

WaterWays

 Beacon Institute
for Rivers and Estuaries

A Newsletter for Friends and Donors **FALL 2010**

REON expands to the Upper Hudson

Over the summer, **Beacon Institute's River and Estuary Observatory Network (REON)** expanded from the lower Hudson and Albany to Troy, Schuylerville and Fort Edward.

REON transmits a range of data in real time about the river's physical, chemical and biological conditions. Information streams via a network of sensors, robotics and computational technology. It provides scientists with a new way of observing, understanding and predicting how large river and estuary ecosystems work, which translates into better policy, management and education.

Technological innovation at work, REON demonstrates first-of-its-kind "smart" river technology that can be replicated on other rivers worldwide to address universal water challenges – from safe drinking water to oil spill remediation and ecosystem protection.

Since early spring, the REON research team has designed, tested and deployed innovative design and engineering improvements to four existing and three new monitoring stations in the Hudson River. The team also conducted a 100-mile mobile monitoring cruise over six days that simultaneously captured nine important measurements from the top to bottom of the water column, all the way from Fort Edward in the upper Hudson to Kingston in the lower Hudson.

In June, Beacon Institute announced a scientific collaboration with General Electric to extend the REON network northward to Fort Edward and Schuylerville near GE's PCB dredging project. The two new REON sensor platforms, B2 and B3, are collecting real-time river water data to enhance the PCB monitoring that GE is conducting with its own equipment. Beacon

REON researchers from Clarkson University deploy the B2 advanced monitoring station at Fort Edward, NY, near the GE dredging site.

REON data, when combined with GE's PCB data, will provide observers, including state and federal regulatory agencies, with a much more complete picture of contaminant movement and the health of the river ecosystem.

In collaboration with Clarkson University, Beacon Institute is creating novel sensors that can be scaled for remote deployment anywhere in the world. IBM is developing a customized application of its advanced analytics infrastructure that will allow the sensors to literally "converse" by responding intelligently to data as it flows in real time, making it possible to significantly improve early warning systems for harmful pollution.

To see REON in action, visit www.bire.org!



Mobile monitoring allows researchers to capture important measurements from the top to bottom of the water column along the length of the river.

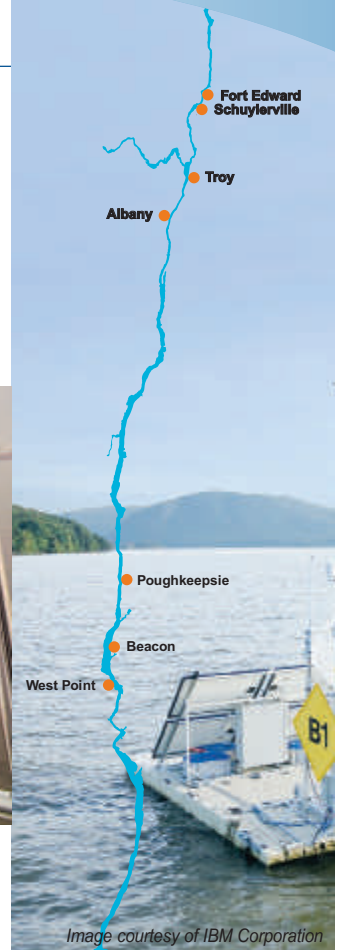


Image courtesy of IBM Corporation



INSIDE

Peter J. Davoren
Program Updates **2**

Happenings
Development News **3**

Message from
Shirley Hartman **4**

Annual Report
Pullout Section

www.bire.org



Donor Profile

Peter Davoren

President, Turner Construction Co.

Peter J. Davoren, President and CEO of Turner Construction Company, is a great friend and champion of Beacon Institute. A Hudson Valley resident, Peter has sought ways to use his talents and resources to strengthen the organization. As chair of our Capital Facilities Working Group, Peter has provided his time and skills as the Institute plans research center developments in Beacon, Troy and Potsdam.

Peter is also a supporter of Beacon Institute's education programs and wants to see our capacity grow. He challenged Beacon Institute supporters to match Turner Construction's annual fund gift to double the impact. Every dollar raised during the challenge last spring was matched by Turner one-to-one, up to \$25,000. By the end of May, we were thrilled with the response to this campaign as 71 supporters together contributed more than \$62,000.

