

# Peer Review Report

## Winthrop Beach Shore Protection Project



**DCR Public Meeting**  
**Tuesday, May 31, 2016 – 6:30 – 8:00PM**  
**Robert A. DeLeo Winthrop Senior Center**  
**Council on Aging**  
**35 Harvard Street, Winthrop, MA**



# Commonwealth of Massachusetts

Governor

**Charles D. Baker**

Lieutenant Governor

**Karyn E. Polito**

Energy and Environmental Secretary

**Matthew A. Beaton**

Department of Conservation and Recreation Commissioner

**Leo P. Roy**



## **DCR Mission Statement**

*To protect, promote and enhance our  
common wealth of natural, cultural  
and recreational resources  
for the well-being of all.*

# **Tonight's Meeting - Purpose**

## **Engineering Peer Review**

- To determine if the project was designed and built in accordance with sound coastal engineering practices
- To determine if suitable material was placed on the beach
- Public Comment

# Peer Review Report

## Winthrop Beach Nourishment Project



Bob Daylor, PE, PLS & Edward Ionata – Senior Vice Presidents  
Mike Barnett, PE & Dick Czapinski, PE – Principal Investigators

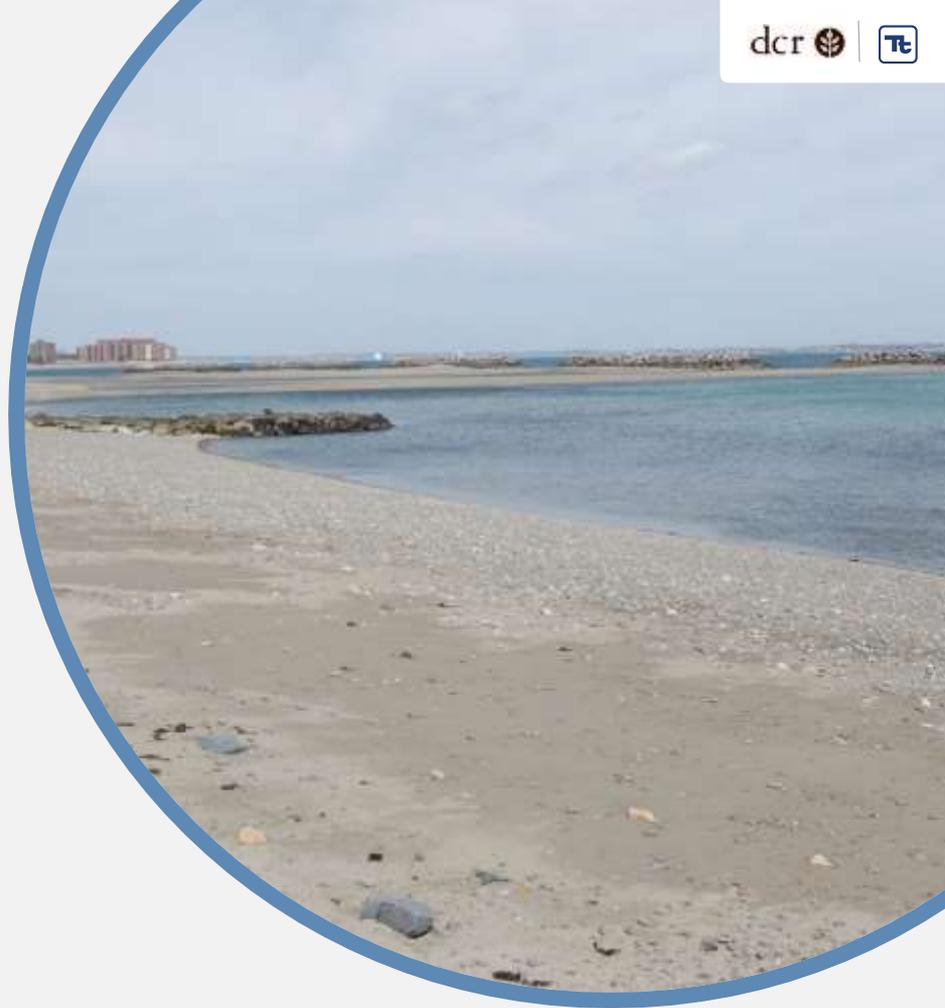
## Purpose of Our Engagement

To provide the DCR with an independent review of their studies, environmental analysis, design and construction of the 2012 and 2013 Shore Protection Projects.



## Primary Purpose of The Project

To provide improved storm protection for Winthrop Shore Drive and the homes in the area of the beach.



