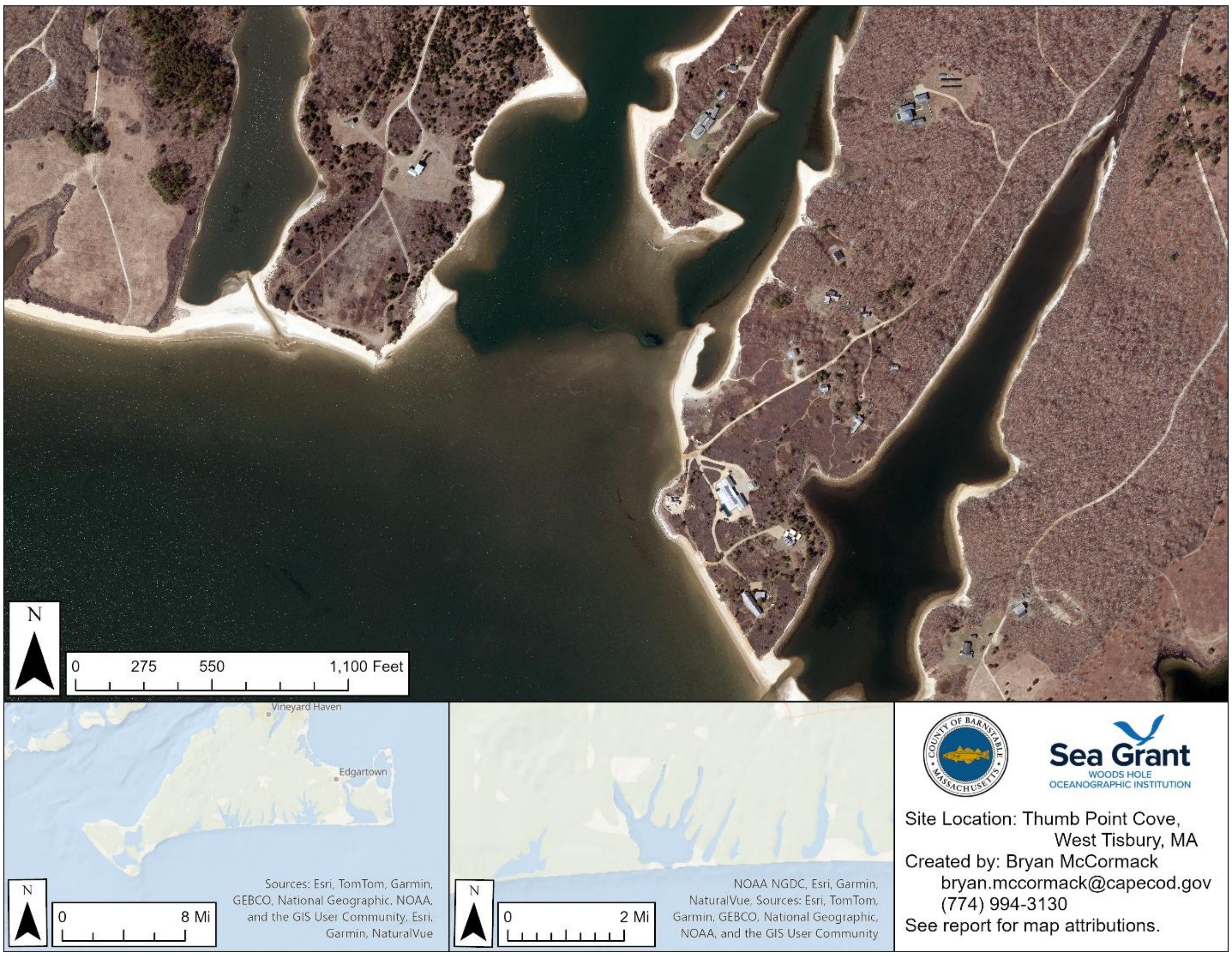


Figure 1: Location of review around Thumb Point Cove in West Tisbury, MA.

## Erosional Volume Analysis

Annual monitoring reports were submitted by Wilkinson Ecological Design Inc. for 208 Middle Point Road and 234 Middle Point Road on October 12th, 2025, and November 12th, 2025, for the respective properties. These reports outline the nourishment that has been placed at each property. At 208, 47 cubic yards of nourishment have been placed on an annual basis since 2017, totaling approximately 427 cubic yards of nourishment. At 234, varying volumes of nourishment from 51 to 165 cubic yards have been placed on an annual basis since 2014, totaling approximately 1002 cubic yards of nourishment.

