

SPECIAL
POINTS OF
INTEREST:

- Water Center
Director's Mes-
sage
- 2008 Highlights

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Reflections on Water

JANUARY 2009

Message From The Director

Dear Friends of the Vermont Water Center:

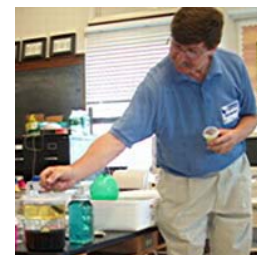
Several projects sponsored by the Vermont Water Resources and Lake Studies Center are nearing completion and may be of interest to you. Dr. Donna Rizzo from the **UVM School of Engineering** and Dr. Leslie Morrissey from the **Rubenstein School of Environment and Natural Resources** and their students have been working with the **River Management Program in the Vermont Agency of Natural Resources** on a project co-funded by the **Vermont Water Resources and Lake Studies Center** to identify improved methods to quantify geomorphic change in rivers using remote sensing tools.

These new methods will be used to help identify flood hazards differs substantially from conventional approaches currently in use. The research team is using advanced mathematical approaches patterned on the way the brain works – artificial neural net-

works – and high resolution satellite images to enhance GIS-based tools that are currently used by watershed managers in Vermont, to characterize sensitivity of rivers to future flood threats based on historic flood patterns and contemporary



Breck Bowden
Water Center Director



Jurij Homziak
Lake Champlain Sea Grant

2008 Accomplishments Highlights

Dr. William "Breck" Bowden, project manager Meredith Curling, and a team of undergraduate students in the Rubenstein School of Environment and Natural Resources at the University of Vermont have been working with Vermont Agency of

Natural Resources Stormwater Section to collect precipitation and discharge data for a set of previously ungauged streams, half of which are listed by the state as being impaired by stormwater and half of which currently attain the state's existing biocriteria

standards. This data will be used to document the degree to which the flow regime of stormwater-impaired streams differs from streams that are not impaired. It will also be used to monitor progress of the state's stormwater discharge permit system toward

development and land use patterns.

Dr. Don Ross and his students in the **UVM Department of Plant and Soil Science** are working with soil scientists from the **US Department of Agriculture Natural Resources Conservation Service** and the **Vermont Agency of Natural Resources Clean and Clear Program** with co-funding from the **Vermont Water Resources and Lake Studies Center** to develop high resolution mapping tools for floodplain soils. These new tools are expected to provide a more accurate representation of the variability in soil chemical characteristics and drainage compared to information provided in standard soil surveys. This information is critical to help design remediation

projects that will reduce phosphorus and sediment inputs from streambank erosion that subsequently impair downstream water resources

Dr. William "Breck" Bowden, project manager Meredith Curling, and a team of undergraduate students in the **Rubenstein School of Environment and Natural Resources** at the University of Vermont have been working with **Vermont Agency of Natural Resources Stormwater Section** to collect precipitation and discharge data for a set of previously ungauged streams, half of which are listed by the state as being impaired by stormwater and half of which currently attain the state's existing

Director's Message Cont'd

biocriteria standards. This data will be used to document the degree to which the flow regime of stormwater-impaired streams differs from streams that are not impaired. It will also be used to monitor progress of the state's stormwater discharge permit system toward flow reduction targets that have been designed to improve the health of the state's stormwater-impaired streams

Final reports on these projects should be available in early 2009. If you have any questions about them, please contact Breck Bowden, Director of the Vermont Water Resources and Lake Studies Center, at 802-656-2513 or breck.bowden@uvm.edu

Have a safe and relaxing holiday season!

Cheers,
Breck Bowden, Director
Vermont Water Resources and Lake Studies Center



Collecting precipitation and discharge data

2008 Accomplishments Highlights (Cont'd)

flow reduction targets that have been designed to improve the health of the state's stormwater-impaired streams.

The Vermont Water Resources and Lake Studies Center partnered with the Lake Champlain Research Consortium and other state, regional, and national partners to host a conference entitled Lake Champlain: Our Lake, Our Future. The conference drew nearly 200 researchers, managers, and

policy makers from Vermont, New York, and the province of Quebec, Canada, who have an interest in protecting the resources of Lake Champlain and its basin. Conference sessions focused on nutrient loading, hydrodynamics, algal blooms, mercury deposition, invasive species, wildlife ecology, and watershed management. This conference was part of a continuing dialogue on research needs in support of manage-

ment objectives that will support a strong economy, an enjoyable place to live, and a sustainable environment.

