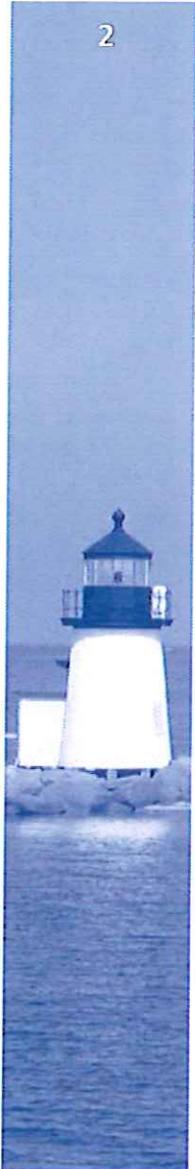


Jetty Repair  
Federal Navigation Project  
Nantucket, MA

*Board of Selectmen Meeting*  
November 5, 2014

# Presentation Outline

- Nantucket Federal Navigation Project Background
- Jetty Repair Data Collection Methods / Results
- Overview of Nantucket Jetty Repair Project Design
- Efforts to Reduce Impacts to Environmental Resources
  - Monitoring
  - Construction Techniques
  - Acquisition Techniques
- Project Schedule and Milestones



# Nantucket Harbor

## Federal Navigation Project (FNP) Background



- Federal Project Consists of:
  - 15-ft Main Channel
  - 15-ft Turning Basin
  - East and West Jetties
- Focus of this Presentation
  - East and West Jetty Repairs
- Last Maintenance Event
  - East Jetty: 1963 (15,059 tons)
  - West Jetty: 1900 (4,750 tons)
- Basis for Repairs
  - Significant damage by Hurricane Sandy
  - Vessel strikes to jetties represent a human and health of the environment hazard

# Nantucket Jetty Repair

## Data Collection Methods to Support Design

### 1. LiDAR

- Used as a means of assessing coastal shoreline impacts of Hurricane Sandy for entire island of Nantucket and not just jetties
- Large Swaths of area at very high accuracy (+/- few centimeters)
- Collected over both dry land and water covered areas to ~20 meters of depth (depending on water clarity).

### 2. Bathymetric Multibeam Sonar / Optical Laser Survey

- Focused on Federal Navigation Project, primarily on the east and west jetty.
- Merged data sets from high accuracy bathymetric sonar and optical laser survey.
- Extremely accurate (<1 cm) 3-dimensional point cloud data product.

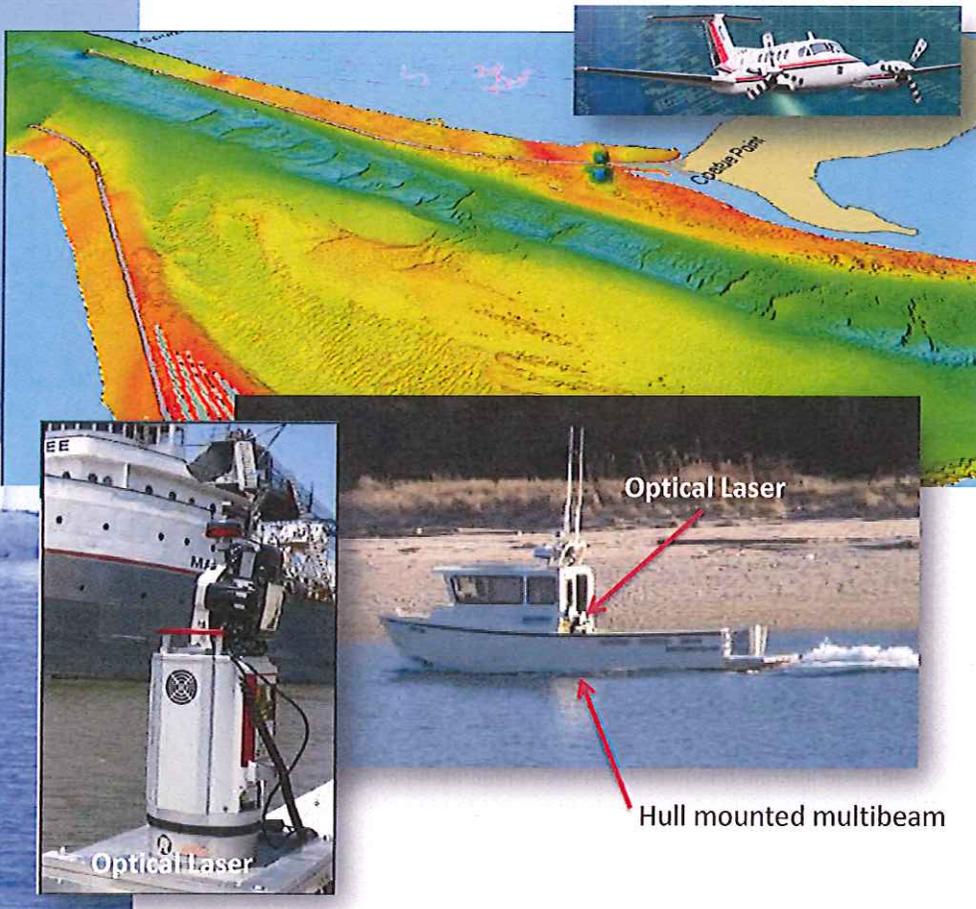
### 3. Submerged Aquatic Vegetation Survey

