

FRIDAY INFORMATIONAL SESSIONS AND WORKSHOPS

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

SESSION I-A (10:10 AM – 10:30 AM) (UNLESS OTHERWISE NOTED)

A. NH Stressed Basins Project – Overview and Extended Data Uses

Water resources in New Hampshire have always been seen as plentiful and virtually inexhaustible. Increasing development pressures, especially in the southeastern portion of the state, have begun to challenge this perception. The “Stressed Basins Project” undertaken by the NH Geological Survey is an initial screening of water demand versus availability across the entire state. This session will review the variety of GIS tools and techniques used to build the datasets that supported this analysis.

Rick Chormann, Hydrogeologist, NHGS and Greg Barker, Hydrogeologist, NHGS

B. Stormwater Management Strategies for Reduction of Nitrogen and Phosphorus Loading to Surface Waters (10:10-10:40)

Strategies targeting nutrient stormwater management should consider treatment system performance and contaminant load. Load reduction considerations include system sizing for treatment volume and the soil infiltration capacity. This presentation will discuss a range of best management practice strategies for managing nutrient loading from stormwater runoff. The results of the project will serve to be useful for both projects where TMDLs and impaired waters require load reductions.

Rob Roseen, Director, UNH Stormwater Center

C. The EPA on Climate Change: the “State of Knowledge” and the Office of Water: “Response to Climate Change” (10:10-10:40)

In this session we will discuss two important documents from the EPA. The first is "The State of Knowledge: What is Known, What's Very Likely, What is Not Certain." The second document is "National Water Program Strategy-Response to Climate Change," which outlines EPA goals and specific action items that water resource managers should be engaging. These are not "regulatory" or rule making documents. However, they clearly lay out EPA's strategies and recommendations which may become part of a regulatory framework in the future.

Ray Sirois, Senior Associate – IT Director, Wright-Pierce

D. A River Runs Through It...Once Again! (10:10-11:10)

There are over 3,100 active dams throughout New Hampshire, the majority of which are near their design life. Dam owners are faced with tough decisions as many dams are in need of repair and long-term maintenance. One potential option is dam removal. This session will provide an overview of two successful dam removal projects – the Maxwell Pond Dam and the Merrimack Village Dam, and describe the decision making processes and partnerships that made these projects such a success.

Deborah Loiselle, River Restoration Coordinator, DES and Stephen Landry, Merrimack Watershed Supervisor, DES

E. Nitrogen – The 21st Century Coastal Watershed Challenge (10:10-10:40)

Nitrogen pollution is the number one threat to our coastal waters. An excess of nitrogen in coastal and estuarine waters can have cascading environmental consequences. This presentation will address the significance of nitrogen in the environment; the sources of nitrogen and how these sources move through the watershed; and nitrogen control strategies. The purpose of the presentation is to educate watershed officials about this growing environmental issue and about the strategies to manage this threat.

William Brown, President/CEO, Wright-Pierce

F. Build-out Analysis and Density Transfer Credits (DTC) to Manage Growth in the Bow Bog Brook Watershed (10:10-10:40)

The town of Bow has long recognized the value of its Bow Bog Brook watershed for its habitat, flood mitigation, and recreational value, and the importance of protecting this resource. As part of Community Technical Assistance Program a town-wide build-out analysis calculated the number of dwelling units that could be built under current zoning, and then tested how alternative zoning techniques would impact development in the watershed. This presentation will show how the build-out process was used as a visioning tool, and how a DTC can be used to direct growth in appropriate areas to preserve open space in priority areas.

Craig Tufts, Regional Planner, Central NH Planning Commission

SESSION I-B (10:30 AM – 10:50 AM) (UNLESS OTHERWISE NOTED)

A. Hydrologic Application of LIDAR Data: Case Study at the UNH Burley-Demeritt Farm

Light Detection and Ranging (LIDAR) is a new technology that can produce high resolution digital elevation models (DEMs). DEMs available from the USGS typically capture topography on a horizontal spacing ranging from 10 to 40 m, while the LIDAR DEM captures topography on a 1 m scale. This study compares the use of a LIDAR DEM with the more widely available 10 m DEM to quantify the hydrologic outputs at the Burley Demeritt Organic Dairy Research Farm in Lee, NH. This study found that the fine scale resolution of LIDAR is essential to accurately define stream networks.

