

Ocean Bluff Preservation Association

BRIEFING BOOK

**STATISTICS, INFORMATION,
DOCUMENTS, REPORTS & MAPS
DETAILING THE STATE OF
DETERIORATION OF OCEAN BLUFF
BEACH & ITS REVETMENT**

2019

About the Briefing Book

This briefing book was written by Ocean Bluff Preservation Association as a way to have ALL of the information, statistics and facts found through the research about the deteriorating condition of Ocean Bluff Beach all in one convenient location. The booklet contains quick statistical information such as tax info, census data, amount spent fixing seawalls, quotes, etc. This booklet also contains links, complete with an attached reference guide, to multiple Local, State and Federal reports/assessments/plans about Ocean Bluff Beach and Town of Marshfield beaches.

The reference guide is a tool to help navigate what is relevant to Ocean Bluff; it is NOT a full summary. The reference guide was written because many of the reports are over 100 pages; these guides serve to help speed up the reading. There are links to the reports/assessments just below each title headline and a picture of the cover page to help differentiate between all the different reports. There are numerous scans/photos of documents, letters, news articles, maps, graphs and other information which are extremely important. They comprise the majority of this booklet.

The information collected and comprised in this booklet proves through documentation, the state of deterioration of Ocean Bluff Beach and its Revetment (Coastal Defense Structure) and while other beaches/Towns have been maintained and rebuilt, virtually nothing has been done to protect the Revetment, Beach and surrounding infrastructure.

INFORMATIONAL STATISTICS, MAPS, LINKS & DOCUMENTS

Taxes from Ocean Bluff (1,000ft Radius of 512 Ocean St, 192 Homes) **Assessed @ \$79.6M \$10.6 Million in Taxes**
TOTAL MARSHFIELD PROPERTY TAX Levy Processed 2017 \$62,775,349. Total Receipts \$143.4 M
According to 2017 Town Report (Treasurer's Report)

Seawall Funds Spent in Marshfield: Fieldston: Hartford Rd Area (2010-ish) \$1 Million
Fieldston: 5th-13th Road (2016) \$2.7 Million Brant Rock: (2018) \$2.4 Million
Green Harbor: 200ft (2012) \$216,000

Last Annual Maintenance by DPW: ??? Selectmen Fitzgerald said "1990's", probably true, December 2016; last Town Excavator Work 2-3 mornings. **No Annual Budget Planning**

November 2018 DPW Repair Work Cost: \$7,500 - Entire Repair Cost

Estimated Sand Nourishment Costs: ?? Unknown

Estimated Crane Rental For Higher Sections:?? Unknown by DPW

Estimated Revetment Rebuild Cost: \$12-20 Million. Per Town Engineer

Estimated Engineering Study Costs: \$150-350K

Coastal Zone Management Grants Awarded 2014-2019 - South Shore: 32 - Marshfield: 2

Grant Amount Totals: South Shore \$4.27 Million. Marshfield: \$107,250

Scituate: 5 Grants, \$852,663 Duxbury: 5 Grants, \$970,113

Traffic Analysis: Mass DOT – Daily Volume: Wed: 10/24/18 –: 5,011 Tues: 6/16/09 – 6,713

Evacuation Route: Ocean Street along Ocean Bluff is a designated Evacuation Route along both directions, Ocean Street North towards Plain Street and South towards Careswell and Rte 3.

Emergency Shelter: Recent storms, Blizzard of 2013, Massasoit Ave Fire Station served as shelter to elderly residents w/o heat/power.

Rescue Staging Area: March 2018 Nor'easters, Fire Station was staging/rescue drop-off for Fire Dept & National Guard rescuing Brant Rock residents.

Census: Coastal Area Households have highest concentration of poverty level households 7.1% as well as At least 500 Households 65+ years of age. Rely on Ocean Street/Emergency Services

Highest population density levels are found within Coastal Areas of Marshfield

QUOTES on Record

"With the amount of storms and intensity, we can't do enough beach nourishment" – Police Lt. Mike DiMeo, Marshfield Harbormaster, Patriot Ledger Article, January 9, 2016

"South River is lined with pure sand and beach pebbles no different than what beach-goers sun-bathe on." Police Lt. Mike DiMeo, Marshfield Harbormaster, Patriot Ledger Article, January 9, 2016

“Beach Nourishment is the first line of defense against rising sea levels...The material is coming from right out there in the ocean...if you’re not doing it, the seawalls can be easily undermined.” - Mike Maresco, Marshfield Town Administrator, May 9, 2018, BOS Meeting

The segment of beach was reinforced to halt erosion that threatens Seawall Boulevard along the seawall. Houston Chronicle article about Sand Nourishment on Galveston, TX, May 25, 2015

Studies/Plans/Assessments Breakdown & Highlights
The Following are pages & highlights concerning Ocean Bluff regarding Multiple Federal, State and Local plans regarding Coastal Issues.

Instead of having to read entire plans/assessments, this is a Reference Guide
*****ALL PAGES ARE THE CORRESPONDING PDF PAGE & NOT THE Printed Version Page******

2018 Marshfield Beach Management Plan

https://www.marshfield-ma.gov/sites/marshfieldma/files/news/marshfield_beach_management_plan_121317_final_reducedsize.pdf

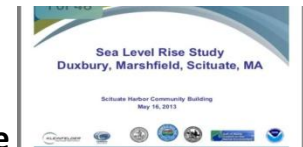
NOT ONE MENTION OF OCEAN BLUFF. Not one.

Interesting part about Fieldston though; Shepherd’s Path (aka The Metal Stairs across from Church) are considered Fieldston in this report even though they are very much in Ocean Bluff.

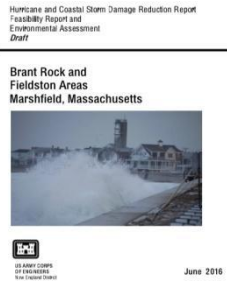
Sea Level Rise Study May 2013: Marshfield, Duxbury, and Scituate

https://www.marshfield-ma.gov/sites/marshfieldma/files/uploads/sea_level_rise_study_5-24-13.pdf

Summary: Literally nothing to do with us. Not one thing. I guess that’s good.



Hurricane & Coastal Storm Damage Reduction Report, Feasibility Report & Environmental Report: June 2016 Army Corps of Engineers (Brant Rock & Fieldston Areas)



https://www.marshfield-ma.gov/sites/marshfieldma/files/uploads/hurricane_and_coastal_storm_damage_reduction_repor1_scm_gwrp-20160510.pdf

76 pages; written by Army Corps of Engineers that has ZERO mention of Ocean Bluff. However some interesting things about Town of Marshfield owning Seawall, Town maintains seawall, a cool Revetment diagram and interesting costs about sand nourishment.

Pg. 8 – MA Executive Office of Energy & Environmental Affairs gave \$500K to Marshfield

Pg. 11 – Coastal Defense Structures were publically built and maintained.

Pg. 13 – 1st Sentence. \$\$\$ Money

Pg. 13 – Second Paragraph – When? And How much did it cost?

Pg. 14 – 2nd Paragraph. Confirms BEACH is the best defense

Pg. 14 – LAST PARAGRAPH, No Action Alternative considered but scrapped due to public outcry

Pg. 15 – Last 2 paragraphs, Talks about Revetment

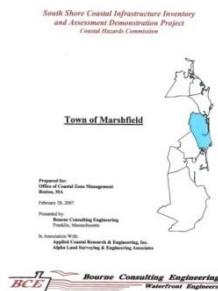
Pg. 18 – Whole Page, but 4th paragraph, Cost for small area of Revetment. Sand nourishment every 5 yrs

Pg. 20 – Town owns and maintains seawall (under “Conclusions”)

Pg. 49 – Nice diagram of a Revetment

Pg. 74 - #4 & #7

**COASTAL ZONE MANAGEMENT
SOUTH SHORE INFRASTRUCTURE INVENTORY & ASSESSMENT
COASTAL HAZARDS COMMISSION February 2008 (135 Pages)**



<https://www.mass.gov/files/documents/2016/08/us/marshfield.pdf>

- Pg. 6 – Prioritizing of Structures was given to density of population & risk to general infrastructure. Infrastructure includes structures/buildings, DOES NOT include Gas, Sewer, Water, Power Utilities.
- Pg. 9-10 – Rating of Structures Defined A through F
- Pg. 11 – Revetment Definition
- Pg. 12-13 - Rating Charts
- Pg. 14 – Cost Chart
- Pg. 16 – Number of Revetments & Condition
- Pg. 17 – Repair Costs, remember this is 2006 figures; *****These are not 2019 numbers/figures**
- Pg. 19 – Start of Assessment Maps
- Pg. 20 – HUGE! We have one of, if not, the HIGHEST concentration of problems
****Nothing about us for a while, hang in there****
- Pg. 46 – High Priority; \$203,000 Repair Cost Estimate, 130 feet in length, remember 2006 figures
- Pg. 48 – High Priority; \$812,000 Repair Cost Estimate, 1,040 feet in length, 2006 figures
- Pg. 67-70 – DPW Spreadsheet
- Pg. 71 – Another Spreadsheet
- Pg. 105 – Ocean Bluff Map
- Pg. 126-130 – Possible Revetment Maps