Contact Information:

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Breck.Bowden@uvm.edu

For questions about the Vermont Water Center: contact Breck Bowden (Breck.Bowden@uvm.edu)

2008 Accomplishments Highlights (Cont'd)

Dr. Don Ross and his students in the Department of Plant and Soil Science at the University of Vermont are working with soil scientists from the U.S. Department of Agriculture Natural Resources Conservation Service and the Vermont Agency of Natural Resources Clean and Clear Program with co-funding from the Vermont Water Resources and Lake Studies Center to develop high resolution mapping tools for floodplain soils.

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2008 Accomplishments Highlights (Con'd)

Dr. Jane Hill and her students in the School of Engineering at the University of Vermont have been working with the Vermont Agency of Natural Resources on a project co-funded by the Vermont Water Resources and Lake Studies Center to develop more accurate methods to estimate the amounts of phosphorus in agricultural soils that might migrate to streams and lakes. Phosphorus is a byproduct of agricultural and urban activity that can lead to uncontrolled growth of undesirable algae in lakes. Unsightly and potentially dangerous algal “blooms” have been a problem in some parts of Lake Champlain in recent years, and excess phosphorus is thought to be a critical factor supporting these

uncontrolled outgrowths. The new methods under development are based on enzymes that may reveal the amounts of phosphorus in soil that are potentially biologically available to algae for growth.



UVM School of Engineering is working with the Vermont Agency of Natural Resources on phosphorus measurement

Dr. Sarah Lovell Taylor in the Department of Plant and Soil Science and Dr. Alan McIntosh in the Rubenstein School of Environment and Natural Resources and their students at the University of Vermont have been working with the Lintilhac Foundation and Shelburne Farms to demonstrate innovative new ways to manage farm runoff. Shelburne Farms is a not-for-profit operational farm and educational organization whose mission is to serve as a model of environmental stewardship by demonstrating new ecological, practical, and cost-effective remediation strategies that will improve the water quality of runoff to Lake Champlain. With co-funding from the Vermont Water Resources and Lake Studies Center, a bioretention system designed to treat runoff from the dairy barnyard source area is being installed. This project will be used to educate the public about opportuni-

ties to improve the health of Lake Champlain through innovative, yet practical, solutions for stormwater management on farms.



Dr. Donna Rizzo from the School of Engineering and Dr. Leslie Morrissey from the Rubenstein School of Environment and Natural Resources and their students at the University of Vermont have been working with the River Management Program in the Vermont Agency of Natural Resources on a project co-funded by the Vermont Water Resources and Lake Studies Center to identify improved methods to quantify geomorphic change in rivers using remote sensing tools. These new methods will be used to help identify flood hazards and differ substantially from conventional approaches currently in use. The research team is using advanced mathematical approaches patterned on the way the brain works – artificial neural networks – and high resolution satellite images to enhance GIS-based tools that are currently used by watershed managers in Vermont to characterize sensitivity of rivers to future flood threats, based on historic flood patterns and contemporary development and land use patterns.

Vermont House and
Senate Contacts

Washington, D.C.—Vermont House and Senate

Senator Bernard Sanders: <http://www.congress.org>

Senator Patrick Leahy: <http://leahy.senate.gov>

Representative Peter Welch: <http://www.welch.house.gov>

Websites of Interest

Vermont Water Resources and Lake Studies Center Website

<http://www.uvm.edu/envnr/vtwater>

The Rubenstein School of Environment and Natural Resources:

<http://www.uvm.edu/envnr>

Lake Champlain
Sea Grant Program

Lake Champlain Sea Grant Program:

<http://www.uvm.edu/~seagrant>

National Sea Grant Program

<http://www.seagrant.noaa.gov>



Conferences and Meetings

2009

January 15-16, 2009. *Two Billion Cars: Driving toward sustainability.* Davis Center, The University of Vermont, Burlington, VT. Information: <http://www.understandingvt.org/>

January 22, 2009. *Café Scientifique—Nanotechnology: Size Does Matter.* Burlington, VT. Contact: (802) 324-3686. Information: <http://www.understandingvt.org/>

January 25-28, 2009. *New England Water Environment Association (NEWEA) Annual Conference & Exhibit.* Boston, MA. Information: <http://www.newear.org>.