# Conditions of the Beach Prior to Project



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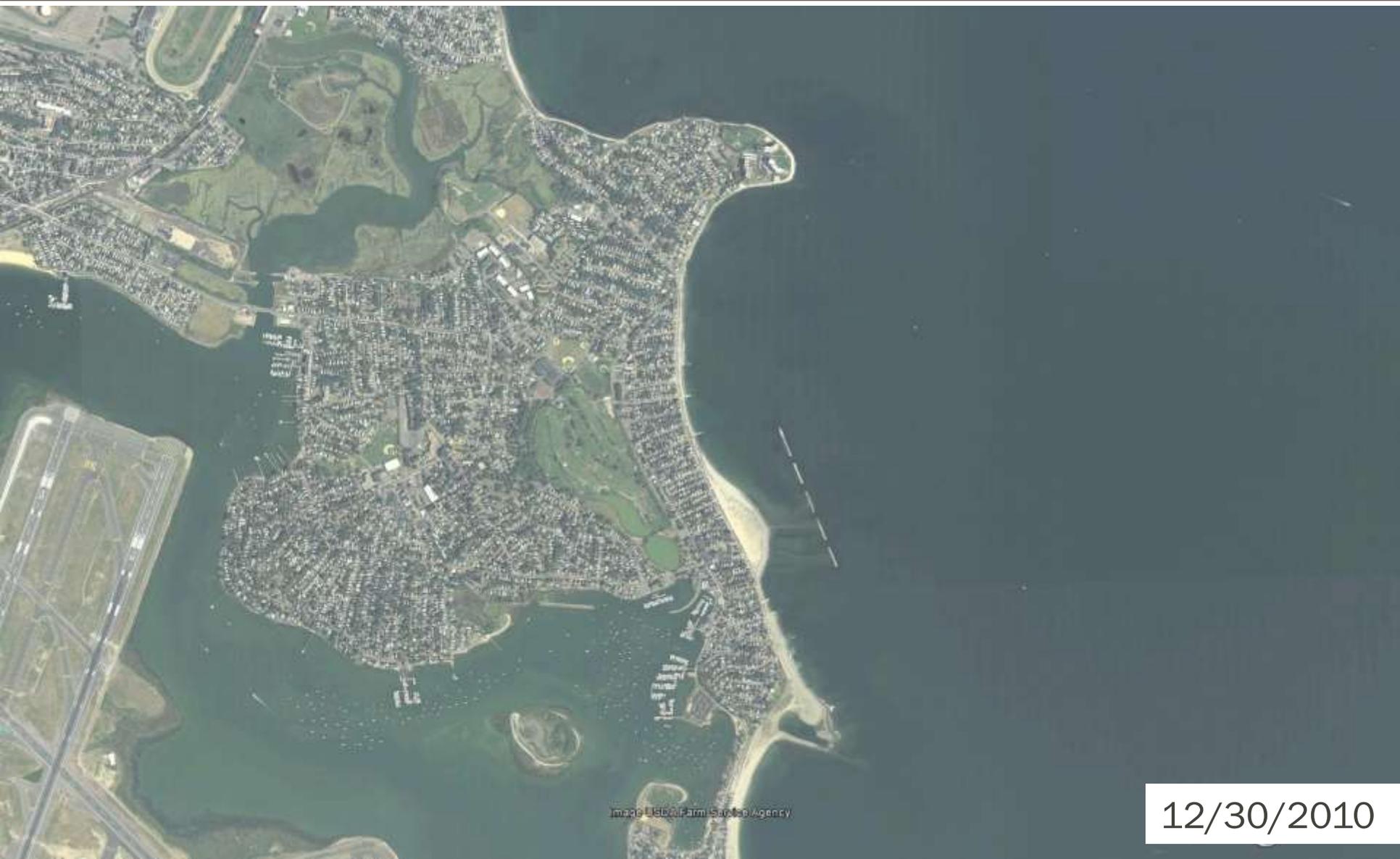


