

# THE BIG



# SPLASH

BY CHUCK COLGAN

New Scripps  
Ship Expands  
Revelle Legacy

Air horns blasted, an astonished crowd roared, and a Navy band struck up “Anchors Aweigh” as more than



2,000 tons of steel ship slid off the land and into Mississippi’s Escatawpa River. The 275-foot ship hit the water sideways, rolled nearly 40 degrees, and splashed a wave of river water 45 feet high. With this fabulous finale,



Roger Randall Dougan Revelle was a geology graduate student at UC Berkeley when, in 1931, Scripps Director T. Wayland Vaughan dropped by looking for a research assistant to analyze deep-sea muds. Revelle took the job, in part because his bride Ellen was a native of La Jolla.

Revelle graduated from Scripps in 1936. As a faculty member, and later director, he led the institution into a new age of exploration. He kept Scripps in the forefront of marine science and recruited faculty from around the world to Scripps and to share in his dream of a UC campus in San Diego. He was the main force in founding UC San Diego in 1960.

Revelle left Scripps in 1964 to found and direct the Center for Population Studies at Harvard University. In the late 1970s, he returned to UCSD. Above, Roger Revelle taking samples aboard *Scripps*, circa 1935. His dedication to oceanography and service to Scripps will live on through the voyages of R/V *Roger Revelle*.

Scripps newest research vessel *Roger Revelle* was launched on April 20, 1995.

On that warm, muggy, southern spring morning, 200 people gathered at the riverside launching ceremony where representatives of the shipyard, the Navy and its Office of Naval Research (ONR) and Naval Sea System Command, Scripps Institution, and the Revelle family remembered and celebrated the life of Roger Revelle and praised the efforts of all those involved in creating and building the ship that bears his name.

Revelle, the institution's most renowned graduate (Ph.D. 1936) and former director (1951-64), died in 1991 at age 82. His extraordinary career spanned an era from the pioneering of modern oceanography to the use of space-age tools for global studies. Of seagoing research and

his years at Scripps Revelle once said, "What I did was to send the institution out to sea, to make it a worldwide institution instead of just a local California institution.... By the time I left we had a Navy that ranked with that of Costa Rica and had sailed literally millions of miles everywhere in the world."

At the launching Scripps Director Edward A. Frieman spoke of Revelle's strong support of seagoing research. He said, "This ship is dedicated to that special breed of oceanographer who has a deep and abiding love of the sea. They savor the sense it brings of exploration and adventure as well as the ability to vigorously pursue their important research."

Arthur Bisson, director of ONR's Science and Technology Directorate, mentioned the appropriateness of naming a Navy-owned, academic

research ship after Revelle, the individual who developed the academic-Navy connection better than anyone else. He commented, "The modern laboratories, expansive work decks, and superb sea-keeping capabilities of this ship will be enjoyed by hundreds of marine scientists in every discipline throughout her life."

Serving as the new ship's sponsor, Ellen Revelle Eckis spoke of her former husband's love of oceanography and his early seagoing experiences on Navy research expeditions. She was then joined by their granddaughter Caroly Shumway, a 1988 marine biology graduate of Scripps, at the bow of the ship, which they christened with a bottle of champagne.

When *R/V Roger Revelle* joins the Scripps fleet in summer 1996, the ship will continue the Revelle legacy by providing the seagoing