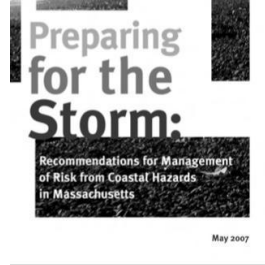


2015 Town of Marshfield Master Plan (249 Pages)

https://www.marshfield-ma.gov/sites/marshfieldma/files/uploads/master_plan_0.pdf

- Pg. 88 – Brant Rock Recommendations
- Pg. 106 – Challenges Faced (Last Line) and Pg. 107 more challenges
- Pg. 117 – Recommendations
- Pg. 121 – Board of Selectmen Responsibilities
- Pg. 133 – Beaches- Ocean Bluff NOT LISTED!!!!!!!!!!!!
- Pg. 134 – Seawalls – 2nd Paragraph (Infrastructure), 3rd paragraph makes our point entirely.
- Pg. 138 – Beach Recommendations.
- Pg. 139 – Capital Improvement Planning – Top Paragraph. Must find Capital Plan to review
- Pg. 150 – Roadway, Pg. 151 – Ocean Street
- Pg. 152 – 9th Road/Ocean Street, (2012) 7,900 daily volume, assume summer, October 2018 was 5,000 volume
- Pg. 158 – Transportation Volume, not wanting to add congestion in certain areas.
- Pg. 164 – Ocean Bluff Neighborhood @ risk
- Pg. 165 – Poverty & Senior Citizen Map
- Pg. 172 – Vulnerabilities & Impacts, Last paragraph important. (Approach)
- Pg. 173 – Anticipate Capital Projects in Coastal Infrastructure, LAST LINE
- Pg. 174 – Recommendations
- Pg. 178 – Dredging Reports
- Pg. 179 – Beaches
- Pg. 180 – Dredge
- Pg. 181 – Public Access
- Pg. 187 – Success in Securing Funding
- Pg. 189 – Last line, PROTECT Infrastructure
- Pg. 194 – Last Chart Box
- Pg. 195 – Procedural Recommendations, What is that???
- Pg. 196 & 197 – H-1, H-4, H-6, H-7
- Pg. 205 – PSF-15
- Pg. 206 – PSF-16
- Pg. 209 – Climate Change, CCA-1, CCA-2, Entire Page pretty much & CCA-6
- Pg. 210 – HRW Recommendations

MA COASTAL HAZARDS MAY 2007
PREPARING FOR THE STORM (49 Pages)



<https://www.mass.gov/files/documents/2016/08/rv/chc-final-report-2007.pdf>

Pg. 10 – 4th & 5th Paragraphs , Shoreline Migration & Coastal Structures

Pg. 11 & 12 – Decreased Sediment Supply

Pg. 12 – Beach Nourishment. OFFSHORE SOURCES HAVE BEEN SUCCESSFUL

Pg. 13 – Bullet Points: 2,3,4,5,6

Evaluate adequacy of coastal hazards tools & data, Evaluate Management practices, existing seawall repair, beach nourishment/along with evaluation of offshore mining, Hazard Mitigation Planning, Detailed assessment of South Shore Region & management practices. Rate Structures, Create 20 year Plan of Protection

Pg. 20 – STORM Resilient Communities Program

Pg. 21 – Executive Orders

Pg. 23 – Voluntary Land Acquisitions – Using CPC Funds

Pg. 24 – Hazard Mitigation Plans. CRS (Community Rating System) through FEMA

Pg. 27 – Transportation & Infrastructure

Pg. 28-29 – Regional Sand Management

Pg. 33 – South Shore Structure Inventory

Pg. 35 – Rating System Definition

Pg. 36 – Priority Definition & Structure Breakdown

COASTAL ADAPTATION HAZARDS STUDY

December 2011 (62 Pages)



**Coastal Zone Management & Conservation Involved

https://www.marshfield-ma.gov/sites/marshfieldma/files/uploads/south_shore_coastal_adaptation_planning_report_12-31-11.pdf

Pg. 6 – Picture of Revetment & Small Jetty

Pg. 7 – 2 Revetments rated in Poor Condition, 4 in Fair Condition

ESTIMATED \$22 Million to bring each structure to Condition A, \$12 Million to address Poor Condition (2006 cost estimates) CHC work completed since inception

Pg. 9 – Hewitt’s Point – Fair Condition in 2011

Pg. 10 – Erosion, Marshfield has lost 2 ft or higher per year shore change

Pg. 14 – US Army Corps of Engineers has topography maps from 2007

Pg. 17 – Adaptation Strategies: Protect, Accommodate, Retreat

“No Adverse Impact” approach, implemented in manner that does not increase municipal costs relative to benefit received.

*Specific actions are proposed to protect already built environment and strengthen coastal protection structures.

Pg. 23 – Transportation – Actually says increased maintenance of structure should be done if in critically Important area

Pg. 24 – Shoreline – Beach Nourishment recommended by CZM

Pg. 30 – Hazard Mitigation Grant Program – FEMA – Used in Marshfield previously

Pg. 30 – Pre-Hazard Mitigation Grants – Provide Funds on an Annual Basis for hazard mitigation planning as well as implementation of mitigation projects

Pg. 31 – NOAA

Pg. 32 – Community Based Restoration Program – Webpage that has info on grants/opportunities

Pg. 32 – MIT & Woods Hole Sea Grant Programs – Are we eligible?

Pg. 32 – Coastal & Ocean Climate Applications – Specific stakeholders grappling w/ pressing climate related issues

Pg. 34 – MassWorks Infrastructure Program – Highly unlikely

Pg. 37 – Jim Cantwell – Community Preservation Act Funding for Coastal Infrastructure

Appendix

Pg. 43 – Revetment Listed under FAIR Condition, 1 part listed as Poor: 530 Ocean St vicinity

Pg. 47 – Revetment – NO PLANNED REPAIR PLANS. This is December 2011

Marshfield Multi-Hazard Mitigation Plan

March 2018 (210 pages)



https://www.marshfield-ma.gov/sites/marshfieldma/files/uploads/marshfield_mhmp_report_final_050218_femaapproved_wappendices_reducedsize.pdf

- Pg. 9 – Last paragraph – Reasons to Prepare
- Pg. 10 – FEMA definition, 3rd version of Mitigation plan, 2005, 2013 & 2018
- Pg. 22 – Evacuation Route Map
- Pg. 23 – Critical Facilities/Infrastructure
- Pg. 24 – Map, 2 Located within Ocean Bluff
- Pg. 25 – Repetitive Loss Area – Last paragraph.
- Pg. 26 – Ocean Bluff “NOT ONE” of them
- Pg. 31 – Ocean Bluff but really Fieldston
- Pg. 33-35 – Flood maps, OB not in one but surrounded by them. Evacuations TO Ocean Bluff
- Pg. 36 – Problems w/ Flooding, proves our point
- Pg. 37 – Coastal Erosion
- Pg. 38 – We are eroding, considered a HOT SPOT
- Pg. 39 – Map. We have one of highest areas of erosion in Marshfield
- Pg. 41 – Proves our point AGAIN
- Pg. 42-51 – We are not flood area, but are a safe area people may need to come to if routes are cut off
- Pg. 53 – Nor’easters
- Pg. 54 – Proves our point
- Pg. 57 – Proves our point yet again
- Pg. 76 – Ocean Bluff Fire, good history
- Pg. 88 – What was selected?????
- Pg. 93 – Parcels & Buildings Vulnerable, Pg. 93-109 Table
- Pg. 110-111 – Evacuation Route
- Pg. 112 – No mention of Fire Station, why?
- Pg. 115 – Plymouth Ave, isolated area
- Pg. 119 – Mitigation Measures
- Pg. 120 – Acquire Flood Prone properties
- Pg. 124 – Mitigation Action Charts
- Pg. 127 – More Charts
- Pg. 130 – Planning Process, especially #1 = Benefits
- Pg. 133 – Purchase Properties
- Pg. 136 – Seawall Master Plan Maintenance, Last Update 2006. Gotta find it.
- Pg. 137 – Town-wide Beach Nourishment Plan – Is Ocean Bluff included????
- Pg. 141 – MVP Grant Funding
- Pg. 174-189 – Surveys

MA COASTAL ZONE MANAGEMENT INTERACTIVE GRANT FINDER

This link will bring you to the MA Coastal Zone Management Interactive Grant Finder, so you can see who received grants, when and how much

<https://www.mass.gov/service-details/coastal-resilience-grant-program> (Overall Program)

<https://mass-eoea.maps.arcgis.com/apps/webappviewer/index.html?id=55671f1a117c4139874543bba50b8a3c>
(Interactive Map)

LINKS TO VIDEOS

<https://vimeo.com/mctvgov>

2 Videos of note, February 11, 2019 Board of Selectmen meeting

<https://vimeo.com/317077528>

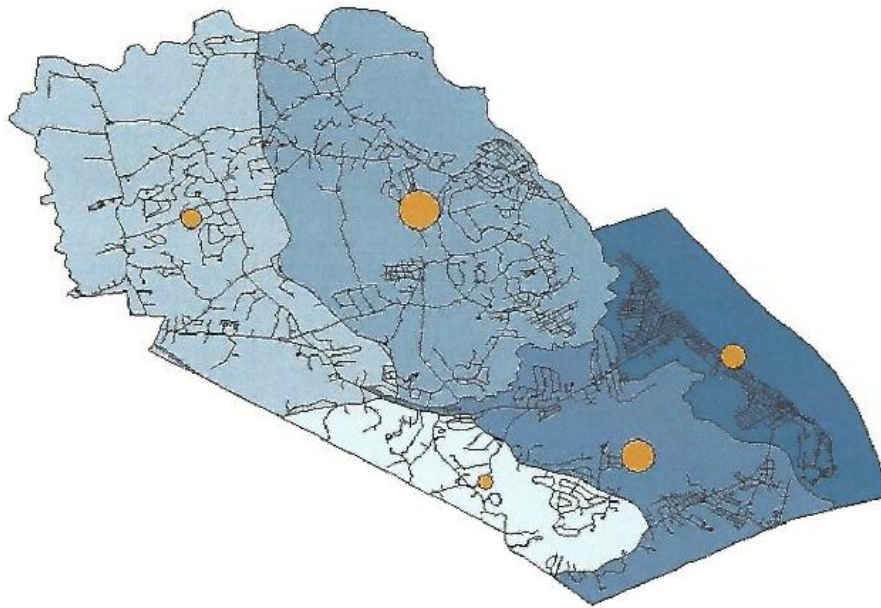
March 25, 2019 Planning Board Meeting

https://vimeo.com/326675527?fbclid=IwAR3HcGWhnkbjmkIEN4nKvo4x0mPEh_BPJDFadvAkw_dIkFt4DVvrbxyjdSDc