Jennifer Campbell, Graduate Student, UNH and J. Matthew Davis, Associate Professor, UNH

B. Nutrient Removal Mechanisms in a Cold Climate Gravel Wetland (10:40-11:10)

Subsurface gravel wetlands are increasingly being installed to manage stormwater runoff in New England and around the country. These systems have shown excellent performance for pollution removal and hydraulic control of stormwater in cold climates. The UNH Stormwater Center, in collaboration with New England Interstate Water Pollution Control Commission, recently performed a detailed study of phosphorus and nitrogen removal in a subsurface gravel wetland located at UNH. Maintenance requirements and pollutant removal effectiveness will be discussed, with emphasis on cold climate performance, temporal trends, and nutrient removal mechanisms.

James Houle, Outreach Coordinator/Program Manager, UNH Stormwater Center; Robert Roseen, Director, UNH Stormwater Center; and Kim Farah, Professor of Chemistry, Lasell College

C. Greenhouse Gas Emissions from Wastewater Treatment and Biosolids Management (10:40-11:10)

EPA estimates that wastewater treatment accounts for about 0.6% of greenhouse gas (GHG) emissions nationwide. While wastewater treatment facilities (WWTF) are often one of the biggest electricity users in a municipality, reducing GHG emissions at these facilities must focus on CO₂, as well as methane and nitrous oxide. These far more potent GHGs are readily produced in anaerobic or low oxygen conditions. This presentation will review the sources of GHG emissions at WWTFs and biosolids

management programs, using Merrimack's biosolids program as an example that highlights the importance of controlling methane and nitrous oxide emissions, even as energy efficiency is increased and fossil fuel consumption is reduced.

Ned Beecher, Executive Director, North East Biosolids and Residuals Association

D. Spatial and Temporal Variability in Nitrogen Concentrations, Export and Retention in the Lamprey River Basin (10:40-11:10)

Coastal managers are often concerned with nitrogen loading to estuaries and coastal zones. The Lamprey River basin is the largest tributary to the Great Bay Estuary, which is experiencing a decline in aquatic health. Nitrogen inputs have been quantified and long-term changes in concentrations have been documented. The temporal and spatial change in nitrate is associated with increased septic systems, sewage, fertilizers and runoff from impervious surfaces, but the relative importance of these sources is still unknown. Targeting and reducing anthropogenic sources of nitrogen that have the largest direct or indirect impact on concentrations and export of nitrogen in the Lamprey River will be of utmost concern for managers who wish to protect the health of Great Bay.

Michelle Daley, Research Scientist, UNH and Dr. William H. McDowell, Professor in Natural Resources at UNH and Director of the NH Water Resources Research Center

E. Recreational Trails and Water Quality: Are Recreational Trails Degrading Stream Quality? (10:40-11:10)

The US Forest Service identified public recreation as one of the four greatest threats to forested landscapes. To quantify the ecological impact of recreation trails 112 trail segments (55 motorized, 26 non-motorized, 31 non-mechanized) were sampled in Maine and New Hampshire. Where recreation trails crossed stream channels the crossing structure (culvert, bridge, or ford) and assessed sediment were recorded. The study found that only 38% of all crossings had no sediment inputs and sediment inputs occurred on all trail types (motorized, non-motorized, and non-mechanized). The results of this study have direct implications for trail managers and land owners.

Ethel Wilkerson, Stream Ecologist, Manomet Center for Conservation Sciences

SESSION I-C (10:50 AM – 11:10 AM)

A. A Tool for Estimating Flood Flow Frequency on Ungaged, Unregulated, Rural Streams in New Hampshire

Effective mitigation of flood hazards, operation of flood-control structures, management of flood prone areas, and design of infrastructure in the riverine environment requires estimates of flood flow frequency, such as the magnitude of the 100-year flood. In cooperation with the NH Department of Transportation, the USGS developed new regression equations for

estimating flood-flow frequency on ungaged, rural, unregulated streams in state for the 2-, 5-, 10-, 25-, 50-, 100- and 500-year events. Geographic information systems coverages and tools were developed to eliminate the need for users to manually measure the basin characteristics required to solve the regression equations, these tools are available online to the public.

