NH WATER AND WATERSHED CONFERENCE ABSTRACTS
SATURDAY, MARCH 26, 2011

ABOUT THE PLENARY

Forests, Water, People, Land Use and Climate Change - Managing the Unavoidable and Avoiding the Unmanageable

A water balance example and a review of land use effects on streamflow and water quality are used to illustrate the urgent need for an integrated approach to forest conservation and low impact development. A suite of sensible policies and effective practices to protect aquatic ecosystems, water supplies, and public health are needed to "manage the unavoidable and avoid the unmanageable" (in the words of Al Sample of the Pinchot Institute) before costly and complex mitigation and restoration projects are the only remaining options.

- Paul Barton, University of Massachusetts

PLENARY SPEAKER PROFILE

Paul Barten, Professor of Forest Resources
University of Massachusetts

Paul is Professor of Forest Resources at the University of Massachusetts Amherst and Director of the Forest-to-Faucet Partnership. He earned undergraduate degrees in forestry from the New York State Ranger School and SUNY ESF and an M.S. and Ph.D. in forest hydrology, watershed management, and water resources engineering from the University of Minnesota. He chaired the 2008 National Research Council study entitled, Hydrologic Effects of a Changing Forest Landscape.

SATURDAY INFORMATIONAL PRESENTATIONS

Each presentation will consist of a presentation and detailed discussion of a specific aspect of lake, river, groundwater or watershed management, and will be wollowed by time allotted for questions.

SESSION I
(10:20 AM – 11:10 AM)
UNLESS OTHERWISE NOTED

A. NH's changing landscape: new trends in population & land use patterns, 2010 - In 1998, the Forest Society published the first report on *NH's Changing Landscape*, a review of current trends in population change, land development, and impact on our natural resources. This ground-breaking research was updated in 2005, and has recently been greatly expanded and revised to 2010. Striking new statistical and spatial trends are evident in population change (now net negative) and in land development for housing (now at all-time low levels) that could affect planning for a wide range of ecosystem services, including drinking water supply. This session is a good match for new detailed data on stratified-drift aquifer water sources presented on Friday.

- Dan Sundquist, Society for the Protection of New Hampshire Forests

B. Floodplains and farmlands: a case study in protecting both local economies and native ecosystems (10:20 – 10:45) - The upper Connecticut River watershed encompasses some of the richest agricultural land in New England and some of the most important floodplain ecosystem in the four-state region. These lands are vitally important to our local economy, our way of life in the North Country, and to native riparian and floodplain ecosystems. The Ammonoosuc Conservation Trust (ACT) and The Nature Conservancy (TNC) are completing a project that combines sophisticated mapping and landowner outreach to identify those lands and landowners who represent the best opportunity to protect ***both*** active agricultural and natural floodplain ecosystems. Our presentation will also introduce and explore some of the emerging tools to protect river-shore properties using "meander easements."

- Doug Bechtel, The Nature Conservancy

C. Making instream flow protection work: the Lamprey Water Management Plan - Identifying protected instream flows is an important step in water resource management. Humans, fish and riparian vegetation and wildlife all need stream flows that support their uses. For protected flows to be maintained, coordination and planning is needed. A Water Management Plan coordinates dam operations and water use to sustain water use in and out of the stream. This discussion describes the considerations, politics, and the science involved in the development of one of the pilot Water Management Plans of the state's Instream Flow Program.

– Wayne Ives, NH Department of Environmental Services

D. Cultivating volunteer monitoring in the North Country - Compared to Southern New Hampshire, the North Country is currently underrepresented in the state's volunteer monitoring programs. Consequently, we have less knowledge about water quality in a region with different characteristics from the rest of the state. In 2009, the NH Department of Environmental Services and Plymouth State University partnered on a project to expand volunteer monitoring in the North Country. This presentation will explore why there needs to be a bigger push to monitor waterbodies in the North Country and lessons learned from past efforts.