The funding will support Beacon Institute's education programs in the coming year, including SENSE IT. SENSE IT enhances the teaching of science, technology, engineering and math (STEM) by drawing high school students to their local waters – the Hudson and St. Lawrence Rivers – to build and deploy sensors. In addition, teachers who participate in our professional development workshops each summer put the new ideas to work in their classrooms and are provided with necessary equipment and ongoing support.

Program Update

SENSE IT

Forty-two high school teachers from New York's Capital District, Hudson Valley and Potsdam regions are bringing the world of high-tech water monitoring into the classroom and embracing new tools to excite students about science, technology, engineering and math.

Beacon Institute's SENSE IT, now in its second year, is engaging teachers and students alike as innovators to protect the environment. Teachers are trained to implement the curriculum – a suite of four modules in which students learn to design and construct multiple water sensors, and then connect them to LEGO™ NXT micro-processors which they've programmed to collect data in real time from their local river.

Enthusiastic adopters, the teachers are also integrating lessons about technology careers and global water issues.

SENSE IT was launched in collaboration with Clarkson University through a major grant from National Science Foundation. Results from this grant are informing plans to introduce SENSE IT to more teachers in 2011.



Students participating in SENSE IT test their water sensors in the Hudson River at Denning's Point in Beacon.

Policy

Beacon Institute CEO John Cronin is chairing the **Mighty Waters Task Force**, formed in September 2010 by **Congressman Paul D. Tonko** to create a regional strategy for New York's waterways. Congressman Tonko assembled the group of 25 leaders and innovators with diverse interests to set goals and timetables for action. In early 2011, they will make recommendations for optimizing the heritage and natural resources of New York's rivers as catalysts for economic development, job creation and improved quality of life. Mobilizing federal resources that encourage these actions are at the forefront of discussions.

"I believe our waterways are shortchanged in comparison to areas like Boston Harbor and the Chesapeake Bay which get a lot of federal money," John Cronin stated to Troy's *The Record*. "Our job also is to be a force to get our fair share."



Congressman Paul D. Tonko assembled the **Mighty Waters Task Force** to create a regional strategy for NY waterways.

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2009-2010 Annual Report



Message from the Chairman

As you will see in this annual report, Beacon Institute's work revolves around three core areas: Science & Technology, Education and Public Policy. Once again I am happy to report significant development and expansion on all three fronts despite the economic challenges facing our state and many not-for-profit and research institutions like ours.

It is with this in mind that I express my sincere thanks for the hard work and dedication of our staff, the powerful and fruitful academic and industry collaborations, and the generous support of our institutional funders, government agencies and individual donors.

We have doubled the impact of the River and Estuary Observatory Network (REON) in the Hudson. This system is completely new in the world of river research. The REON team has created new sensors and continues to provide real-time data transfer – all available on our website. IBM is finalizing the cyber-infrastructure that will virtually link each sensor to the others so that our technology will literally be able to “talk.”

Our outreach programs include public events at both the Main Street Beacon Gallery and the Center for Environmental Innovation & Education (CEIE) on Denning's Point. If you've shared your email with us, then you receive the weekly updates about exciting happenings.

Our core education program seeks to create the next generation of tech-savvy river patrons and champions by increasing the science, technology, engineering and math (STEM) skills and interests of today's students. This summer we ran the second season of SENSE IT. Our REON engineers worked with teachers and students to create and build a basic, yet impactful, four-sensor model with the goal to make it work, make it cost effective and make it possible for students to recreate the technology. The outcome is a device that can be built for under \$15!

The use of technology in monitoring and understanding our waterways creates a new era of public policy and environmental stewardship. The application of technology redefines the enforcement of the Clean Water Act. Imagine being able to tell a power plant in real time when fish are migrating in their area so that they can react and limit kills. Technology creates a new paradigm for how we interact with the natural world and how we can limit our impacts intelligently.