The total length of the installed coastal erosion protection at 208 Middle Point Road is about 505 linear feet (including revetment, gabion, and fiber rolls). This would indicate that over the 9 years covered in the monitoring report, the average annual nourishment per linear foot of protected shoreline since 2017 is about 0.09 cubic yards. If only calculating for the 200 feet of gabion and fiber rolls, the average annual nourishment per linear foot of protected shoreline since 2017 is about 0.24 cubic yards.

The total length of the installed coastal erosion protection at 234 Middle Point Road is about 220 linear feet (including gabion and fiber rolls). This indicates that over the 12 years covered in the monitoring report, the average annual nourishment per linear foot of protected shoreline is about 0.41 cubic yards.

Three areas around Thumb Point Cove that do not have erosion control were used to calculate volume changes using lidar datasets (Figure 2). The analysis was conducted for 2010 to 2021, 2013 to 2021, and 2016 to 2021. These volume changes were used to calculate the erosion per linear foot of shoreline per year for a direct comparison to the nourishment figures calculated above. The figures for sites 1, 2, and 3 are shown in Tables 1, 2, and 3 below, respectively. It is important to note that these figures would be reflective of any nourishment that was transported into these areas within the timeframe.

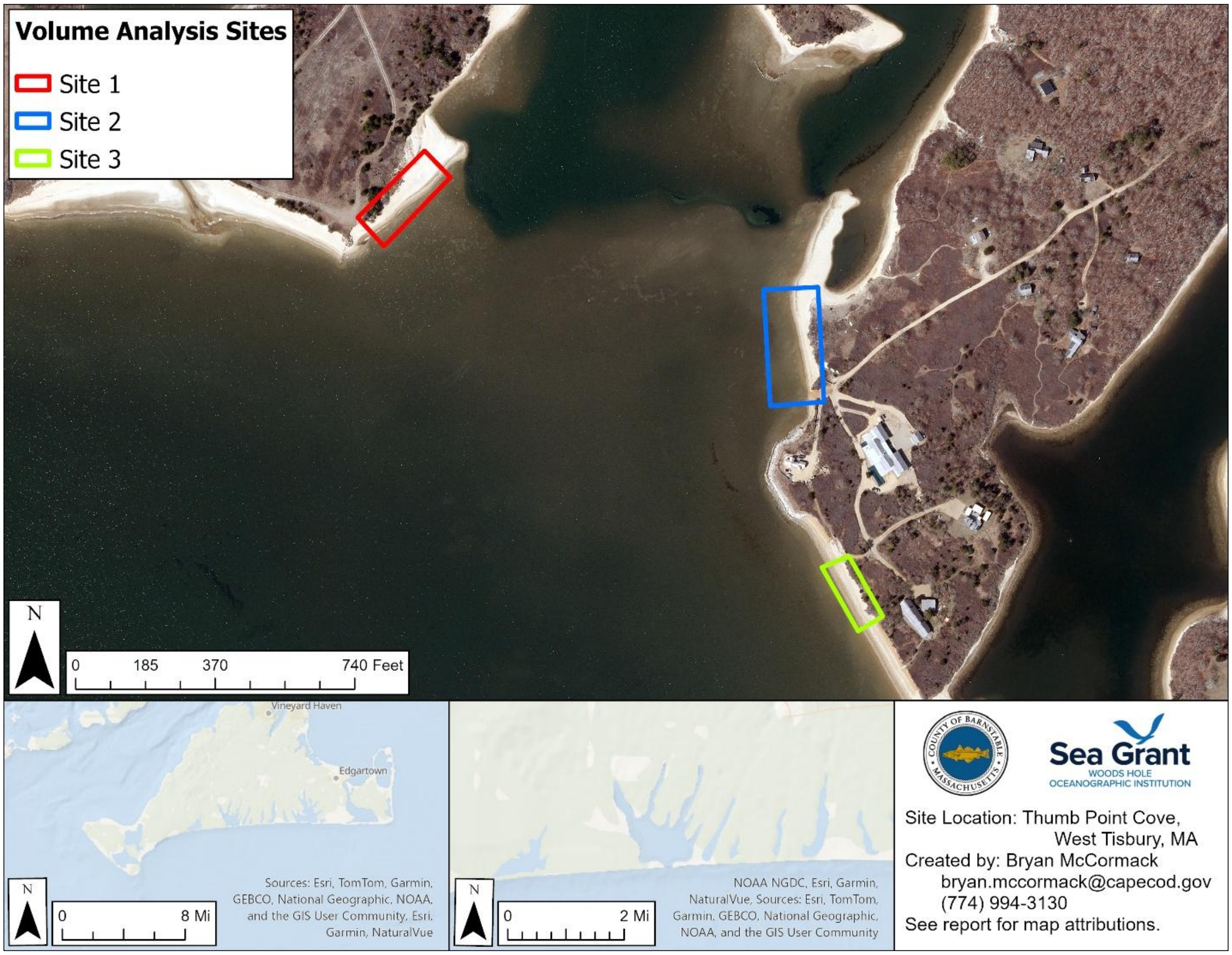


Figure 2: Sites for volume change analysis around Thumb Point Cove.

Table 1: Erosional Volumes for Site 1.

| Years | Total volume loss (yd^3) | Average annual volume loss (yd^3/year) | Average annual volume loss per linear foot of shoreline (yd^3/ft/year) |
|---|---|---|---|
| 2010 – 2021 | 315.11 | 28.65 | 0.11 |
| 2013 – 2021 | 259.13 | 32.39 | 0.13 |
| 2016 - 2021 | 326.34 | 65.27 | 0.26 |
| Average | 300.19 | 42.10 | 0.17 |

Table 2: Erosional Volumes for Site 2.

| Years | Total volume loss (yd^3) | Average annual volume loss (yd^3/year) | Average annual volume loss per linear foot of shoreline (yd^3/ft/year) |
|---|---|---|---|