- Aaron Johnson, Center for the Environment, Plymouth State University

E. Warren Brook floodplain restoration: a partnership based success (10:45 – 11:10) - After the October 2005 flood disaster, NH Department of Environmental Services (NHDES) and other project partners provided funding for restoration planning and implementation for Warren Brook in the Town of Alstead. Upon the completion of the restoration planning effort and stabilization in 2006 and 2007, NHDES, working with NH Fish & Game Department, Town of Alstead, and U.S. Fish and Wildlife Service restored adequate flood water conveyance and riparian habitat for 900 linear feet of Warren Brook.

- Steve Couture, NH Department of Environmental Services, and Sean Sweeney, Headwaters Hydrology

SESSION II
(11:10 AM – 12:00 PM)
UNLESS OTHERWISE NOTED

F. A subwatershed approach to developing a management plan for Lake Winnipesaukee – An addition to being the state's largest water body and a significant economic force, its morphology is more a system of interconnected bays rather than a single cohesive body of water. Each embayment has differing characteristics and land-based influences and in-lake responses to nutrient inputs. Thus, we are taking an approach in which management plans are developed for each embayment, accounting for their unique characteristics. The Lake Winnipesaukee Watershed Management Plan represents the combined efforts of many partners to forge a unique, subwatershed approach to create an effective, sustainable planning and implementation process using state-of-the-art information systems.

- Pat Tarpey, Lake Winnipesaukee Watershed Association & Lakes Region Planning Commission

G. Impacts of proposed developments on groundwater: assessment tools for municipalities and planning boards - As open space diminishes in our communities and demands on water resources increase, more planning boards are requiring that the impact of a proposed development on groundwater resources be assessed during the site plan approval process. Several areas of assessment can include: investigating the impact of a development on rainfall recharge rates, groundwater quality and water availability; refining aquifer protection area boundaries; predicting nitrate impacts from proposed septic systems; and assessing the potential impact to groundwater of nitrates originating from ammonium-nitrate fuel oil (ANFO) explosives used at sites requiring rock blasting.
- Timothy Stone, Chad Tomforde, and Michael Towle, StoneHill Environmental, Inc.

H. Who owns the water? Exploring how public trust affects NH's lakes and rivers (11:10 - 11:35) – In New Hampshire there are approximately 1,000 lakes and ponds totaling an area of nearly 165,000 acres and approximately 17,000 miles of rivers and streams. With all of this water and shoreline, and all the uses of the state's lakes and rivers from recreation to industrial use to drinking water supplies, a question often asked is "who owns the water?" In short, you probably do! In New Hampshire, lakes over ten acres and navigable rivers and streams are considered "public waters" and are just that, water that the citizens of New Hampshire own. However, the state is entrusted to ensure the use of that water is for the greatest public benefit, i.e. public trust. This session will explore the background of who owns and regulates various aspects of the state's lakes and rivers, how that impacts the way our waterbodies are managed, and the implications on individual users.
- *Jennifer Rowden, NH Department of Environmental Services*

I. The Student Conservation Association's Watershed Education Project (11:10 - 11:35) - The SCA Watershed Education Project delivers meaningful watershed experiences to over 1200

4th and 5th grade students in Manchester and Allenstown, NH. Through a ten week standards based curriculum, completion of a service learning project, and an investigative field trip to Bear Brook State Park, students explore the connections between the plants, animals and people who share the water in the Merrimack River Watershed.
- Marlee Leveille, The Student Conservation Association

J. State water resources planning – with no resources (11:35- 12:00) – In 2003, the legislative Water Resources Committee was charged with developing a comprehensive water resources plan for the state. That effort resulted in publication of the *NH Water Resources Primer* in 2008, identifying four major water resources challenges. Several legislative commissions have developed recommendations to address most of those challenges, but municipalities will play a key role in implementing solutions.
- Paul Susca, NH Department of Environmental Services

K. Introduction to social marketing (11:35- 12:00) - Watershed groups, municipalities and others are increasingly interested in eliciting behavior change through their water-related outreach campaigns. Social marketing is a technique that borrows from commercial marketing to encourage behavior change especially for health and environmental behaviors. This session will introduce the principles and practices behind social marketing that help distinguish it from informational campaigns and increase its potential to result in behavior change.
– Julia Peterson, NH Sea Grant and UNH Cooperative Extension