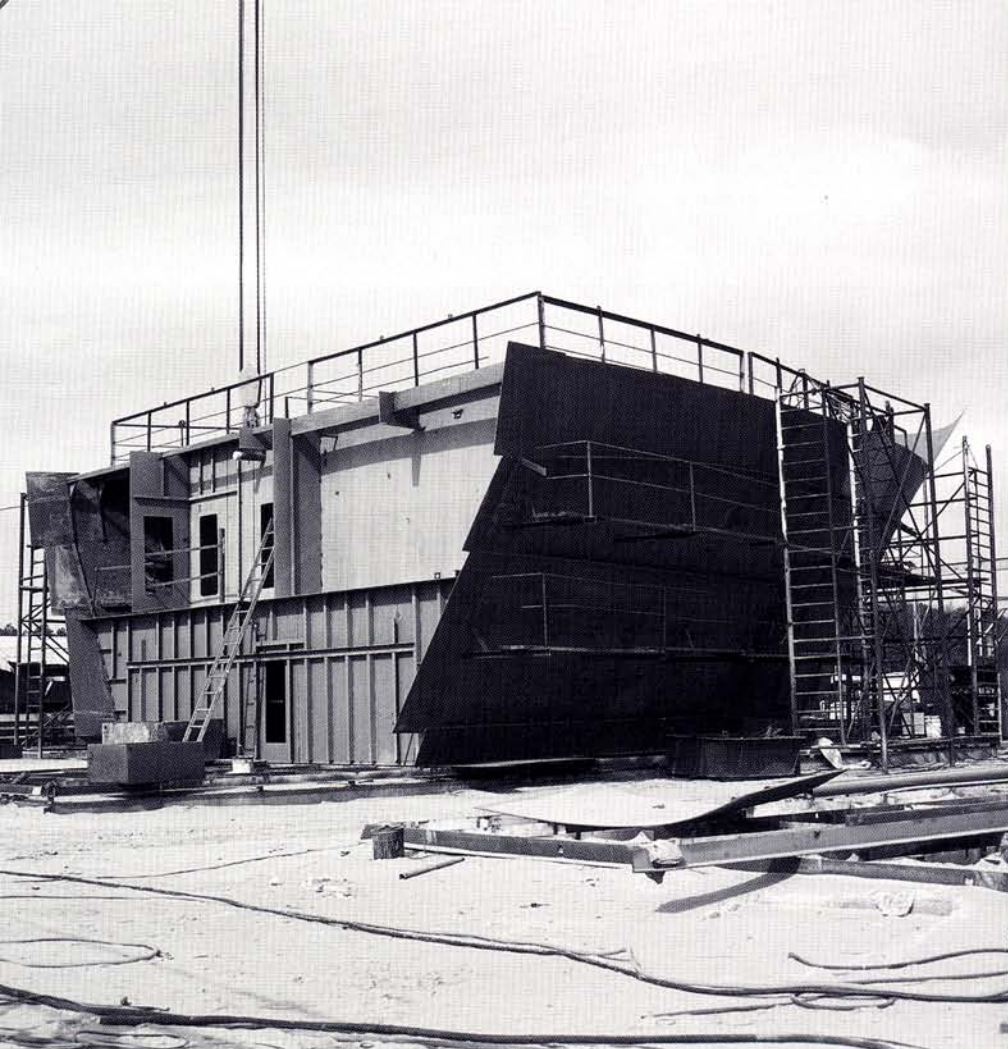
academic community with the latest ship-borne technology for observing and studying the oceans.

Revelle was one of the first scientists to express concern about the potential for increased greenhouse warming from the burning of fossil fuels. As one of the nation's most modern large research vessels, *R/V Roger Revelle* will voyage worldwide to examine the global environment and will be a key participant in several international marine research programs to detect and understand climate change.

*R/V Roger Revelle* will be of major importance to the many Scripps scientists and other researchers worldwide involved in these diverse programs: the World Ocean Circulation Experiment (WOCE), an effort to describe and understand the general circulation of the oceans with an emphasis on climate; the Joint Global Ocean

Hull of *R/V Roger Revelle* (below) nearing completion of construction at Halter Marine, Inc., in Moss Point, Mississippi. Modern ships are built in modules which are joined together to form the finished vessel. At Halter, some modules are built directly in the yard, some are built nearby, barged to Moss Point, and lifted ashore by cranes. The stern module was yet to be joined to the ship in the photograph below. The ship's skag, at the foot of the ladder, awaits welding onto the keel of the vessel.