Image: USFA, Farm Services Agency

12/30/2010

# Conditions of the Beach After the Southern Project - 2012



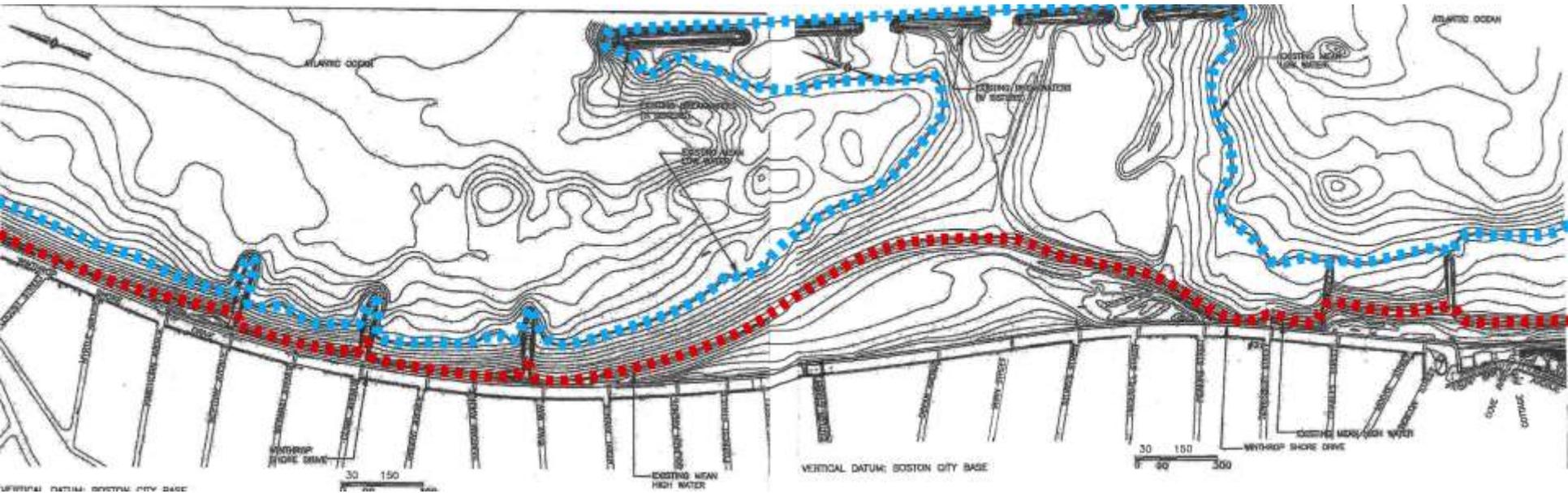
8/24/2013

# Conditions of the Beach After Both Projects - 2014



6/6/2015

# Survey Comparisons Pre Project Condition



- ■ ■ ■ MLW
- ■ ■ ■ MHW

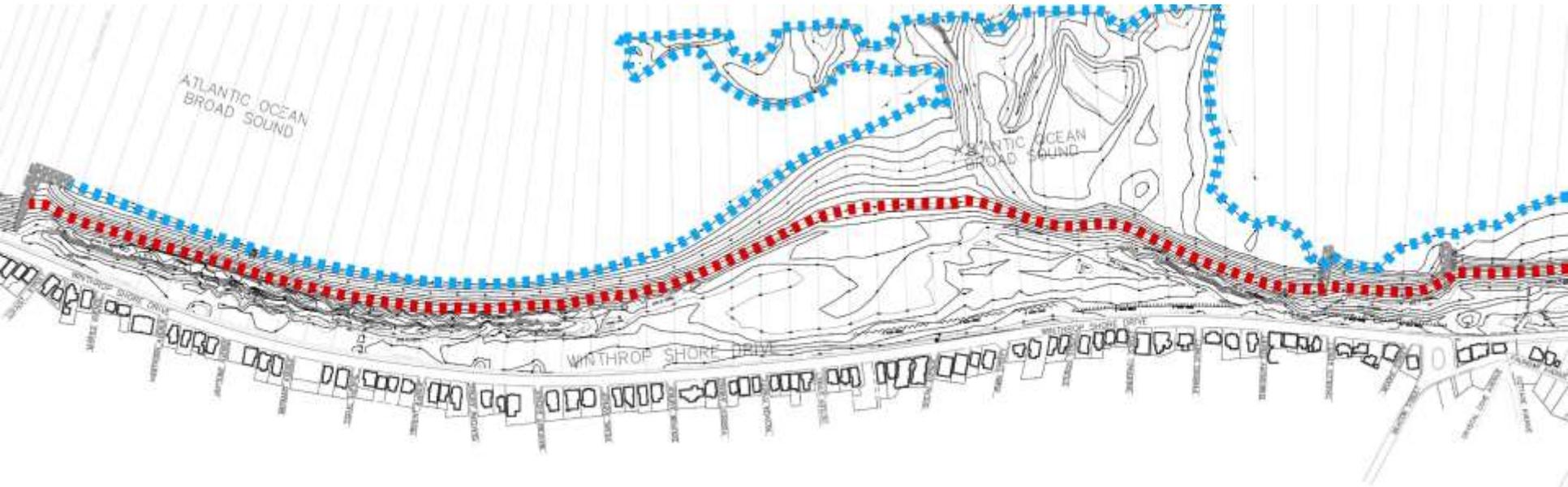
# Survey Comparisons Design Plan



-  MLW
-  MHW
-  Area of Dredging

# Survey Comparisons

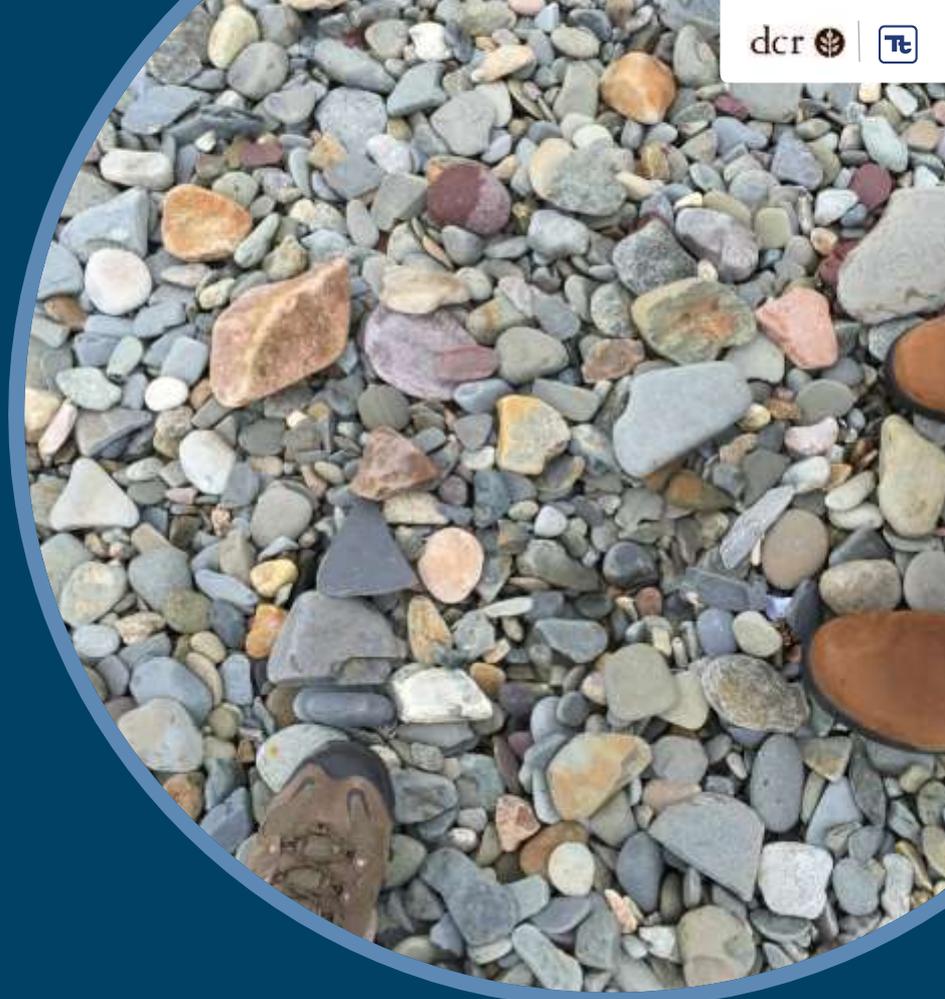
## Post Construction Condition



- ■ ■ ■ MLW
- ■ ■ ■ MHW

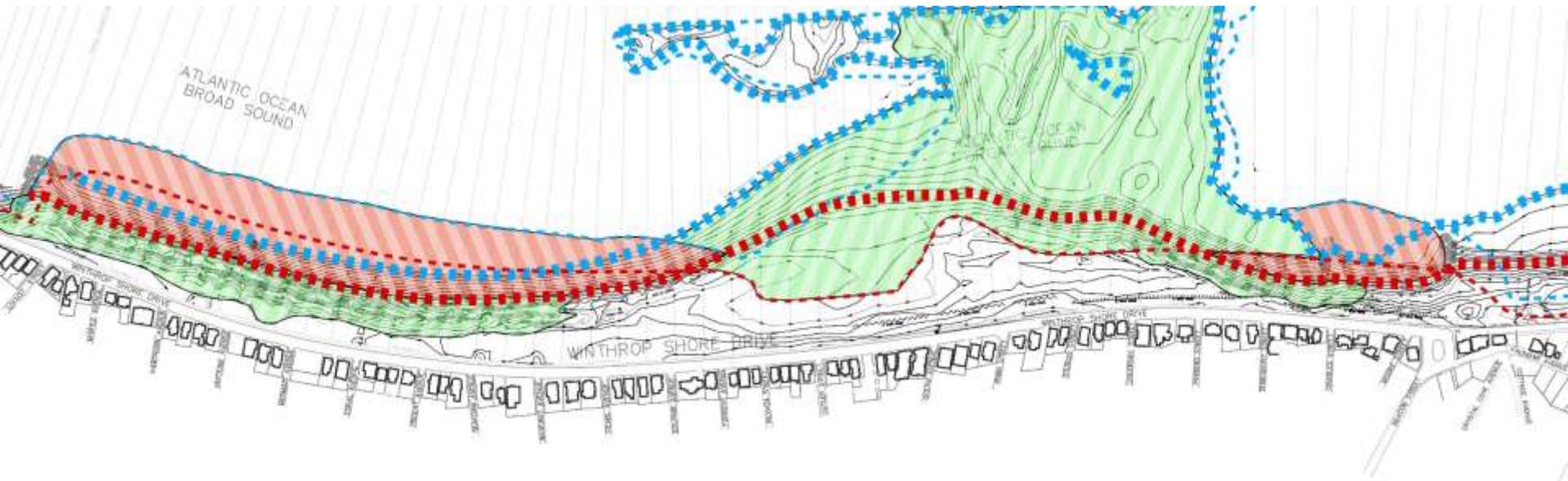
## What Happened to the Sand?

The constructed fill has been resorted and redistributed by the wave energy over the 2015 and 2016 winters. In large measure, the sand has built the large sandy salient and low-tide tombolo beach behind the Five Sisters breakwater and in the exposed beach areas the shingle cobble material has built tall shingle berms at approximately the seawall height.



# Survey Comparisons

## Erosion and Deposition



■ ■ ■ ■ Post Construction MLW

- - - - Design Plan MLW

■ ■ ■ ■ Area of Deposition

■ ■ ■ ■ Post Construction MHW

- - - - Design Plan MHW

■ ■ ■ ■ Area of Erosion

# Peer Review Conclusions

- The studies and design meet coastal engineering good practice standards
- The project met the shore protection and flood damage reduction recommendations of the Corps of Engineers 1994 Reconnaissance Report
- The soils used for beach shore protection were appropriate for Winthrop Beach
- The project provides significant improvements to shore protection



# Peer Review Conclusions

- Winthrop Beach has too great an exposure to wind-driven waves to maintain a sandy beach over its entire length
- The change in the beach profile and condition from the end of the project is natural
- The beach shore protection is not lost
  - The shingle/cobble has formed into steep berms
  - The sand has created the broad salient and low tide tombolo beach behind the Five Sisters

