

# HURRICANE SANDY

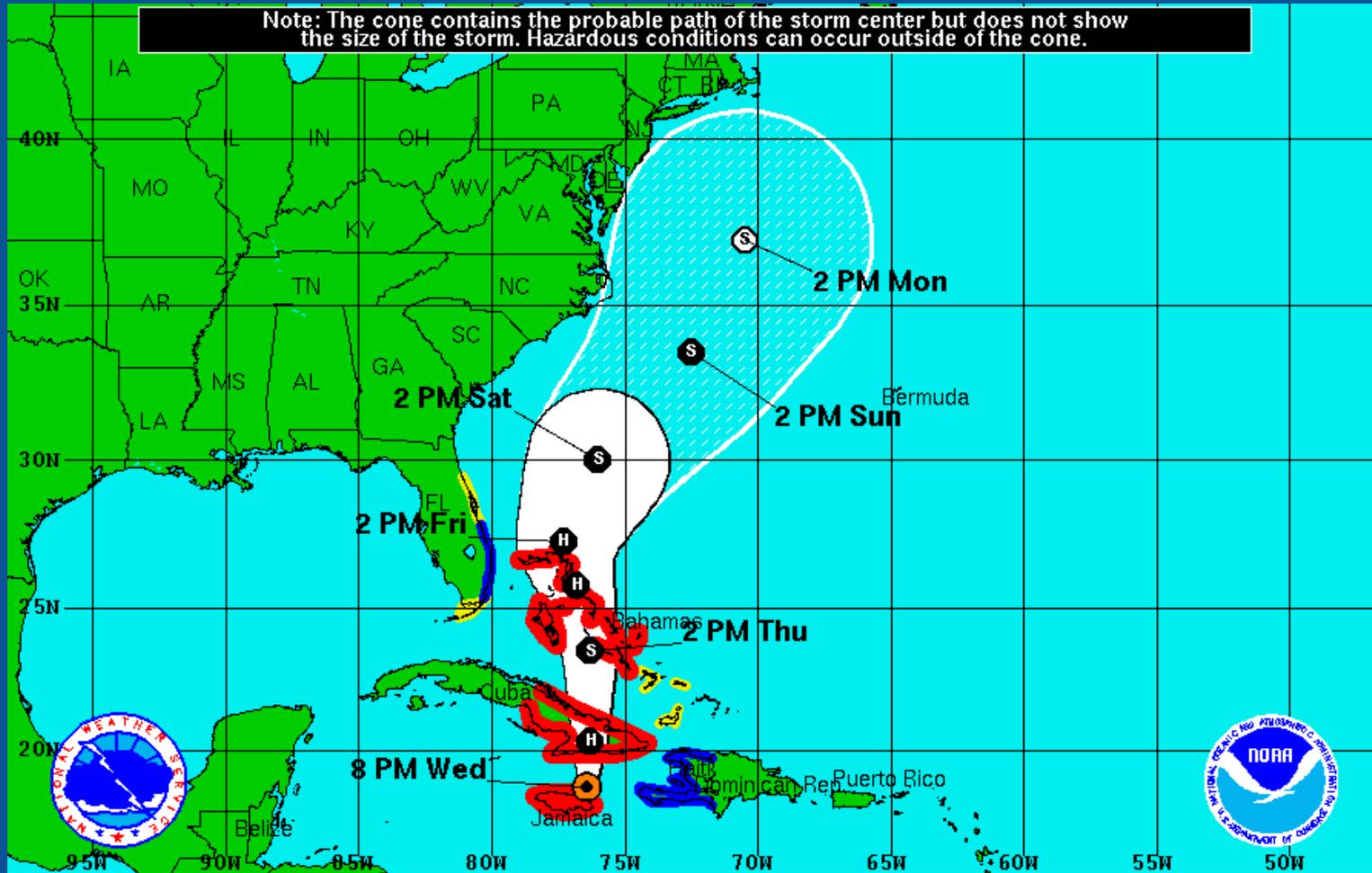
## *Rapid Maritime Response*

*presented to*  
13<sup>th</sup> MACHC

Katie Ries



Note: The cone contains the probable path of the storm center but does not show the size of the storm. Hazardous conditions can occur outside of the cone.



**Hurricane Sandy**

Wednesday October 24, 2012

8 PM EDT Intermediate Advisory 10A

NWS National Hurricane Center

**Current Information:**

Center Location 18.7 N 76.4 W  
 Max Sustained Wind 85 mph  
 Movement N at 14 mph

**Forecast Positions:**

● Tropical Cyclone ○ Post-Tropical  
 Sustained Winds: D < 39 mph  
 S 39-73 mph H 74-110 mph M > 110mph

