Graduate Program in Underwater Archaeology

Underwater archaeology is the study of the remains of past human activity through the exploration, documentation, and study of a variety of submerged sites, from shipwrecks to caves and springs to lakes and rivers. Archaeology makes history tangible. It provides a completely different portal through which to view the past. Perhaps most importantly, archaeology can make a difference. Archaeology has numerous benefits to us as a society. Archaeological sites and artifacts can play a large role in education, community cohesion, national identity, economic development, sustainable tourism, conservation, and, of course, entertainment among others. The material culture of our shared heritage and past provides cultural continuity, perspective, and a tangible link to those who preceded us. Archaeology can also give a voice to those who were not documented in historical texts or were overlooked. Shipwrecks and submerged sites have long fascinated humankind, perhaps never more so than in modern day, and given climate change worldwide, it is becoming even more important to document, study, manage, and find innovative ways to preserve what remains of our past.

The graduate program in underwater archaeology at the University of Miami Rosenstiel School of Marine, Atmospheric, and Earth Sciences (Rosenstiel) offers options for a Master of Professional Science and multi-disciplinary PhD tracks. The MPS Underwater Archaeology track (UARCH) is a minimal two-year program that focuses on the theory, field techniques, and management practices necessary to work within the field of archaeology and the broader general field of marine sciences. Coursework integrates topics such as site mapping and documentation, interpretation of shipwrecks and submerged sites, best management practices for cultural heritage, marine protected areas, and marine survey technology. Students will have opportunities to work side-by-side with professional archaeologists through internships and field projects with private, public, or non-governmental agencies, both nationally and internationally, and conduct relevant fieldwork. There are possibilities for a multi-disciplinary PhD program with a focus on underwater archaeology through the Department of Environmental Science and Policy and the Abess Center for Ecosystem Science and Policy, which are determined on a case-by-case basis and dependent upon funding.
MPS in Underwater Archaeology
Degree Schedule

Prerequisites:
- BA/BS in Anthropology, History, or related field
- Meet minimum ROSENSTIEL diving standards as outlined by the ROSENSTIEL Dive Office
  - Minimum open water scuba certification with a minimum of 10 logged dives
  - Medical clearance from a physician (must be an MD not an RN or LPN)
  - Ability to complete the required swimming test:
    - 400-yard swim in less than 12 minutes using no swim aids
    - 800-yard swim untimed using mask, fins, and snorkel
    - 10-minute tread
    - 25-yard underwater swim
    - Retrieval of an object from 15 ft to surface
    - 3 breath snorkel swim to demonstrate airway management
    - Buddy tow
  - Certified divers with prior scientific diving training and more than 50 logged dives
    may qualify for the Experienced Diver Checkout and not be required to take RSM 600
- Recommended:
  - Participation in an archaeological field school prior to commencing the UARCH program
  - Volunteer for terrestrial or underwater archaeological projects

Fall Semester Year 1:
EVR 632 Theory and Method in Underwater and Maritime Archaeology (3)
EVR 626 Submerged Cultural Resource Management (3)
EVR 660/661 Introduction to Marine GIS (3)
RSM 600 Research Diving Techniques (3)

*Recommended attendance at the Annual Conference on Historical and Underwater Archaeology by the Society for Historical Archaeology (SHA) in January and/or the annual conference of the Society of American Archaeology (SAA) for education and professional networking.

Spring Semester Year 1:
EVR 614 Underwater Site Mapping and Visualization Techniques (3)
EVR 615 Marine Geophysical Survey and Technology (3)
EVR 672 The Archaeology of Seafaring (3)
RSM 667 Motorboat Operator Certificate Course (2)
Elective Course (optional)

Summer Semester A-B Year 1:
EVR 691 Maritime Archaeology Field Study (3)
EVR 693 Maritime Archaeology and the Conquest of Mexico (3, based upon availability)
EVR 805 Internship (1-6)
Final Study/Thesis Research

Fall Semester Year 2:
EVR 692 Archaeological Study of Submerged Pre-Contact Sites (3, under development)
EVR 805 Internship (1-6)
Writing Course
Elective Course(Optional)
Final Study/Thesis Research
*Recommended attendance at the Annual Conference on Historical and Underwater Archaeology by the Society for Historical Archaeology (SHA) in January and/or the annual conference of the Society of American Archaeology (SAA) for education and professional networking.

Spring Semester Year 2:
EVR 805 Internship (1-6)  
Elective Course (optional)  
Final Study/Thesis Writing

Due at the End of Spring Semester Year 2:
Submission of Final Study/Thesis  
Presentation of Final Study/Thesis

Examples of elective courses:
APY 514 Human Osteology  
APY 617 Archaeometry: The Science of Material Culture  
MES 665 Exploration Technology and Media  
MES 674 From Gold to Glory: The Evolving History and Ethics of Exploration  
MES 618 Coastal Zone Management  
MES 616 Ocean Policy and Development and Analysis  
MES 720 Coastal Law and Policy  
MES 664 Citizen Participatory Science  
MES 606 Advanced Fieldwork in Coastal Cultures  
OCE 642 Physics of Remote Sensing I: Passive Systems  
OCE 643 Physics of Remote Sensing II: Active Systems  
MBE 716 Bayesian Statistics for Marine Scientists

Note:
EVR 691 and 692 can take place in a number of locations including, but not limited to Florida in Biscayne National Park, Florida Keys National Marine Sanctuary, Dry Tortugas National Park, Little Salt Spring, Manasota Key Offshore, or in conjunction with international projects in Mexico, Bahamas, Puerto Rico, Panamá, Colombia, or elsewhere in Latin America and the Caribbean.