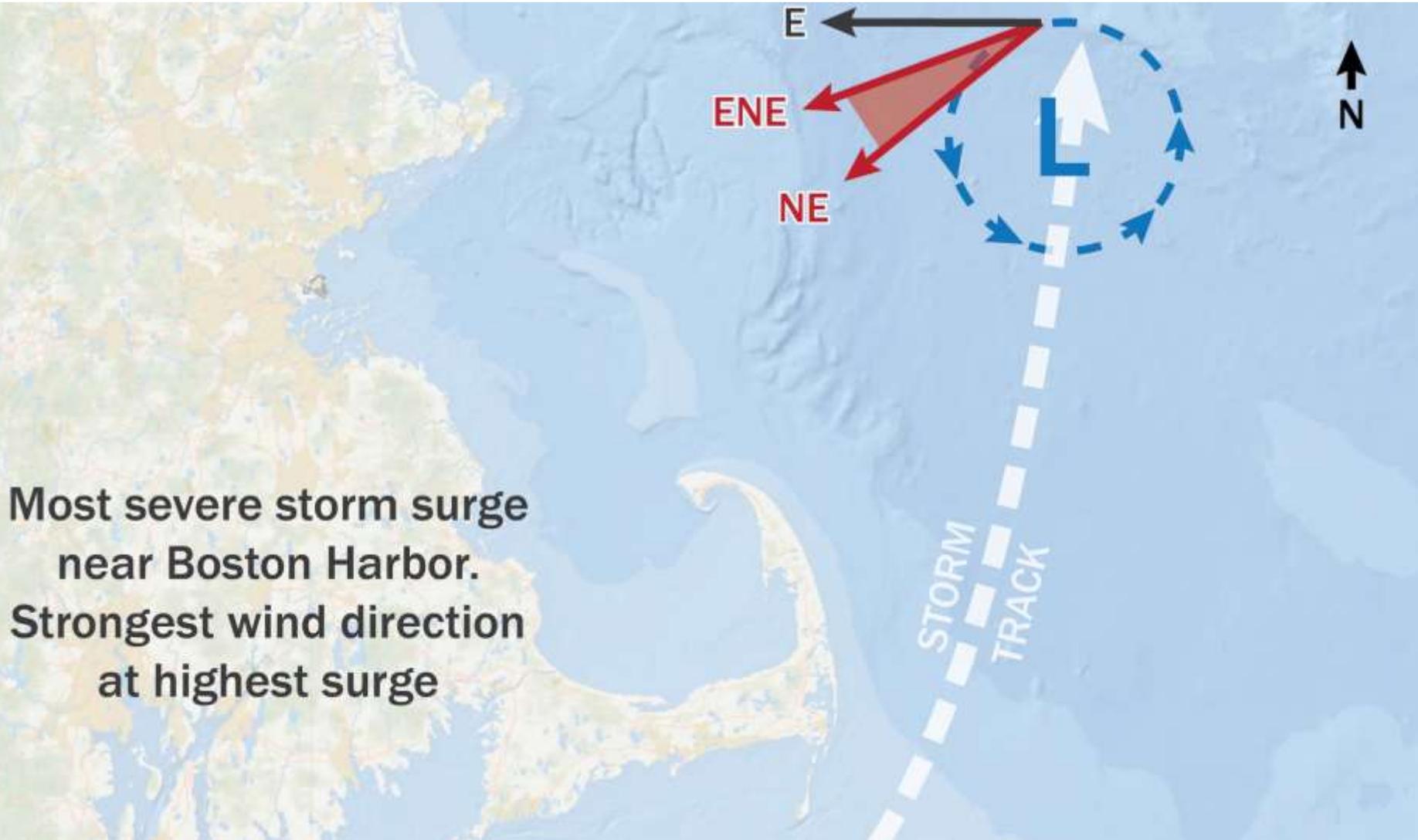


## Why Didn't Sand Fill Remain in Place like Revere Beach?

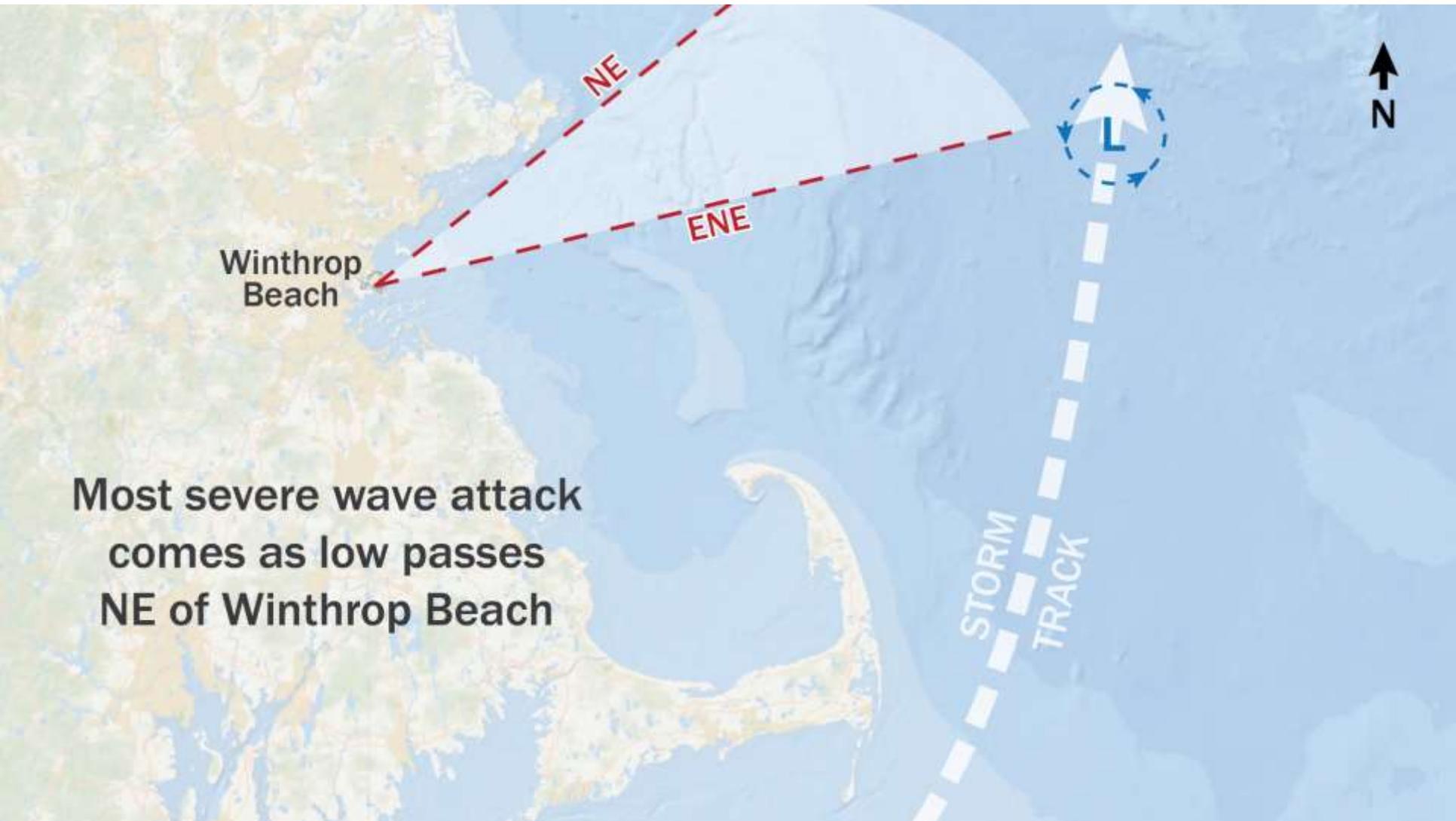
Revere has a completely different nearshore bottom configuration. Revere Beach does not see the wave climate that Winthrop Beach does.