**Potential Track Area:**

▭ Day 1-3 ▭ Day 4-5

**Watches:**

▭ Hurricane ▭ Trop.Storm

**Warnings:**

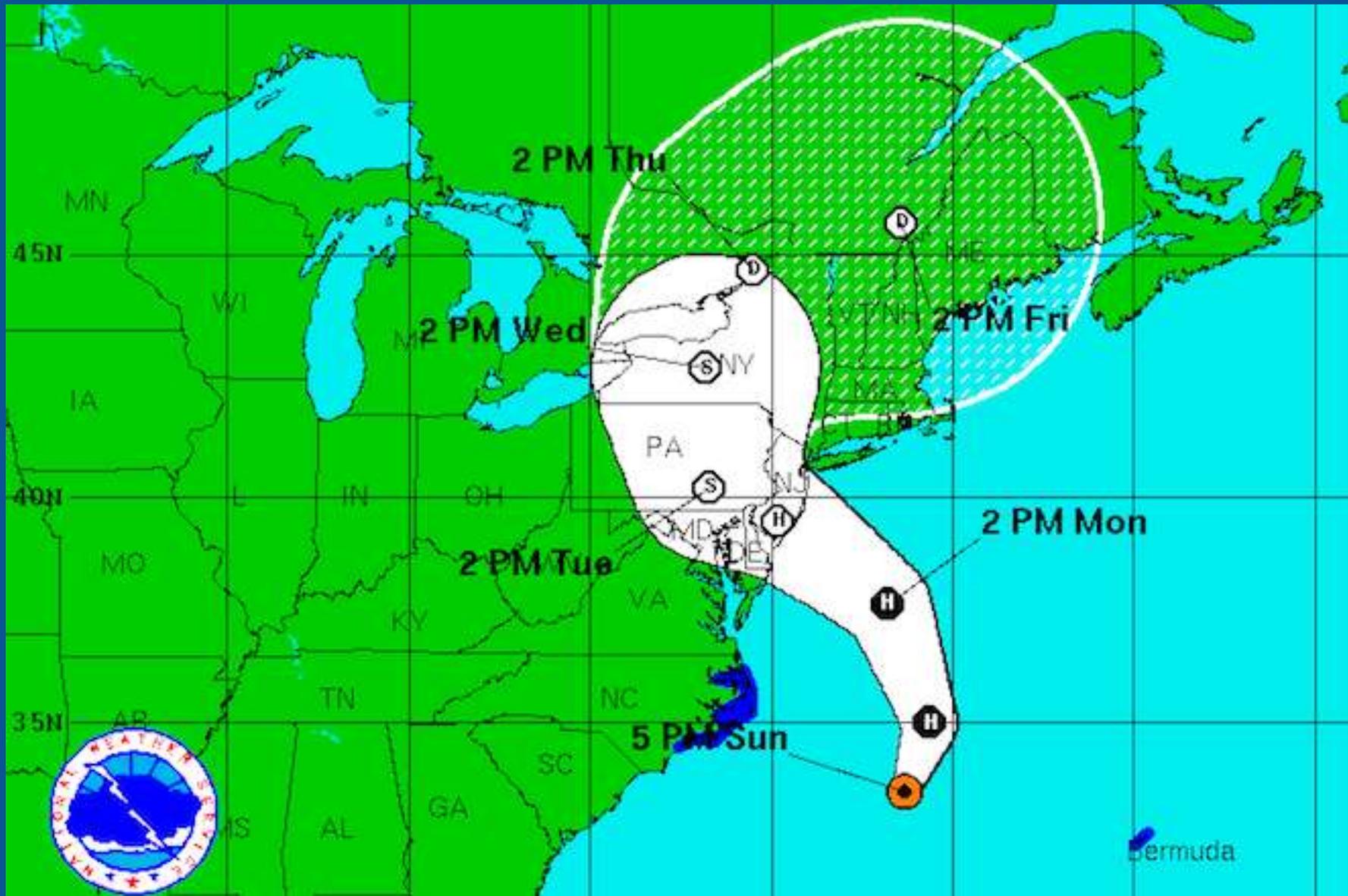
▭ Hurricane ▭ Trop.Storm





Office of Coast Survey





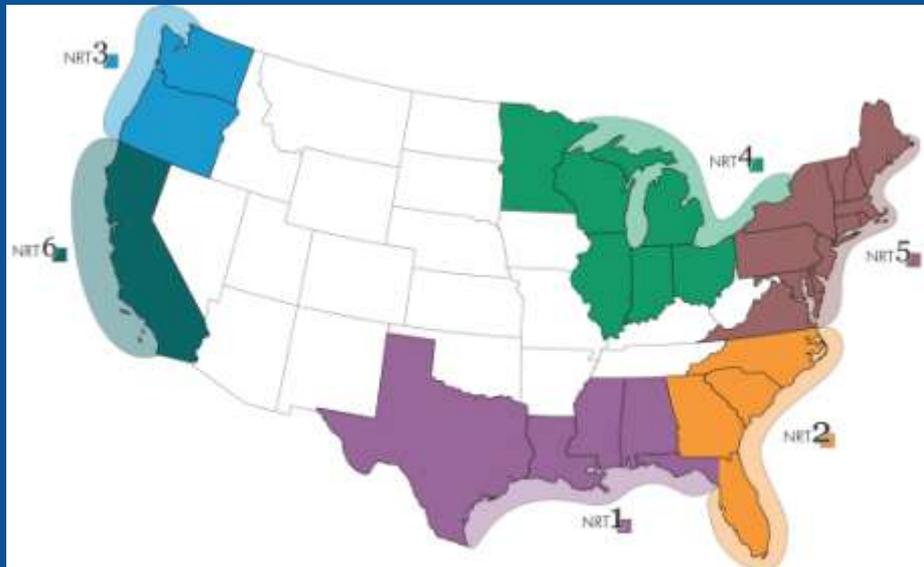


Office of Coast Survey



# Coast Survey is set up for rapid maritime response

Navigation managers coordinate activities and assets with Coast Guard, port officials, and other agencies



