



NAVAL RESEARCH LABORATORY

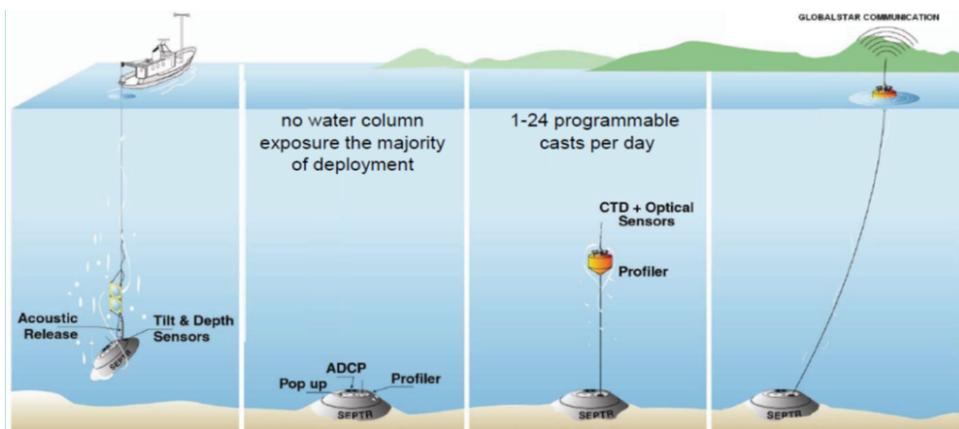
The Corporate Laboratory for the Navy and Marine Corps

BOPPERS: Autonomous Underwater Environmental Monitoring System

The US Naval Research Laboratory detachment at Stennis Space Center has developed and tested a patent-pending device capable of relatively lengthy unattended operations and high sampling frequency of underwater environmental data anywhere in the world. Boppers—the Bio-Optical Physical Pop-Up Environmental Reconnaissance System—is housed in a trawl-resistant case that has been field tested to 90m. A bottom-mounted, upward looking acoustic Doppler current profiler monitors currents of an entire water column. A tethered sensor platform is released from the base and rises to the surface at pre-determined intervals to continuously collect data such as water temperature, salinity, pressure, waves, and optical properties throughout the water column. Once the sensor platform reaches the surface, the data can be transmitted in near real-time via a variety of means, including Iridium global satellite communication, radio, or local cellular. Once transmission is complete, the sensor platform is retracted back into the protective housing underwater.

Boppers systems can conduct about 120 water column profiles on a single charge.

The system features an advanced energy-efficient winching system, and anti-fouling mechanisms for long and efficient sensor life. The sensor payload is highly customizable to accommodate an array of physical and bio-optical sensors, and Boppers could even act as a communication gateway for other sensors in the area.



The US Navy has developed and tested Boppers for the repeated unattended collection and reporting of environmental data from the entire water column from depths of 100m or less.

Benefits

- Unattended Operation: Capable of conducting up to 120 water column profiles from a depth of 100m
- Robust: Boppers is built into a sturdy, trawl-resistant base that is energy efficient and protective against the damaging effects of biofouling on the pop-up sensor platform
- Flexible: System can accommodate a large number of diverse sensors to measure a variety of physical and bio-optical properties

Status and Opportunity

- Published US patent application 2014/0214323 and international filing PCT/US13/75267 are available for license
- Potential for collaboration with NRL Stennis Space Center researchers
- Additional information available at techlinkcenter.org/boppers