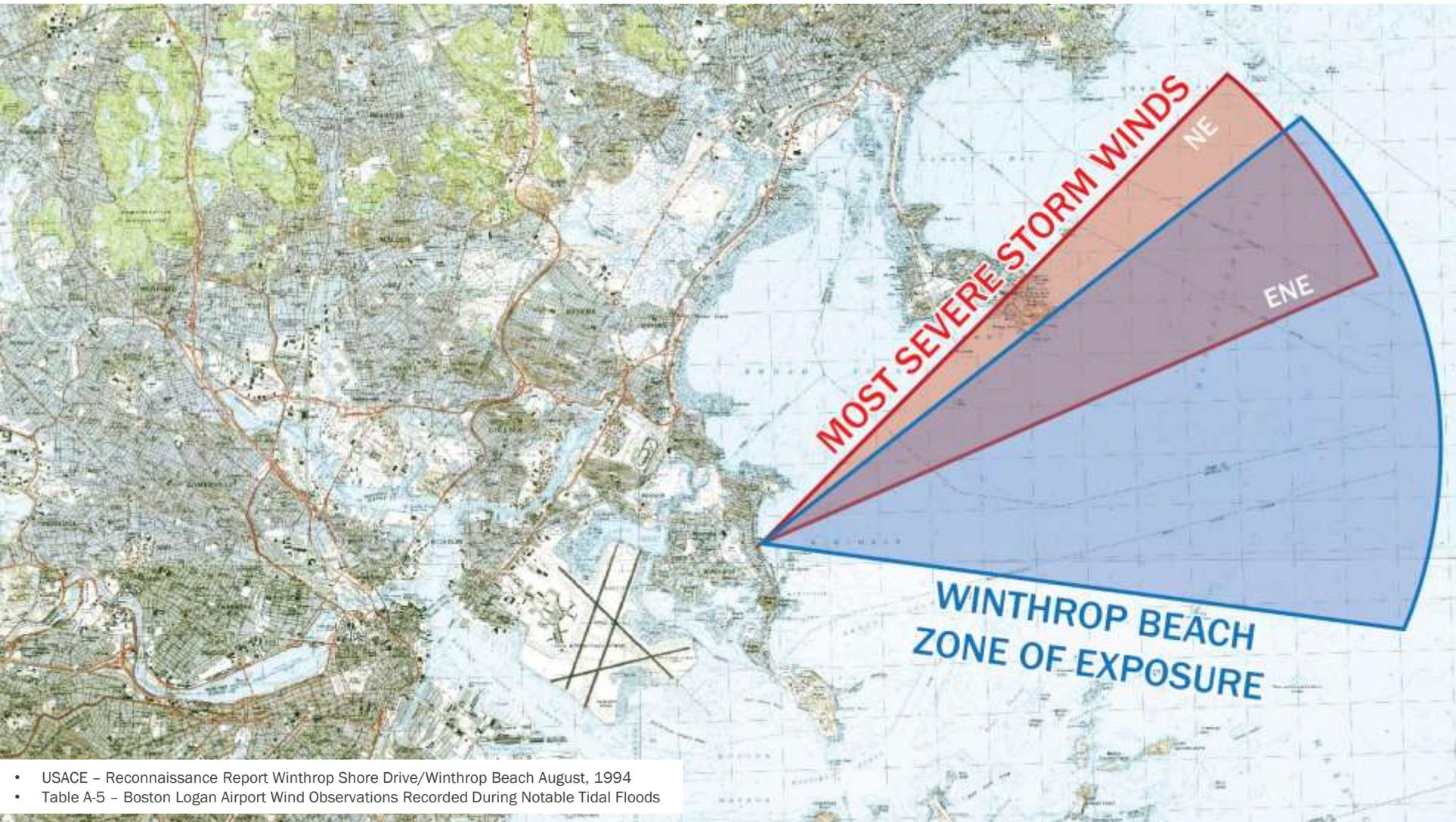
# Cyclonic Storm Tracks – Wind Exposure Directions