Navigation response teams and NOAA survey ships, if available, conduct surveys

# Two objectives for pre-storm preparation

1. Move navigation response people and assets into strategic position
2. Secure survey vessels; protect boats and people from harm during the storm



# Available East Coast survey assets

NOAA Ship *Thomas Jefferson*



NOAA Ship *Ferdinand R. Hassler*



2 Navigation Response Teams



Research Vessel *Bay Hydro II*





# Response Assets and Locations

**NRT4**  
Galveston TX

**MIST**  
DRC – Mobile AL

**NRT1**  
Panama City FL

**NRT2**  
Fernandina Beach FL  
Mobilizing North along the I-95 Corridor  
0600 EDT Tuesday - October 30th



**Bay Hydro II**  
Norfolk VA

**MIST and AUV**  
Silver Spring MD

**Potomac**  
Annapolis MD

**Thomas Jefferson**  
New London, CT

**NRT5**  
Old Saybrooke, CT

*Created by Office of Coast Survey  
October 29, 2012 – 1200 EDT*

# Navigation managers coordinated with:

- ✓ Coast Guard
- ✓ Army Corps of Engineers
- ✓ Pilots
- ✓ Port officials
- ✓ Terminal operators



*Lt. Brent Pounds uses sunlight to explain survey plans to a terminal operator.*

*For days, the team in NY-NJ had no power, no phones, no hot water / hot food, little / no connectivity, and a major fuel crisis.*

*Port of New York - New Jersey*

- *NOAA starts surveying Oct 31*
- *Port resumes modified ops within 5 days*

*Cape May, New Jersey - Lewes, Delaware*

- *NOAA starts surveying Oct 31*
- *After comparison with earlier data, shoaling reported on Nov 4*

*Hampton Roads - Norfolk, VA*

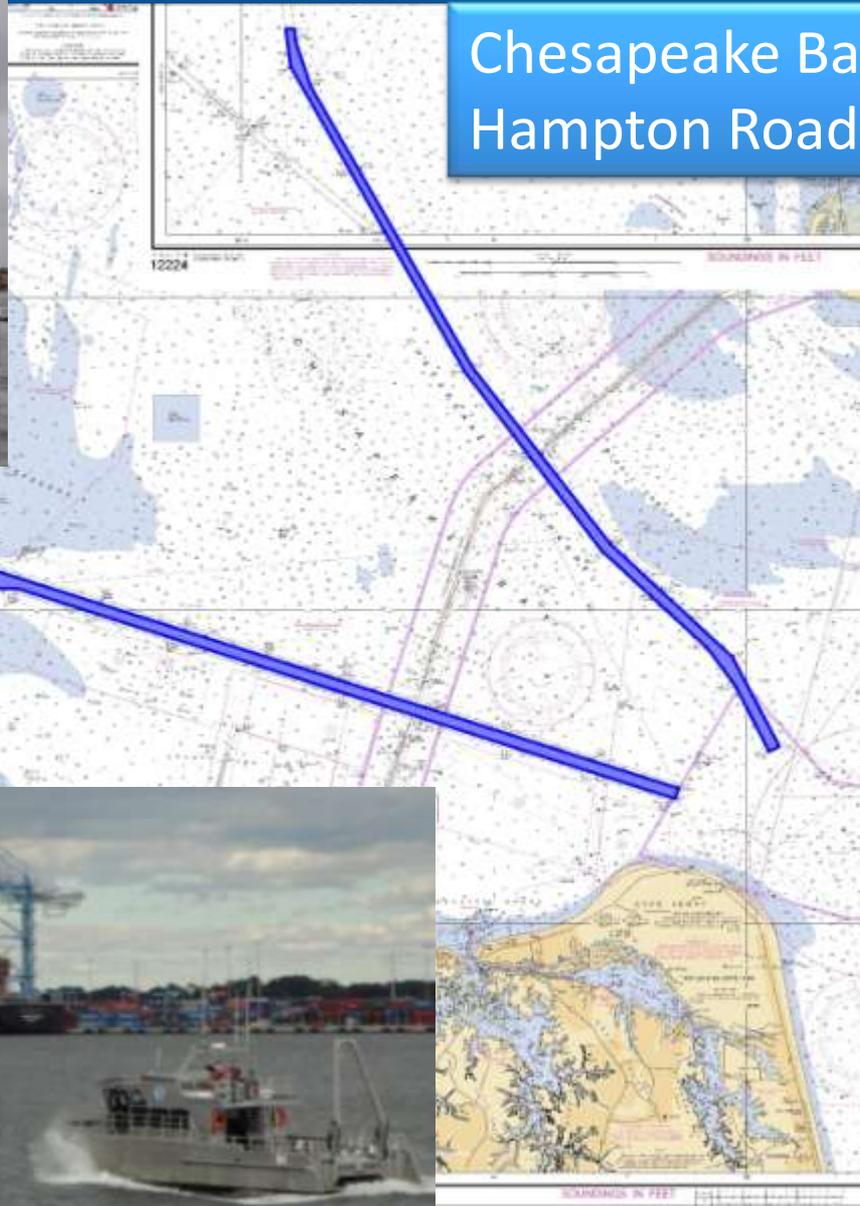
- *NOAA starts surveying Oct 29*
- *Port resumes normal operations at 4 pm the next day (Oct 30)*



