**BYZANTIUM BENEATH THE BLACK SEA**

**DEEPWATER INVESTIGATIONS OF TWO BYZANTINE SHIPWRECKS, 2007**

The August 2007 Black Sea Expedition of the Institute for Archaeological Oceanography at the University of Rhode Island (IAO) and the Institute for Exploration (IFE) investigated two Byzantine shipwrecks lying just outside the territorial waters of Ukraine and Turkey. Our goal was the experimental char-
acterization of both sites, and the implementation of long-term site monitoring, decay rate testing, and sediment analyses, in addition to archaeological recording and targeted excavation using IFO's remotely operated vehicle (ROV) Hercules. We conclude with a preliminary assessment of our abil-
ity to record, excavate, monitor, and conserve deepwater sites as underwater museums using oceanographic tools and technology.

The Black Sea in antiquity supported a robust trade in raw materials and luxury goods between the Medi-
terranean and the hinterlands of Europe and Asia. In contrast to the Mediterranean, however, the Black Sea has a
unique geophysical setting that supported a scientifically rich and historically significant underwater cultural heritage.

The 2001 UNESCO Convention for the protection of the Underwater Cultural Heritage (COPAHP) chal-
lenge archaeologists to consider in situ preservation as the first option. The cost and technical challenge of deep
submergence excavation and wholistic conservation makes this a particularly appropriate philosophy for
deepwater sites in the Black Sea. In addition, COPAHP promotes public access to in situ underwater cultural heri-
tage. Recent developments in telematic technology allow us to speedily make remote transitioning and permanent
public access to in situ underwater cultural heritage sites. We see in situ preservation as the first option, as re-
moved conservation and excavation have significant costs and risks.

For each site, we deployed conservation experiments and applied a different model of nautopsy, a
research model suitable for the in situ conservation of large, unique underwater cultural heritage sites. We
developed and implemented long-term observational and experimental conservation experiments that will
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**Two Byzantine Shipwrecks** were the focus of our 2007 field season. The early medi-
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A.D.-Chersonesos A shipwreck sank in the almost intact state of Chersonesos A, discovered in 2004, lies at 115 meters depth off Genoa, Italy. The site was not disturbed by earlier excavations, and the wreck was found complete with a cargo of amphorae, jars, and other artifacts. The site is located in an area of the Black Sea known as the “Lost City of the Western Mediterranean,” and is considered one of the most important archaeological sites in the region. The site is a key example of the rich trade in luxury goods that took place between the Mediterranean and the Black Sea in the Roman period.

**Environmental Analysis** and monitoring of deepwater sites help us to understand their
developmental history and the impacts of natural and human activities on the site. The site is located in an area of the Black Sea known as the “Lost City of the Western Mediterranean,” and is considered one of the most important archaeological sites in the region. The site is a key example of the rich trade in luxury goods that took place between the Mediterranean and the Black Sea in the Roman period.

**Decay Rate Experiments** (called “nau-tologies” and “sea-
tologies”) were deployed at each site. These experiments were designed to test the effects of various parameters on the decay of the site, including temperature, salinity, and the presence of organic material. The experiments were designed to test the effects of various parameters on the decay of the site, including temperature, salinity, and the presence of organic material. The results of these experiments will provide valuable information on the decay rates of underwater cultural heritage sites and help inform the conservation and management of these sites.

**Mapping** of the shipwrecks was conducted using both visual and sonar techniques. The shipwrecks were mapped using multibeam sonar, which allowed for the creation of detailed 3D models of the site. The maps were then used to guide the excavation and conservation work, and to inform the development of long-term management plans for the sites.

**Sustainability, Accessibility, and Archaeological Oceanography**

As private enterprise moves into the deep sea with budgets that far outstrip the resources usually available to public
institutions, it is imperative for the safeguarding of humanity’s underwater cultural heritage that archaeologists find
a way to keep pace. One option available to archaeologists is to form partnerships with marine scientists, accessing oceanographic
data and tools for in situ oceanographic data collection and analysis, and collaborating with marine biologists and ecologists to
understand the impact of deepwater sites on the marine environment. As deepwater sites are often located in sensitive
areas, it is important to consider the potential impacts of deepwater site conservation on the marine environment and to
develop strategies for minimizing these impacts. This is especially important for deepwater sites that are located in areas of marine biodiversity, such as coral reef systems or marine protected areas.

While recognizing that complete excavation is the best way to understand an ancient shipwreck, for the majority of
depthwater sites, this is neither feasible nor justified. The concept of ‘nautopsy’ is a research model suitable for the
investigation of deepwater sites using current technology. In designing long-term research and site management plans
for deepwater sites, it is important to consider the potential impacts of deepwater site conservation on the marine environment and to develop strategies for minimizing these impacts. This is especially important for deepwater sites that are located in areas of marine biodiversity, such as coral reef systems or marine protected areas.

As deep submergence excavation technology develops, the depths of the Black Sea are likely to become one of the
most significant sources of new information about the ancient world. As new frontiers of archaeological discov-
eries are being explored, it is important to consider the potential impacts of deepwater site conservation on the marine environment and to develop strategies for minimizing these impacts. This is especially important for deepwater sites that are located in areas of marine biodiversity, such as coral reef systems or marine protected areas.