- Performed by USACE New England District (NAE) Environmental Resources staff with standard hydro acoustic survey system.
- Data processed with USACE ERDC SAVEWS to determine canopy height and % coverage for area within construction footprint.



# Nantucket Jetty Repair

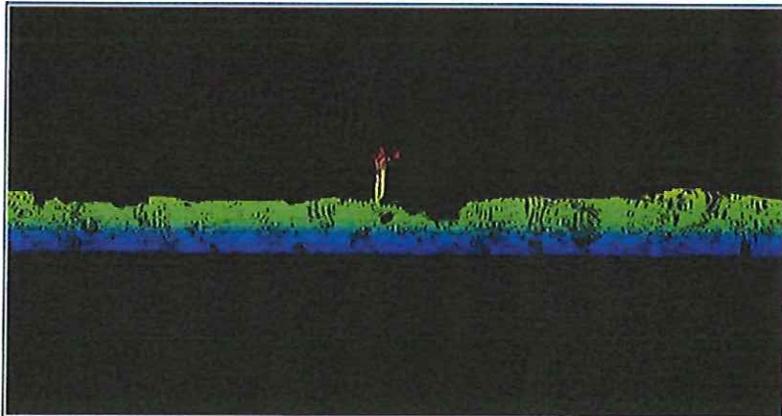
## Data Collection Results



- LiDAR performed by USACE Joint Airborne LiDAR Bathymetry Technical Center of Expertise (JALBTCX) in May 2013
- Bathymetric/Optical Laser survey performed by Substructure Inc. under contract to the New England District.
- Substructure simultaneously collected multibeam sonar and optical laser survey over a two week period in July 2013.
- Data post processed to merge data sets for one seamless topographic layer.
- Combination provided complete high resolution coverage of federal navigation project.