# Re-opening Hampton Roads / Norfolk port complex was essential to economy and homeland security

- Norfolk has nearly \$55 billion in waterborne trade per year
- Hampton Roads / Norfolk port's economic impact is \$4.5 million daily
- Hosts the largest U.S. military naval base

# Chesapeake Bay and Hampton Roads



# Surveys critical for resumption of ship traffic in Baltimore and Port of Virginia

- 78 large vessels were waiting to transit through entrance to Chesapeake Bay
  - including ships in the Navy's Atlantic Fleet
- Ships carrying coal exports needed 50 foot depth clearance
- New York cargo was diverted to the Norfolk – Hampton Roads port complex

# Coast Guard requests surveys of Delaware Bay, Delaware River

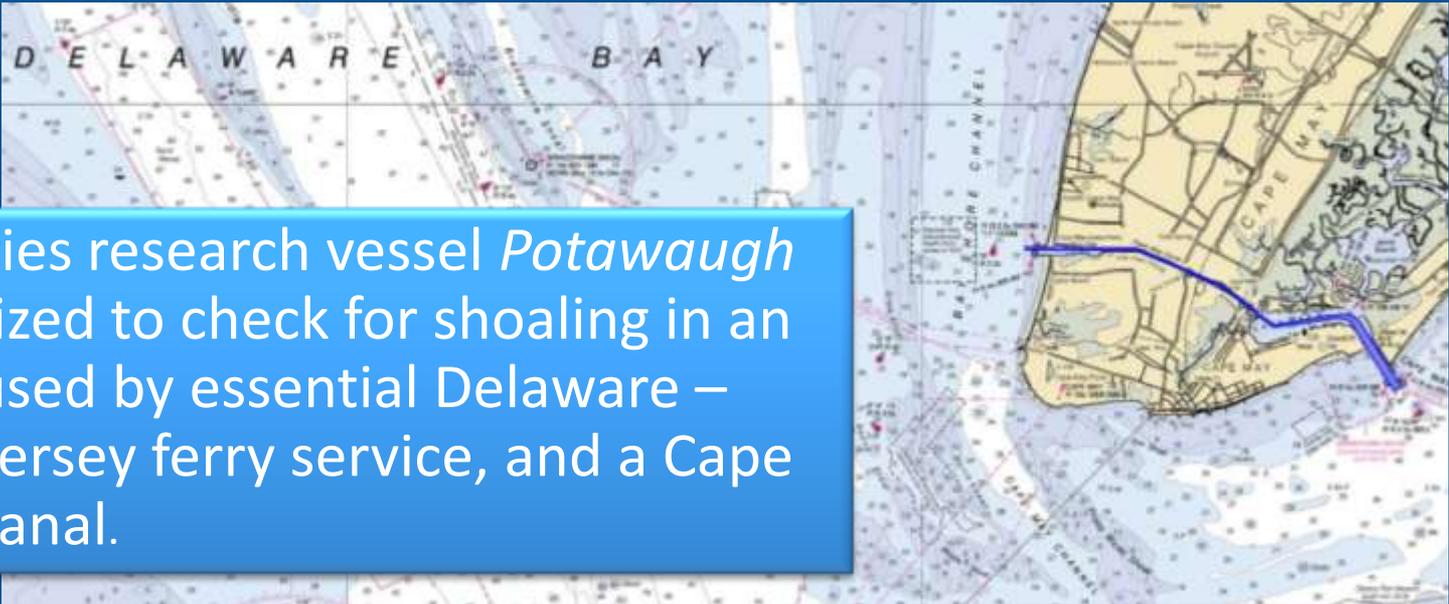
- Ferry terminal
- Anchorage

R/V *Potawaugh*, a NOAA research vessel based in Annapolis, Maryland, is mobilized.