Flux Study (JGOFS), a long-term observation of changes in ocean biogeochemical cycles in relation to climate change; the Global Ocean-Atmosphere-Land System (GOALS), an investigation of large-scale oceanic and atmospheric interactions and their relationship to short-term climate variation; and the Global Ocean Ecosystem Dynamics (GLOBEC), a program examining populations and communities of marine animals and how they are influenced by climate processes.

R/V *Roger Revelle* is the second of a new class of Navy-owned research vessels operated by academic institutions for general purpose oceanography. Scientists aboard the ship will be able to conduct studies in biological, chemical, and physical oceanography, as well as marine geology and geophysics, acoustics,

and engineering. *Roger Revelle* has the speed, endurance, and seaworthiness required to conduct year-round research in all of the world's oceans.

The cost of building one large-class ship, such as R/V *Roger Revelle*, is about \$50 million, so the academic community depends on the Navy for new ship construction. R/V *Roger Revelle* is the second of three new ships of its type and size. The U.S. academic fleet currently has six large ships. The addition of R/V *Roger Revelle* and her new sister ship, R/V *Atlantis*, to be operated by Woods Hole Oceanographic Institution, will conclude a multi-year, Navy-sponsored ship-building program to provide scientists with vessels for projected research needs into the 21st century. The scheduling and research mission of the U.S. academic fleet is coordinated

One of the modules (above left) not yet incorporated into the ship. Fabricating and welding (above right) is the essential process in hull construction. The hull of the R/V *Roger Revelle* (near right) is almost complete in this photo. The opening at the top of the ladder is an access convenience, which will be welded closed prior to launch. Hulls are erected on supports mounted on a number of railway carriages on parallel tracks. After a ship is launched, others are rolled riverward along the tracks. Taken just prior to launch (far right), workers release sand from a steel box that forms part of the support structure atop one of the railway carriages, easing the ship's weight off the railway carriages and onto a second set of support columns that ride on the actual launch ways. When the steel fixtures that restrain these launch supports are cut loose, the supports slide down the inclined, greased launch ways by gravity, launching the ship broadside.

by an organization of 57 institutions and national laboratories called the University National Oceanographic Laboratory System, or simply UNOLS.

Twenty-seven major oceanographic ships are operated by 19 UNOLS members throughout the continental states, Alaska, Hawaii, and Bermuda. The annual cost of operating the UNOLS fleet is nearly \$50 million with the largest share of the funding, about 80 percent, coming from the National Science Foundation. The Office of Naval Research provides about 10 percent and the National Oceanic and Atmospheric Administration about five percent. The remaining funding is from other federal and state agencies and university sources.

For the first year, *R/V Roger Revelle* operations will be limited to the northeastern Pacific in order to accommodate required sea trials

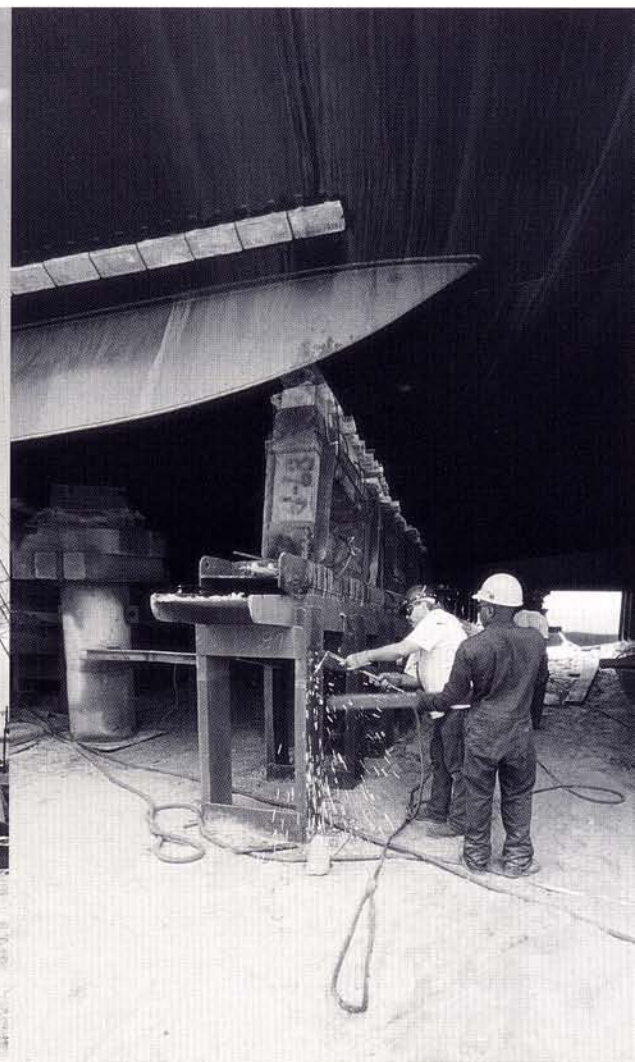
and inspections. She then will be available to all qualified and funded scientific users through UNOLS, which also coordinates ship scheduling and assists agencies in planning for future ship requirements. Based on projected research needs, it is anticipated that a large fraction of the ship's use will be by scientists from Scripps and other University of California campuses.