February 1-4, 2009. *New York Water Environment Association (NYWEA) 81st Annual Meeting and Exhibition.* New York City, NY. Information: <http://www.nywea.org>

February 25-26, 2009. *A Sustainable Future: Fish Processing Byproducts Meeting.* Portland, Oregon. 81st Annual WaterEC, the International Water Efficiency Conference. Newport Beach, CA. Information: <http://seagrant.uaf.edu/conferences/2009/>.

Conferences and Meetings (Cont'd)

- March 10-13, 2009. 25th Lowell Wakefield Fisheries Symposium.** Biology and Management of Exploited Crab Populations under Climate Change. Anchorage, Alaska. Information: <http://seagrant.uaf.edu/conferences/2009/>
- March 30-April 2, 2009.** 1st Annual WaterEC, the International Water Efficiency Conference. Newport Beach, CA. Information: <http://www.waterec.net>
- April 1-2, 2009. New England Water Works Association (NEWWA) Spring Exhibition and Conference.** DCU Center, Worcester, MA. Information: <http://www.newwa.org>
- April 7, 2009. 6th Annual Water Resources Research Conference.** Water Dependencies in New England: Systems, Stresses, and Responses. Lincoln Campus Center, University of Massachusetts—Amherst. Information: <http://www.umass.edu>
- April 7-9, 2009. 26th Annual Vermont Travel Industry Conference.** Equinox Resort, Manchester, Vermont. Information: <http://www.vtic.org>
- May 4-6, 2009. 2009 AWRA Spring Specialty Conference.** “Managing Water Resources and Development in a Changing Climate.” Anchorage, Alaska. Information: <http://www.awra.org>
- May 18-20, 2009. New England Interstate Water Pollution Control Commission (NEIWPCC) Annual Nonpoint Source Pollution Conference.** Portland, Maine. Information: <http://www.neiwpcc.org>
- June 14-18, 2009. American Water Works Association Annual Conference and Exposition (ACE09):** San Diego, California. Information: <http://www.awwa.org>
- June 28-July 1, 2009. Water Environment Federation—Nutrient Removal Conference 2009:** Washington, DC. Information: <http://www.wef.org>
- June 29-July 1, 2009. AWRA Summer Specialty Conference:** “Adaptive Management of Water Resources II.” Snowbird, Utah. Information: <http://www.awra.org>
- July 17-24, 2009. The 2009 Appalachian Trail Conservancy Biennial.** Castleton State College, Castleton, VT. Information: <http://www.understandingvt.org>
- August 9-12, 2009. Water Environment Federation. TMDL 2009: Combining Science and Management to Restore Impaired Waters.** Minneapolis, Minnesota. Information: <http://www.wef.org>
- August 16-20, 2009. Eighth Annual StormCon.** The North American Surface Water Quality Conference & Exposition. Anaheim, California. Information: <http://www.stormcon.com>
- August 31-September 2, 2009. ASIWPCCA Annual Meeting 2009.** Skamania Lodge, Stevenson, Washington. Information: <http://www.asiwpcca.org>
- October 24-31, 2009. North American Lake Management Society (NALMS) 29th International Symposium:** “Insuring Our Lakes’ Future.” Hartford, Connecticut. Information: <http://www.nalms.org>
- November 8-12, 2009. AWRA Annual Conference.** Seattle, Washington. Information: www.awra.org





AQUACULTURE CORNER

European Aquaculture Society: <http://www.easonline.org/home/en/default.asp>

Fishery Bulletin: <http://fishbull.noaa.gov/fcontent.htm>

Fish Farmer Magazine: <http://www.fishfarmer-magazine.com>

The Aquaculture Network Information Center [aquanic.org](http://www.aquanic.org) is a gateway to the world's electronic aquaculture resources. The goal of AquaNIC are to:

1. Provide access to all electronic aquaculture information at the national and international level.
2. Increase the quantity and quality of electronic information available to the aquaculture industry.
3. Provide self-paced aquaculture instruction to the aquaculture industry.
4. Obtain user input in directing AquaNIC services.