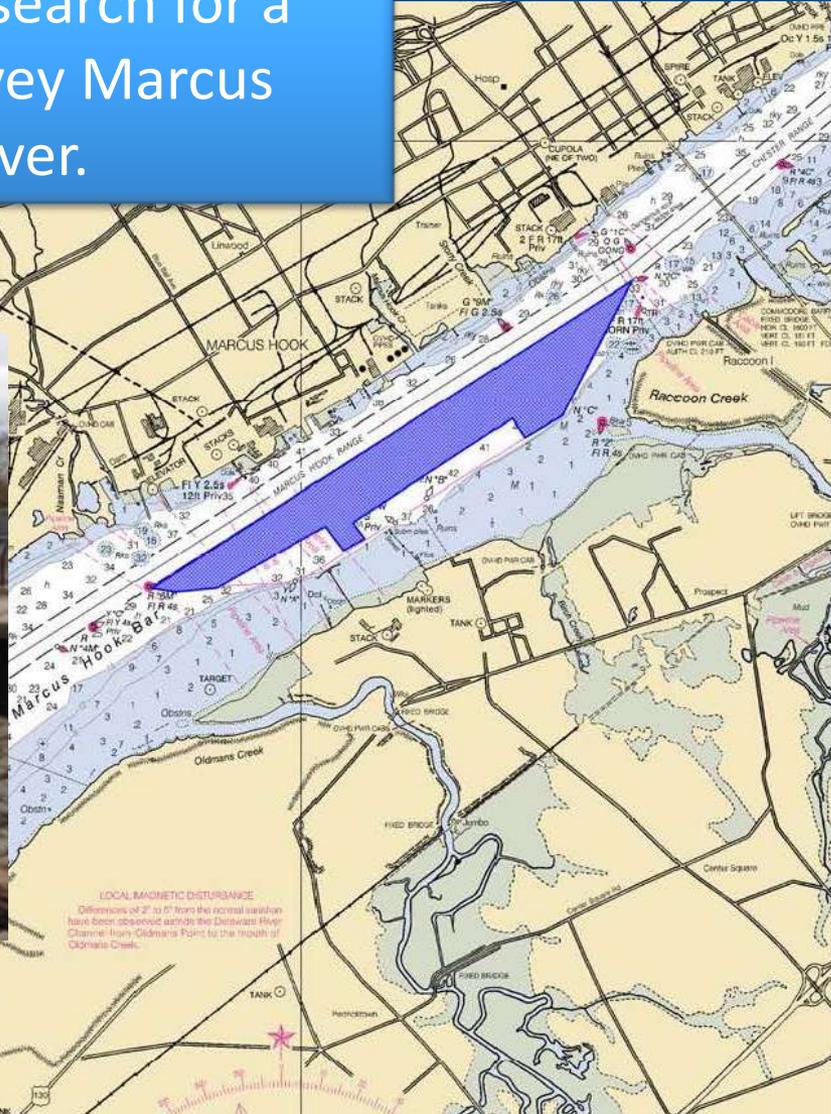


*Ferries are idled when Potawaugh starts surveying Oct. 31*

Fisheries research vessel *Potawaugh* mobilized to check for shoaling in an area used by essential Delaware – New Jersey ferry service, and a Cape May canal.



Navigation Response Team 2 had to search for a usable boat ramp, so they could survey Marcus Hook anchorage, on the Delaware River.



