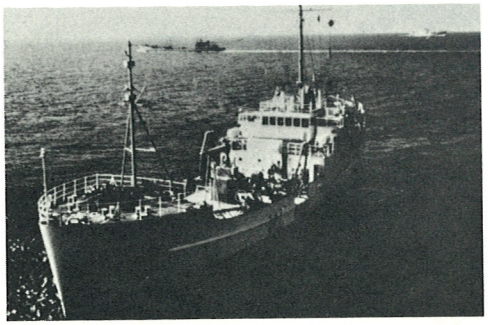
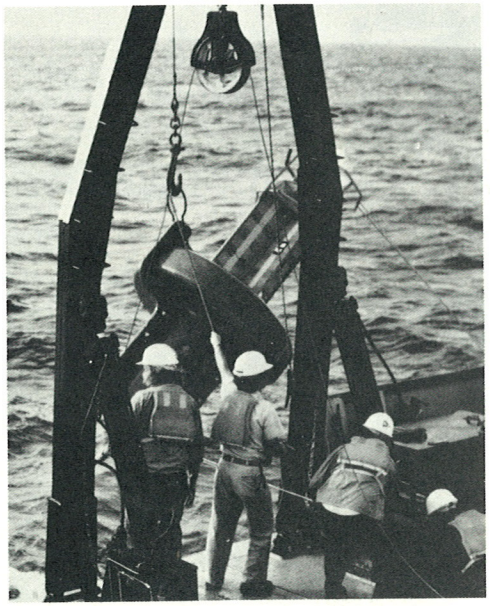
U.S. DEPARTMENT OF COMMERCE
National Oceanic and
Atmospheric Administration
National Ocean Survey

NOAA SHIP GEORGE B. KELEZ

R 441

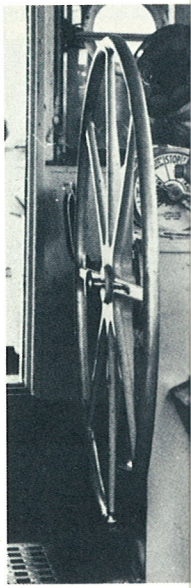


The *George B. Kelez,* R-441, is part of the largest fleet of oceanographic vessels in the United States, the research and survey ships of the Commerce Department's National Oceanic and Atmospheric Administration. *Kelez* reached its present post through a varied career that was thought to be over in 1954. Now the revitalized post-war cargo ship has been given a new purpose: to help define the relationship between man and the marine environment. Staffed by seven officers and 18 crewmembers — and with accommodations for 9 scientists — *Kelez* traverses a patch of the Atlantic on a busy, year-round schedule, as part of an effort to understand and protect the oceans it has sailed for more than three decades.



Buoy will mark current meter location.

Marker buoys line



The ship's bridge

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The KELEZ and the New York Bight

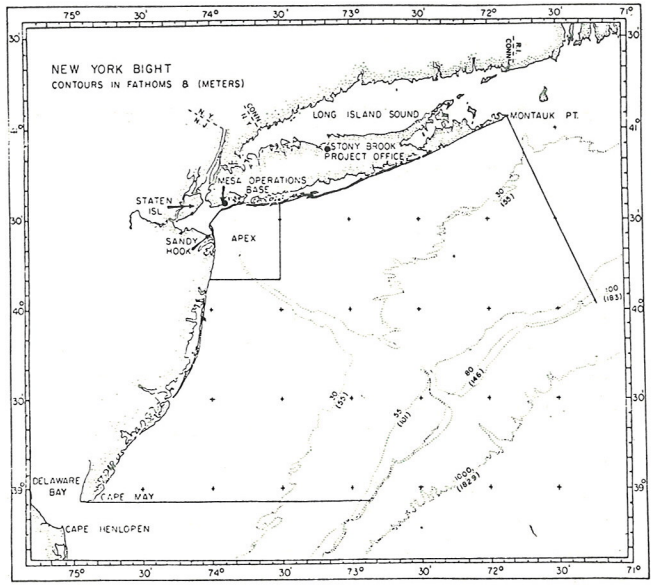
In recent years it has become clear that the oceans cannot absorb an infinite amount of human waste or give unstintingly and unendingly of their resources. Scientific measurements over the years have shown distinct shifts in the chemical and biological makeup of many marine areas, subtle hints of human impact. Oil spills have provided more dramatic demonstrations of the effects we can have on the marine ecology.