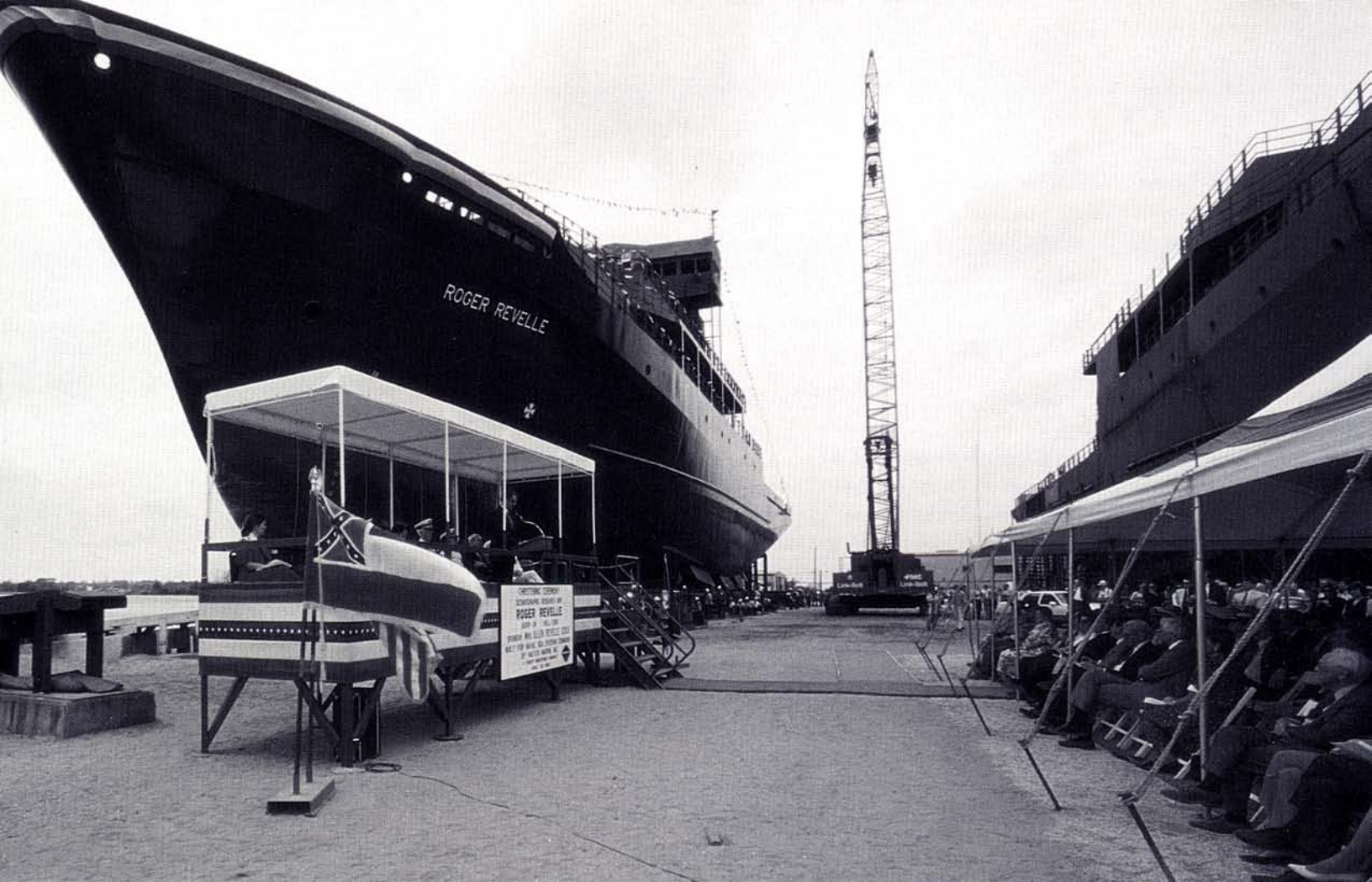
For now, *R/V Roger Revelle* is tied to the dock at the Halter Marine shipyard in Moss Point, Mississippi, about five miles up the river from the gulf coast, where the ship grew from flat sheets and rolled stocks of steel into the structure that was launched last April.