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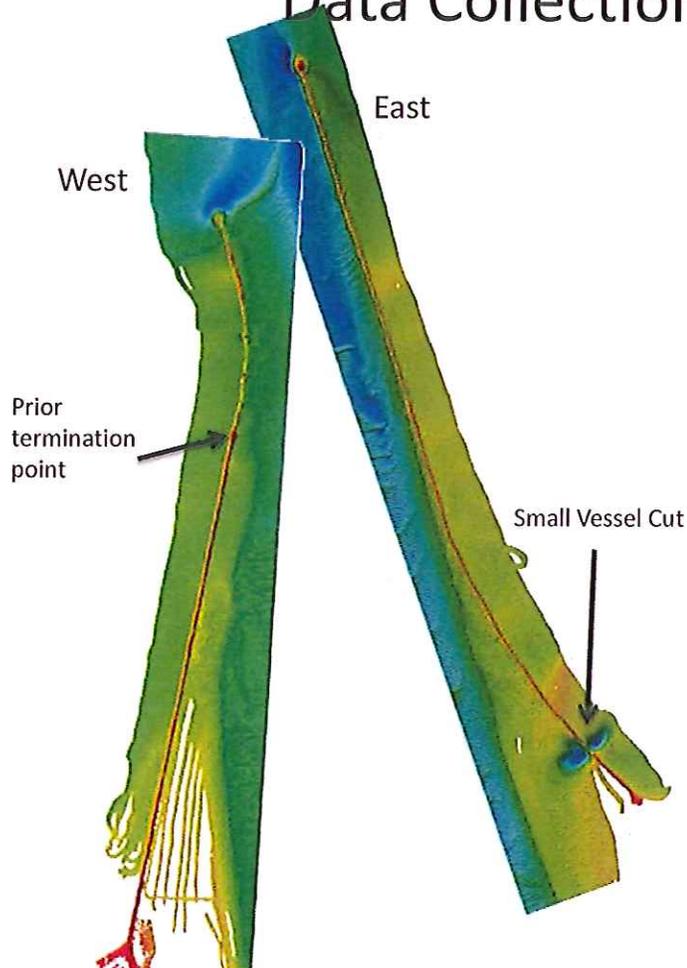
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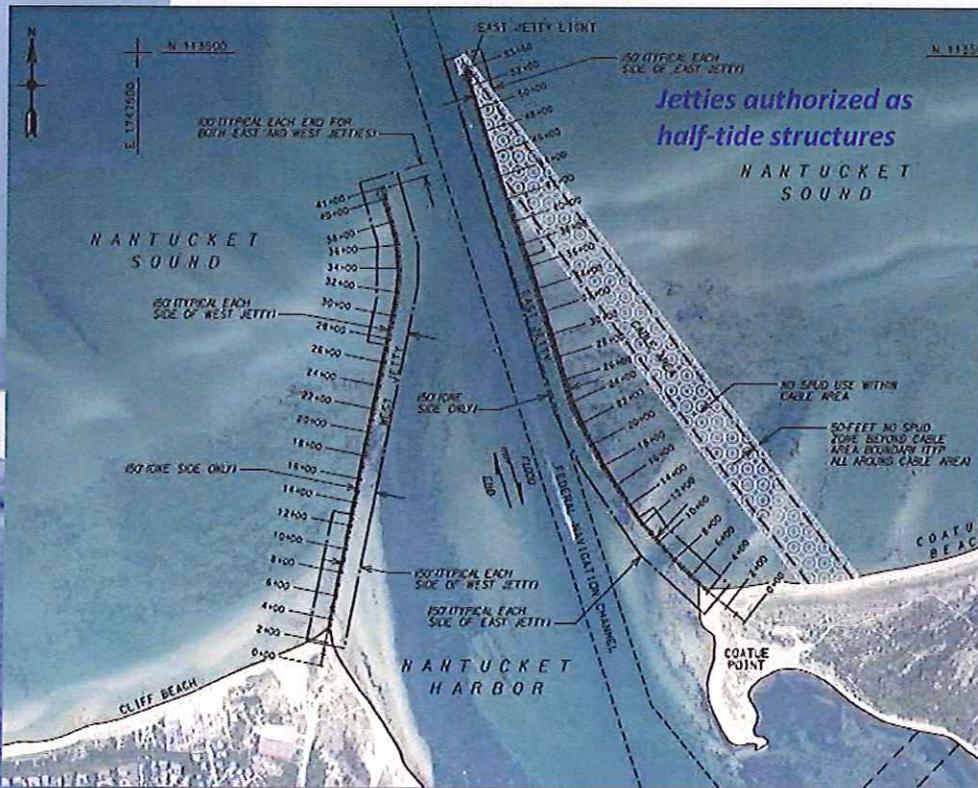
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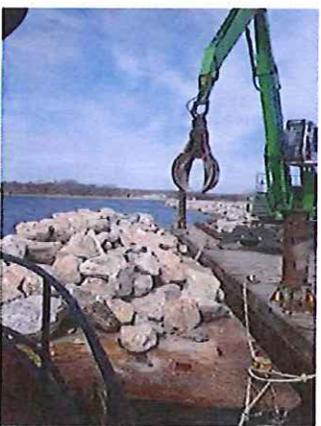


# Overview of Nantucket Jetty Repair Project Design



- Repairs will require approximately 32,300 tons of 2-4 ton stone to bring structures back to authorized dimensions.
- Crown widths / heights make working from crest of structure impossible. Work will be done from marine plant only with stone and equipment coming by barge.
- Jetties will be pulled apart to below water line where damage is less extensive and rebuilt to meet construction tolerances.
- Jetty Repair incorporates Sea Level Rise over the next 50 yrs.
- Authorized Design Heights
  - East Jetty : + 3.2 MLLW
  - West Jetty: + 5.2 MLLW
- Construction to begin in April 2015.

