June 24, 2010

Media Contacts:
Kathleen Hickey
Chief Communications Officer
Beacon Institute for Rivers and Estuaries
845-325-8243
khickey@bire.org
http://www.bire.org

For General Electric:
Mark Behan
Behan Communications
518-792-3856

Beacon Institute extends river observatory network to Fort Edward

Collaboration with General Electric launches real-time monitoring of the upper Hudson River

Fort Edward, NY–Beacon Institute for Rivers and Estuaries announced today that it has deployed its first of many real-time monitoring stations that will monitor the northern reaches of the Hudson River. Launched in cooperation with General Electric, the new data collection platform, designated "B2," is the latest 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.

B2 is deployed just north of the Thompson Island Dam in the vicinity of the first phase of the Upper Hudson River Dredging Project performed by GE last year. B2 was designed and engineered by Beacon Institute's Chief Research and Education Officer, James S. Bonner, Ph.D, P.E. and his REON research team from Clarkson University. GE provided additional equipment and logistical support for the deployment.

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 will be shared with state and federal regulatory agencies.

"The upper Hudson is more than a site for remedial PCB dredging," said John Cronin, Director and CEO of Beacon Institute, a thought leader on water issues who lectures nationally on our environmental future. "It has its own ecological, hydrological and chemical characteristics, which deserve independent full-time observation. Few people realize that the acreage of the Hudson River watershed is greatest north of Albany, and that the largest freshwater input to the river comes from this area. We plan continued significant deployments in the upper Hudson. Our scientific collaboration with GE is our next step in creating a 'source-to-sea' real-time monitoring network that will observe and monitor changes in the entire watershed."

"GE is excited to work with the Beacon Institute with this new data-collection platform," said John G. Haggard, GE's Hudson River project manager. "We are able to help with the necessary infrastructure and technical resources to facilitate the daily maintenance of the upriver REON network and, at the same time, partner with the Beacon Institute to advance our scientific understanding of conditions in the Upper Hudson River."

The B2 platform features several on-board sensors that track multiple environmental parameters (see attached sensor array description), including a laser in-situ scattering and transmissometery 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 of how particles collide, bundle together and move through water. Since PCBs are transported through the water by readily attaching to sediment particles, understanding this mechanism will help researchers create a model of particle and contaminant transport. Real-time data from B2 is publicly available at www.bire.org/fortedward.php.

In close proximity of B2, 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.

"B2 gives us the means to correlate PCB and suspended solids data, collected by GE, with our own independent real-time data regarding suspended particle size and distribution," explained Dr. Bonner, who, in addition to leading Beacon Institute's REON initiative, 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.

Dr. Bonner continues, "This is important scientific research that will help us create a more refined computer model of how particles are transported in the water. This is relevant both to movement of PCBs in the river and to the movement of other contaminants, phytoplankton blooms, and even dispersed oil. This is a rare opportunity to study particle transport characteristics in a way that will yield important new scientific and environmental insights."

About the REON B2 advanced monitoring platform at Fort Edward:

Real-time data from B2 available at www.bire.org/fortedward.php

Beacon Institute and Clarkson University deployed and field tested B2, the second advanced monitoring platform in the REON network, in the Hudson River 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 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 being 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 TRANSMISSOMETERY (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), TEMPEPATURE 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

Editor's Note: High resolution color images are available for publication upon request. Please contact Kathleen Hickey at 845-325-8243.

###