| 2010 – 2021 | 1184.67 | 107.70 | 0.35 |
| 2013 – 2021 | 1053.83 | 131.73 | 0.43 |
| 2016 - 2021 | 1087.47 | 217.49 | 0.71 |
| Average | 1108.66 | 152.31 | 0.50 |

Table 3: Erosional Volumes for Site 3.

| Years | Total volume loss (yd^3) | Average annual volume loss (yd^3/year) | Average annual volume loss per linear foot of shoreline (yd^3/ft/year) |
|---|---|---|---|
| 2010 – 2021 | 520.47 | 47.32 | 0.25 |
| 2013 – 2021 | 289.58 | 36.20 | 0.19 |
| 2016 - 2021 | 499.75 | 99.95 | 0.54 |
| Average | 436.60 | 61.16 | 0.33 |

All the sites in the analysis showed erosion throughout each time period. Despite the adjacent nourishment, sites 2 and 3 showed higher annual erosion per linear foot of shoreline. This suggests that the erosional volume being brought in for these sites is likely appropriate for the scale of erosion control.

The previous report submitted in 2024 found that the nourishment volumes used are lower than the volume that would naturally be eroded from the bank through a separate calculation and analysis method. The report states, "Although the nourishment volume for 208 and 234 Middle Point Road could be contributing to nearby shoaling within Tisbury Great Pond, it is likely that depositional sediment comes from multiple sources within the littoral system. This shoaling would also likely be accelerated if the system was left unmodified and no shoreline protection was implemented, or the natural erosion volume was matched with the nourishment volume.” This statement is still accurate based upon the analysis in this report.

**Sediment Transport**

This area shows a flood dominant sediment transport regime, meaning that sediment is more likely to travel into the cove. This is likely due to wind coming from the south and potentially from a stronger flood current when Tisbury Great Pond is opened to the ocean. This is evident by the spit formation and elongation that can be seen in aerial imagery. Aerial imagery from 1995, 2014, and 2025 shows that this flood-dominant regime existed prior to the nourishment that began in 2014. These datasets are displayed below with traced shorelines to show the change through time.