Scans/Photos/Exhibits Reference Guide

- Exhibit 1: Census Map/Breakdown: Seniors & Poverty Level (High in Coastal Areas)
- Exhibit 2: Flowchart of Town Beach Management Structure/Chain of Command
- Exhibit 3: Mass DOT Traffic Analysis: 9th Rd/Ocean Street (State Route 139) pg 1
- Exhibit 4: Mass DOT Traffic Analysis: 9th Rd/Ocean Street (State Route 139) pg 2
- Exhibits 5, 6, 7: Galveston, TX (Houston Chronicle) article about sand nourishment. Pages 1, 2, 3
- Exhibits 8, 9, 10: Patriot Ledger article about Marshfield conducting sand nourishment at Rexhame.
- Exhibit 11: 2015 Town Master Plan – “Success in getting grants”
- Exhibit 12: 2015 Town Master Plan – Recommendations
- Exhibit 13: Storm Damage Map from 2006. Highest concentration of damage in Town
- Exhibit 14: Erosion Map – Done by Town, Mitigation Plan
- Exhibit 15: Evacuation Route out of Town
- Exhibit 16: Ocean Bluff considered Erosion “Hot Spot” to use their own words
- Exhibit 17: MA Real Estate Law proving beach is public between high tide and low tide
- Exhibit 18: 2006 South Shore Coastal Infrastructure Inventory & Assessment Report; State of MA pg 1
- Exhibit 19: Page 2 of Coastal Infrastructure Report, cites MULTIPLE beneficial things. High priority fix, 1,130 feet of Revetment needs repair, (Remember 2006!!!) Built around 1930, Public owned
- Exhibit 20: Mike Maresco article mentioning sand nourishment is best defense.
- Exhibit 21: Page 2 of Mike Maresco article regarding best defense is sand nourishment.
- Exhibits 22, 23, 24, 25: Erosion Letter by Town & MA CZM to Army Corps of Engineers (2012)
- Exhibit 26: Repair Amount spent on Marshfield Seawalls
- Exhibit 27: MA CZM Grant Funds on South Shore Graph
- Exhibit 28: Individual Breakdown of South Shore MA CZM Grants & Amounts

Marshfield Percent Population in Poverty & Households with a Member Age 65 and Over



— Marshfield Roads % Population in Poverty

65+Households

F2

- 277
- 278 - 447
- 448 - 507
- 508 - 570
- 571 - 683

F2

- 2.1%
- 3%
- 4.4%
- 4.6%
- 7.1%

0 1 2 4 Miles



3.0 MANAGEMENT STRUCTURE OF MARSHFIELD PUBLIC BEACHES

3.1 DEPARTMENT ROLES AND RESPONSIBILITIES

The management structure for public beaches within the Town of Marshfield involves a number different departments and personnel, each with different interests and responsibilities in managing the Town’s beaches (Figure 3-1). These interests range from the daily operations of the beach and summer staffing, to facilities maintenance, to conservation and protection of natural resources. As part of this Beach Management Plan, the roles and responsibilities of the various departments in charge of managing the public beaches have been identified. This information can be useful in providing coordinated and effective management of the Town’s public beach sites, and ultimately for meeting the goals stated in this plan for improving the quality of Marshfield Beaches. It does not, however, need to remain static. Roles and responsibilities can be redistributed, at which point, this section would be a useful starting point for streamlining operations in the future. A general organization chart and a brief list of department responsibilities is provided in Figure 3-1.

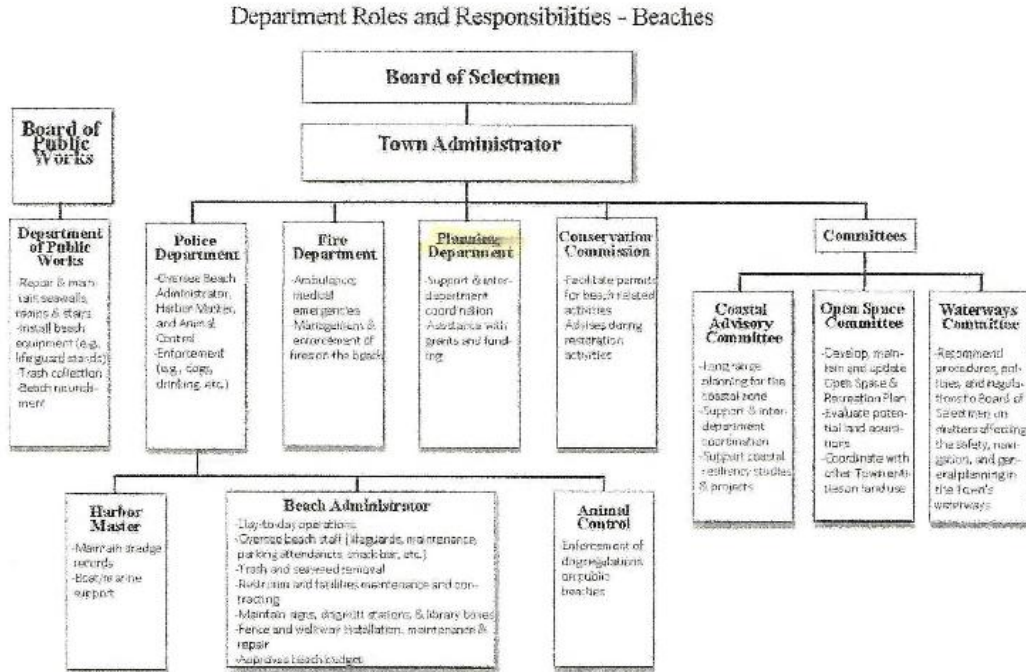


Figure 3-1. Town of Marshfield department roles and responsibilities for beach management.



Transportation Data Management System

List View All DIRs Report Center

Record 2 of 2 Goto Record

Location ID	7160	MPO ID	
Type	SPOT	HPMS ID	171002703570
On NHS	No	On HPMS	Yes
LRS ID	SR139 EB	LRS Loc Pt.	26.42551
SF Group	U4-7	Route Type	SR
AF Group	U4-7	Route	139
GF Group	U4-7	Active	Yes
Class Dist Grp	U4-7	Category	HPMS
Seas Ciss Grp	MHD Statewide		
WIM Group			
QC Group	Default		
Funct'l Class	(4) Minor Arterial	Milepost	
Located On	Route 139		
Loc On Alias	OCEAN STREET		
BETWEEN	HUTCHINSON ROAD AND Arkansas Street		
	PR	MP	PT
	0		

More Detail

STATION DATA

Directions:

AADT

Year	AADT	DHV-30	K%	D%	PA	BC	Src
2018	4,639	428	9	53	4,571 (99%)	68 (1%)	
2017	5,514 ³				5,260 (95%)	254 (5%)	Grown from 2016
2016	5,260				5,000 (95%)	260 (5%)	Grown

AAADT

Year	AAADT	DHV-30	K%	D%	PA	BC	Src
2018	4,639	428	9	53	4,571 (99%)	68 (1%)	
2017	5,514 ³				5,260 (95%)	254 (5%)	Grown from 2016
2016	5,422 ³		9	52	5,123 (94%)	299 (6%)	Grown from 2015
2015	5,105	461	9	52			
2011	6,052 ²		9	55			

<< < > >> 1-5 of 21

Travel Demand Model										
Model Year	Model AADT	AM PHV	AM PPV	MD PHV	MD PPV	PM PHV	PM PPV	NT PHV	NT PPV	

VOLUME COUNT			
Date	Int	Total	
Wed 10/24/2018	15	5,011	
Tue 10/23/2018	15	5,036	
Tue 4/14/2015	60	5,164	
Mon 4/13/2015	60	5,238	
Tue 6/16/2009	60	6,713	
Mon 6/15/2009	60	6,558	
Wed 5/28/2003	60	5,773	
Tue 5/27/2003	60	5,892	
Mon 5/8/2000	60	6,727	
Tue 2/11/1997	60	4,452	

<< < > >> 1-10 of 11
mm/dd/yyyy To Date

VOLUME TREND	
Year	Annual Growth
2018	-16%
2017	2%
2016	6%
2015	-4%
2011	5%
2010	-4%
2009	0%
2008	-1%
2007	-2%
2006	16%

<< < > >> 1-10 of 20

SPEED					
Date	Int	Pace	85th	Total	
Wed 10/24/2018	15	29 - 39	39	5,011	
Tue 10/23/2018	15	29 - 39	38	5,036	

CLASSIFICATION			
Date	Int	Total	
Wed 10/24/2018	15	5,011	
Tue 10/23/2018	15	5,036	
Tue 6/16/2009	60	6,713	
Mon 6/15/2009	60	6,558	

WEIGH-IN-MOTION			
Date	Axles	Avg GVW	Total
No Data			

PER VEHICLE			
Date	Axles	85th	Total
No Data			

Galveston scoops up free sand to build new beach

Galveston dredges up help for its beaches from the Army Corps of Engineers

Harvey Rice May 26, 2015 Updated: May 26, 2015 7:29 p.m.

GALVESTON – For the cost of shipping and handling, Galveston's park board was able to snag enough sand to replenish all of the seawall beaches on the island and build a new one.