Work continues to complete the ship under the watchful eyes of Ed Petersen, Scripps's on-site construction representative. For Petersen it has been a challenging

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EDWARD A. FRIEMAN  
DIRECTOR, SCRIPPS INSTITUTION  
OF OCEANOGRAPHY





two years of overseeing a complex program of implementing and improving a detailed ship construction project while controlling costs and meeting the demands of scientists, shipbuilders, Naval personnel, and others. Through this maze, he has kept a steady course toward the delivery of this valuable research vessel. The anticipated long and successful service of R/V *Roger Revelle* will reflect his vigilance.

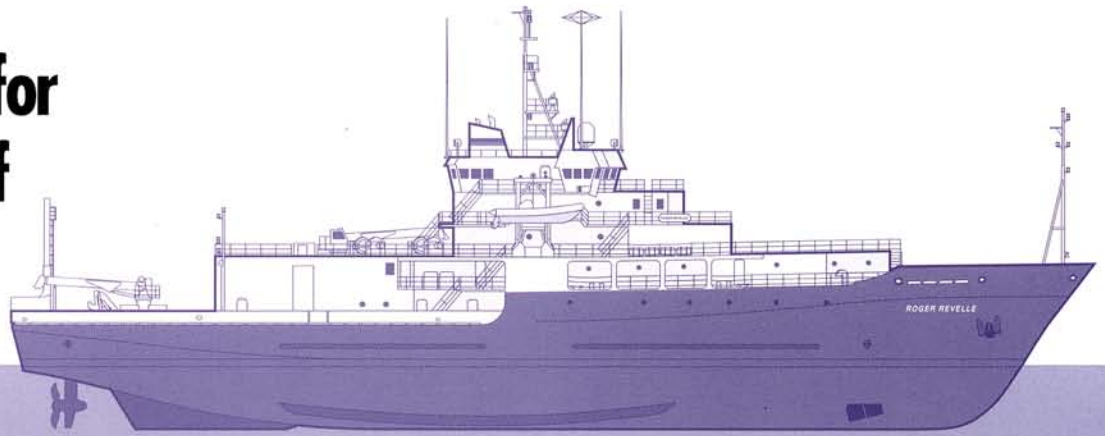
In accepting R/V *Roger Revelle* on behalf of the institution, Robert Knox, Scripps associate director for Ship Operations and Marine Technical Support, stated, "There is a strong, deep tradition of energy and excellence in seagoing science at Scripps and that tradition is as alive

and well today as it was in Roger Revelle's time. We are ready, willing, and able to accept the honor and the responsibility of operating this wonderful new ship for the good of the nation's oceanographic research." 