Keith Robinson, NH/VT Water Science Center Director, U.S. Geological Survey

SESSION II-A (11:30 AM – 12:00 PM) (UNLESS OTHERWISE NOTED)

A. GIS to Google: Sharing Interactive GIS Maps Online Using Google Earth and Google Maps (11:30-12:30)

While geographic information systems software is becoming more widely used by professionals in planning and conservation circles, the level of technical knowledge required (and cost) still prevent widespread adoption of the technology. At the same time, free and interactive mapping programs have become common place on almost every computer with a high-speed internet connection. This presentation will detail techniques ArcGIS users can use to create interactive maps to share their work with non-GIS users through commonly used software such as Google Earth and Google Maps.

Shane Bradt, Geospatial Extension Specialist, UNH Cooperative Extension

B. Pervious Concrete: When it Rains, It Drains! (11:30-12:30)

As concern grows regarding stormwater quality and the increase of impervious cover due to development, pervious concrete offers an excellent option to capture and treat stormwater on site while allowing for more efficient land use. Topics covered in this presentation include: properties of pervious concrete, applications, benefits, design considerations, placement guidelines, freeze-thaw durability, and project review. This presentation is registered with American Institute of Architects and offers one hour of Professional Development Credit.

Jonathan Kuell, Executive Director, Northern New England Concrete Promotion Association

C. The Northeast Climate Impacts Assessments and What it Means to Public Works (11:30-12:30)

Most discussions of "solutions" to climate change focus on mitigation strategies, energy efficiency, renewable fuels, etc. However, in this session we plan to discuss ADAPTATION strategies, which more profoundly impact the planning, design, and management of public works infrastructure. We will utilize the Northeast Climate Impacts Assessment, a higher resolution, regional, climate model for the study area from Maine to Pennsylvania, and we will address how the findings of that research affect water, stormwater, and wastewater management, and public works in general.

Ray Sirois, Senior Associate – IT Director, Wright-Pierce and Ryan Wingard, Senior Project Manager, Wright-Pierce

D. Water Supply Aid in Central NH – An Evaluation of Water System Interconnections

Maintaining water supply during natural disasters, major accidents and other unexpected events is of critical concern. The Central New Hampshire Regional Planning Commission initiated a mutual aid study to assess the feasibility of enhancing or developing new interconnections between several public water systems. This presentation will summarize the study, including collection of baseline data, development of an area-wide distribution model, and proposed infrastructure improvements.

Matthew Monahan, Regional Planner, Central NH Regional Planning Commission and Rob M. McCoy, P.E., Project Manager, SEA Consultants, Inc.

E. Temperature Regime Characteristics of High-Quality Coldwater New Hampshire and Massachusetts Streams

Baseline or natural stream thermal conditions are necessary to determine detrimental change to a stream's thermal regime. The natural variability in stream temperatures at multiple locations was quantified using an approach that parallels recent instream flow standards.

Baseline temperature metrics are the magnitude, frequency, timing, duration, and rate of stream temperature change. Metrics for all sites were combined and show a range of variability across the observed coldwater streams. These results will be presented within a management context relevant to the development of improved Total Maximum Daily Load targets for coldwater streams and effectively regulating and monitoring streams and stream temperature under the requirements of the Clean Water Act. *Jennifer M. Jacobs, Associate Professor, UNH and Gary Lemay, Research Assistant, UNH*

F. DES's Innovative Permitting and Technical Assistance Initiative: Introduction and Discussion (11:30-12:30)

The NH Department of Environment Services is embarking on an exciting new agency initiative to improve technical assistance and permitting programs to achieve superior environmental results, streamline permitting procedures, and improve coordination with other agencies and municipalities. DES intends to establish voluntary guidelines for achieving a higher standard of environmental performance for land development activities, explore opportunities to enhance pre-application meetings, and identify ways to better coordinate state and municipal project reviews and standards. Learn about approaches currently under consideration and provide your input to make this initiative successful.

