Opportunities for Students at BIOS in 2022

Research Diving Methods
Summer Course

Bermuda Institute of Ocean Sciences
The Bermuda Institute of Ocean Sciences (BIOS) is a United States 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 US 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, 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, BIOS’s research portfolio has global relevance. BIOS also leverages its core research to create unique educational programs at all levels—grade school through graduate school—many in collaboration with US universities (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 USA. 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, BIOS 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 13 - July 1

Instructors: Kyla Smith BIOS (Dive Safety Office and Small Boats Manager)
Dr Samantha de Putron (BIOS Associate Scientist and Senior Lecturer)
**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 imparted include: navigation, search and recovery procedures, rescue diving 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 whilst underwater using a range of methods and equipment, such as: underwater video and photographic 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, and blue water diving to study planktonic communities. By the end of the course, participants will be qualified Science Divers, as defined by the American Academy of Underwater Sciences, of which BIOS is an organizational member. During the course, participants will also have the option to elect into further 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 qualifications whilst being immersed in marine science. In addition, given the usefulness and increasingly common employment of SCUBA as a research tool for marine science, students, graduate students and professionals possessing underwater research qualifications will enjoy a competitive advantage.

**Reading Material**
- AAUS self-study theory modules.
- PADI Advanced Open Water, Rescue, and O2 Provider manuals.
- Emergency First Response participant material.

**Prerequisites**

Participants must already be SCUBA certified by a nationally-recognized agency, prior to arriving at BIOS. In order 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 package, including all such forms and supplemental information, can be downloaded from the BIOS website.
Course Structure

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.

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).

Introductory Science Lectures:
- Bermuda: Anatomy of an oceanic island
- Coral Reef Ecology
- Reef Fish Ecology
- Seagrass Communities
- Coral Population Dynamics: measuring changes in community structure
- The Open Ocean and Planktonic Communities
- Global and Anthropogenic Threats
- Coral Restoration