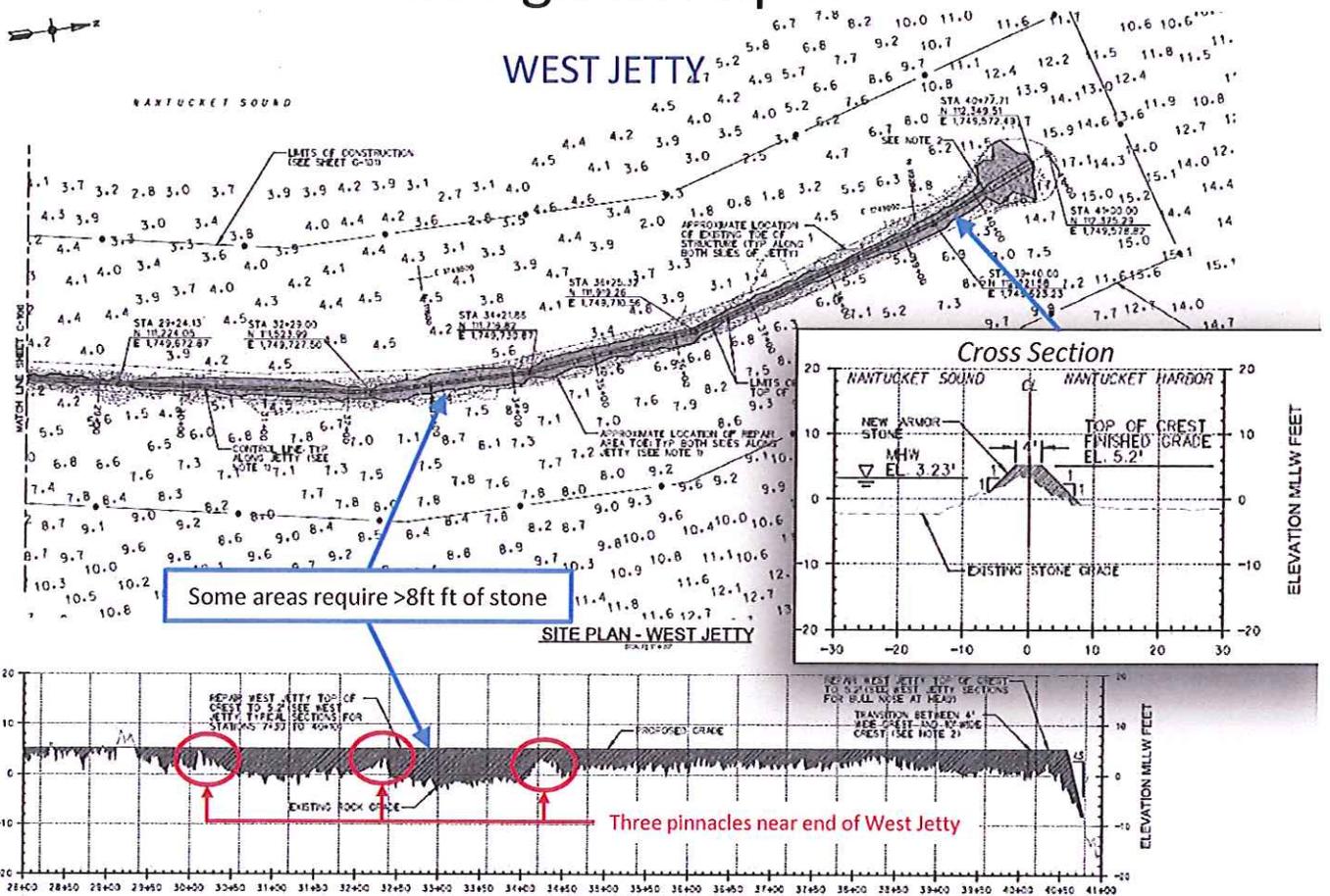
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Photos Courtesy of Mohawk Northeast, Inc.