The Navy launching ceremony (above) marked the culmination of two years of construction at the shipyard. Ellen Revelle Eckis, (below) Roger's wife for 60 years, and her granddaughter Carly Shumway took a determined aim and christened the ship with a bottle of champagne.



# Decked Out for a New Era of Exploration



"T here is considerably more good ocean science research already in the minds of UC scientists, research that would use the capabilities of R/V *Roger Revelle* effectively and innovatively, than there is time on the ship or research funding to accomplish it all," said Robert Knox, Scripps associate director for Ship Operations and Marine Technical Support.

R/V *Roger Revelle*, under construction since 1992 at the Halter Marine shipyard in Moss Point, Mississippi, is scheduled to leave there on her maiden voyage to Scripps's Nimitz Marine Facility on San Diego Bay in June 1996.

The future ocean research envisioned and proposed on R/V *Roger Revelle* by UC scientists during the first three years of operation will take advantage of the ship's extensive capabilities. The exact research programs and schedule for operations beyond the first year are not currently fixed, but will likely include a wide range of studies.

Most of R/V *Roger Revelle's* operations will be funded by research supported by the National Science Foundation and the Navy's Office of Naval Research. The University of California has committed funds in the amount of \$750,000 per year for the life of R/V *Roger Revelle*.

R/V *Roger Revelle* will supply enhanced endurance, increased load-carrying and handling capabilities, enlarged laboratory space, precise navigation and positioning, and comfortable scientific accommodation, while carrying first-class instrumentation for underway measurements.

Scientists aboard R/V *Roger Revelle* will be able to suspend com-

plex arrays of acoustic devices and operate as a "quiet ship" with main propulsion shut down. Using the precise ship-handling capability available, researchers will be able to accurately place instruments on the seafloor to study plate tectonics. Deck-mounted cranes, winches, and wire-handling systems will be used by scientists to deploy nets for marine life surveys. Extensive laboratories will be available for analyzing seawater and air samples to interpret chemical cycling. Onboard systems will measure rapidly changing water currents and temperatures from the deep sea to the sea surface.

For efficient at-sea scientific operations, the scientific work areas are located on the ship's main deck with 3,500 square feet of open space and 4,000 square feet enclosed. A 30-foot high A frame is positioned on the ship's stern to handle cable work on deck along with two large cranes. Forward of the after deck is an enclosed staging bay where work can be conducted out of the weather. Next is the wet lab where researchers will handle water samples and marine life. Then comes the hydro lab for analyzing seawater, a divers' locker, and an electronics and computer lab. The largest space is the main lab, with nearly 2,000 square feet. There is also a clean lab for biology and chemistry, a photography dark room, scientific freezers, office space, and room for scientific storage. Two laboratory vans can be loaded on the main deck with additional space for vans on the two decks above.

For a ship of its size, R/V *Roger Revelle* is designed to be highly maneuverable and capable of precise navigation, positioning, tracking, and station keeping to support deep-ocean and coastal research. She is driven by two large "Z-drive" propellers and a rotating bow thruster, which will move the ship in any direction.

Control of the ship will be possible from the pilot house, as well as the aft control station and one of the labs to allow close coordination with scientific operations. There is an automated positioning system and several acoustic systems for positioning in respect to moored beacons, remotely operated vehicles, and other devices.

On-board scientific apparatus includes the multibeam echo sounding system SeaBeam 2112, a sophisticated, deep-sea charting and imaging system. There are also other acoustic instruments—bottom profilers, an underway current profiler, and more. Three winches supply a huge capacity for handling cables up to 45,000 feet long.

R/V *Roger Revelle* will give the Scripps community of scientist, technicians, students, and crew expanded capabilities for working at sea, making measurements, collecting data, and sampling the environment from the seafloor, through the depths of the ocean, and to the tops of clouds. 