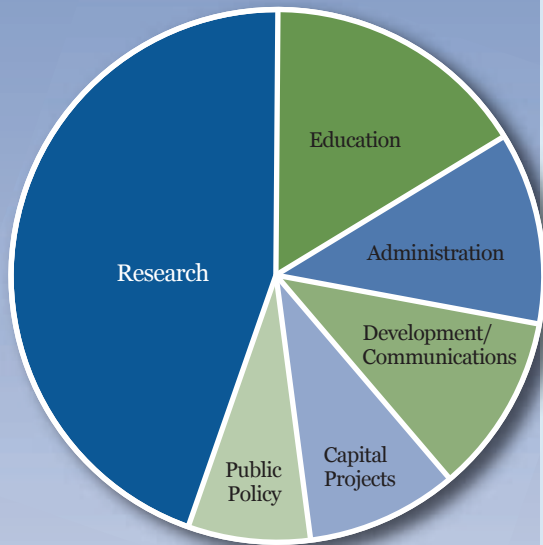
On behalf of the Institute's entire Board of Trustees, please accept my sincere thanks for your interest and support in building a smarter way to take on the challenges of rivers around the world, and for your tremendous support in making this year of progress possible.

Brian Ruder
Chairman

How does Beacon Institute use your gifts?

Expenditures 2009-2010

	Total	Percent
Research	\$1,397,420	43.3
Education	547,085	17.0
Administration	438,761	13.6
Development/Communications	361,511	11.2
Capital Projects	272,010	8.4
Public Policy	208,834	6.5
Total	\$3,225,621	100.0



Endowments

This year, thanks to the generous support of **Lucy R. Waletzky, M.D.**, Beacon Institute created a permanent and quasi endowment.

The establishment and growth of endowment funds are critical to the sustainability of any not-for-profit. As these endowments grow through fundraising and proper management, Beacon Institute will create dedicated funds for research, education, policy, public programs and of course, unrestricted support. A named fund in endowment is one of the most meaningful legacy gifts a donor can provide.

2009-2010

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The Beacon Institute, Inc., is a charitable, not-for-profit corporation classified by the Internal Revenue Service as a publicly supported tax-exempt organization under Section 501(c)(3) of the Internal Revenue Code. A copy of the latest financial report may be obtained by writing to Beacon Institute, or to the New York State Attorney General's Office, Charities Bureau, 120 Broadway, New York, NY 10271

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Docent

2009-2010 Highlights

Science & Technology

- The River and Estuary Observatory Network (REON), Beacon Institute's collaboration with Clarkson University and IBM, now boasts seven monitoring stations from West Point to Fort Edward – major progress in the engineering and testing of this unparalleled “mountain to sea” research observatory.
- REON researchers conducted an extended mobile monitoring cruise from Fort Edward to Kingston – 100 miles over three days – using the “acrobat,” a robotic device that undulates through the water column behind a research vessel, which added a 3D information layer to REON.
- Beacon Institute hosted foreign visiting delegations including a U.S. Department of State Foreign Press Tour representing five countries, as well as environmental ministry delegations from Korea and China who came to learn about REON as a world-class model for a scientific understanding of global water issues.



Education & Outreach

- Forty-two teachers completed their second summer of SENSE IT professional development workshops. The two-week sessions, which included students during the second week, were held in Potsdam, Troy and Beacon and prepared teachers to integrate an expanded SENSE IT program into their science and math classrooms.
- Beacon Institute exhibits, events and programs drew in nearly 7,000 visitors to Main Street in Beacon, River Street in Troy and the Center for Environmental Innovation and Education at Denning's Point in Beacon. It's been a year of enriching lectures, films, workshops, field trips, landscape walks, exhibits, public forums and cultural events.
- The 2010 public programs at CEIE were made possible in part with the generous support of The Wachovia/Wells Fargo Foundation, M&T Bank Foundation, Partners of Sedore & Company, Jeannette F. Schlobach Trust, and Arthur DeDominicis, CPA.
- Beacon Institute celebrated the 40th anniversary of Earth Day with a lecture about global water issues by John Cronin and a concert by Pete Seeger.

Public Policy

- John Cronin delivered the keynote address at the United Nations Global "Water Matters!" Conference for World Environment Day in Pittsburgh in June 2010.
- Beacon Institute and Pace University co-sponsored the Environmental Consortium of Hudson Valley Colleges & Universities conference titled *NY State Water Resources: Assessing the Need for a Comprehensive Water Policy* in September 2009.



Happenings

Beacon Institute offers a rich and varied outreach and informal education program at both its Gallery at 199 Main Street and the Center of Environmental Innovation & Education at Denning's Point, in Beacon, NY. Each event offers innovative and creative ideas about Hudson River research, conservation and history to our communities, inspiring local awareness and action.