Of course, the estimated delivery costs for 725,000 cubic yards of sand runs about \$9 million. Still, given the value, Galveston wanted to find a way to get the sand from the U.S. Army Corps of Engineers, which turns it up by dredging every 18 to 24 months.

With the help of the Texas General Land Office, a deal was brokered that paves the way for the second part of the most ambitious beach nourishment program ever contemplated for Galveston.

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"This was not on anybody's books, so we all scrambled," said Kelly de Schaun, executive director of the Galveston Park Board. "An opportunity arose and we were prepared to act upon it and had good science as to why we should do it and the political will within our community."

The Corps recently awarded a dredging contract and the contractor is expected to begin dredging in late June, said Tricia Campbell, an operations manager with the Corps' Galveston District. About 60 days after dredging begins, the contractor is expected to begin bringing sand to be put in front of the seawall between 61st and 85th streets, where no beach now exists.

Campbell said the Corps was close to signing a contract with the land office and the park board. The sand will be used to build a 100-foot-wide beach in an area where erosion erased the beach decades ago, leaving only giant granite rocks to protect the seawall.

Bolstering other sites

The new beach is likely to boost property values for the condominium across the street owned by Frederick Cherry, 69, and his wife, Jackie, 65. Cherry welcomes the increase in property value because the law freezes the tax rate of older owners.

But he acknowledged being a bit nervous about the crowds that a beach might bring. "I am (worried), but it's OK," Cherry said.

The newly formed beaches will also act as a "sand engine," which will bolster island beaches farther west as erosion carries sand in that direction, de Schuan said.

Early next year, the park board plans to put new sand from Corps dredging on the existing beaches in front of the seawall, from 16th to 61st Streets.

"It's very important because beaches are becoming the No. 1 economic driver for Galveston," said Craig Brown, the City Council representative on the park board.

In March, the city finished rebuilding 0.38 mile of beach stretching from the end of the seawall to the city-owned Dellanera RV Park, replacing sand swept away by Hurricane Ike in 2008.

Dump trucks hauled in 118,000 cubic yards of sand over four months to get the job done. The importance of rebuilding such a short stretch of beach is greater than its length suggests, Brown said.

The segment of beach was reinforced to halt erosion that threatens FM 3005, known as Seawall Boulevard along the seawall - the main east-west thoroughfare for the entire length of the island. "It's a very important area because it's a washout area for storms and hurricanes," Brown said.

The project also built a huge protective artificial dune to replace the dune system demolished by Ike. The dune is 75 feet wide at the base, 35 feet wide at the top and 11 feet high.

The project cost \$4.5 million, much of it to purchase sand, but the two larger projects are expected to cost less per cubic yard because the sand will be free.

subhdhre

Any agreement with the Corps will dramatically slash the cost of the final two phases of the project, de Schaun said. The park board purchased private sand for the recently completed project, but will receive free sand from the Corps from dredging projects already scheduled.

The city will pay only for the transportation costs. The windfall of sand will mean that what would otherwise cost an estimated \$23 million will instead cost about \$9 million, de Schaun said.

Galveston, TX Article

To seal the agreement with the Corps, the land office cut through an often long and involved bureaucratic process by adding the seawall projects to an existing agreement with the Corps. State officials also reached into their pockets to come up with about \$2 million that wasn't budgeted, with the city paying the balance from funds reserved for the beaches.

"A beneficial use like this is the most cost-effective way to put sand on the beach," Land Office spokesman Jim Suydam said. "This is sand that would have otherwise been spread around at sea."

The park board hopes to maintain the newly refurbished beaches with sand from regular dredging done by the Corps.

"One of the reasons we really committed this year is they dredge every 18 to 24 months," de Schaun said. "We want to be on a regular dredge cycle."

Doing so will mean tapping federal money for beaches given to nearly every other coastal state but Texas, de Schaun said. "There is more money given to the Great Lakes than to the Texas Coast," she said.

Galveston is also eyeing money from the Coastal Erosion Planning and Response Act, used by South Padre Island to maintain its beaches, de Schaun said.

Galveston, Tx Article

The Patriot Ledger

Marshfield, Scituate to recycle sand from dredging to bolster beaches

By Kristi Funderburk / kfunderburk@wickedlocal.com

Posted Jan 9, 2016 at 5:00 AM

Dredging projects along the South River are helping two town's bolster their shorelines.

In the final weeks of 2015, sand was sucked out of a shallow section of the South River and poured onto Rexhame Beach in Marshfield as a long-planned dredging project presented an opportunity for beach nourishment.

It's a kind of natural recycling, and Marshfield and Scituate are fortunate for the opportunity, Marshfield Harbormaster Mike DiMeo said. Some towns have a silt base in their waterways and can't make use of their dredged materials, but the South River is lined with pure sand and beach pebbles no different than what beach-goers sunbathe on, he said.

"If you scooped sand from the beach and this, it would be virtually the same when it dries," DiMeo said.

While the nourishment from this dredging effort benefits Marshfield most directly, the next dredging project planned would benefit the beaches of Humarock, DiMeo said. That dredging would open up the section of the South River from the Sea Street bridge to and including the mouth of the river at the New Inlet.

Exactly where on Humarock the sand will go is yet to be determined, because the estimated 60,000 cubic yards to be dredged would be more than is needed on the small portion of public beach there, DiMeo said. The sand can't go on a private beach without an agreement, from the property owner, he said.

That project is only in the planning stages anyway, as both towns are waiting to hear if they will receive a piece of the state's \$2.2 billion environmental bond bill to pay for it.

Scituate Harbormaster Stephen F. Mone said the dredging projects, which have their own

merit, have added value with the beach nourishment aspect.

"The more sand out in front of those houses, the sooner the waves will break and disperse," he said. "The more sand out there, the better off they are."

Using dredging materials on the beach isn't a new concept, DiMeo said, pointing to the Cape and Islands where it has been done for years, and it makes sense for the towns in terms of money and public safety.

"It's a good use of material rather than having to buy sand for beach nourishment, which could cost up to \$20 per cubic yard," DiMeo said, citing contractors he's spoken to. "We're actually reclaiming the beaches with our own material."

Dredging 10,000 cubic yards would yield about \$200,000 worth of sand, by DiMeo's estimate.

From dredging to beach nourishment, the project cost about \$350,000. That cost also includes equipment and transportation, moving and replacing mooring, a post-dredge survey and a piping plover management plan, DiMeo said. Marshfield and Scituate shared in the costs.

The beach nourishment aspect of the recent dredging effort is an added plus to a project that DiMeo said took years of planning and adjusting, partnerships between two counties and financial support from two towns, Marshfield and Scituate, to start.

Starting Dec. 21, Barnstable County, with Plymouth County's approval, used its workers and equipment to pull sediment and materials from a 1,500-foot stretch of the river south of the Sea Street Bridge.

A portion of the dredging effort, about 900 cubic yards, was completed in 2013. Workers uncovered pilings from an old bridge that had to be removed, and that took more time and money than officials had planned, DiMeo said.

The dredging project was critical to see through, however, to clear a path for boaters accessing the river from the shores of Marshfield and Scituate, DiMeo said. Boats were running aground and hitting old mooring blocks, but those have since been removed, he said.

"It keeps the channels wide so it's safer," Monc added.

Ledger Article

During the recent dredging project, hydraulic equipment ran back and forth on two cables scouring and cutting the edge of the channels to suck the sand up through a mile-long pipe like a vacuum.

DiMeo estimated about 10,000 cubic yards would be removed from the South River and sent through pipes to Rexhame. The project will leave a 1,500-foot by 75-foot area of the public beach about 1.5 feet deeper with sand, Marshfield engineer Rod Procaccino said.

"With the amount of storms and their intensity, we can't do enough beach nourishment," DiMeo said.

Follow editor Kristi Funderburk on Twitter [@kfunder](#)

Ledger Article

Administration/Finances

Issues

1. The Town has experienced success in securing funding for dredging and waterfront improvements. These efforts need to continue along with pursuing options for stable sources of revenue dedicated to the waterways.

Recommendations

Goal I: Ensure adequate and stable funding for waterfront and waterway activities.

Objective I – Pursue funding to support management of the Town’s waterways and waterfronts

- a. Review, catalog, and assess the trends of existing sources of funding for harbor and waterways-related operations and capital improvements and increase efforts to secure new financial support, e.g., grants.
- b. Work with the Town to obtain a consolidated quarterly report of all Waterways income and expenses. Include information from all relevant accounts such as police salaries, capital expenses and state launch ramp income.
- c. Explore establishing a separate account for all user fees and other existing and future revenue sources attributed to Waterways operations, the balance of which may be rolled over from year to year as retained earnings.
- d. Explore the desirability and possibility of waterways-related expenses being paid for by existing and future waterways-related revenue

Objective II – Ensure that the Town is capturing all revenue to which it is entitled from the economic value that is generated from the Town’s waterways assets.

- a. Work with the Assessor’s office and boating businesses to ensure the Town is collecting excise taxes on boats in accordance with state law.

Climate Change Recommendations

CCA-1. Explore the potential benefits of developing a beach management plan that will (1) comprehensively identify beach management needs and issues throughout the Town, and (2) provide recommendations to strategically address those needs and issues.

CCA-2. Develop a plan to guide, funding and scheduling for beach re-nourishment.

CCA-3. The Sea Level Rise Study recommends rebuilding the existing seawalls at least two feet higher to accommodate rising sea levels over next 25 years to help protect the Town's existing infrastructure. Storm closure panels at openings in sea walls should also be constructed that can be closed in advance of a storm to ensure that water does not pass through openings during storm events to minimize penetrations in sea walls.

CCA-4. Consider raising sections of several roadways (Bay Avenue, Dyke Road, Ocean Street, Island Street, Cove Street, Maccombers Ridge, Maccombers Way, Bartletts Isle Way) to reduce flooding and maintain access to flood prone areas.