# Port of New York and New Jersey took the brunt of the storm



BEFORE



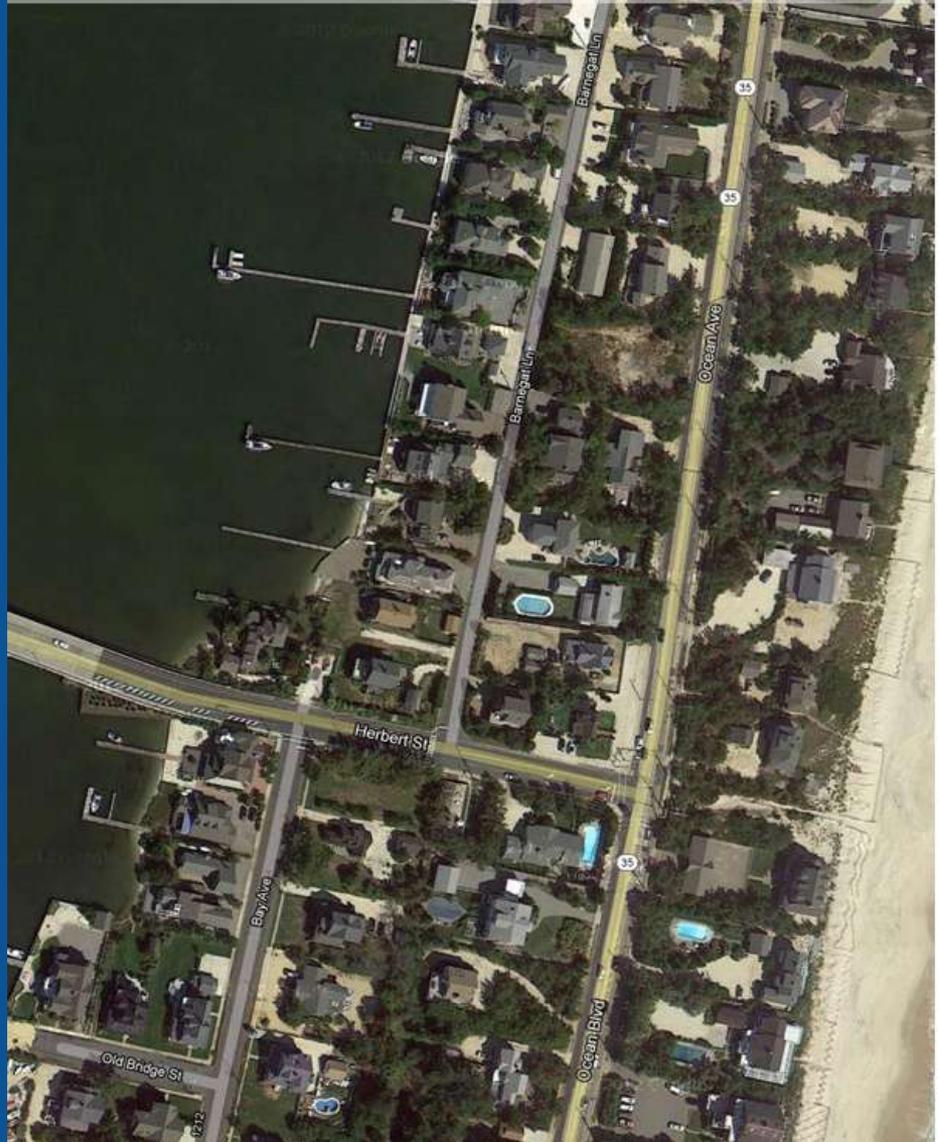
AFTER



# Staten Island, New York

(“After” image captured by  
NOAA’s National Geodetic Survey)





Mantoloking, New Jersey (“After” image captured by NOAA’s National Geodetic Survey)

# Surveys in NY/NJ were essential for the nation's economy

- Over \$200 billion of trade moved through the port in 2011
- It is country's third largest port, by value of cargo (fourth largest, by volume)
- The flow of trade starts from America's heartland, with exports like automobiles and meat, in addition to many other commodities



## Response Surveys Port of New York/New Jersey

Area	NOAA Complete	USACE Complete	Port Authority Complete	Unassigned
Upper Bay	100%	0%	0%	0%
Lower Bay	100%	0%	0%	0%
Harlem River	100%	0%	0%	0%
