



August 30, 2010

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**Beacon Institute adds additional advanced monitoring station to river observatory network for upper Hudson**

***New Schuylerville sensor platform will augment Fort Edward river data at a critical time***

**Schuylerville, NY**– On the heels of the recent report by independent scientists to the U.S. Environmental Protection Agency recommending more data about the upper Hudson River, Beacon Institute for Rivers and Estuaries has deployed an additional real-time monitoring station, designated “B3,” in the upper Hudson River near the village of Schuylerville, visible from the Champlain Canal Lock #5.

B3 is the newest addition to Beacon Institute’s River and Estuary Observatory Network (REON). REON provides minute-to-minute data regarding the physical, chemical and biological conditions of New York's Hudson and St. Lawrence Rivers via an integrated network of sensors, robotics and computational technology distributed throughout both rivers.

Beacon Institute deployed the first upper Hudson platform, B2, on June 22-23, 2010, in cooperation with General Electric. Located just north of the Thompson Island Dam, B2 is in the vicinity of the first phase of the Upper Hudson River Dredging Project performed by GE last year. Beacon Institute and GE entered into the scientific and technical collaboration to enhance monitoring of the upper Hudson, in particular the movement of sediments and particles that are naturally suspended in the river. Data collected in the research effort will be made available publicly and shared with state and federal regulatory agencies.

The B2 and B3 platforms feature several on-board sensors that track multiple environmental parameters (see sensor array description below), including a laser in-situ scattering and transmissometry sensor, or LISST. This advanced sensor shines a narrow red laser beam into the water to measure the number of suspended particles in the water column. These parameters are key measurements toward a better understanding how particles collide, bundle together and move through water. Since PCBs are transported through the water by readily attaching to sediment particles, the combined data from the B2 and B3 platforms will help researchers better understand this mechanism create a model of particle and contaminant transport.

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In close proximity of both B2 and B3, GE deploys its own automated monitoring buoys to collect water samples for laboratory analysis and perform real-time water quality measurements. GE will also continue to perform routine PCB monitoring upstream and downstream of B2 and B3.

Beacon Institute's Chief Research and Education Officer, James S. Bonner, Ph.D, P.E. and his REON research team from Clarkson University have designed and deployed all of the sensor equipment in the REON system. In addition to leading the REON initiative, Dr. Bonner is a Shipley Fellow at Clarkson University, a professor of civil and environmental engineering and an oil spill remediation expert. REON's sensor instrumentation and innovative monitoring technologies have been adapted for river use from Dr. Bonner's years of oil spill remediation studies and the advanced monitoring network he deployed in Corpus Christi Bay in the Gulf.

The REON system includes B2 and B3 on the upper Hudson River, the B1 platform located off Denning's Point in Beacon, NY, and additional monitoring stations at West Point, Poughkeepsie, Albany, and Troy.

"The upper Hudson is an environmental frontier for knowledge and technology that has ecological, economic and historical value of its own," said John Cronin, Director and CEO of Beacon Institute, a thought leader on water issues who lectures nationally on our environmental future. "Beacon Institute is investing millions in research, education, and technology development to bring 21<sup>st</sup> century resources and a new generation of recognition to this under-valued resource. Real-time monitoring will transform what scientists and students alike will learn, and what we can do to protect this vital and important part of the Hudson River."

### ***About the REON B2 and B3 advanced monitoring platforms at Fort Edward and Schuylerville:***

**Real-time data from B3:** <http://www.bire.org/schuylerville.php>

**Data for the entire REON system:** <http://www.bire.org/approach/reondata.php>

Beacon Institute and Clarkson University deployed B3, the third advanced monitoring platform in the REON network, in the Hudson River on Thursday and Friday, August 26-27, 2010. B3 is moored in the Hudson River near the village of Schuylerville, NY, south of the Thompson Island dam in Fort Edward, NY, and just east of the Champlain Canal Lock #5.

B2 was deployed and field tested on Tuesday and Wednesday, June 22-23, 2010. B2 is moored in the Hudson River approximately 2,700 feet north of the Thompson Island dam in Fort Edward, NY.

The shackles and chains of mooring adjust tension on the platform based on water and wind conditions, much like the way shock absorbers smooth the ride of an automobile. Photovoltaic panels provide solar power to batteries on deck, which power everything on the sensor platform including the wireless communications. The computer-controlled autonomous robotic profiler enables an array of multiple sensors to move up and down in the water for measurements. An on-board computer receives information from the instruments and serves as a data logger, and relays commands to profilers. Remote programming allows for autonomous and cyber control of the sensor array.

The REON B2 and B3 advanced monitoring platform capabilities include:

**METEOROLOGICAL TOWER** that measures wind direction, flow and speed, as well as air temperature and barometric pressure.

**ACOUSTIC DOPPLER CURRENT PROFILER (ADCP)** that uses sound waves to measure the direction and speed of water currents. This instrument provides fundamental hydrological data that can be combined with other environmental data (e.g. sediment concentration data) to calculate the amount the sediments transported over time. This technology is currently be evaluated as an alternative method to measure sediment concentration.

**COMPUTER CONTROLLED AUTONOMOUS ROBOTIC PROFILER** with multiple sensors to take a series of measurements of the river at several depths and/or locations.

- **LASER IN-SITU SCATTERING AND TRANSMISSOMETRY (LISST):** A narrow red laser beam shone into the water measures the amount of particles in the water and their size range. Since many contaminants, (including PCBs) readily bind to aquatic sediments, particle size and concentration are particularly important to measuring transport of PCBs in the river.
- **OPTICAL OXYGEN SENSOR:** This state-of-the-art sensor uses optical fluorescence technology to detect the amount of oxygen in the water. Oxygen is an important indicator of ecological health.
- **CONDUCTIVITY (SALINITY), TEMPERATURE AND DEPTH (CTD):** These basic hydrologic parameters are important alone, but when coupled with others, provide scientists with important information about the water in the river.
- **THREE-CHANNEL FLUORIMETER (FL3):** A unique instrument that provides biological, physical and chemical data.
  - **Chlorophyll A (biological)** measures the presence of algae, which can be a food source at certain levels, but overabundance can be detrimental to ecosystem.
  - **Fluorescein (physical)** is a harmless green dye that, when placed in the water, can be used to track water movement in the river. This can be useful for modeling and predicting where pollutants can flow.
  - **Color Dissolved Organic Matter (CDOM -- chemical)** is of interest as a natural water mass tracer. Dissolved organic matter can affect how organic contaminants and metals distribute themselves in the environment.

### *About Beacon Institute*

Beacon Institute for Rivers and Estuaries, with offices in Beacon and Troy, New York, is a not-for-profit environmental research organization engaging scientists, engineers, educators and policy experts in collaborative work focusing on real-time monitoring of river ecosystems. It aims to make the Hudson Valley a global center for scientific and technological innovation that advances research, education and public policy regarding rivers and estuaries. [www.bire.org](http://www.bire.org)

**Editor's Note:** High resolution color images are available for publication upon request. Please contact Kathleen Hickey at 845-838-1600 x15.

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