



NOAA *Background*

NOAA's Hydrographic Survey Ships Aid the Nation During Disaster Recovery Efforts

The downing of TWA Flight 800 into the Atlantic Ocean off Long Island, N.Y., in July 1996 was the first of three national air disasters in recent years that called for the special expertise of NOAA's hydrographic survey vessels. It was the NOAA ship *Rude* that scanned the ocean floor and found the primary wreckage fields

of the aircraft. *Rude*, in conjunction with a shore-based NOAA data processing team, created highly accurate maps of the debris fields, which enabled Navy divers to recover crash victims and the flight recorders as quickly as possible.

Exactly three years later, another disaster occurred when John F. Kennedy Jr.'s aircraft plunged into waters off Martha's Vineyard. Once again it was *Rude* that found the wreckage, with the assistance of fellow NOAA hydrographic survey ship *Whiting*, enabling Navy divers to recover the victims.

EgyptAir Flight 990 fell from the sky into the Atlantic in November 1999. This time *Whiting* arrived on scene to use its special capabilities to scan the seafloor and find the primary debris fields. A Navy submersible remotely operated vehicle (ROV) then took over to complete the search for victims and the flight recorders.

The work of these NOAA ships was part of a joint effort with the U.S. Coast Guard and U.S. Navy, with coordination by the National Transportation Safety Board. NOAA's involvement following the tragedies stemmed from the capabilities of the agency's hydrographic survey ships to survey coastal waters for the production of the nation's nautical charts. The ships specialize in locating on the seafloor submerged wrecks and obstructions to navigation using side-scan sonar (SSS) technology. Housed in a small torpedo-shaped instrument called a "fish," the SSS provides an accurate acoustical image of the bottom extending up to 200 meters on each side of the ship. As the SSS fish is towed slowly astern, the SSS creates a map-view image of the bottom. Differential global positioning

A WORD ABOUT NOAA. . .

The National Oceanic and Atmospheric Administration (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 protection 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 organizations: 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 units. In addition, NOAA research and operational activities are supported by the Nation's seventh uniformed service, the NOAA Corps, a commissioned officer corps of men and women who operate NOAA ships and aircraft, and serve in scientific and administrative posts.

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system (DGPS) receivers use satellites to position the ship within three to five meters (10-17 feet).

Rude and *Whiting* were under the command of officers of the NOAA Corps, the nation's smallest uniformed service. NOAA Corps officers, who hold science or engineering degrees, have the flexibility and mobility to respond immediately to such crisis situations. These officers are highly skilled at operating and managing the agency's fleet of research and survey ships as well as supporting the scientific research conducted on board. Many, including the commanding officers of the survey ships, are also expert hydrographers. The NOAA Corps is part of the Office of Marine and Aviation Operations, composed both of officers and civilians.

During each of the air disasters, NOAA's National Ocean Service mobilized an on-site shore team of civilians and NOAA Corps officers from the Office of Coast Survey to create charts of the search area, using the sonar data from the ships. Team members were well trained and proficient in interpreting the data, which are not easily read by an unskilled eye. The highly-specific charts precisely pinpointed submerged debris hidden under the miles of watery expanse and gave Navy divers an idea of the dimensions of the wreckage for which they were searching. The divers or ROVs were able to deploy directly to identified points without wasting limited underwater search time. The charts were an invaluable tool to all those involved in the search and recovery efforts, including investigators from the NTSB and FBI.

NOAA Services Play Other Roles

Other NOAA services played an important role following these national disasters. The National Ocean Service's Hazardous Materials Response Division in Seattle, Wash., used its Trajectory Analysis Techniques program to provide trajectory analysis that aided in the search for floating surface debris. NOAA has been using this analytical approach in oil spill response for a number of years, and found it extremely useful for oil spill response and planning exercises after the TWA, JFK and EgyptAir crashes.

NOAA's National Weather Service provided search and salvage vessels with tailored weather forecasts, which included wind and sea state predictions. This service proved especially valuable when severe weather was approaching, and also enabled EgyptAir searchers to deploy vessels during a small window of opportunity after rough seas forced search and recovery ships back to port.

Hydrographic Services Also Aid Coastal Areas Following Hurricanes

When hurricanes strike the fragile coasts, navigation and shipping lanes can become extremely hazardous. Vessels may sink, and storm surge can drag cars or even houses into the ocean. Sea floor topography may shift, creating shoals of sand and debris.

NOAA hydrographic ships have been called upon by local officials to resurvey busy harbor areas and shipping lanes following a hurricane. These special surveys enable NOAA chart makers to update the areas' nautical charts to ensure safe navigation of the nation's commercial, government, and recreational vessels. ☺

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