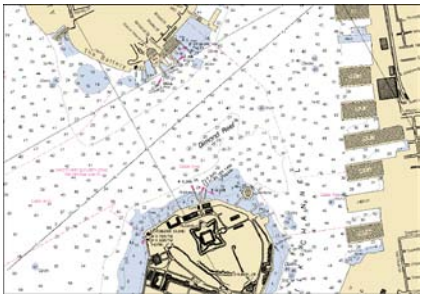
NOAA Ship THOMAS JEFFERSON S-222

Mission

The National Oceanic and Atmospheric Administration (NOAA) ship *Thomas Jefferson* in one of a fleet of research and survey vessels owned and operated by NOAA to improve our understanding of the marine environment. Based out of Norfolk, Virginia the *Thomas Jefferson* operates along the Atlantic and Gulf Coasts ranging from Maine to Texas, including Puerto Rico and the U.S. Virgin Islands.



A section of a nautical chart near the Battery and Governor's Island, NY

Hydrographic Survey Technology

Using advanced sonar technology, the crew of the *Thomas Jefferson* conducts hydrographic surveys for the primary purpose of updating NOAA's suite of nautical charts. Commercial shipping, commercial fishing and recreational vessels all rely on accurate NOAA nautical charts or safe navigation of coastal water in the United States. The *Thomas Jefferson* and its two survey launches acquire data by using specialized echo sounders, multibeam sonars and side-scan sonars.

The Thomas Jefferson's sidescan fish

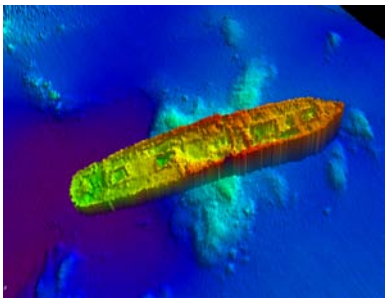
Hydrographic Survey Operations

Side scan sonar is used in hydrographic surveying to search the sea floor for wrecks and obstructions that could be navigational hazards to surface ships. The side scan sonar, resembling a small torpedo, is towed astern of the ship or fixed to the hull of the launches to collect high resolution pictures, or imagery, of the sea floor.

Sound waves are transmitted out from each side of the sonar in a wide fan. Reflected sound waves generate an image of the sea floor and objects such as wrecks, rocks, or other debris are clearly visible on a computer monitor. Positions of these objects can be accurately determined during processing of the sonar image data. A more accurate determination of the height of the object detected can be found by using multibeam echo sounders during subsequent investigations.

Image of a plane captured by sidescan sonar

Mounted on the hull of the ship and its launches, the multibeam echosounders are used to collect very accurate depths over the entire sea floor. The bathymetric data from the multibeam echo sounders can be converted into three dimensional models and colored by depth to provide an intuitive interpretation of the sea floor and detected objects.

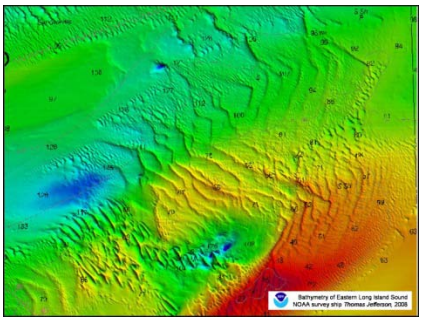


A shipwreck found using multibeam data

Image of multibeam swath bottom coverage

Thomas Jefferson's Environmental Initiatives

In keeping with NOAA's mandate of environmental stewardship, the *Thomas Jefferson* has adapted her own equipment and operations to help lower its environmental footprint. Some of these include, biodegradable grease used on deck equipment, fluorescent light bulbs throughout the ship, low sulfur diesel fuel, 15ppm oily water separators, Halon 1301 aboard the ship and FM-200 aboard the launches for firefighting capabilities. In addition, the *Thomas Jefferson* has also been modified to provide increased sewage and gray-water holding capacity to provide zero-discharge capabilities for up to 7 days of operation in sensitive coastal waters. The *Thomas Jefferson* uses of new low emission EPA Tier engines on the ship and for propulsion of both of the ship's launches.



Eastern ***Long Island Sound bathymetry from multibeam data***

Lastly, the *Thomas Jefferson* routinely operates at lower survey speeds at the peak efficiency of her main propulsion engine.

One of the Thomas Jefferson's hydrographic survey launches

Thomas Jefferson Crew

The NOAA Corps is one of the seven uniformed services of the United States, composed of commissioned officers who provide NOAA with an important blend of operational, management, and technical skills that support the agency's science and surveying programs at sea, in the air, and ashore. In addition to the NOAA Corps personnel, the *Thomas Jefferson* crew is also comprised of wage mariners, civilian scientists, and interns. Wage mariners fill positions in the deck and engine department while the civilian scientists work in the survey department.

About NOAA

NOAA conducts research and gathers data about the global oceans, atmosphere, space, and sun and applies this knowledge to science and service that touch the lives of all Americans.

NOAA warns of dangerous weather, charts our seas and skies, guides our use and protections of ocean and coastal resources, and conducts research to improve our understanding and stewardship of the environment which sustains us all.

A Commerce Department agency, NOAA provides these services through five major divisions: the National Weather Service, the National Ocean Service, the National Marine Fisheries Service, the National Environmental Satellite, Data and Information Service, and Office of Oceanic and Atmospheric Research and numerous special program offices.

Length: 208 ft
Breath: 45 ft
Draft: 14 ft
Displacement: 2054 tons
Cruising speed: 12 kts
Range: 19,200 nm
Endurance: 80 days
Hull Number S222
Call Sign: WTEA
Commissioned Officers: 8
Licensed Engineers: 4
Crew 19
Launched: February 14, 1991
Delivered: January 10, 1992
Transferred to NOAA: March 3, 2003
Commissioned July 8, 2003
Builder: Halter Marine, Inc.
Designer: Halter Marine, Inc., Moss Point, MS.

Visit the ship's website at www.moc.noaa.gov/tj or visit NOAA's website at www.nmao.noaa.gov