East River	100%	0%	0%	0%
Manhattan Waterway	100%	0%	0%	0%
Brooklyn Waterway	100%	0%	0%	0%
Queens Waterway	100%	0%	0%	0%
Long Island Sound	100%	0%	0%	0%
North Channel	100%	0%	0%	0%
South Channel	100%	0%	0%	0%
East Channel	100%	0%	0%	0%
West Channel	100%	0%	0%	0%
North Channel	100%	0%	0%	0%
South Channel	100%	0%	0%	0%
East Channel	100%	0%	0%	0%
West Channel	100%	0%	0%	0%
North Channel	100%	0%	0%	0%
South Channel	100%	0%	0%	0%
East Channel	100%	0%	0%	0%
West Channel	100%	0%	0%	0%

NOAA's planned and completed surveys are 82% of total survey requests for the Port of New York/New Jersey

- NOAA COMPLETE
- USACE COMPLETE
- PORT AUTHORITY COMPLETE
- UNASSIGNED

\* Unfilled Areas with Color Border are in Progress

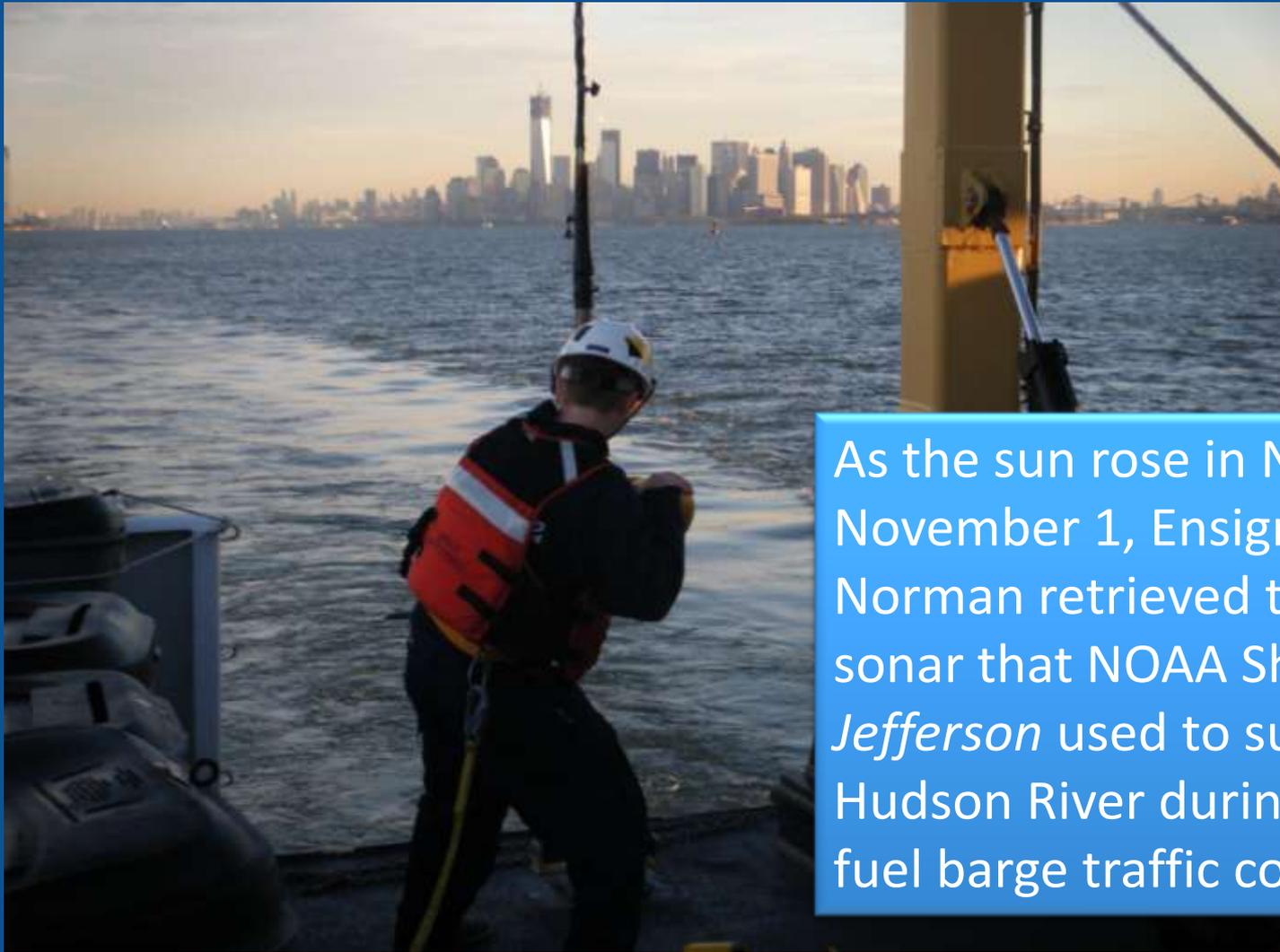
Graphic compiled by Office of Coast Survey based on data received by 1400 hours, Nov 2, 2012