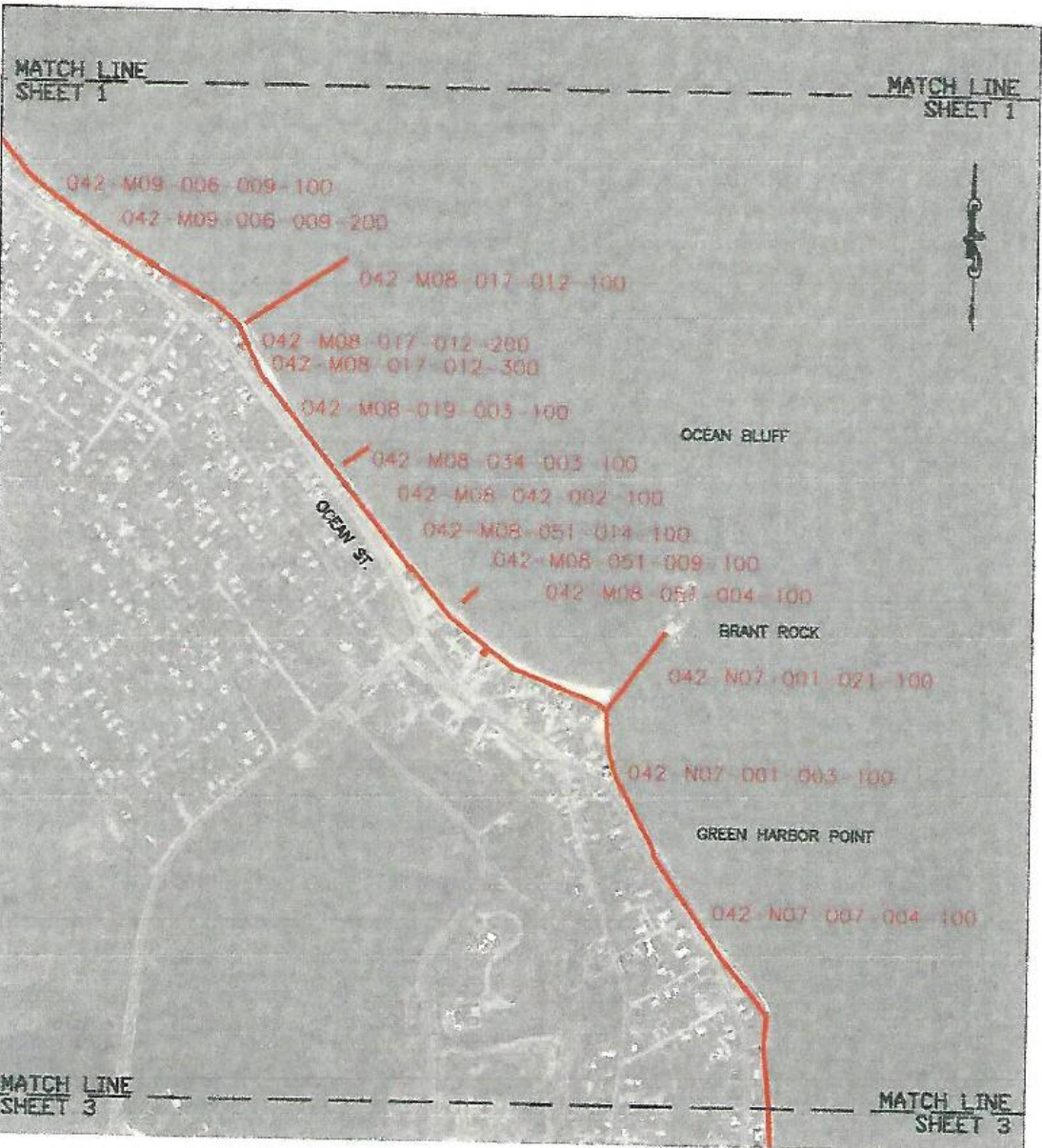
CCA-5. Study the impacts of constructing offshore breakwaters or other attenuation devices to absorb wave energy to preserve beach re-nourishment efforts and protect seawall.

CCA-6. Investigate possibility of instituting a home buy-back plan in repetitive loss areas.

CCA-7. Conduct an assessment of health of the tidal salt marshes and develop restoration strategies.

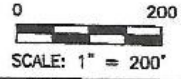
CCA-8. Investigate the possibility of implementing rolling easements in the flood prone sections of town. (Note: Rolling easements are not likely in areas with lot sizes under 10,000 square feet.)

File: X:\26600-26637\Final Town Report Ortho Drawings\Marshfield_Report_Drawing.dwg



COASTAL STRUCTURE LOCATION PLAN

TOWN OF MARSHFIELD
SOUTH SHORE COASTAL INFRASTRUCTURE INVENTORY
AND ASSESSMENT DEMONSTRATION PROJECT
AUGUST 2006



BCE Bourne Consulting Engineering
All Work Covered Under
Professional Seal
REG. (000) 400-0000 REG. (000) 400-0000

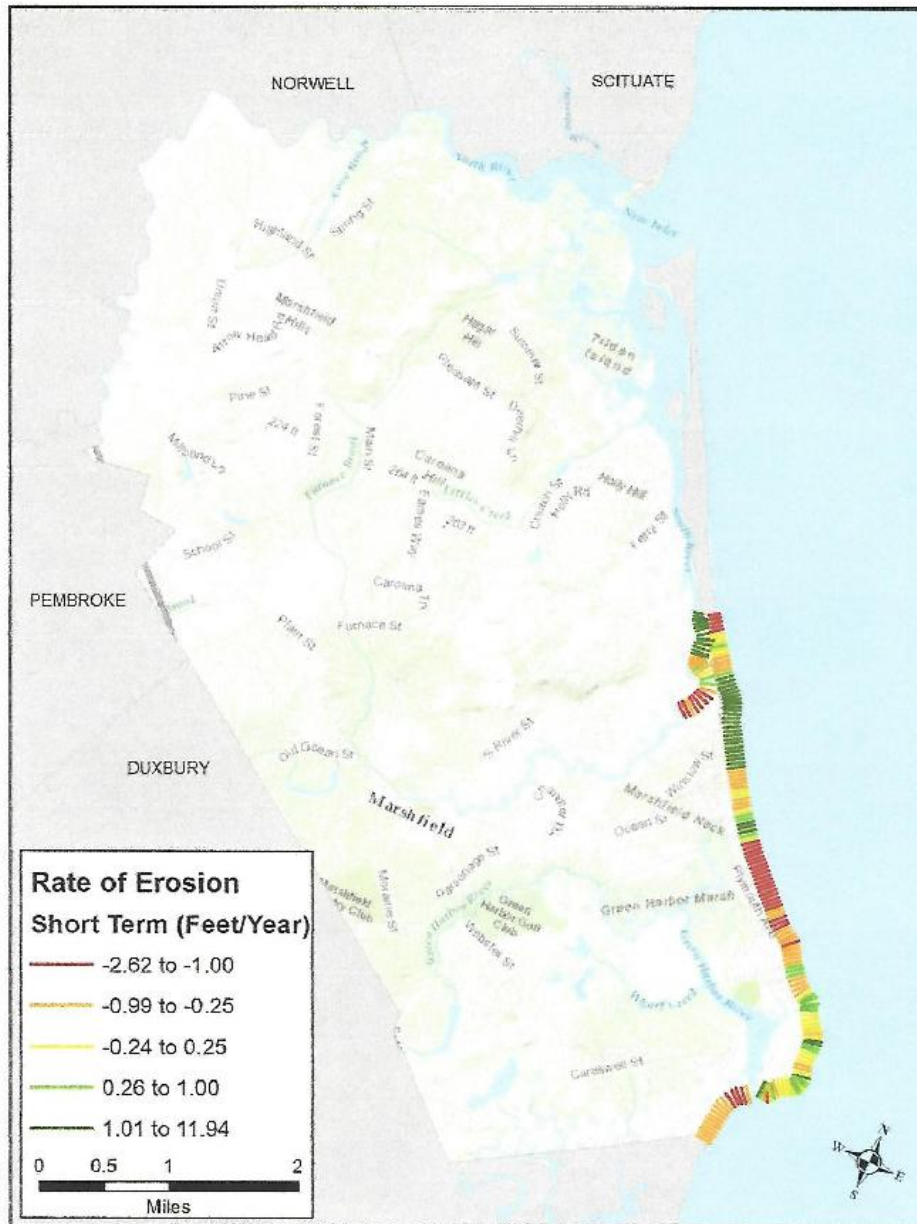


Figure 3-6. CZM Shoreline Change Project data from 1978 to 2008 in Marshfield.