SESSION III
(1:00 PM – 2:00 PM)
UNLESS OTHERWISE NOTED

L. Low Impact Development – What it is and why is it important?
Description not yet available.
– Robert Roseen, University of New Hampshire Stormwater Center

M. Fish grow on trees (1:00 – 1:30) - Research in the eastern US has shown the importance of deep pools and large logs to healthy brook trout populations in streams. Instream logs provide cover, create pools and can form spawning areas. Our recent research at Nash Stream State Forest has also documented this. However, we learned something new: brook trout seem to depend strongly on the presence of small sticks for cover to avoid predators. In addition to providing important habitat to streams, instream wood has another very important value: it helps reduce the nutrient load downstream! I will present some of our research results and information on how healthy forests provide healthy stream (and downstream) ecosystems.
- John Magee, NH Fish and Game Department

N. Land resources management permitting – enhancing the local role - A session on effective engagement of local conservation commissions and local river advisory committees (LACs)

with development projects and the NHDES permitting process – perhaps sharing some guidance from various land resource management programs and Steve Couture from NHDES' Rivers Management and Protection Program on preparing comment letters (e.g., what sort of issues NHDES can address and cannot address), timing, engaging with applicants prior to NHDES permit application, and discussion on ideas for improving the opportunity for local folks to meaningfully engage in and influence the land development projects and NHDES permitting.
- Carolyn Russell and Steve Couture, NH Department of Environmental Services

O. Working on salt solutions for NH roads and parking lots - Chloride levels have increased steadily and substantially in New Hampshire's freshwater streams, rivers, lakes, ponds, wetlands, and groundwater over the last 25 years, threatening the health of sensitive fish species and drinking water supplies. There is no easy solution. At this time, the only way to prevent chloride from reaching surface and ground water is to reduce the amount applied to our roadways and parking lots without compromising safety. NHDES, NH Department of Transportation, municipalities, University of New Hampshire, and private winter maintenance companies are working together to come up with solutions in watershed towns along the I-93 corridor expansion and state-wide.
– Eric Williams, NH Department of Environmental Services, Caleb Dobbins, NH Department of Transportation, and Pat Santoso, University of New Hampshire Technology Transfer Center

P. Climate change adaptation (1:30 – 2:00) -The impacts of climate change, such as extreme storm events and flooding, have been wide spread in New Hampshire. These events are projected to become even more common with the potential to have profound social, economic and environmental implications. This session will explore some of the issues communities face responding to extreme weather events and the potential impacts on human health. We will discuss local, regional and state-wide initiatives currently under way to help communities prepare for the impacts of climate change.
– Sherry Godlewski, NH Department of Environmental Services

Session IV
(2:30 pm – 3:30 pm)
unless otherwise noted

Q. Green grass, clear water – is it possible? - Is your community, watershed or municipal group interested in conducting outreach about lawn care and water quality? This session will provide you with the latest water quality-based recommendations for turf nutrient management as well as the latest findings about do-it-yourselfers' practices, beliefs and attitudes about lawn care. We'll discuss what the plant and social science findings mean for conducting effective lawn care outreach and how to implement them. *– Julia Peterson, NH Sea Grant and UNH Cooperative Extension*

R. Development and adoption of a post-construction stormwater management ordinance in New Durham (2:30 - 3:00) - The Town of New Durham, with the assistance of an engineering firm, developed a stormwater management ordinance that was subsequently adopted at the 2010 Town meeting. The ordinance is largely based on the NHDES Innovative Land Use Planning model post-construction stormwater management ordinance and is aimed at protecting water quality. The presenter will discuss the educational efforts, undertaken to inform members of the planning board and public, which were instrumental in this planning initiative. Key elements of the ordinance will also be discussed.

