

Long-term Deployments in Estuarine Conditions with EXO Antifouling Capabilities

YSI Environmental Monitoring Systems
Application Note A598

Situation: The shallow waters of Tampa Bay, on the west coast of Florida, are home to many species of fish and birds. The warm saline environment also supports a variety of micro-organisms that readily colonize water monitoring equipment deployed in the Bay for long-term studies. When instruments become covered in biofouling, their ability to accurately collect water quality data is compromised, and various anti-fouling systems have attempted to mitigate this.

Technology: Two YSI EXO2 sondes were tested alongside a YSI 6600 V2-4 sonde at a stationary site in the estuarine waters. After 30 days the sondes were removed and inspected for biofouling buildup.

The new antifouling features of EXO outperformed the current leading technologies. These features include: 1) a central wiper with nylon bristle brush that "clean sweeps" all sensors, which are now the same length, and 2) a wiper brush guard, or "parking garage," which keeps the brush cleaner and more protected.

Data: "We've listened to feedback from our customers," notes YSI Applications Engineer Mike Lizotte, "and protecting the integrity of data through decreased biofouling is one of their prime concerns."



EXO2 sonde with central wiping brush and other antifouling components after 30-day deployment in Tampa Bay, FL, USA



YSI 6600V2-4 with antifouling components after 30-day deployment in Tampa Bay, FL, USA

Individual mechanical wipers and copper-alloy materials used for the YSI 6-Series sondes successfully deterred much biofouling, although “there were still a few hard-to-reach areas on the sensors where pesky organisms could grow,” says Lizotte. See *photo, bottom right*. After 30 days, biofouling around the edges of the sensors or top of the wiper shaft could grow long enough to possibly interfere with sensor readings for dissolved oxygen, turbidity, chlorophyll, or blue-green algae.

To further reduce instances of biofouling, the EXO2 sonde uses a central wiper with a wider sweeping circumference. See *photo, top right*. The larger wiper reaches the edges of all sensors to remove buildup, and the sensor assembly is made of antifouling metal so organisms cannot attach to the top of it. Furthermore, the EXO sonde uses proven YSI antifouling techniques, such as a copper screen around the conductivity-temperature probe, copper tape around probe housings, C-Spray solution, and a brass sensor guard.

Results: Many current antifouling systems have successfully deterred biofouling in various environments; however, in certain estuarine conditions biofouling can still be a menace during long-term studies. Improving on its previous antifouling technologies, YSI tested new antifouling strategies for its EXO platform with excellent results.

Biofouling is a key issue for many water monitoring teams, and new approaches to dealing with it would be welcomed by the monitoring community. A National

Estuarine Research Reserve site in South Carolina will conduct validation studies of the EXO and its antifouling technologies during the summer 2012.

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