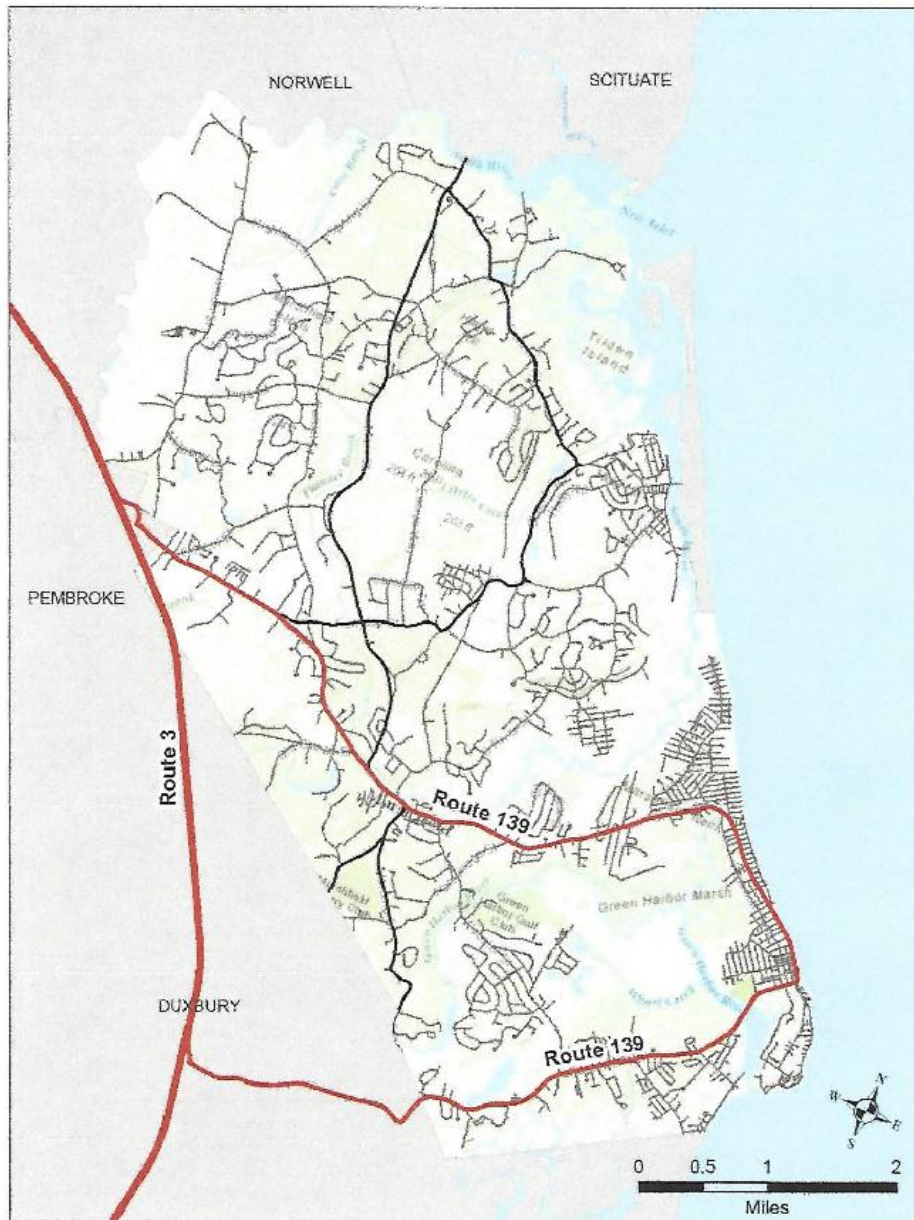


Figure 2-2. Emergency evacuation routes in Marshfield.

such as those generated by nor'easters. The Town of Marshfield has approximately 4 miles of shoreline at least partially protected with shorefront coastal structures (e.g., seawalls, bulkheads and jetties). Sea wall failure and coastal erosion are related issues increasingly impacting towns along the Massachusetts coast. Rising sea levels have led to increased rates of erosion along beaches and coastlines and the undermining of sea walls, some of which in the Boston region are many decades old. Sea walls protect the buildings behind them from storm damage and their failure can lead to increased property damage. Similarly, intact beaches with dunes dissipate wave energy, protecting buildings behind them. As the beaches erode away, this protection is lost. In some cases, sea walls can accelerate beach erosion. In April of 2010, 500 feet of sea wall in Marshfield collapsed due to undermining of its foundation from erosion. In addition, many areas have no remaining high tide beach for recreation (Figure 3-4).

HAZARD LOCATION The Massachusetts Office of Coastal Zone Management (CZM) has documented the rate of change of all ocean-facing shorelines of Massachusetts through their Shoreline Change Project (2013). Shorelines were delineated and evaluated to demonstrate trends from the mid-1800s to 2009. These data were then incorporated into MORIS, the Massachusetts Ocean Resource Information System, to provide better access to the shoreline change data and to allow the public to view the data using the online tool. Figure 3-5 displays the long-term shoreline change data in Marshfield from CZM's Shoreline Change Project. Figure 3-4 shows the long-term rates of change, from 1848 to 2008, in feet per year, where negative values indicate erosion and positive values indicate accretion. From these data, it is evident that the majority of the Town's coastline (55%) is experiencing some level of coastal erosion. Additionally, there is a localized area of greater erosion in the Rexhame area, where the long-term rates of erosion are significantly higher than the rest of Town (i.e. more than 1 feet per year). As shown in Figure 3-5, based on CZM's Shoreline Change Project data, coastal erosion has been occurring along much of the Marshfield coastline since at least the 1800s. However, this erosion is often episodic, as a result of significant storm flooding and wave impacts, rather than continuous erosion. The rates of shoreline change between 1978 and 2008 are shown in Figure 3-6. It is notable that erosion in the last few decades has increased along much of Marshfield's coastline, despite the large percentage the coastline that is armored with sea walls. However, due to the presence of seawalls, these shoreline retreat rates will not continue indefinitely. Given that there is currently little to no dry high tide beach in many areas, it is likely that the seawalls will

B1.c B2.a B2.c
Chapter 3 Hazard Identification – Coastal Erosion

3-11 Marshfield Multi-Hazard Mitigation Plan

prevent any further horizontal retreat of the shoreline. Vertical erosion, which must be measured through targeted low-tide LiDAR data or through field topographic surveys, can and likely will continue to occur. If the beach profile is lowered enough, the stability of the seawalls will be threatened. The Report of the Massachusetts Coastal Erosion Commission tabulated the average shoreline change rate, in feet/year, for all coastal communities (CEC 2015). The Coastal Erosion Commission calculated 0.1 ft/yr as both the short- and long-term shoreline change rates for the Town of Marshfield. While this implies a stable or even slightly accretional shoreline, the standard deviation was 2.5 and 1.0 for the short- and long-term rates, respectively, indicating that some areas of town are in fact experiencing erosion. In fact, the area from Brant Rock to Fieldstone Beach and along Bay Avenue were considered to be erosion "hot spot" areas. The CEC defines "hot spots" as known locations where the combination of erosion, storm surge, flooding, and waves have caused damage to buildings and/or infrastructure during coastal storm events over the past five years. That the average rate indicates essentially no change is likely a result of the large percentage of the Town's shoreline that is armored.

opens in May. By permitting Ahab to store the boat on his property, Herman has given Ahab a license. But if Herman buys his own boat in March, he can tell Ahab to remove his boat, and Ahab will have no legal remedy.

■ RIPARIAN RIGHTS

Owners of property that includes or lies alongside bodies of water face particular ownership issues, called *riparian rights*. In Massachusetts, there are three types of common riparian rights situations: streams, surface waters, and tidal waters.

The word *riparian* refers to the rights of an owner along a river or watercourse, but when the rights are adjacent to a lake or the ocean, they may be called *littoral* rights. The terms *riparian rights* and *riparian owner* are often used in conjunction with all water-related issues. For study purposes, just remember that Riparian refers to Rivers (and other flowing bodies of water), and Littoral refers to Lakes (and other standing waters).

Streams

If the stream is navigable, that is, if a boat can float down it, then the public owns both the water and the land under the water. The Commonwealth is responsible for the care and supervision of the stream. The owner of the land next to the stream, or through which the stream runs, owns the land *up to the bank* of the stream.

An owner of land abutting a navigable waterway owns the right to use the water as it passes, but he cannot obstruct it or prevent it from flowing in its natural course or from being used for navigation.

If the stream is not navigable, ownership may be held in one of two ways. First, if the stream separates two properties, the adjacent landowners own the water and the land under the water to the center of the stream. Second, if the stream runs through a single property, then the riparian owner owns the water all the way across and all the land on both sides and underneath.

Ponds and Lakes

Surface waters—such as ponds, swamps, and lakes—are controlled by the state and are regulated according to antipollution statutes. Adjacent property owners own the land up to the shore and do not have an unlimited right to fill in a wetland or lakeshore. Use of the water must be approved under the state environmental laws.

Tidal Water

An owner whose property abuts tidal waters (i.e., oceanfront property) owns the land to the mean low water line or 100 rods below mean high water, whichever is less. The land between low water and high water is reserved for the use of the public by state law and is regulated by the state.

CZM South Shore Coastal Infrastructure Inventory and Assessment
Structure Assessment Form

Town: **Marshfield**
 Structure ID: 042-M09-006-009-100
 Key: community-map-block-parcel-structure

Property Owner: Local	Location: Ocean St.	Date: 8/16/2006
Presumed Structure Owner: Local	Based On Comment: DCR - Contract Drawings	
Owner Name: Marshfield	Earliest Structure Record: 1930	Estimated Reconstruction/Repair Cost: \$203,346.00

Length: 130 Feet	Top Elevation: 13 Feet NAVD 88	FIRM Map Zone: VE	FIRM Map Elevation: 22 Feet NGVD
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Primary Type: Revetment	Primary Material: Stone	Primary Height: 10 to 15 Feet
Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

This structure is a stone revetment. There is significant movement of the armor stone evident. Some armor stones are displaced and there are voids evident within the armor layer.

