



# Historic Voyage in Chesapeake Bay Provides Unique Water Quality Data Set

A small wooden boat sets sail into the Chesapeake Bay on a crisp, sunny morning. Twelve brave explorers aboard grip oars and row, contemplating the many miles of water they will traverse on their day's journey. And for the next 121 days.

This scene could be of America's early explorers, but it actually describes a present day event. An historic replica of John Smith's famed shallop (watercraft) of the early 1600s, set sail from historic Jamestown on May 12, 2007.

The shallop, manned by members of Sultana Inc., will retrace the path of Smith's exploration of the waterways and tributaries of Maryland, Delaware, Washington, D.C., and Virginia over four months, returning in September to Jamestown. ([www.johnsmith400.org](http://www.johnsmith400.org))

Four hundred years ago, John Smith kept journals while on his original voyage. He describes the beauty of the Chesapeake waters and its incredible ecosystem. Now, researchers from NOAA ([chesapeakebay.noaa.gov](http://chesapeakebay.noaa.gov)) are working with the shallop crew to collect high-resolution data about the present-day quality of this same water.

Discreetly mounted aboard the shallop replica are some decidedly non-historic, high-tech instruments for collecting this data, provided by YSI Inc. During every half-hour of the voyage, a YSI Underway Water Quality Monitoring System -- consisting of a 6600 V2 sonde, GPS antenna, flow cell, pump, and data logger/telemetry module -- measures the dissolved oxygen content and temperature, as well as the salinity, pH, chlorophyll, blue-green algae, and turbidity levels in the water.

Doug Wilson, Oceanographer and Program Manager for Integrated Coastal Observations at the NOAA Chesapeake Bay Office, states, "This will provide a unique record of Chesapeake Bay water quality conditions along the route traveled by the first European explorers 400 years ago. It is especially interesting given

that the standard benchmark for today's Chesapeake Bay restoration efforts in the Bay ecosystem described by John Smith on his voyages. The data set will be valuable to environmental scientists and educators long after this voyage is completed."

The system was installed by YSI field engineers so as to minimize the aesthetic impact to the replica vessel. Additionally YSI is providing regular maintenance, helping to ensure the continual quality of the data being collected. This service allows the crew to focus on its voyage and training stops; the underway system works autonomously without the need for crew intervention.

The data is logged by instruments on ship and then sent to a NOAA data server in Williamsburg, VA, via the Verizon Wireless broadband wireless data network. In addition to the water quality data, GPS positions logged and transmitted every ten minutes allow "virtual voyagers" to precisely follow the shallop's journey on the internet.

Chris Heyer of YSI assisted NOAA and Sultana with the design and installation of the monitoring system. He notes that the shallop's continuous 1700-mile journey is an excellent opportunity for "underway sampling," collecting highly resolved water quality data over a large area. In the case of the Chesapeake Bay, it is one of the United States' largest and most important estuarine watersheds.



Top: The replica of John Smith's shallop at dock. Above: The underway monitoring system, including a YSI water quality sonde, discreetly mounted aboard the shallop.

YSI has built customized underway monitoring systems for a wide variety of vessels including passenger ferries and research vessels. “If YSI can customize a system for this historic voyage, then I am confident that we can build a system for any watershed monitoring need,” says Heyer.

YSI Incorporated is an employee-owned company that designs, manufactures, and distributes sensor technology, instruments, and systems for the global environmental monitoring market.

*For additional information, please contact YSI Integrated Systems & Services: 800-363-3269 (U.S.), 508-748-0366, [systems@ysi.com](mailto:systems@ysi.com), [www.ysi.com/systems](http://www.ysi.com/systems).*



*The replica of John Smith's shallop under sail in April 2007.*