Many studies are now underway to define the effects on the environment of varying human activities and provide knowledge to balance use with preservation of resources. The NOAA ship *Kelez* is the heart of one of the biggest such studies, the Marine Ecosystems Analysis (MESA) New York Bight Project. The Project is a major, finite effort to understand and mediate the relationship between humanity and the marine environment.

The New York Bight study examines a corner of the Atlantic bounded by the southern coast of Long Island, the beaches and marshlands of New Jersey, and the edge of the continental shelf. For centuries, its human neighbors have bathed, traveled, over-fished, and dumped wastes in this 15,000-square-mile (39,000-square-kilometer) tract of water. The MESA project seeks to learn the impact this intense utilization has had on the marine ecology.

The *Kelez* is NOAA's primary research vessel for the New York Bight studies. From the ship, MESA scientists, from NOAA and other institutions, conduct studies of the physical and chemical properties of the water, the geology of the sea floor, and the abundance and interrelationships of life forms.

The ship has been well equipped for such research. There are "wet" and "dry" laboratories inside, refrigerators, freezers and dry holds for storage of specimens. Heavy-duty winches and cranes on the decks assist in deploying large oceanographic instruments — buoys dangling current meters, or nets to collect biological samples. *Kelez* can also carry three portable vans to provide additional laboratory space.



New York Bight study area

Knowing the precise location where data are collected is vital. So in addition to basic navigation systems — two radar units, Loran C, and shallow- and deep-water fathometers — the *Kelez* has a precision electronic navigation system, called RAYDIST, which enables the ship's navigator to determine the ship's position to within 33 feet (10 meters).

Water movements in the Bight — currents caused by tidal forces, storms, shoreline runoff — determine the movement of nutrients, organisms, sediment, and pollutants in the Bight. From the *Kelez,* scientists deploy, maintain, and recover current meter arrays. The five or six meters on each array record current speed and direction, ocean water temperature, salinity, and pressure (depth) for periods of from four months to a year.

Four times a year the *Kelez* traverses the Bight in a water chemistry investigation. Instruments deployed from the ship measure eight critical parameters on site, and collect water samples to be analyzed later for suspended sediment, organisms, chemical con-

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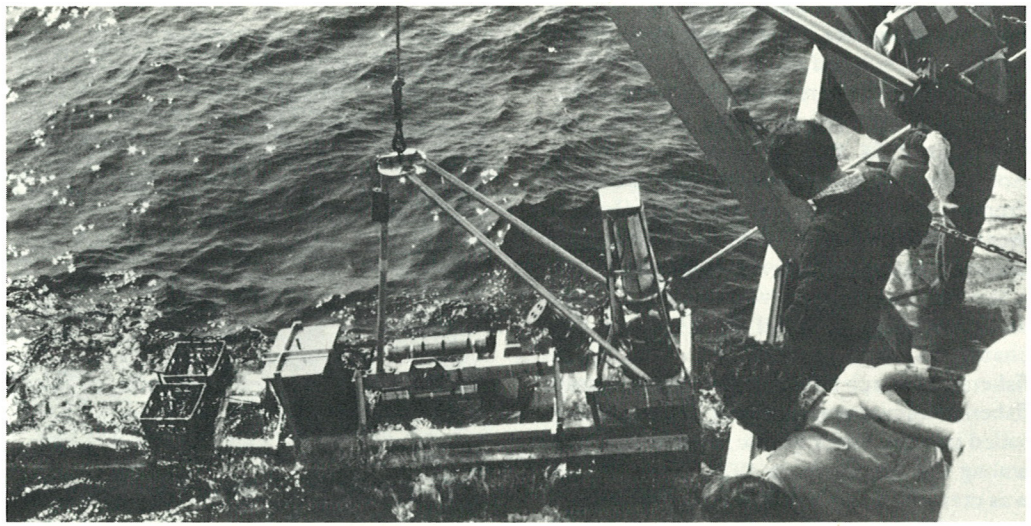
stituents. The results will help MESA scientists identify the different water masses and how they respond to natural and human-induced changes.