- Robert Craycraft, New Durham Planning Board

S. **Status Update: 2011 Surface Water and Wetland Legislation and the 2010 Legislative Water Study Commissions** (2:30 - 3:00) - During the 2011 Legislative Session several bills were introduced that would significantly alter (and even repeal) long-standing legislation pertaining to the Shoreland Protection Act, Wetlands, Septic Systems, and NHDES funding and permitting programs. In November 2010, four legislative water study commissions submitted reports to the General Court; these four commissions included: the Commission to Study Issues Relating to Land Development and Development Regulation in New Hampshire; the Commission to Study Water Infrastructure Sustainability Funding; the Commission to Study Issues Relating to Stormwater; and the Commission to Study Issues Related to Groundwater Withdrawals. During this session, Mr. Pelletier will provide a brief overview of the recommendations of these commissions and he will also update the attendees regarding the status of the numerous pieces of legislation pertaining to the quality of the state's surface waters that the General Court is considering.
- Rene Pelletier, NH Department of Environmental Services

T. **Groundwater quality of New England crytalline bedrock aquifers** (2:30 - 3:00) – A regional-scale analysis was done to characterize the water quality of crystalline rock aquifers in New England and in a small area in northern New Jersey. Data used in this study were compiled from untreated groundwater samples collected from 117 domestic-supply bedrock wells sampled during 1995 to 2000 as part of the U.S. Geological Survey National Water-Quality Assessment program and from 4,775 public-supply bedrock wells sampled during 1997 to 2007 as part of the State Safe Drinking Water Program. Major ion, trace element, and organic compound chemistry will be presented.
- *Sarah Flanagan, US Geological Survey, NH/VT Water Science Center*

U. **The Southeast Watershed Alliance – building inter-municipal cooperation to improve water quality** (3:00 – 3:30) - The New Hampshire Great Bay and Hampton Bay have recently been listed as impaired waters under the Clean Water Act. In response to this need the NH Legislature created the Southeast Watershed Alliance under RSA 485-E. The Alliance is a unique organization representing all of the municipalities in the NH coastal watershed with the purpose of improving and protecting the state's coastal water resources through increased inter-municipal cooperation. This talk will present the initial actions taken by the Alliance, and will discuss challenges and opportunities encountered, and future plans.
- Alison Watts, Ph.D., Southeast Watershed Alliance

V. **Is there life after residual designation authority (RDA)? (**3:00 – 3:30) - Under the federal Clean Water Act "Residual Designation Authority",the Environmenal Protection Agency can require permits from additional dischargers where a Total Maximum Daily Load (TMDL) supports such a determination and where discharges are contributing to water quality violations. Two watersheds within New England have recently experienced the challenges of RDA. Since GZA has participated in implementation efforts in both of these regions, comparisons are offered relative to the two approaches adopted in these areas where RDA

decisions have required community collaboration. GZA's involvement, which included representing a regulated permittee in Maine (a delegated state) and a municipality faced with regulatory responsibility in Massachusetts (a non-delegated state), allows direct comparison of many critical aspects, including lessons learned.
- Robyn Saunders and Rosalie Starvish, GZA GeoEnvironmental, Inc.

W. The Ore Hill Mine: partnering on water quality monitoring and exploring hydrologic research (3:00 – 3:30) - The former Ore Hill Mine in Warren, NH in the White Mountain National Forest (WMNF) has impacted Ore Hill Brook due to the discharge of acidic water with high metal content. The mine produced lead, zinc, copper, and silver between 1834 and 1915. The Forest Service reclaimed the site in 2006 and partnered with Plymouth State University's Center for the Environment for monitoring water quality at the site. Graduate students have been involved in regularly sampling the stream that drains the site to monitor changes in the water chemistry at the site providing an opportunity to explore additional research questions. The project model provides a good example of a partnership that can assist in long term monitoring to protect the water resources of the area around the mine while providing educational and research experience.
- Aaron Johnson, Christopher Nealen, June Hammond Rowan, and Mark Green, Center for the Environment, Plymouth State University, and Sheela Johnson, White Mountain National Forest