

Scientific Ocean Drilling: Path to Innovation and STEM Workforce Development

Scientific ocean drilling engenders a virtuous cycle of new discoveries, technological innovation, and workforce development. Addressing its scientific objectives requires continual advances in drilling systems, observatory technologies, sensor capabilities, and laboratory techniques. At the same time, it provides the opportunity to train the next generation of scientists and engineers and fosters collaboration in complex international research teams. By selecting the most compelling and impactful scientific objectives through rigorous peer review, scientific ocean drilling programs have not only advanced fundamental Earth system knowledge, but also strengthened U.S. capabilities in climate science, hazard assessment, energy and carbon-storage research, technological innovation, workforce development, and global scientific leadership. The central hub of the next phase of U.S. scientific ocean drilling is the NSF Scientific Ocean Drilling Coordination Office, which is tasked with securing drilling platforms, implementing mission-specific expeditions, and coordinating support in an effort to preserve U.S. leadership at the forefront of scientific ocean drilling, even as other nations expand their capabilities.

Specific technological and workforce benefits of scientific ocean drilling include

- Driving innovation in drilling, sensing, robotics, data systems, and marine engineering with applications beyond ocean science.
- Training the next generation of scientists, engineers, technicians, data specialists, and educators through direct participation in expeditions and shore-based research.
- Serving as a gateway for students into careers in academia, government, environmental consulting, energy, engineering, and technology sectors.
- Producing a highly skilled workforce capable of addressing future challenges in climate, oceans, energy, and natural hazards.
- Supporting federal agencies responsible for climate prediction, environmental stewardship, and national resilience.
- Maintaining U.S. leadership in a globally visible scientific enterprise, with the possibility of continued international collaboration when deemed beneficial to the U.S.