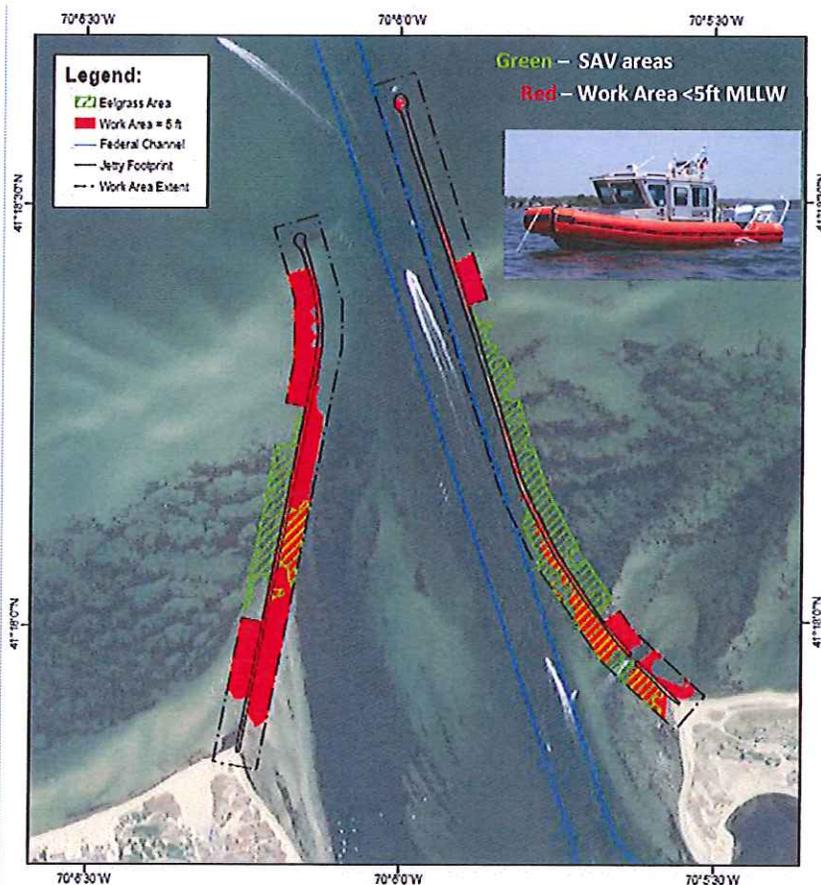
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# Nantucket Jetty Repair Design Example



# Nantucket Jetty Repair

## Efforts to Reduce Impacts to Environmental Resources



- Increased height of structure for visual identification by vessels to prevent strike (within authorized dimension requirements).
- Construction tolerances relaxed to +12 in. / - 6 in. to allow work from one side in areas of SAVs.
- Construction techniques reduces potential impact to SAVs from 18.5 acres to 6.9 acres.
- Due to limited depth in conjunction with barge drafts construction equipment may come into contact with ocean bottom. (Red areas)
- Construction techniques to reduce impacts to resources may increase total cost by up to 20 %.

# Nantucket Jetty Repair

## Efforts to Reduce Impacts to Environmental Resources

### Monitoring

- Pre & Post Construction SAV surveys for any damage assessment.
- Use of test plots in vicinity of project to determine construction impact vs. natural increase/reduction of SAVs.
- Created Damage Assessment and Mitigation Plan as a part of the Environmental Assessment.

### Construction Techniques

- Limited construction footprint to minimum area to effectively complete repairs - 150 ft radius from each side of structure; Limited construction areas to one side of the structure when eelgrass is present.
- Requiring spudded barges and limiting prop use to maintain location to stop excessive bottom disturbance.
- Included best available science on sea level rise to increase structure effectiveness and period between maintenance events.

### Acquisition Techniques

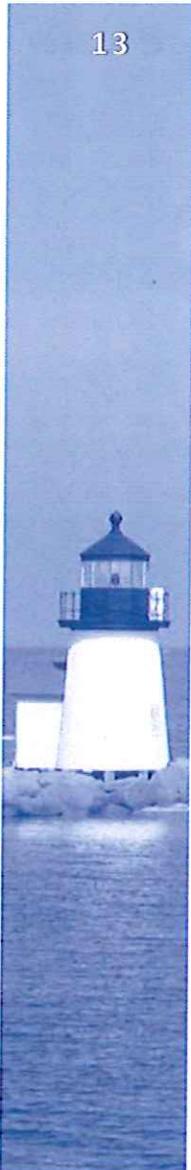
- Use of Lowest Price Technically Acceptable contract method to find contractor with expertise in shallow water construction, instead of based solely on price.
- Selection criteria which focuses on avoidance of environmental resources and contractor safety.