<i>Condition</i>	D	<i>Priority</i>	IV
<i>Rating</i>	Poor	<i>Rating</i>	High Priority
<i>Level of Action</i>	Major	<i>Action</i>	Consider for Next Project Construction Listing
<i>Description</i>	Structure exhibits advanced levels of deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure has strong risk of significant damage and possible failure during a major coastal storm. Structure should be monitored until repairs/reconstruction can be initiated. Actions taken to reconstruct structure to regain full capacity to resist a major coastal storm. Landform eroded, stability threatened. Landform not adequate to provide protection during major coastal storm. Actions taken to recreate landform to adequate limits for full protection from a major coastal storm.		High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)

Structure Images:

042-M09-006-009-100-PHO1A.jpg

Structure Documents:

MA DPW	NOV 1930	PROPOSED	042-M09-006-009-100-DCR1A
MA DPW	AUGUST 19	PROPOSED RIP	042-M09-006-009-100-DCR1B
MA DPW	APRIL 1954	PROPOSED SHORE	042-M09-006-009-100-DCR1C
MA DPW	APRIL 1958	PROPOSED SHORE	042-M09-006-009-100-DCR1D
MA DPW	DEC. 1967	PROPOSED SHORE	042-M09-006-009-100-DCR2E
MARSHFIELD D	NOV 1978	PROPOSED	042-M09-006-009-100-TWN1C
MARSHFIELD D	NOV 1978	PROPOSED SHORE	042-M09-006-009-100-TWN1D
MARSHFIELD D	NOV 1992	SEAWALL	042-M09-006-009-100-TWN1E
MARSHFIELD D	NOV 1978	PROPOSED STONE	042-M09-006-009-100-TWN1F
MA DPW	DEC 1967	PROPOSED SHORE	042-M09-006-009-100-TWN1A
MARSHFIELD D	JUL 2001	SEAWALL REPAIR	042-M09-006-009-100-TWN1B

Prepared By: Bourne Consulting Engineering

CZM South Shore Coastal Infrastructure Inventory and Assessment
Structure Assessment Form

Town: **Marshfield**
 Structure ID: 042-M09-006-009-200
 Key: community-map-block-parcel-structure

Property Owner: Local	Location: Ocean St.	Date: 8/16/2006
Presumed Structure Owner: Local	Based On Comment: DCR – Contract Drawings	
Owner Name: Marshfield	Earliest Structure Record: 1930	Estimated Reconstruction/Repair Cost: \$812,698.00

Length: 1040 Feet	Top Elevation: 13 Feet NAVD 88	FIRM Map Zone: VE	FIRM Map Elevation: 22 Feet NGVD
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Primary Type: Revetment	Primary Material: Stone	Primary Height: 10 to 15 Feet
Secondary Type:	Secondary Material:	Secondary Height:

Structure Summary :

This is a stone revetment. There is some movement of the armor layer and displaced armor stones.

<i>Condition</i>	C	<i>Priority</i>	IV
<i>Rating</i>	Fair	<i>Rating</i>	High Priority
<i>Level of Action</i>	Moderate	<i>Action</i>	Consider for Next Project Construction Listing
<i>Description</i>	Structure is sound but may exhibit minor deterioration, section loss, cracking, spalling, undermining, and/or scour. Structure adequate to withstand major coastal storm with little to moderate damage. Actions taken to reinforce structure to provide full protection from major coastal storm and for extending life of structure. Moderate wind or wave damage to landform exists. Landform may not be sufficient to fully protect shoreline during a major coastal storm. Actions taken to provide addition material for full protection and extended life.	<i>Description</i>	High Value Inshore Structures with Potential for Infrastructure Damage and/or Moderate Density Residential Dwellings (1-10 dwellings impacted / 100 feet of shoreline)

Structure Images:

042-M09-006-009-200-PHO2A.jpg

Structure Documents:

MA DPW	NOV 1930	PROPOSED	042-M09-006-009-100-DCR2A
MA DPW	AUGUST 19	PROPOSED RIP	042-M09-006-009-100-DCR1B
MA DPW	APRIL 1954	PROPOSED SHORE	042-M09-006-009-100-DCR2C
MA DPW	APRIL 1958	PROPOSED SHORE	042-M09-006-009-100-DCR2D
MA DPW	DEC. 1967	PROPOSED SHORE	042-M09-006-009-100-DCR2E

MAY

MUNICIPAL GOVERNMENT

9

2018

Marshfield approves beach management plan

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Following a period of three storms in quick succession that caused extensive damage to seawalls, beaches and property, the Marshfield Board of Selectmen has approved a comprehensive beach management plan for the town's six public beaches.

The plan provides a framework for maintaining the beaches as both recreational and protective resources for the town far into the future, and identifies action items for the town, as well as some already in place.

The town worked with Woods Hole Group on the management plan for the past year, having previously worked with the group on a hazard mitigation plan. Development of the plan included public outreach in the form of an online survey.

"It's required of cities and towns on the coast," said Town Administrator Michael Maresco. "If you're not doing this and you have these violent storms like this spring, the seawalls can be easily undermined."

The plan focuses on beach nourishment – the process of replacing sand after it's lost to the ocean. The sand serves as an important barrier and an anchor for seawalls and coastal

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properties against damaging waves. When sand is depleted, like it was this past March, it often needs to be replaced.

"Beach nourishment is the first line of defense against rising sea levels," Maresco said. "It's a tool to keep the water back and calm the waves. Along seawalls, the sand acts as a buffer."

Sand is dredged for replenishment.

"That material is coming from right out there in the ocean," Maresco said. "It matches up. The sand has a tendency to be darker initially, but it lightens."

The town has to work with residents and state and federal agencies as part of the permitting process to dredge. In order to use public funds for dredging, there has to be a public benefit, such as access, so the federal government requires easements.

"We recently had a public meeting about access and dredge material," Maresco said. "Residents from areas where beach nourishment would be beneficial were supportive."

A number of town departments will work together to implement the plan, including the Conservation Commission, town planner, Planning Board and Department of Public Works.

The town is facing \$10 million to \$15 million in seawall repairs, as well as other infrastructure damage and debris removal, from the destructive storms this March alone. The town is looking into state and federal grants to help mitigate the costs.

Written by [Meredith Gabriliska](#), [Digital Communications Coordinator](#)

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November 7, 2012

John Kennelly,
Chief of Planning
US Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751

Dear Mr. Kennelly,

Thank you for the opportunity to comment on the U.S. Army Corps of Engineers (USACE) New England District study regarding the flooding and storm damage problems in the Fieldston and Brant Rock sections of Marshfield ("study area"). The Massachusetts Office of Coastal Zone Management (CZM) participated in the interagency site visit on September 27th, attended by local, state and federal officials. We also reviewed the Reconnaissance Study, dated January 5, 2006, and the Initial Feasibility Study Report, dated February 2007. We have provided extensive technical assistance to the Town of Marshfield regarding the storm damage issues in this area. Based on observations and review of available information regarding the flooding, erosion and storm damage patterns, the flooding and storm damage issues in this locale are complex. CZM believes that there needs to be a multi-faceted approach to addressing the range of flooding and storm damage issues as no one single option can mitigate all of the current issues. CZM offers the following comments and recommendations to address these issues.

As discussed at the site visit, there are significant issues with flooding and storm damage along the majority of the shoreline from the Fieldston area south through Brant Rock. One indicator of the level and extent of damage being experienced in this area are the claims submitted under the National Flood Insurance Program (NFIP). In 2005, CZM published the *South Shore Coastal Hazards Characterization Atlas*, which provides maps that illustrate shoreline variables, including properties with multiple flood insurance claims between 1978 and 2002. Attached is the map for the study areas, which depicts significant concentrations of properties with multiple flood insurance claims from Fieldston to Brant Rock. The Atlas is available online at: http://www.mass.gov/czm/hazards/ss_atlas/atlas.htm. Since this is a subset of all the claims data, CZM recommends that the USACE obtain all the NFIP claims data from Department of Conservation and Recreation (DCR) Flood Hazard Management Program (FHMP), which implements the NFIP for the state. In addition to the NFIP claim data, the Atlas also contains maps of other variables, including littoral cell boundaries, shoreline type, and beach width fronting coastal banks. The *Description of Variables Report*, also available online, contains maps of tide range, wave climate, and storm susceptibility for the entire coast of Massachusetts. This data should be helpful as the USACE proceeds with this study.

There are vertical concrete seawalls along the entire length of the shoreline from Fieldston to Brant Rock. In some sections, the seawalls are fronted by riprap revetments, constructed to help prevent further undermining of the seawalls. The state Coastal Hazards Commission initiated an inventory and assessment of all publicly owned seawalls, revetments, groins, jetties and other coastal



engineering structures in 2006. The *Massachusetts Coastal Infrastructure Inventory and Assessment Project* (CIIA) reports produced as a result of this effort include condition ratings and estimated repair or reconstruction costs for publically owned coastal engineering structures on ocean facing shorelines. The reports are available online at:

http://www.mass.gov/czm/stormsmart/mitigation/infrastructure_reports.htm. As discussed at the site visit, one of the main findings of the CIIA for the majority of seawalls and other coastal engineering structures from the Fieldston area to Brant Rock is that the landforms in front of and under the structures (i.e. coastal beach and nearshore) are eroded, threatening the stability of the structures. The report also states that the landform is not adequate to provide protection during a major storm event. Past efforts by the Town and State have included repairing the walls, increasing the height of them in some cases, and placing riprap seaward of the walls to provide structural support. The result of the seaward encroachment of the riprap is that the tides and waves interact with the structures more frequently, causing more erosion of the beach and nearshore. As the erosion of the beach has increased, the riprap has been undermined and larger revetments are constructed to protect the structural integrity of the seawalls. The more the waves and tides interact with the walls and the riprap, the more water and waves come over the wall, leading to increased flooding and storm damage landward of the walls.

Although there has been some reduction in the storm damage directly behind the walls as a result of increased height, a recurved cap, or when a new revetment was placed seaward of them, this cycle of building bigger structures each time they get undermined has resulted in significant impacts to the beach and nearshore making the storm damage and flooding situation worse in the long term. In addition, the environmental impacts to the beach and nearshore have been significant; the elevation and volume of the fronting landforms has been significantly diminished, completely changing the habitat and function of these areas. The conclusion in the Initial Feasibility Study that the option of raising the existing seawall poses limited environmental impacts does not appear to take into account the significant impacts that have been occurring as a result of similar projects.