Deliverables Necessary for Graduation:
Final MPS Study/Thesis: minimum of 65 pages, maximum of 120, not including bibliography  
Final MPS Presentation: 30 – 45 minutes with additional time for Q&A  
Minimum 2 credit hours of internship  
(Note: The program is rigorous and there is no guarantee of degree completion within the proposed two-year framework without a high quality final thesis and defense.)

Rosenstiel Underwater Archaeology Track Course Descriptions

EVR 632 Theory and Method in Underwater and Maritime Archaeology
This course covers archaeological theory and methodologies used to interpret underwater and maritime sites in both prehistoric and historic contexts. The interconnection of theoretical constructs with submerged archaeological remains is emphasized, providing a broad toolset that can be used to better understand and explain the archaeological assemblage and associated data sets acquired from the investigation of these sites and their association with human behavior and activity.

EVR 626 Submerged Cultural Resource Management
This course discusses various aspects and details of managing underwater cultural heritage/submerged cultural resources. Topics will include ethics, policies and procedures, marine protected areas, and federal, state, and international laws governing management of submerged archaeological sites. Specific focus is placed on examining the variety of management concepts and frameworks utilized both in the U.S. and internationally. Finally, the role and value of public archaeology in management is also presented and discussed.

**EVR 614 Underwater Site Mapping and Visualization Techniques**
This course is designed to provide students the practical and scientific tools necessary to conduct archaeological investigations in underwater contexts. Critical skills such as baseline mapping, trilateration, artifact illustration, photography, orthomosaics, 3D photogrammetric modeling and others are discussed, practiced, and ultimately applied during the dive portions of the course. Dive practicum will take place on shipwrecks in Biscayne National Park and nearby Virginia Key. This course will also place an emphasis on post-fieldwork efforts and professional report writing. Please note that there is a significant amount of diving to complete in this course. Prerequisite: RSM 600.

**EVR 615 Marine Geophysical Survey and Technology**
This course is designed to provide students with an introduction to current technologies and marine remote sensing tools utilized in archaeological survey. Instruction in the use of technology such as the magnetometer and sidescan sonar are covered in detail through permitted survey within the Florida Keys National Marine Sanctuary. The use of data acquisition software and the post processing of data are also key elements of this course. Additionally, aerial drone survey is also covered along with introductory skills for drone flight and operations. There is a significant component of this course utilizing boats and also a smaller diving component. Prerequisite or concurrent: RSM 667.

**EVR 672 The Archaeology of Seafaring**
While it has been argued that maritime archaeology is simply archaeology by a different name, the material culture associated with the maritime realm of human existence encountered in coastal or underwater archaeological investigations often differ considerably from their terrestrial counterparts. Often stripped of other diagnostic artifacts, remnants of the vessel itself along with its means of propulsion, machinery, and other auxiliary systems, often serves as the penultimate evidence of a vessel’s existence. As such, the study of naval architecture, technology, and the construction of vessels, argued to be one of the most complex machines produced by pre-industrial societies, provides invaluable insight into the societies in which they were created and may provide clues to a vessel’s history including age, purpose, nationality, and period of use that may not be readily apparent from other extant remains. This course will provide a basic overview of vessel construction techniques from antiquity to the modern era and will specifically focus on the challenges of interpreting the archeological remains of vessels in the western hemisphere.

**EVR 691 Maritime Archaeology Field Study**
This course will allow graduate students the opportunity to work professionally as archaeologists on a maritime archaeological project and put into practice the knowledge and skills they have acquired in the first year of their MPS courses under guided supervision. This course will be completely field-based and may be conducted in a number of locations, including the Florida Keys National Marine Sanctuary (FKNMS), Dry Tortugas National Park, Biscayne National Park, Emerald Bay State Park (CA), or on field projects in Panama, Colombia, or the Caribbean. Taking part in this class will allow students to work as underwater archaeologists with guided supervision, which will serve to better prepare them to function in a more independent role in their MPS internships and future professional careers.