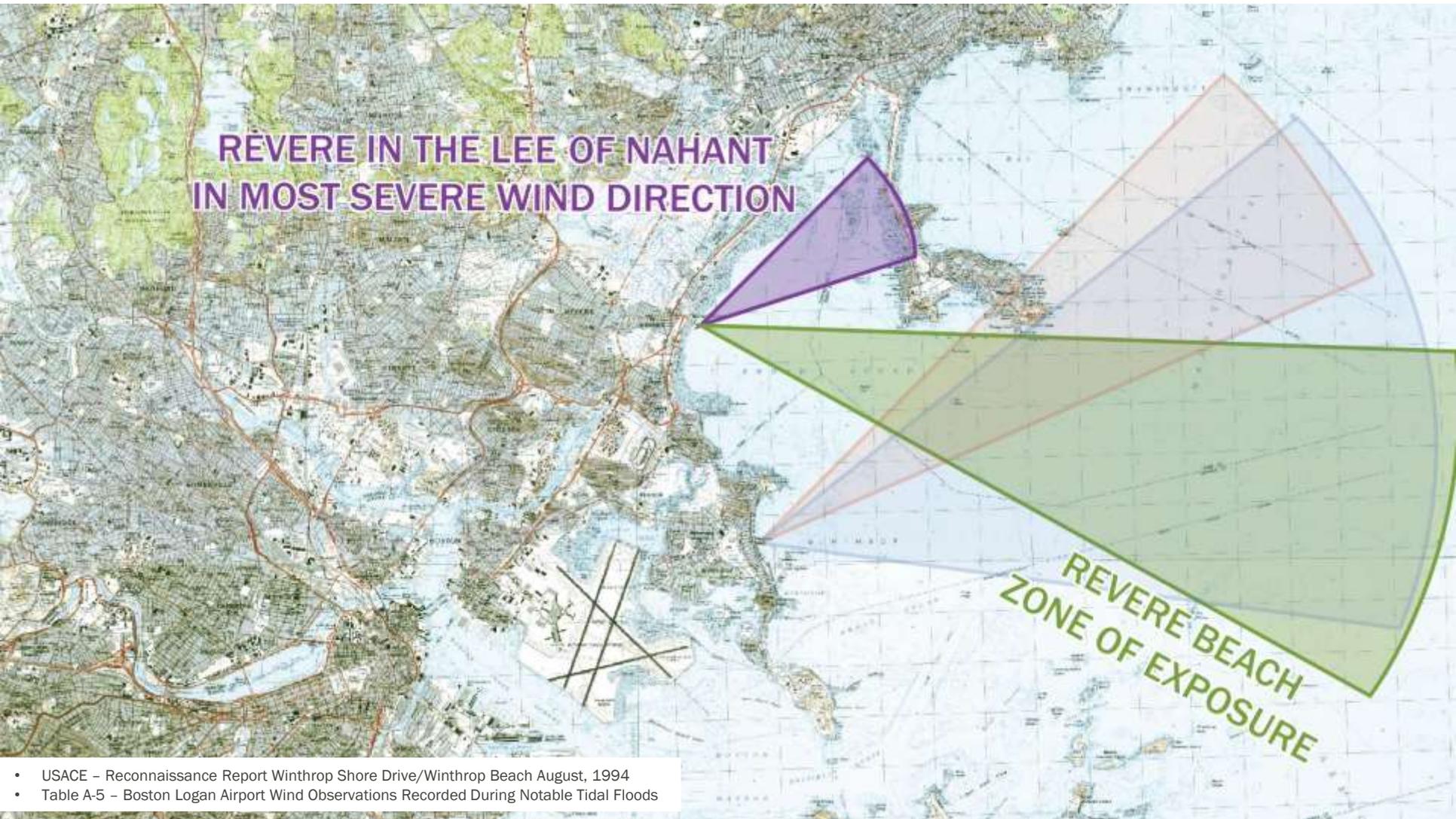
# Cyclonic Storm Tracks – Winthrop Beach Exposure



# Winthrop Beach Storm Wave Exposure



# Comparison of Storm Wave Exposure Winthrop Beach and Revere Beach



# Comparison of Winthrop Beach and Revere Beach Storm Wave Exposure

- The largest tidal flooding historically has occurred with predominately NE to ENE winds.
- The highest storm surge accompanies peak wind periods out of the NE and ENE directions.
- Winthrop Beach has unlimited ocean fetch in those wind directions and is unprotected from large ocean waves (except for Five Sisters Breakwaters).
- Revere Beach is protected by Nahant in those most damaging wind directions and is not exposed to wind-driven ocean waves.
- The foreshore and nearshore areas at Winthrop Beach are much steeper and deeper and allow a higher energy wave to break on the beach.
- Revere beach has a much flatter, shallower nearshore profile (see large mapped tidal flat) which causes waves to break over these flats and not directly onto the beach face.
- These differences in exposure and the configuration of the shores produce the difference in the beaches.

