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Indian River Lagoon Observations

May 12, 2016: Barnacle Busting

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Harbor Branch Engineers Ben Metzger (left) and Geoff Beiser examine our first LOBO unit, with antifouling painted over its taped surfaces and copper cladding over its cables shortly, before its first deployment in January 2013. The unit never looked this good again! (Image credit: Brian Cousin)

Barnacles and oysters, and bryozoans, oh my! Welcome to the wonderful world of biofouling, or more specifically the biofouling of in situ water quality instrumentation we use in IRLON. Biofouling is the unwanted growth of organisms on submerged structures. Biofouling organisms serve an important role in estuarine environments by improving water clarity, providing nursery habitat as well as a food source for other species.

Despite the benefits biofouling organisms have on the estuary, they are the biggest challenge facing long-term water quality monitoring. Biofouling can degrade sensor performance by growing atop optical windows and preventing flow through instrumentation. The rate of biofouling changes throughout the year with peak growth typically in the wet summer season when temperatures are higher and salinities are lower.



Heavy growth and sedimentation are evident on this SUNA, which measures nitrate, and its integrated wiper, after three weeks at our Link Port site (IRL-LP), near Harbor Branch, July 25, 2015. (Image credit: Kristen Davis)

IRLON's approach to combat biofouling is multi-tiered. LOBO instrumentation was selected for use in the IRL and St. Lucie Estuary based in part on its combination of active and passive anti-fouling capabilities. For example, the water quality monitor (WQMx) has copper cladding and a wiper that rotates over the face of the optics window before every measurement. Each instrument is wrapped in copper tape, and the LOBO cage is painted with anti-fouling paint before the instruments are attached.



Three weeks of heavy barnacle and bryozoan growth on the sensor end of SeaFET, which measures pH, resulted from lowered salinities following an unusual rain event at our "Crossroads" site (IRL-SLE), October 12, 2015. (Image credit: Kristen Davis)

Even with all of the preventative measures, biofouling organisms still find ways to colonize the LOBO units, and that is where our field team comes into play. Led by IRLON Technical Coordinator Jon Richardson, the IRLON team visits each site every three weeks to retrieve the LOBO and perform continuing calibration verifications, both before and after cleaning has been performed. These protocols help us to determine the extent of drift that has occurred because of biofouling.

During the four-hour site visit, typically at least one of the three person-team removes biofouling organisms from the LOBO instruments and cage. So whoever draws the short straw is the designated barnacle scraper for the day, right? This is not typically the case due to the unusual IRLON phenomenon of “the zen of barnacle scraping” that allows even the most frustrated team member to achieve a level of calm!

Namaste.

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