



Southampton Oceanography Centre Utilizes YSI Multiparameter Technology to Search for Clues to Harmful Algal Blooms

Harmful algal blooms (HABs) create noxious and toxic conditions for aquatic animals as well as human beings in and about the water where they occur. Data indicate that these phenomenon are on the rise world-wide, hence estuarine and near-coastal researchers have begun to invest increasing amounts of time and other resources in efforts to characterize these phenomenon and understand what causes them.

Dr. Duncan Purdie, University of Southampton, Southampton Oceanography Centre, has been studying the water quality of the Fleet Lagoon in Dorset, England for the last two years as part of a cooperative effort that includes the doctoral research work of Silvia Nascimento on Harmful Algal Blooms. The program is funded by the Brazilian Agency CAPES and by the EU agency's Harmful Algal Blooms Expert System (HABES) program. In September 2000, the Fleet Lagoon experienced a massive dinoflagellate bloom which prompted Southampton Oceanography Centre to acquire continuous water quality monitoring technology in order to learn more about the factors associated with HABs there and to record such an event should it happen again.

In September 2001, Dr. Purdie and coworkers deployed a YSI 6600 multiparameter sonde affixed to a bottom-mounted frame at the head of the Fleet Lagoon, adjacent to the Swannery at Abbotsbury. The sonde was left fully submerged collecting data in unattended mode every 10 minutes for three weeks

(Figure 1).

Water quality measurements

including temperature, salinity, pH, dissolved oxygen, chlorophyll and turbidity, as well as depth data, were logged internally by the 6600 and stored in its memory. These data are being compared with tidal and meteorological information to begin to understand the conditions influencing the development and maintenance of algal blooms in the lagoon.

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The Fleet Lagoon is a productive estuarine environment in which stationary substrates become covered or “fouled” by biological growth. After three weeks, the 6600 was retrieved



Figure 1. The YSI 6600 instrument affixed to the deployment apparatus after a three week deployment.

from its station. Visual inspection revealed the advantage of YSI's wiped sensor technology for minimizing fouling (Figure 2). Using the 6600, Dr. Purdie and company were able to observe the consequent and concomitant changes in water quality in response to and associated with the spring-neap tide patterns.

Dr. Purdie commented that through the use of the 6600 they were able to observe, “that temperature and salinity data fit with the spring-neap tide pattern, and that pH and percent dissolved oxygen saturation data show large diel

changes reflecting day time production of dissolved oxygen and nightly removal by respiration. Similarly, pH increased during the day due to CO₂ uptake and decreases at night due to CO₂ release.” Differences in turbidity and chlorophyll between spring and neap tides were also

observed, with turbidity being notably higher on neap tides, when water depth is shallower, resulting from re-suspension of sediment by wind.

The 6600 is an *in-situ*, water quality datalogger that can measure up to 17 parameters simultaneously. It can be deployed in unattended mode using self-contained power or can be used with YSI’s 650 MDS (Multi-parameter Display System) handheld display-logger for measurements in horizontal and vertical profile. In addition, the 6600 is easily integrated, via RS-232 or SDI-12, with data collection platforms (DCPs) and functions as a vital part of real-time and remote data acquisition systems, such as YSI’s 6200 DAS.



Figure 2. Wiped sensor tips at end of a three week deployment. Note the rings of biological fouling at the wiped periphery: demonstrates the value of YSI wiped technology.

The YSI 6600 continues to facilitate the efforts of Southampton Oceanography Centre with the capability of continuously collecting accurate estuarine water quality data that could not be practically collected otherwise. Investiga-

tions are continuing on HABs in the Fleet Lagoon and other south coast estuaries like Southampton Water and Solent in 2002-2003 through the HABES project. Information about HABES can be obtained by visiting their web site at www.habes.org. To learn more about Dr. Purdie and the Southampton

Oceanography Centre’s studies please visit their web site at www.soc.soton.ac.uk/SOES/STAFF/dap.html. To learn more about YSI’s multiparameter water quality monitoring sondes and systems in Europe, please contact Darren Hanson at 441-252-541164. Worldwide, call 937-767-7241 or 800-897-4151.

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