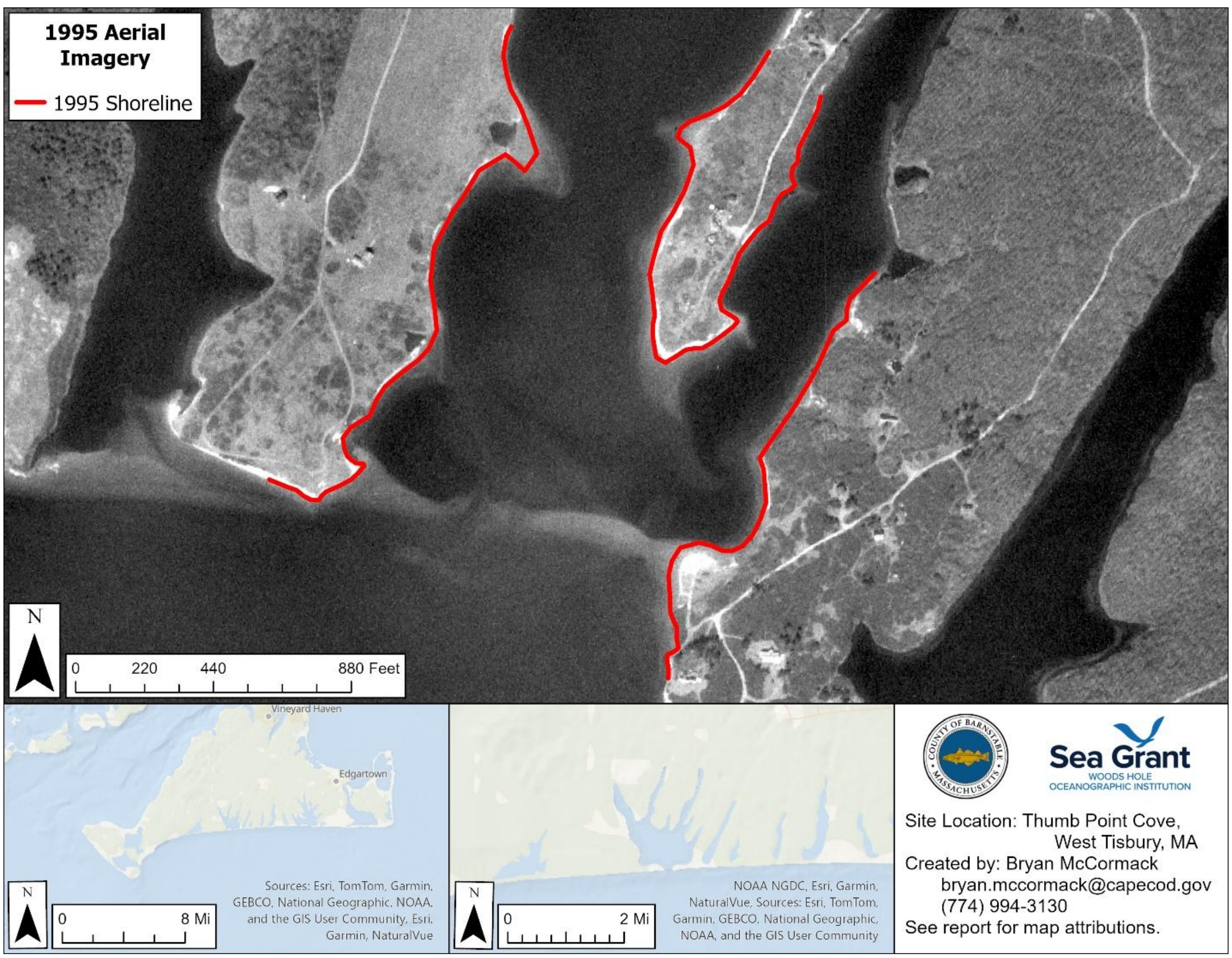


Figure 3: 1995 aerial imagery.