NOAA surveyed 20 square nautical miles in 5 days, ensuring that all shipping channels in the Port of NY/NJ were clear of any hazards.



Navigation Response Team 5 makes its way through the Sandy rubble at Carteret, New Jersey, public boat ramp

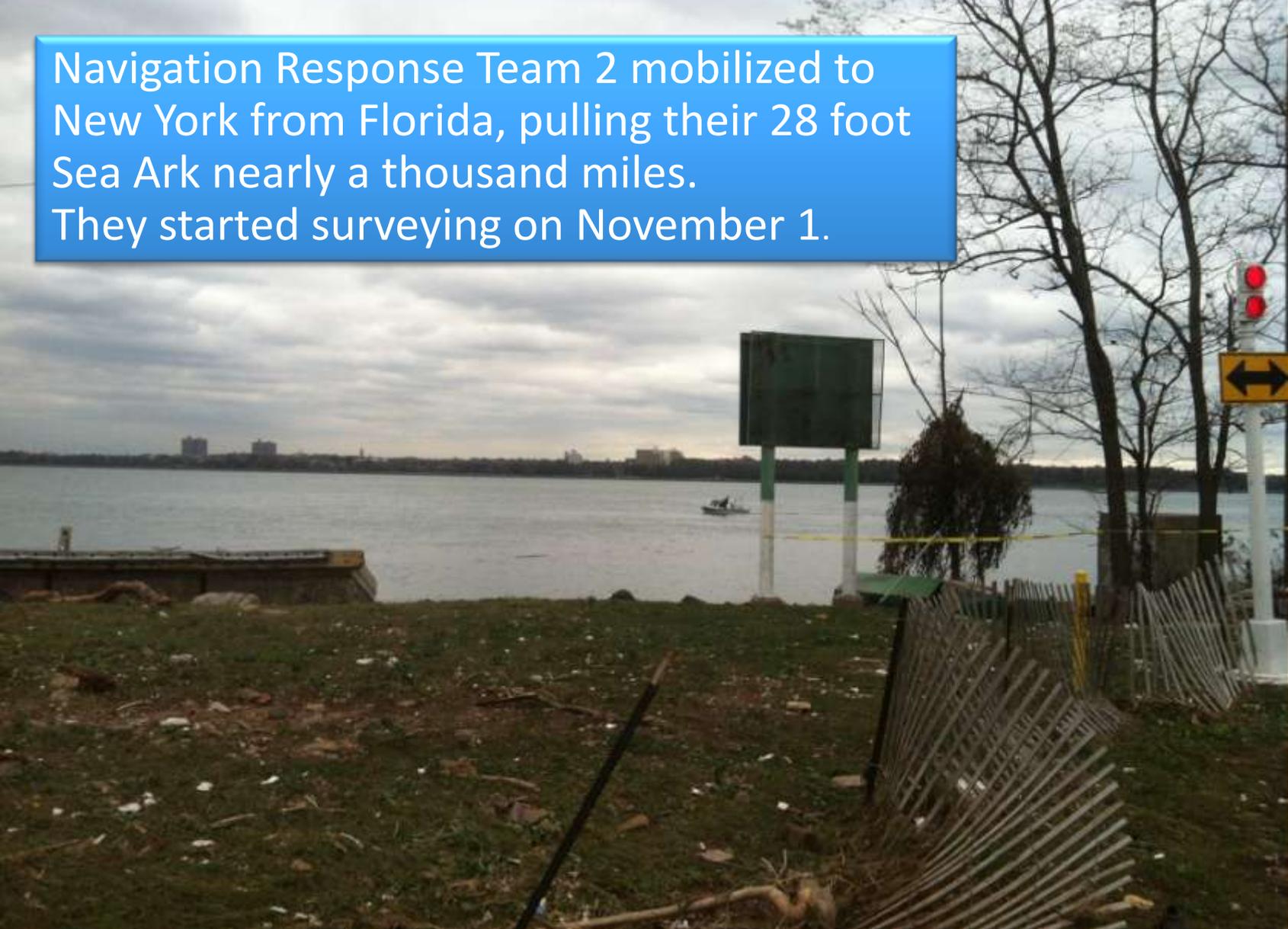




As the sun rose in New York on November 1, Ensign Lindsey Norman retrieved the side scan sonar that NOAA Ship *Thomas Jefferson* used to survey the Hudson River during the night, so fuel barge traffic could resume.

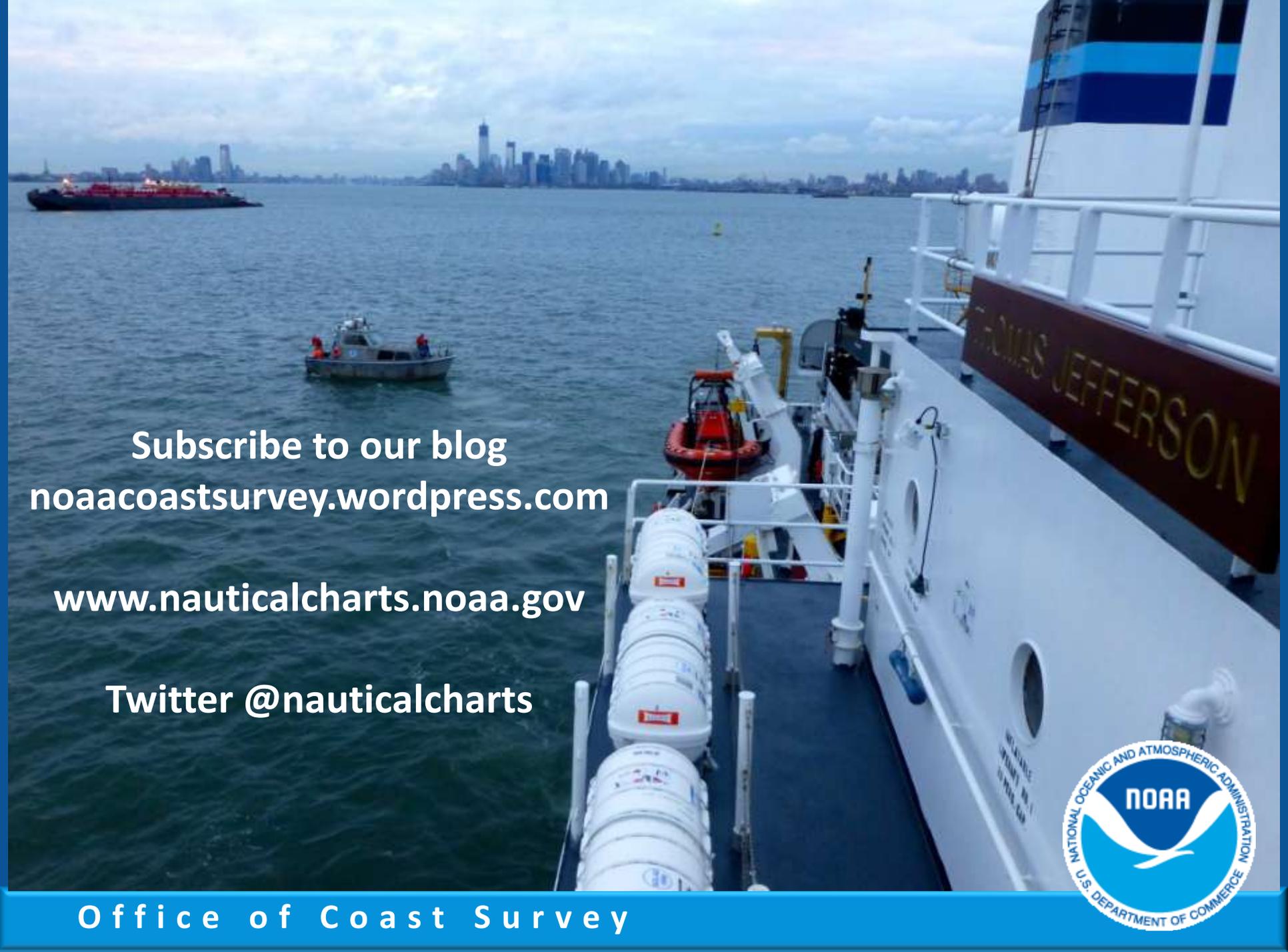
*The New York / New Jersey port area is the country's largest for petro-chemical transportation, with the second largest oil refinery.*

Navigation Response Team 2 mobilized to New York from Florida, pulling their 28 foot Sea Ark nearly a thousand miles. They started surveying on November 1.



NRT 5 sees shipping resume in the Port of NY/NJ.





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