November 8-15

REON Technology Expo at CEIE



REON engineers will present their work and innovative sensor technology to scientific and technical colleagues on November 8. Teachers and students from Beacon and Haldane school districts

and the Oakwood Friends School will experience a taste of REON and SENSE IT on November 9-10. **Sensor technology will be on display to the public November 9-15.**

November 13, 12 pm

History Walk & Talk at CEIE with Jim Heron



Jim Heron, Project Historian at Beacon Institute, gives a walking tour and discussion of the rich and historic landscape of Denning's Point.

November 14, 4 pm

Sunday Authors Series featuring Joanne Michaels at the Gallery at 199 Main Street



Joanne Michaels presents her book *Hudson River Valley Farms: The People and the Pride Behind the Produce*. Joanne explores the valley as a travel destination and as an area

experiencing a renaissance as a source of artisanal cheeses, grass-fed beef, and organic fruits and vegetables.

Complete details about each of these and other events can be found at www.bire.org/events. Join our email list for weekly news about upcoming events!

Development News

Dedicated Funds Created – New Ways to Support BIRE

Beacon Institute has created three new dedicated funds to provide donors with the ability to further direct the impact of their gifts:

The Beacon Institute Fund for Innovation and Technology

The Hudson River is a virtual laboratory for the design and deployment of the real-time sensors of the River and Estuaries Observatory Network (REON). REON is revolutionizing the way we understand our local and global waters. With information that is literally updated minute-by-minute, like a weather report, we can truly understand and protect our waters. Over the next three years, Beacon Institute will raise \$5,000,000 to sustain these efforts.

The Future Fund for STEM Education

Beacon Institute's program in STEM skills (Science, Technology, Engineering and Math) trains teachers in the educational methods that help students learn the skills for tomorrow's innovation careers. The next generation must solve real world problems – especially environmental problems – in real time. Today's eighth grader will be an innovation leader before the decade ends and Beacon Institute will leverage \$5,000,000 in investment by 2014.

The Fund for Public Awareness

Beacon Institute's public awareness program introduces everyday people to world-class experts and innovators, and to the Institute's natural and historic campus at Denning's Point in Beacon, NY. We expect 10,000 visitors next year – and we hope that each of these visitors will inspire at least four others about our mission when they return home. Help us make 50,000 friends for the planet! Beacon Institute will raise \$500,000 through the fund, including event underwriting.

For events, news and water-related insights, find Beacon Institute on [Facebook](https://www.facebook.com/beaconinstitute) and sign up for our weekly email newsletter at www.bire.org



Message from Shirley Hartman

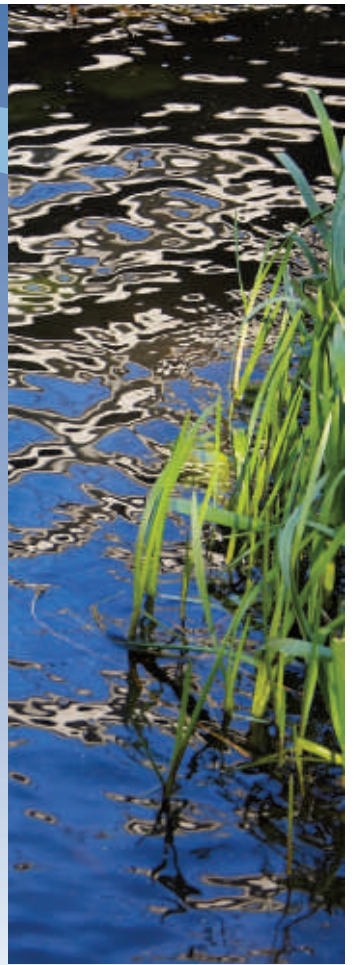
Dear Friends,

Welcome to the first issue of *WaterWays* – Beacon Institute’s quarterly newsletter for supporters and friends. I hope that you find it delivers information and updates on the work that we do – work made possible with the financial support of so many of you.

I also hope that it inspires you to learn more about the challenges our global waters face and how with the application of innovation and technology we can learn to reduce our impacts and enhance our quality of life.

To learn more about Beacon Institute please visit us at www.bire.org. While you’re there, join our e-list to hear about upcoming events and happenings, or find us on Facebook!

Shirley Hartman
Chief Development Officer



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A Newsletter for Friends and Donors



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