



## An Autonomous Profiler for Estuarine Monitoring

### Challenge

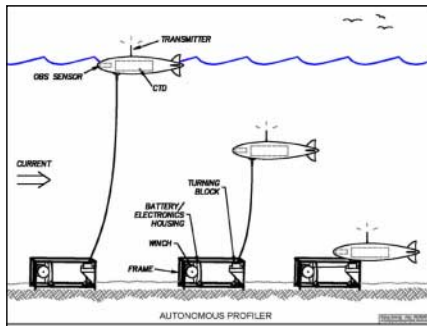
In order for researchers and managers to more accurately understand the complex ecology of estuarine environments, it is important that they be able to collect data in a continuous manner from different water depths. "Profiling" estuarine water columns in this way can provide integral information on such conditions as salinity, temperature, chlorophyll fluorescence, suspended sediments and dissolved oxygen. This project seeks to develop an autonomous general-purpose profiler that is easily operated, impervious to the elements, and able to be deployed for long periods of time.



### Science

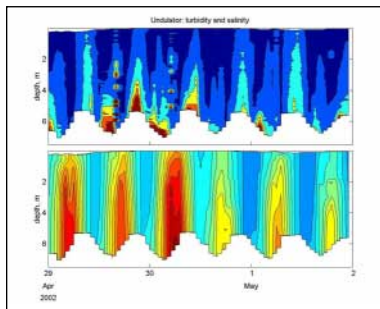
#### Profiler Components

- The new profiler is composed of two units: the winch, motor and battery unit and the buoyant sensor module. The winch releases the sensor module, which ascends slowly to the surface. As it rises, sensors are activated, taking continuous measurements through the water column. When the module reaches the surface, the winch detects the release of tension and collects slack, maintaining the module in place until it is winched back to the bottom.



#### Results

- The prototype profiler system was tested extensively in Woods Hole Harbor under a variety of conditions. It was also tested twice in the Hudson River in an area with high currents. The new profiler proved reliable even in murky waters with high amounts of suspended sediments, strong currents and large waves. The figure to the right shows data collected during the second Hudson River deployment when 391 hourly profiles were collected over a 16 day interval.



### Application

#### Compact and Easy to Use

Unlike pre-existing profilers, this instrument is small and light-weight, easy to program and operate, and readily deployed and retrieved from a small boat. It can successfully perform hourly profiles of the water column in 20m of water, for up to 2 months.

#### Broad Use in Research and Management

This newly developed profiler has broad applications in estuarine research and management, and has particular relevance to studies of hypoxia and sediment and contaminant transport.

#### Use as a Commercial Product

The Autonomous Profiler technology is in the process of being licensed to a company that manufactures environmental monitoring equipment and should be available in a commercial form by the end of 2004.

### Project Essentials

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*Start - End Date:* 01/09/2000 - 01/09/2002

*NERR Reserve(s):* Great Bay, Winyah Bay, Hudson River

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