CZM recommends that the USACE and the Town revise the study area and explore a larger nourishment project to address the flooding, storm damage and erosion problems along the Fieldston to Brant Rock area. Based on our observations of flooding and storm damage as well as review of available information, CZM believes that the study area should extend from Fieldston all the way to Brant Rock, rather than just two relatively short sections of the shoreline. CZM strongly urges the USACE to consider the need to address the erosion of the beach and nearshore as part of the shore protection system in this area. Nourishment would be much more effective in reducing the overtopping of the seawalls than increasing the height of the walls and/or increasing the footprint of the revetments fronting the walls. This option could involve regular beach nourishment to maintain a range of beach widths to reduce overtopping of the wall and erosion of the beach and nearshore. Since there are several groins along the shoreline, sections of this area function as pocket beaches, which would reduce end losses from a nourishment project and provide increased stability of the fill placed in this area. CZM believes nourishment with relatively coarse grained sediments (i.e. a mix of sand, gravel and cobble sized sediments), with similar to slightly coarser grain size distribution to the existing beach, could be an effective method reducing the overtopping of the seawalls and restoring the beach and nearshore system. This is particularly effective if the project scope is expanded to address the flooding and storm damage issues along the entire stretch of shoreline.

Another data source to consider as part of the study is the Massachusetts Shoreline Change Project, which has five to nine high water shorelines from the mid-1800's to 2009, with change rates calculated at 40-meter intervals along the ocean-facing shoreline. The current data available on CZM's website includes shorelines up to 1994. CZM is updating this data to include three new shorelines (2000, 2001 and 2008). As example, the Historic Shoreline Change Project and the South Shore Coastal Hazards Characterization Atlas Historic Shoreline Change Rate data layer both indicate, for the most recent reporting periods, the shoreline in the Fieldston vicinity is eroding at a rate of approximately 1.5 to 2 feet per year. The most recent shoreline available, from 2008, indicates that for the majority of the project site the high tide line is at the base of the seawall. Therefore, as shoreline erosion continues the high tide line will not be able to migrate landward but will instead continue to lower the elevation of the beach fronting the seawall, potentially at an increased rate, exposing and eventually undermining the lower portions of the seawall and the proposed revetment. Please contact us to get the updated data layers for use in your study.

There are multiple options that should be considered for reducing the flooding and damage caused by the water that comes over the seawalls. Buildings, patios and decks can be elevated on open pilings to allow the water to flow unimpeded across a wider area, slowing down the water and reducing damage and flooding to landward areas. In addition, driveways and parking areas can be minimized to reduce impervious surfaces. Erosion control vegetation, such as beach grass, coastal panic grass, beach pea, and seaside goldenrod which have extensive root systems, can be planted to help hold soils in place. Additional information regarding coastal landscaping for erosion control and storm damage protection is available on CZM's website: http://www.mass.gov/czm/coastal_landscaping/index.htm. CZM also recommends that the Town consider applying for FEMA Hazard Mitigation Grants through the Massachusetts Emergency Management Agency and the DCR FHMP to help defray the cost to elevate at-risk buildings and structures. CZM encourages the Town to work with the residents in this area to identify the problems, their causes, and provide information regarding some options for each property owner to address these flooding and storm damage issues.

Both the 2007 Initial Feasibility Study and the 2006 Section 103 Reconnaissance Study Coastal Engineering Analysis reference a drainage ditch and undersized and deteriorated road culverts as contributors to flooding of the low lying area in the Fieldston section. It should be noted that since these reports were developed the Town of Marshfield, with financial assistance from FEMA/MEMA, has widened and deepened this drainage ditch and replaced and enlarged the associated culverts. In addition, Bass Creek is scheduled to be dredged as part of the mitigation requirements for the Marshfield Airport redevelopment project. These projects have the potential to significantly reduce the degree and duration of flooding in the Fieldston area by more efficiently evacuating floodwater from the this low lying are and should be considered as part of this study.

CZM is available to provide technical assistance to the USACE, the Town and the other agencies as this study moves forward. CZM encourages the USACE to provide regular updates and opportunities for input to make the study process as efficient as possible.

If you have any questions regarding CZM's comments, please contact CZM's South Shore Regional Coordinator, Jason Burtner, at 781 545-8026 x209.

Sincerely,



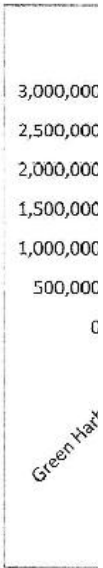
Bradford V. Washburn,
Assistant Director

Cc: Rod Procaccino, Charlie Swanson, & Paul Tomkavage, Marshfield DPW
Paul Halkiotis, Marshfield Town Planner
Jay Wennemer, Marshfield Conservation Agent
Cindy Castro, Marshfield Beach Commission
James Sprague & Lealdon Langley, DEP Boston
Elizabeth Kouloheras & Jim Mahala, DEP SERO
Richard Zingarelli, DCR, MA NFIP Coordinator
John Logan, DMF
Sue Tuxbury, NMFS
Ed Reiner, EPA
Jason Burtner, CZM
Rebecca Haney, CZM

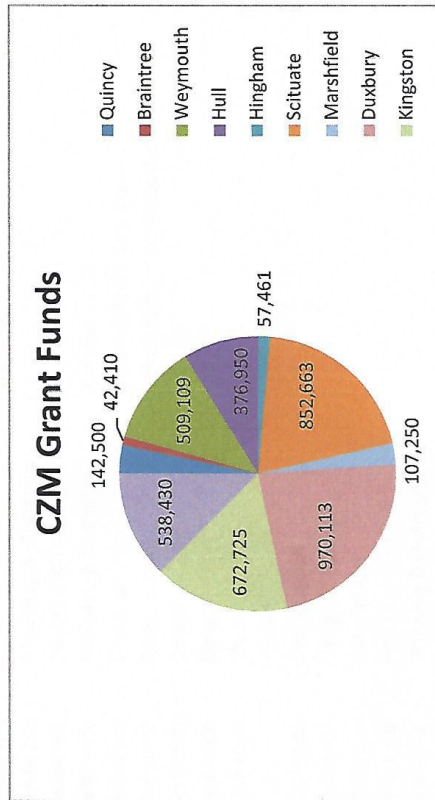
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TOWN	# Grants	Amount
Quincy	2	142,500
Braintree	1	42,410
Weymouth	4	509,109
Hull	4	376,950
Hingham	2	57,461
Scituate	5	852,663
Marshfield	2	107,250
Duxbury	5	970,113
Kingston	3	672,725
Plymouth	4	538,430
TOTAL	32	\$ 4,269,611



TOWN	YEAR	AMOUNT	GRANT PROGRAM	TYPE	Descript
Quincy	2016	\$ 75,000	Coastal Resilience	Modeling & Outreach	
Quincy	2017	\$ 67,500	Coastal Resilience	Planning & Outreach	
Braintree	2019	\$ 42,410	Coastal Resilience	Planning & Outreach	Erosion
Weymouth	2014	\$ 22,605	Coastal Resilience	Construction	Seawall Reconstruction
Weymouth	2018	\$ 360,000	Coastal Resilience	Construction	Infrastructure Construction
Weymouth	2015	\$ 75,000	Coastal Resilience	Design	
Weymouth	2017	\$ 51,504	Coastal Resilience	Design	
Hingham	2014	\$ 44,461	Coastal Resilience	Study	
Hingham	2014	\$ 13,000	Pollutant	Permit	
Hull	2019	\$ 148,350	Coastal Resilience	Construction	
Hull	2019	\$ 142,011	Coastal Resilience	Design & Permit	
Hull	2015	\$ 45,339	Coastal Resilience	Assessment	
Hull	2014	\$ 41,250	Coastal Resilience	Permit	
Scituate	2016	\$ 180,000	Coastal Resilience	Planning & Outreach	
Scituate	2015	\$ 241,163	Coastal Resilience	Design & Permit	
Scituate	2014	\$ 118,000	Coastal Resilience	Design & Permit	
Scituate	2017	\$ 103,500	Coastal Resilience	Planning & Outreach	
Scituate	2018	\$ 210,000	Coastal Resilience	Design & Permit	
Marshfield	2017	\$ 71,250	Coastal Resilience	Planning & Outreach	Tide Gate at Dyke Road
Marshfield	2018	\$ 36,000	Coastal Resilience	Planning & Outreach	Sand Dredge Assessment @ G.H.
Duxbury	2018	\$ 51,916	Coastal Resilience	Design & Permit	Dune Restoration
Duxbury	2015	\$ 206,250	Coastal Resilience	Assessment	
Duxbury	2019	\$ 500,000	Coastal Resilience	Construction	Dune Restoration
Duxbury	2014	\$ 86,947	Coastal Resilience	Construction	Berm Restoration
Duxbury	2015	\$ 125,000	Pollutant	Construction	Infrastructure Construction
Kingston	2018	\$ 497,725	Coastal Resilience	Construction	Replace Deter. Stone Revetment
Kingston	2019	\$ 50,000	Coastal Resilience	Monitor	Monitor New Dune, former Revetm
Kingston	2016	\$ 125,000	Pollutant	Construction	Storm Filtration
Plymouth	2015	\$ 279,080	Coastal Resilience	Construction	Cobble Nourishment
Plymouth	2014	\$ 75,000	Coastal Resilience	Planning & Outreach	
Plymouth	2016	\$ 73,350	Coastal Resilience	Design & Permit	Cobble Nourishment
Plymouth	2017	\$ 111,000	Coastal Resilience	Planning & Outreach	Evaluate Harbor
		\$ 4,269,611	TOTAL CZM GRANTS	2014-2019 South Shore	