

Texas A&M University



INTERNATIONAL OCEAN DISCOVERY Program

For more than half a century, scientific ocean drilling has provided foundational research that contributes to advanced scientific research at the state, national, and international levels as well as workforce development and higher education. Indeed, the most continuous record of last 150 million years of Earth's history and the interconnected geologic processes in the complex Earth system are locked in the sediments and rocks below the seafloor. This archive is only accessible with scientific ocean drilling, which has provided critical new data about geohazards that pose risk to society (e.g., tsunamis causing earthquakes), Earth's climate history, including cataclysmic events that caused prehistoric extinctions, and new discoveries about microbial life that provides glimpses into life that may exist on other planets. These results are due to research conducted, supported, or facilitated by the IODP and its predecessors since 1968.

IODP'S IMPACT ON THE STATE, THE NATION, AND THE WORLD



Credit: IODP

FOR TEXAS:

- ▶ Enhances development of the state's workforce areas associated with science, technology, engineering, and mathematics (STEM)
- ▶ Attracts a diverse student population from multiple fields of research
- ▶ Provides outstanding opportunities for hands-on experience toward creating tomorrow's geoscientists and microbiologists
- ▶ Generates remarkable opportunities for advanced research across multiple disciplines



Credit: IODP

FOR THE UNITED STATES:

- ▶ Apprises US policymakers on the key issues of geohazards, ocean health, coastal resilience, carbon sequestration, and more
- ▶ Strengthens US longstanding leadership in scientific ocean drilling around the world just as China starts to launch its own scientific drilling vessel
- ▶ Provides state-of-the-art training opportunities for US students and early career scientists on an international stage
- ▶ Creates economic and employment opportunities for Americans
- ▶ Confronts significant challenges for science and engineering in the United States
- ▶ Creates unprecedented opportunities for scientists who study the Earth, sea, life in extreme environments and other planets

FOR THE WORLD:

- ▶ Contributes to our understanding of how climate and sea levels have fluctuated over millions of years
- ▶ Provides the foundation for advances in climate science, risk assessment, and resilience planning, addressing vital questions about Earth's past, present, and future
- ▶ Delivers cutting-edge monitoring of the tectonic processes that trigger mega-earthquakes and tsunamis, making forecasts more reliable, and assessing risks to vulnerable populations and infrastructure
- ▶ Enables the exploration of the world's seafloor, which is mapped to a lesser degree than the surface of the moon



Credit: IODP

“Scientific ocean drilling is a signature research capability that has continuously revolutionized science with great impact to the US and society. This is underscored by the effort of more than 650 scientists who came together and produced the visionary 2050 Science Framework. To achieve the framework’s Strategic Objectives and Flagship Initiatives, it is imperative in our opinion that NSF (1) establishes a bridging program to allow the JOIDES Resolution to continue to operate from October 2024 through 2028, and (2) leases or acquires a new US operated global-ranging riserless drilling vessel.”
 – United States Scientific Ocean Drilling Alliance (US-SODA), 2022

Over the last 55 years, IODP and its predecessors have completed more than 282 expeditions (186 with Texas A&M as the science operator). These explorations have yielded staggering returns, enabling pure discovery and revealing foundational knowledge about the geosphere, the biosphere, and the entire Earth system. The ocean drilling programs have also yielded economic returns—for example, through the discovery of salt domes linked to oil and gas resources—as well as expanded knowledge of the deep biosphere. The programs have also led to technological advances in coring systems, and provided countless opportunities for training and education in science and engineering for the next generation of explorers.

BY THE NUMBERS, THE JOIDES RESOLUTION*

PERCENTAGE OF ALL IODP EXPEDITIONS IMPLEMENTED **82%**

EXPEDITIONS SUPPORTED PER YEAR ON AVERAGE** **05**

PERCENTAGE OF ALL IODP COLLECTED SEDIMENT AND ROCK CORE **93%**

KILOMETERS OF SEDIMENT AND ROCK CORE COLLECTED **65+**

ACHIEVED THE OPERATIONAL GOALS LAID OUT IN THE 2013 IODP SCIENCE PLAN



Credit: IODP

The long-lasting impact of scientific ocean drilling is demonstrated by scientists and students from the United States conducting more than 53,000 database downloads of IODP expedition data and requesting more than 124,000 samples from IODP repositories since 2014. This contributes to a robust research environment. Since 2003, more than 4,000 peer-reviewed papers using IODP-associated samples and data have been published in 30 high-profile scientific journals including Nature and Science. Citations for these papers exceed 67,000. Such high-impact research is possible only through continuous funding from the National Science Foundation as well as the professional management of the JOIDES Resolution.

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* 2013-2024
 ** corrected for COVID-related expedition cancellations