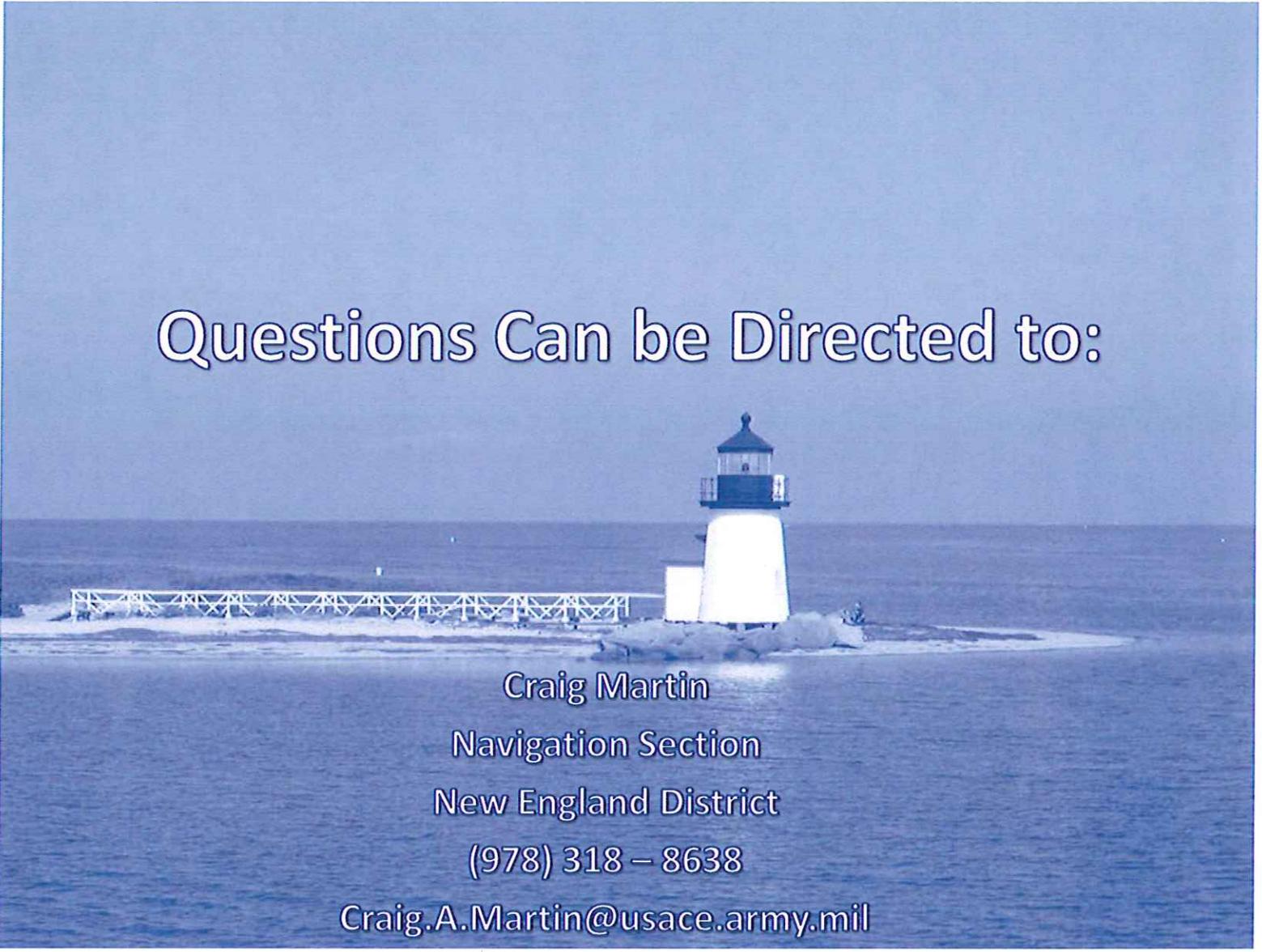


## Nantucket Jetty Repair Project Schedule

Schedule Item	Date(s)	Note
Environmental Coordination	Mar 2014 – Dec 2014	Environmental Assessment / Mitigation Plan will be sent to Resource agencies by 14 Nov 2015
Coastal Zone Consistency Determination	Dec 2014	State/Fed resource agency approval of plan
Plans and Specifications	Dec 2013 – Oct 2014	<i>Completed</i>
Contract Solicitation Process	Jan 2014 – Feb 2015	Lowest Price Technically Acceptable (LPTA) Contract
Contract Award / Notice to Proceed	Mar 2015	
Construction Activities	April 2015 - April 2016	
Jetty Repairs Complete	May 2016	

Construction costs estimated to be \$8,000,000 – 10,000,000.





Questions Can be Directed to:

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