**EVR 692 Archaeological Study of Submerged Pre-Contact Sites**
This course will allow students to take part in a prehistoric underwater archaeological field project and put into practice the knowledge and skills they have acquired in the first year of their MPS courses under
guided supervision. This course will be based both in the field and laboratory and skills such as mapping, excavation, in-field conservation of water-logged artifacts, artifact cataloging, etc. Students will also have an extensive reading list in order to familiarize themselves with the various assemblages and artifact typologies associated with the human activity of the time period of the given site being studied. Taking part in this class will allow students to be exposed to a broader array of site types within the field of underwater archaeology and acquire a broader skillset that is applicable to prehistoric archaeological sites and not just to shipwrecks and maritime sites. This course may take place at any number of submerged prehistoric sites including, but not limited to, Florida, the Bahamas, Puerto Rico, and Cuba. This will also serve to better prepare students to function in a more independent role in their MPS internships and future professional careers.

**EVR 693 Maritime Archaeology and the Conquest of Mexico**

This course will allow students to experience firsthand the archaeological and historical sites associated with the conquest of Mexico and to participate in international fieldwork investigating maritime archaeological sites associated with this seminal historic event. Site-based learning experiences will include world-renowned museums and very significant archaeological sites, both prehistoric and historic, which will provide perspective on cultural transition and conflict over time within the prehistoric societies in Mesoamerica and the eventual collision of cultures and civilizations at the height of the Aztec empire and the advent of Spanish colonialism. The fieldwork portion of the course will take place in the town of Villa Rica de la Vera Cruz and will be conducted from a borderlands/landscape lens, incorporating both terrestrial and underwater efforts. Students will participate in the archaeological study of and search for shipwrecks associated with the conquest. The fieldwork portion of the course will be conducted in collaboration with professional archaeologists and students and under permit from Mexico’s Instituto Nacional de Antropología e Historia (INAH) and the team will base out of the town of Villa Rica de la Vera Cruz. This course will be offered based on project need and available slots on the project team.

**RSM 600 Research Diving Techniques**

This course is designed to introduce students to the practices and policies of scientific diving. The object is to prepare students to use SCUBA as a research tool for the marine sciences. The course content will qualify students as Research Divers under the UM/Rosenstiel Scientific Diving Program and will meet the standards set by the American Academy of Underwater Sciences (AAUS).

**RSM 667 Motorboat Operator Certificate Course**

The MOCC course was developed and formalized by the United States Department of the Interior in the early 1990’s. The course is designed to give students broad academic knowledge and practical training running small boats (Boats 26’ in length or shorter). In addition to the relevant theory, students will get hands on training trailering small boats, launching and loading at boat ramps, slow and high speed maneuvering, in-depth understanding of navigation, Marlinspike (knot tying), as well as in water emergency training and the use of flares and pyrotechnics. The MOCC certification is the training standard for occupational small boating and used by government, public and private research organizations, public aquaria, etc. The certification is a marketable skill for students moving ahead in their careers in marine science.

**People**

*Faculty:*
Dr. Frederick H. Hanselmann, Director
Mr. Joshua Marano, Adjunct Lecturer/NPS

*Current and Past Committee Members and Internship Advisors:*
Mr. Matthew Lawrence, NOAA FKNMS
Dr. Kenneth Broad, Rosenstiel
Dr. Art Gleason, UM Physics
Dr. Keene Haywood, Rosenstiel
Dr. William Pestle, UM Anthropology
Dr. Meryl Shriver-Rice, UM Abess Center

**Current Research Projects**

Lost Ships of Cortés Project, Villa Rica, Mexico
Little Salt Spring Archaeological Visualization and Characterization Project, North Port, FL
Aerial Archaeological Survey and 3D Documentation Project, Key Largo, FL

*In development:*
Philippines DPAA Mission
Documentation and Study of Submerged Archaeological Sites, Bahamas

**Past Projects**

2021 Quicksands Archaeological Survey Project, Marquesas Keys, FL (NOAA OER funding)
2021 MA/RI Geophysical Anomaly Investigation and Site Documentation Project (BOEM funding)
2021 GOM Magnetic Anomaly Identification and Assessment Project (BOEM funding)
2021 Maritime Heritage in America’s Inland Seas: Three-tiered Cultural Resources Survey within NOAA’s Great Lakes National Marine Sanctuaries (NOAA OER funding)
2022 Trinidad and Tobago DPAA Mission (DOD funding)

**Project Assistance**

*Guerrero* Shipwreck Project, Biscayne National Park/Florida Keys National Marine Sanctuary
Deep Wrecks Documentation Project, Key Largo, Florida
Manasota Key Offshore Project, Manasota Key, Florida

**Partner Organizations**

*National Park Service:*
Biscayne National Park
Dry Tortugas National Park
Everglades National Park
Submerged Resources Center

*NOAA:*
Florida Keys National Marine Sanctuary
Wisconsin Shipwreck Coast National Marine Sanctuary
Lake Ontario National Marine Sanctuary
Office of National Marine Sanctuaries

*State of Florida:*
Division of Historical Resources
Bureau of Archaeological Research
Florida Public Archaeology Network

*International:*
Instituto Nacional de Antropologia e Historia, Mexico
National Museum of the Bahamas
University of the Bahamas
Universidad del Norte, Colombia
Non-profit:
Archaeological Society of South Florida
Submerged Archaeological Conservancy International

Recent Student Theses