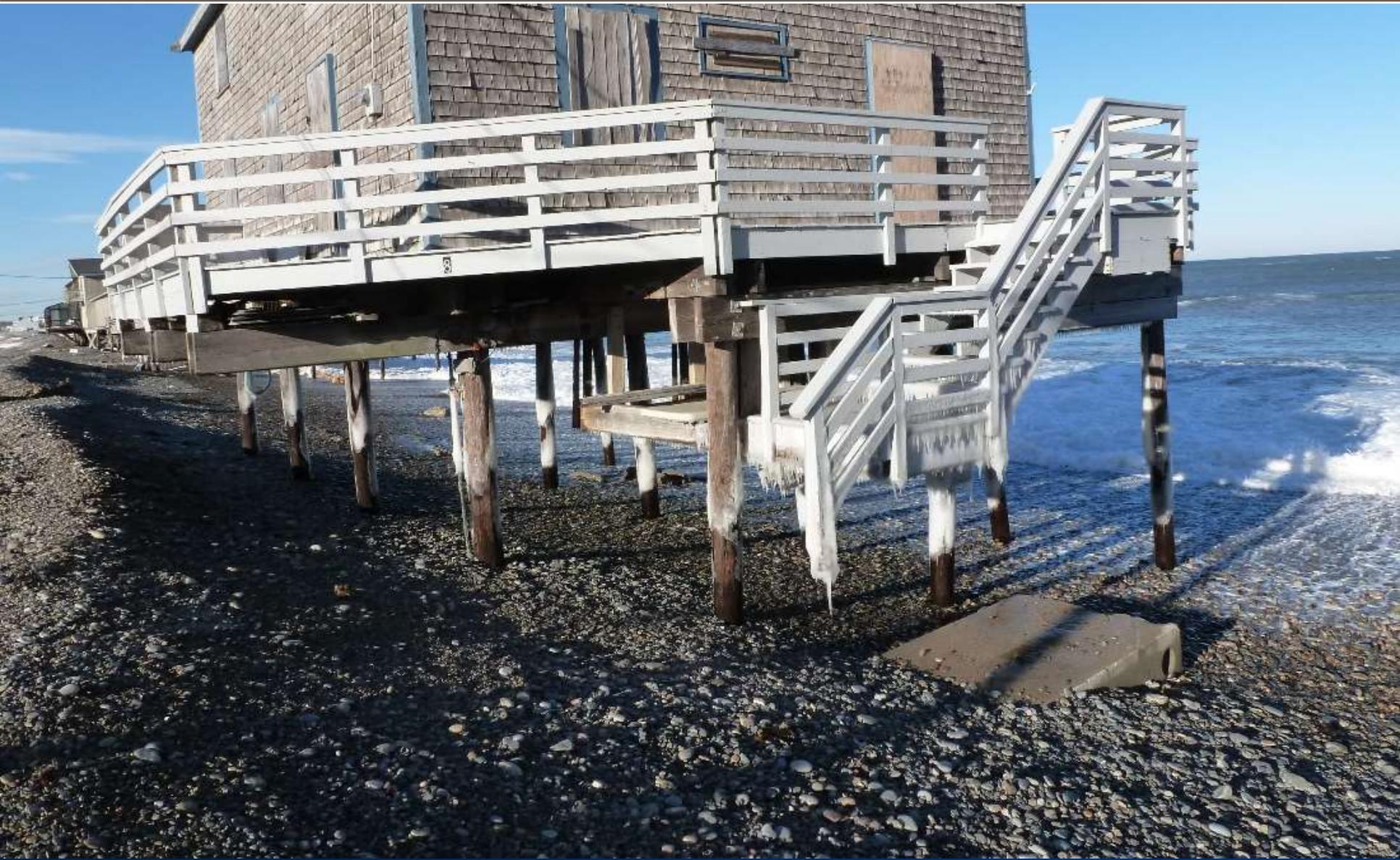


**No severe storms in the 2015-16 Winter,  
but the ocean still has a lot of energy.**

Minot Light House – January 2016

# Cobble Berm Beaches

## Mann Hill Beach, Scituate



# Cobble Berm Beaches

Humarock, Scituate



# Cobble Berm Beaches

Egypt Beach, Scituate



# Cobble Berm Beaches

Brant Rock, Marshfield



# Cobble Berm Beaches

## Cressy Beach, Gloucester



## Next Steps

Improving access



# Current Attempt at Improving Access



- Grade Shingle Berm into Smooth Gradient in the Intertidal Zone

# Cobble Berm Before Regrading



May 2016

# Cobble Berm After Regrading



May 2016

## Additional Information

### **For more information:**

<http://www.mass.gov/eea/agencies/dcr/public-outreach/public-meetings/>

### **If you have comments or suggestions on this project:**

*Submit online:*

<http://www.mass.gov/eea/agencies/dcr/public-outreach/submit-public-comments/>

*Write:* Department of Conservation and Recreation  
Office of Public Outreach  
251 Causeway Street, Suite 600  
Boston, MA 02114

*Note: Public comments submitted to DCR may be posted on the DCR website in their entirety.*

**If you have questions or concerns or wish to subscribe to a DCR general information or project-related listserv:** contact

DCR's Office of Community Relations at 617-626-4973 or

[Mass.Parks@state.ma.us](mailto:Mass.Parks@state.ma.us).