Carolyn Russell, Senior Environment and Land Use Planner, DES

SESSION II-B (12:00 PM – 12:30 PM)

A. Wastewater Nutrient Control

Over the better part of the past four decades, secondary wastewater treatment has been the norm, with only a small fraction of facilities having to meet more advanced standards. However, increasing water quality concerns are making nutrient standards common place. Over the next decade, advanced wastewater treatment for nitrogen and/or phosphorus nutrient removal will become the norm and many municipal wastewater treatment facilities will be required to make costly upgrades. The purpose of this presentation is to educate municipal officials about these pending regulatory changes and the most common methods to effect nutrient removal, and some of the more innovative strategies. Multiple projects will be profiled. *William Brown, President/CEO, Wright-Pierce and Peter Atherton, Vice-President, Wright-Pierce*

B. Identification and Assessment of New Hampshire Fish Assemblages

The DES Biomonitoring Program is charged with classifying, developing, and assessing the condition of aquatic communities. Toward this end, three distinct fish assemblages have been identified using data from unimpacted sample locations. To date, condition indices have been developed from two of the three assemblages. The indices provide numeric interpretations of DES's narrative water quality standards for biological communities. The presentation will demonstrate how to identify expected fish assemblage types, how the indices are applied in making water quality assessments, and future applications of these tools in developing in-stream water temperature standards.

David Neils, Biomonitoring Program Manager, DES

WORKSHOP I-A (1:30 PM – 2:00 PM) (UNLESS OTHERWISE NOTED)

A. The Habitat Priority Planner: A GIS-Based Tool to Help Focus Financial and Community Resources on Critical Habitat Areas (1:30-3:30) (add \$20 fee)

The Habitat Priority Planner (HPP) is a GIS-based tool developed to assist with prioritizing areas within towns or watersheds as part of the decision-making process for conservation, land-use planning, and natural resource restoration.

HPP was developed and is supported by the NOAA Coastal Services Center for ArcGIS 9.2 and 9.3. This session will introduce participants to the basics of the HPP, discuss what types of GIS data can be used, and provide participants with hands-on experience.

Shane Bradt, Geospatial Extension Specialist, UNH Cooperative Extension

B. Stormwater Management in New Hampshire: What Is and What Should Be (1:30-3:30)

New Hampshire's surface waters are a valuable natural resource that provide vital habitat, supply drinking water, offer recreational opportunities, and support our economy and quality of life. As population growth and development pressures increase, it is becoming increasingly difficult to protect and maintain the quality of our surface waters. This workshop will provide an overview of the current hot topics in stormwater and the activities that aim to protect the state's surface waters from the impacts of stormwater pollution. Significant time will be spent discussing continued areas for improvement in managing stormwater and drawing upon expertise in the room to prioritize current and future stormwater management needs, and to brainstorm potential solutions to address these needs.

Jillian McCarthy, Stormwater Coordinator, DES

C. LID Practices as a Means of Resilience and Short-Term Adaptation to Climate Change (1:30-2:30)

Many surface water bodies have been severely degraded by runoff from centuries of continuous human development without regard to the impacts of stormwater. Local governments are beginning to respond to the need for action about increased imperviousness by adopting local low impact development (LID) ordinances. The purpose of this study was to evaluate the hydrologic abilities of LID development to: reduce peak runoff flow rates to the pre-development values; to infiltrate the recharge volumes mandated by current criteria; and to attenuate the impacts of extreme storm events. The results show that the LID site design: generated much lower runoff volumes than the conventional and pre-development site conditions; infiltrated more than the recharge volumes required by current regulations; and attenuated the impacts of extreme storms modified for climate change.

