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Foreword

By Arthur E. Maxwell and Margaret Leinen

One of us (Art Maxwell) played a pioneering role in proposing the first scientific ocean drilling program during the 1960s. The other (Margaret Leinen) was a graduate student at the time whose research interest in the history of the ocean depended on the core samples collected via this new program. Together, we have watched scientific ocean drilling evolve in many ways. The focus of drilling expanded from an effort to recover samples that could resolve hypotheses about Earth's crust (the nature of the Moho, plate tectonics, and global volcanism) to one that addresses hypotheses about the history of the ocean itself, about the interactions between the ocean, ice sheets, mountain building, and climate, and now to one that studies the coevolution of the ocean, oceanic crust, and life.

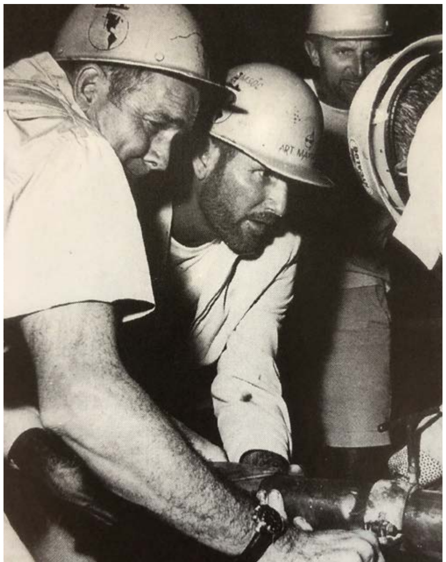
Along the way, technology innovations in scientific ocean drilling and sampling developed by both the program and scientists involved in the program led to vastly improved recovery of sediments and rock, the ability to collect pristine samples of fluids and microbiota associated with the samples, and capabilities for performing a range of experiments within the boreholes.

The scope of the program has expanded dramatically in 50 years. Several years ago, an internal analysis by the US National Science Foundation found that nearly a quarter of all US geoscientists in the country had some association with ocean drilling, through participation in expeditions or site surveys, through the use of samples and data made available by the program, or through participation in planning or scientific workshops focused on scientific ocean drilling.

The program originally depended on a single drilling ship funded by the United States. It now encompasses mission-specific platforms contributed by a European-led consortium and a unique riser vessel funded by Japan that is capable of deep drilling into tectonically active ocean margins.

During these 50 years, ocean drilling has pulled together the global geology, oceanography—and now also the geomicrobiology—communities. Many of our individual research relationships began in the core labs of the drilling vessels *Glomar Challenger*, *JOIDES Resolution*, *Chikyu*, and other platforms, or on ships conducting site surveys in preparation for and in support of the expeditions. The luxury of time spent together in labs at sea, or over meals during those cruises, spawned new ideas and directions for geology, geophysics, oceanography, and the life sciences that are independent of nationality or academic institution affiliation. Furthermore, the well-preserved core samples are available for continuing use by the global community. These core repositories represent an important data archive that will be used by scientists ad infinitum.

In this way, the drilling programs have supercharged scientific discovery. For example, paleoceanography was a word barely used before scientific ocean drilling provided the samples on which this very field depends so heavily.



One of the features of the program that excites us is its capacity for nurturing new ideas and creating opportunities to follow new scientific directions. While early drilling focused on resolving questions of interest to scientists, the themes of recent and proposed expeditions focus on issues critical to the future of humankind that depend on answers to basic science questions about climate, natural hazards, Earth dynamics, and the limits and sensitivity of life. This capacity for meaningful evolution is a key feature of the scientific ocean drilling program and one that makes us confident that it will continue to be an essential element of Earth, ocean, and life sciences studies in the future.

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ABOVE. Co-Chief Scientists David Rea and Margaret Leinen on the bridge of D/V *Glomar Challenger* during DSDP Leg 92 in 1983. *Photo credit: Victor Sotelo*

LEFT. Art Maxwell (center), along with Jim Dean and Dick Von Herzen, removing a core aboard *Glomar Challenger* on DSDP Leg 3 in 1968. *Photo credit: DSDP*