



Bermuda Institute
of Ocean Sciences



Julie Ann Wrigley
Global Futures Laboratory
Arizona State University



Summer Course Research Diving Methods

2025



The Bermuda Institute of Ocean Sciences, a unit of the Julie Ann Wrigley Global Futures Laboratory, is a U.S. oceanographic research institution based in Bermuda. Founded in 1903, BIOS gained prominence after 1927 when the US National Academy of Sciences appointed the Lillie Commission to assess the needs of the U.S. oceanographic research community. Bermuda was selected as a key “substation” because it is “truly oceanic in location” and therefore in “the best situation in the North Atlantic for investigation into the phenomena that are fundamentally characteristic of the ocean basins.”

Today, ASU BIOS continues to conduct state-of-the-art oceanographic research with an emphasis on the North Atlantic Ocean and the coral reef platform of Bermuda. Because Bermuda is in the path of major ocean currents and in a region of significance with respect to climate change, our research portfolio has global relevance. We also leverages our core research to create unique educational programs at all levels—grade school through graduate school—many in collaboration with U.S. universities including; Princeton University, Furman University, Lehigh University, University of Rhode Island, Roger Williams University.

Bermuda is located in the sub-tropical Atlantic Ocean, some 600 miles from the coast of the U.S. Located in the middle of the North Atlantic Ocean, Bermuda is uniquely situated to serve as a base for research on a variety of inland, coastal, and deep water issues of both local, national and global interest. From here, scientists can easily venture into the surrounding Sargasso Sea, one of the world’s most diverse open-ocean ecosystems. Bermuda is also home to some of the world’s most northern coral reefs, allowing researchers from around the globe an opportunity to study corals outside tropical waters.



Summer Course

Research Diving Methods

Course Syllabus

subject to change

June 30 – July 18, 2025

Instructor: Kyla Flook (ASU BIOS, Dive Safety Officer)



Course Overview

The Research Diving Methods (RDM) course aims to familiarize participants with the fundamentals of scientific diving, both theoretical and practical. Research methods and practices are taught in class and then subsequently rehearsed on SCUBA during open-water sessions in the field. Underwater research techniques include navigation, search and recovery procedures, rescue diving, proper usage of lift bags and mapping techniques. A series of introductory science lectures provide the basic understanding of why and how marine scientists study communities using SCUBA. These lectures are integrated with field work to practice data acquisition using a range of methods and equipment, such as: underwater surveys to measure coral communities, coral condition monitoring to measure coral bleaching and disease, coral recruitment surveys, reef fish counts, seagrass surveys, common restoration techniques and underwater cementing, blue water diving to study planktonic communities, and marine archaeology. By the end of the course, participants will be trained to the standards defined by the American Academy of Underwater Sciences, of which BIOS is an organizational member. Future renewals will be subject to AAUS requirements. During the course, participants will also have the option to elect into additional specialist PADI qualifications, such as Advanced Open Water and Rescue Diver.

This course is aimed at all SCUBA enthusiasts who are looking to expand their experiences and skill sets whilst being immersed in marine science. In addition, given the usefulness and increasingly common employment of SCUBA as a research tool for marine science, undergraduate students possessing underwater research training will enjoy a competitive advantage.

Prerequisites

Participants must already be SCUBA certified (minimum of open water certified or internationally recognized equivalent). A minimum of 12 dives and at least one dive in the past six months is highly recommended. Per AAUS guidelines, participants are expected to provide all their own equipment as well as proof of recent gear servicing (regulators and BCD) within the last 12 months prior to arrival at BIOS. To be permitted to dive at BIOS, you must complete, and return to the Dive Safety Officer, various forms and meet certain medical safety standards, which will require physical examination from a health practitioner. The student dive information package (SDIP), including all such forms and supplemental information, will be provided after notification of acceptance on this course.



Reading Material

- AAUS self-study theory modules
- DAN DFA PRO course materials
- BIOS Dive Safety Manual
- PADI Advanced Open Water and Rescue Diver Manual (if applicable)

Course Structure

Grading

Course grading will consist of module quizzes, assignments, a final exam and a participation mark

Dive Theory (including but not limited to):

- Diver emergency care training
- Dive rescue
- Physics and physiology of diving
- Introduction to diving environments, including specialized environments and conditions
- Decompression theory and its application
- AAUS dive regulations and history
- Underwater scientific methods and data gathering techniques (including, but not limited to, quadrating, transecting, mapping, collecting, identification and survey techniques).
- Handling high pressure cylinders

Dive Practical (including but not limited to):

- Checkout dive
- Search and recovery
- Rescue diving
- Navigation
- Mapping project
- Series of dives to learn and practice underwater scientific methods and techniques (in conjunction with the introductory science lectures - below)

*Dive schedules are subject to change and dependent on prevailing weather and sea conditions

Introductory Science Lectures:

- Bermuda: Anatomy of an oceanic island
- Coral Identification and Ecology
- Reef Fish Identification and Ecology
- Seagrass Communities
- Coral Population Dynamics: measuring changes in community structure
- Marine Archeology
- The Open Ocean and Planktonic Communities
- Coral Reef Health and Restoration
- The Atlantic Lionfish Invasion



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