From the *Kelez,* geologists collect samples of the New York Bight sea floor. Their purpose is to identify the type of sediment — sand, silt, mud, rock — and map the areas and depths covered by each type. Sediment samples are analyzed for grain size, and for significant chemicals that may be potential indicators of pollution. These studies combine with current measurements to give a picture of how materials on the sea floor move around.

With the Energy Research and Development Administration, NOAA scientists conducted a special study to monitor the movement of bottom sand. In this Radio Isotope Sand Tracing (RIST) experiment, samples of New York Bight sand were tagged with a radio isotope. The "tagged" sand was then taken on the *Kelez* and dropped in an area where currents were being studied. At periodic intervals after that, the *Kelez* towed a specially designed scintillometer over the bottom to trace the movements of the tagged sand and, hence, of the currents.

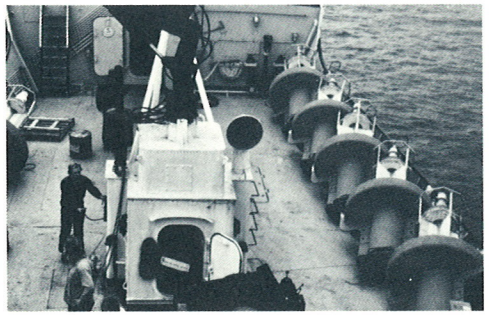
Despite heavy commerce and dumping of wastes, the Bight is still a major living resource. MESA-funded biologists collect samples to determine the abundance, distribution, diversity, and health of marine organisms. Grab samples collected by the *Kelez* from the sea floor are screened and sorted for organisms, some microscopic in size. Small sediment cores are analyzed for bacteria.

Sometimes the *Kelez* tows fine nets through the waters of the Bight to collect plankton, the tiny plants and animals that are the base of the oceanic food chain, to help understand plankton dynamics and nutrient cycling.

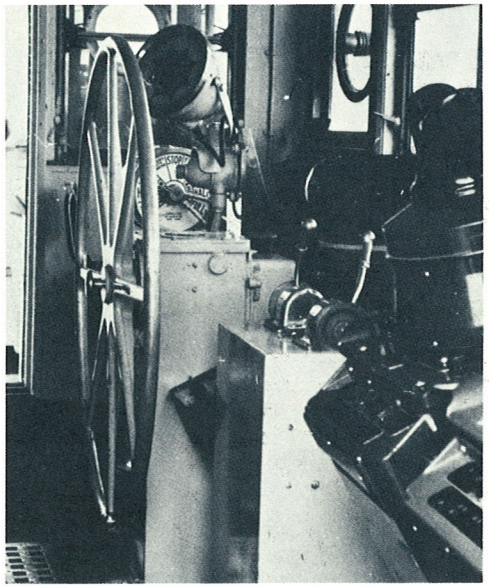


Unique apparatus generates bottom currents and measures the amount of sediment a given current stirs up.

Water samples for lab analysis



Marker buoys line Kelez' *decks*



The ship's bridge

The ship that was to become the *George B. Kelez* was launched from an Alabama shipyard in 1945. Built for the war, the FS-400 never saw battle, but after being outfitted in New Orleans, the vessel served as an Army transport, carrying food and supplies from Honolulu to American troops at Midway, Wake, Johnson, and other mid-Pacific islands.

