

Searching for Oil

NOAA Ship *Thomas Jefferson* Looks for Oil Below the Surface in the Gulf of Mexico



NOAA ship *Thomas Jefferson*.

[High resolution](#) (Credit: NOAA)

The NOAA ship *Thomas Jefferson* has a long history of underwater exploration. During its seven years in the NOAA fleet, the ship and its crew have mapped countless bodies of water for missions ranging from surveying harbors for obstacles to locating underwater wreckage. Now, the *Thomas Jefferson* is looking for something entirely different – oil beneath the water.

Normally, the ship is ultimately concerned about what's on the bottom of the ocean. However, it's also important to know the properties of the water. The ship's advanced sensing equipment can detect differences in things like temperature and salinity, which affect what the ship "sees" at the bottom. The crew is now testing innovative ways to use its underwater sensing capabilities to help determine the presence or absence of oil in various parts of the Gulf of Mexico.

Setting Course for a New Mission

The *Thomas Jefferson* was already scheduled to be in the Gulf of Mexico when the BP Deepwater Horizon oil rig exploded and sank in April, resulting in what has now become the largest oil spill in history. Like many across the federal government, the ship's crew found their plans suddenly changed, as they were called upon to help mount what has become the largest federal response ever to an environmental emergency.



Jason Sadler of Dade Moeller and Associates Data Intake shows proper sample labeling techniques to ENS Jasmine Cousins.

[High resolution](#) (Credit: NOAA)

The Naval Oceanographic Office offered use of some of their oceanographic instruments to assist with the scientific response to the spill, but they didn't have any vessels available to deploy the equipment. "NOAA offered up the TJ to assist," said Cmdr. Shepard Smith, *Thomas Jefferson's* commanding officer. "We deployed the Navy's gliders, drifters and floats in an effort to understand the Gulf of Mexico's loop current and what was happening to surface oil that was drifting in that direction."

After returning to port, the ship was quickly re-fitted for its next oil spill mission. In this second project, which lasted eight days, the *Thomas Jefferson* put its underwater sensing capabilities to work, trying out innovative methods for locating sub-surface oil.



Survey Technician Frankie Daniel retrieves the Moving Vessel Profiler.

[High resolution](#) (Credit: NOAA)

They used a combination of measurement techniques to try to get a clear picture of what was happening deep below the surface. This included mid-water sonar scanning; water sampling to measure the salinity, temperature and density of water; and utilizing a fluorometer — a device that uses ultraviolet radiation to detect dissolved organic matter. The fluorometer used for this project was specially calibrated to detect oil. A report of initial observations from this mission can be accessed [online](#), and additional data will be posted as it becomes available.

Collecting Vital Data for Assessment & Restoration

Currently, the crew has been sent on yet another mission in the Gulf area to continue their work. This time in shallower water closer to the coast. First, they took baseline water samples in and around [Flower Garden Banks National Marine Sanctuary](#). Baseline samples show conditions that existed in an area before any impacts from the spill have occurred. Then the ship headed closer to shore, taking samples off the Louisiana, Alabama and Mississippi coastlines.

“We utilized coastal oceanographers to help determine what we’re finding,” Smith said. “Is what we’re seeing normal? Should we follow up? We don’t want to waste time mapping a subsurface anomaly only to find out it’s a school of shrimp or an outflow of a river.”



A cooler full of samples, secured with red tamper-evident tape, is transferred to a boat to be taken ashore.

[High resolution](#) (Credit: NOAA)

The *Thomas Jefferson* stopped briefly in Pascagoula, Miss., on June 22, to off load water samples and replenish supplies before heading out to do water and air sampling in the vicinity of the Deepwater Horizon wellhead site. After that, the ship will return to Pascagoula again for another brief stop before continuing with coastal water sampling en route to Key West, Fla.

To follow *the Thomas Jefferson*'s mission progress as well as other NOAA science missions in the Gulf of Mexico, visit [NOAA's science mission](#) website. 🌐

Podcast: [Commanding Officer Shep Smith describes mission and sampling tools on board NOAA ship *Thomas Jefferson*.](#)