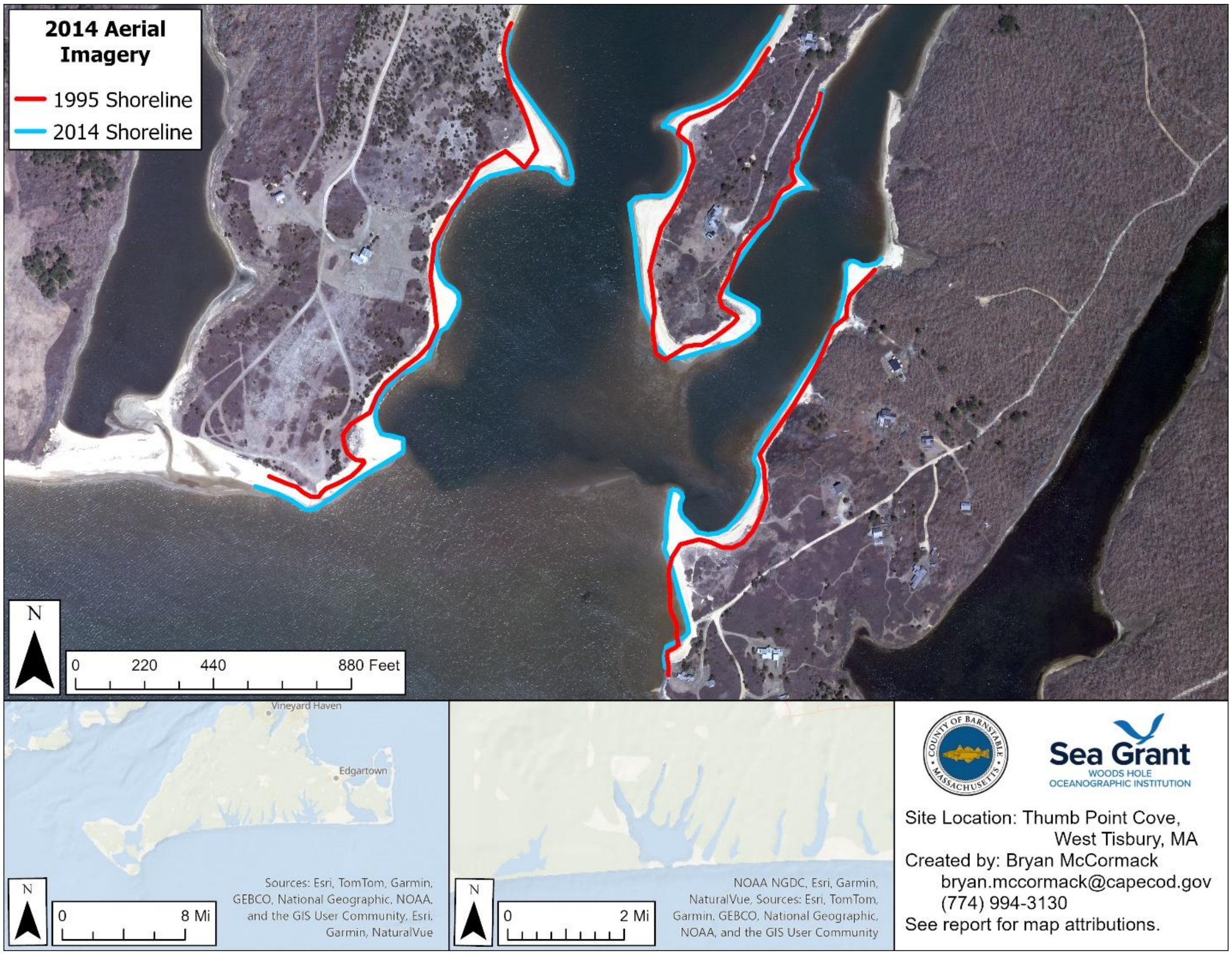


Figure 4: 2014 aerial imagery.