In 1948, the ship was transferred to the Navy and assigned a new port, Yokohama, Japan. From there, the crew of 24 Japanese sailors and three American officers carried supplies to the Bonins, Marianas, and Marshalls under the War Reparations Act. During the Korean conflict, FS-400 saw some of the military action it had missed in World War II, sailing with a Navy crew from Japanese ports.

The ship, then known as the AKL-30, was retired in 1954 and spent seven years in mothballs. The vessel was brought out of retirement in 1961, when the Interior Department's Bureau of Commercial Fisheries needed a vessel for fisheries research. It was when the ship was converted from a cargo carrier to a fishing vessel that the name was changed to *George B. Kelez,* to honor a fisheries research biologist and former Alaska fisheries administrator. From Seattle, *Kelez* sailed into the north Pacific, Bering Sea, and among the Aleutians. In 1970, when NOAA was created, *Kelez* was still on the job, working now for the new National Marine Fisheries Service.

Kelez got the first taste of marine geophysical work in 1974, when the U.S. Geological Survey borrowed the ship for a few months to conduct seismic profiling, bottom sampling, coring, and magnetic studies. In late summer of that year, a new crew took the vessel through the Panama Canal back through the Gulf of Mexico to the Atlantic waters it had left 30 years before. At port in Florida, the ship underwent extensive modifications, in preparation for New York Bight work. Since March, 1975, *Kelez* has sailed out of Floyd Bennett Field in Brooklyn into a new career, helping us understand our environment.

General Description

Length, overall	**176.5 feet (53.8 meters)**
Beam	**32 feet (9.7 meters)**
Draft (full load)	**12 feet (3.7 meters)**
Displacement (full load)	**936 tons (851 metric tons)**
Propulsion	**Twin screw (fixed pitch) 2 GM 6-278A Clev. diesel engines**
Cruising speed	**10.5 knots (19.5 km/hr)**
Cruising range (20% fuel reserve)	**5,980 miles (9,630 kilometers)**
Complement	**25**

Oceanography at NOAA

The National Oceanic and Atmospheric Administration exists as a national recognition of the need to understand the atmosphere, oceans, and space environment, their interrelationships, and their relationship to us. Created in 1970, this agency of the Department of Commerce operates the nation's largest and most modern fleet of oceanographic research and survey vessels. The *Kelez* is one of 24 ships ranging in size from 86 to 303 feet (26 to 92 meters) long. The ships are staffed by the uniformed NOAA Commissioned Corps, some 400 officer-scientists who guide them to sea from ports on all coasts.

The ships are the platforms, tools, and heart of NOAA's marine activities, activities as varied as the oceans. NOAA charts our coastal and Great Lakes waters, monitors and predicts tides and currents, develops full bathymetric and geophysical descriptions of the world oceans, and develops new instruments such as a prototype system of automatic ocean buoys for obtaining essentially continuous marine environmental data.

Major laboratory complexes in Miami and Seattle conduct geophysical studies of plate tectonics, the Gulf Stream and other major current systems, coastal and estuarine processes, air-sea interaction, tropical meteorology. Special programs investigate the probable environmental consequences of deep ocean mining or oil development activities on the Alaskan continental shelf.

Fisheries experts conduct broad research and service programs aimed at improving our comprehension and uses of the ocean's living resources. Laboratories on every coast study regionally important species, supply data for international conservation efforts, and provide new technology and marketing information for the nation's fishing industry.

The Weather Service's meteorological research and forecast services extend to the oceans. Marine weather services include high-seas weather broadcasts; special forecasts of sea state, water temperature, surf; warnings of hurricanes and other maritime disturbances.

NOAA also processes and archives the world's largest collection of marine environmental data and is developing satellite systems that provide, in addition to weather data, sea surface temperature maps, and monitoring systems to relay data collected at sea by robot buoys.

A grant system supports marine research at universities around the country, and another office of NOAA supports and coordinates efforts by states to manage and protect their coastal zone resources.

Zodiak returns to the Kelez.

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