The mission of the Regional Aquaculture Centers is to support aquaculture research, development, demonstration, and extension education to enhance viable and profitable U.S. aquaculture that will benefit consumers, producers, service industries, and the American economy. Two centers are important to those interested in aquaculture in Vermont and northern New York. The Northeastern Regional Aquaculture Center (NRAC)

www.umassd.edu/ is a principal public forum for the advancement and dissemination of science and technology needed by Northeastern aquacultural producers and support industries. The North Central Regional Aquaculture Center www.ncrac.org supports more than 1,000 producers of food fish, baitfish, and fish for stocking into recreational water bodies.

These websites support a highly diverse range of producers, ranging from well established producers who have made a significant capital investment and are interested in ways of reducing production costs while increasing output to those who could be classified as newcomers, who need training, capital, and an awareness of the potentially high risk, high investment, and low returns that most producers encounter.

FAO GLOSSARY OF AQUACULTURE. The Food and Agriculture Organization of the United Nations (FAO) Fisheries Department has published a multilingual Glossary of Aquaculture containing, at the time of publication, 2,958 terms with definitions, synonyms, related terms, information sources and images, when available. The primary objectives of the glossary are to: (i) serve as a reference to fish farmers, consultants, administrators, policy makers, developers, engineers, agriculturists, economists, environmentalists and all those interested in aquaculture, and (ii) facilitate communication among experts and scientists involved in aquaculture research and development. Website: www.fao.org/fi/glossary/aquaculture/

MEETINGS/CONFERENCES

January 11-13, 2009. 2009 Cool Water Fish Culture Workshop. Rend Lake Resort, Whittington, Illinois. Information: <http://aquanic.org>

January 21, 2009. 39th Annual Conference and Trade Show. Texas Aquaculture Association. Bay City Civic Center, Bay City, Texas. Information: <http://aquanic.org>

January 22, 2009. Missouri Aquaculture Biosecurity Workshop. Jefferson City, Missouri. Information: <http://aquanic.org>

January 27, 2009. 1st International Congress & Exhibition on Aquatic Animals Health Management and Diseases, Iran. Tehran, Iran. Information: <http://aquanic.org>

February 1-3, 2009: Seafood Summit 2009. San Diego Resort, San Diego, California. Information: <http://aquanic.org>

February 15-18, 2009: Aquaculture America. Seattle, Washington,. Information: <http://www.was.org>

March 4-7, 2009: Aquariya Expo 2009. Dubai—U.A.E., Sangeeta Dhanak. Information: <http://aquanic.org>

March 10-12, 2009: Climate Change: Global Risks, Challenges & Decisions. Bella Center, Copenhagen, Denmark. Information: <http://aquanic.org>

March 25-27, 2009: 11th Aquaculture Insurance & Risk Management Conference. Lewes, East Sussex. Information: <http://aquanic.org>

April 19-23, 2009: 16th International Conference on Aquatic Invasive Species. Fairmont Queen Elizabeth, Montreal, Quebec, Canada. Information: <http://www.icaais.org>

May 25-29, 2009. World Aquaculture 2009. Veracruz, Mexico. Information: <https://www.was.org>

2010

August 18, 2010: Aquaculture Engineering Society Issues Forum. Roanoke, Virginia. Information: <http://aquanic.org>

August 20-22, 2010: 8th International Conference on Recirculating Aquaculture. Roanoke, Virginia. Information: <http://aquanic.org>

This newsletter is prepared by Dr. Breck Bowden, Director, Vermont Water Resources and Lake Studies Center, The Rubenstein School of Environment and Natural Resources, The University of Vermont, George D. Aiken Center, Burlington, Vermont 05405-0088, (802) 656-4057; and Dr. Jurij Homziak, Lake Champlain Sea Grant Program, The Rubenstein School of Environment and Natural Resources, George D. Aiken Center, The University of Vermont, Burlington, VT 05405-0088, (802) 656-0682. This newsletter is published with funds provided in part by the U.S. Geological Survey, Department of the Interior, as authorized by the Water Resources Research Act of 1984 and by the University of Vermont Extension System and U.S. Department of Agriculture.

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and Lake Studies Center
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