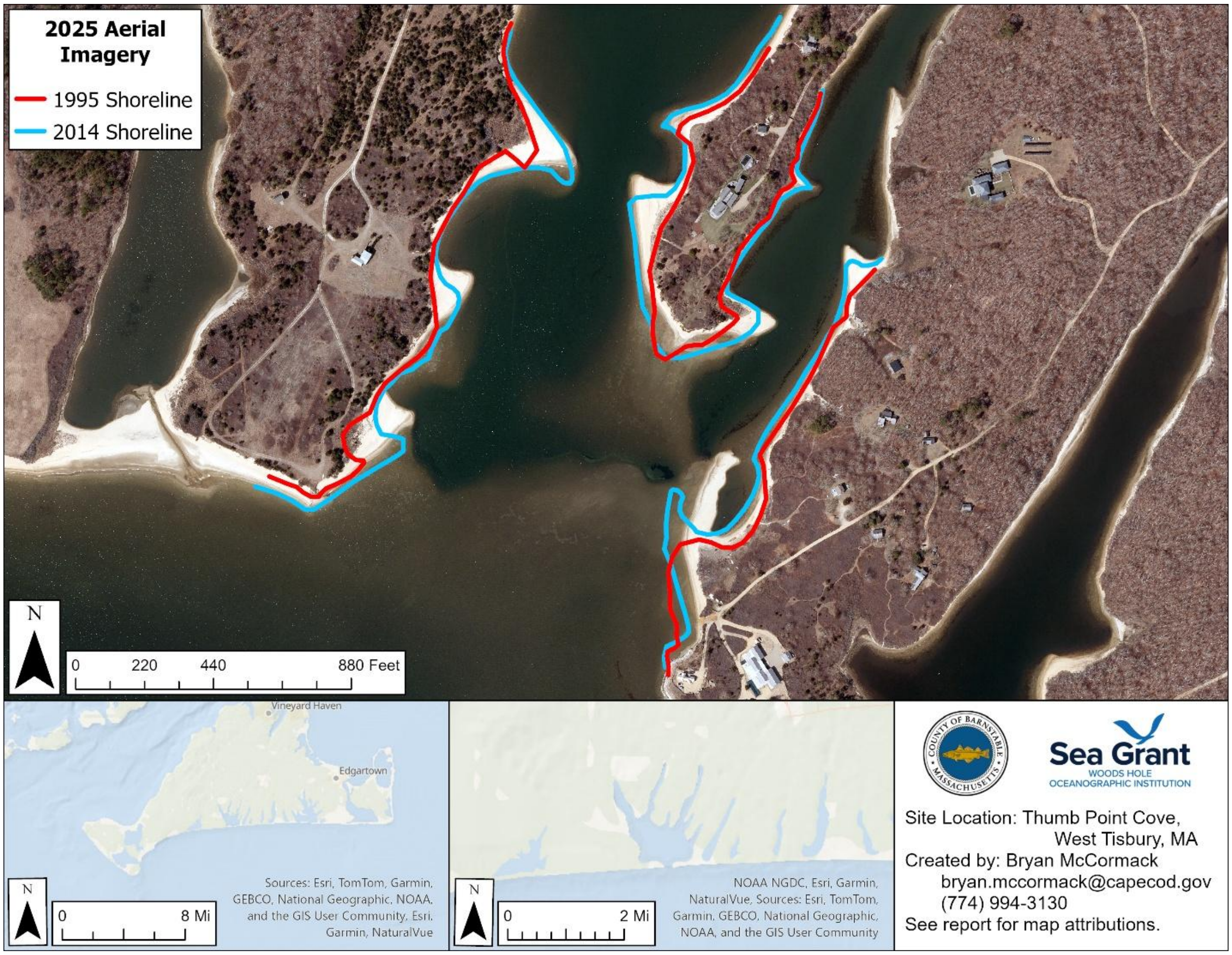


Figure 5: 2025 aerial imagery.

## GIS Analysis Information

A GIS analysis of the property was performed using publicly available data to help inform the relevant coastal processes. All maps provided use the NAD83 Horizontal datum and NAVD88 Vertical Datum in feet. The map projection is State Plane 1983 Massachusetts Mainland 2001. A GIS package of map data is available upon request. Links to the metadata for each dataset are listed below. The aerial imagery data set used in this analysis in the main frame is 2025 MassGIS Aerial Imagery unless otherwise noted.

2025 MassGIS Aerial Imagery: https://www.mass.gov/info-details/massgis-data-2025-aerial-imagery

2014 National Oceanic and Atmospheric Administration (NOAA) Aerial Imagery: https://www.fisheries.noaa.gov/inport/item/48418

1995 U.S. Geological Survey Aerial Imagery: https://earthexplorer.usgs.gov/scene/metadata/full/5e83a021c2655d64/DI00000000900737/

2021 U.S. Geological Survey Lidar: https://www.fisheries.noaa.gov/inport/item/69417

2016 NOAA Lidar: https://www.fisheries.noaa.gov/inport/item/51272

2013-2014 U.S. Geological Survey Lidar: https://www.fisheries.noaa.gov/inport/item/49846

2010 Federal Emergency Management Agency Lidar: https://www.fisheries.noaa.gov/inport/item/49841

## Background

Since the inception of the coastal processes position established within WHOISG & 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.