Robert Roseen, Director, UNH Stormwater Center; Thomas Ballesterio, Senior Scientist, UNH Stormwater Center; and Iulia Barbu, Graduate Assistant, UNH Stormwater Center

D. Developing a Water Resources Plan for New Hampshire: An Opportunity to Participate in the Planning Process (1:30-3:30)

DES has developed the Water Resources Primer to inform policy makers and residents about the state's water resources and the challenges of sustainably managing them. The primer's lead author is DES, but the document was greatly

influenced and improved by the contributions of many stakeholders and experts. This workshop will consist of presentations summarizing the work done to date and the findings, followed by a discussion session. This is an opportunity for attendees to participate in the process of developing a water resources plan by identifying key concerns and suggesting actions and strategies.

Paul Susca, Supervisor – Planning, Protection & Assistance, Drinking Water and Groundwater Bureau, DES; Sarah Pillsbury, Administrator, DWGB, DES; and Paul Currier, Administrator, Watershed Management Bureau, DES

E. Recent Improvements to the US Geological Survey Streamgaging Program

US Geological Survey continues to incorporate emerging technologies in an effort to enhance its streamgaging program, which was established in 1903. Hydroacoustic instruments that use pulses of sound and the Doppler shift to measure water velocity are replacing mechanical meters for the computation of discharge and as index-velocity gaging stations in areas where the standard stage-discharge relationship does not apply. Satellite telemetry is also used to transfer data from streamgages in real-time generally on an hourly interval.

Richard Kiah, Hydrologic Technician, USGS

F. Environmental Characteristics Zoning: Let's Get Ready for Town Meeting 2010 and Beyond! (1:30-3:30)

Working with the *Innovative Land Use Planning Techniques: A Handbook for Sustainable Development*, regional planners, who were contributors to the *Handbook*, will present a summary of Section 2 - Environmental Characteristics Zoning. The presenters will provide information on actual ordinances that were developed by New Hampshire communities using the *Handbook*. The final section of the presentation will be an interactive discussion in small groups, where participants can ask in-depth questions about developing ordinances, building political support, providing outreach and education, and legal considerations.

Jack Munn, AICP, Chief Planner, Southern NH Planning Commission; Tara Bamford, Planning Director, North Country Council; Erica Anderson, Senior Planner, Lakes Region Planning Commission; Minda Shaheen, Environmental Planner, Nashua Regional Planning Commission; and Cynthia Copeland, AICP, Executive Director, Strafford Regional Planning Commission

WORKSHOP I-B (2:00 PM – 2:30 PM)

A. The Other Half of the Protected Instream Flow Pilot Program: Water Management Plans

When protected instream flows are established for a designated river, they become surface water quality standards for that river. Stream flows are a result of many activities occurring in the watershed, not usually the result of one person's actions. Water management plans need

to describe water management activities to maintain the protected instream flows, and define management actions so that water users can have access to the water they need. This means cooperation and coordination among the water users and dam owners to see that their common and individual needs are being met.

C. Wayne Ives, P.G., Hydrogeologist, Instream Flow Specialist, DES

WORKSHOP I-C (2:30 PM – 3:00 PM)

A. Stream Temperature and the Hyporheic Zone - Implications for Stream Protection and Restoration

Stream temperatures are regulated by heat added to or removed from streams as they flow downstream. When stream water enters the streambed or hyporheic zone, it exchanges with subsurface water and its temperature may moderate. This presentation will summarize factors that influence stream temperature, review significant stream and watershed features, and present key research findings regarding stream temperature and stream restoration.

Danna B. Truslow, Hydrologist, D.B. Truslow Associates and Jennifer M. Jacobs, Associate Professor of Civil Engineering, UNH

B. Raising the Profile of Watershed Management: Contoocook and North Branch Rivers Management Plan Update

Central New Hampshire Regional Planning Commission, in partnership with the Southwest Region Planning Commission, is assisting the Contoocook and North Branch Rivers Local Advisory Commission (CNBRLAC) in updating their River Management Plan. The project aims to generate a cohesive and implementable work plan for CNBRLAC, and increase public awareness and support through cooperation among the 14 communities. The update takes advantage of new GIS and web-based tools.

Vanessa Bittermann, Regional Planner, Central NH Regional Planning Commission

WORKSHOP I-D (3:00 PM – 3:30 PM)

A. Climate Change and Simulated Groundwater Availability in the Seacoast Region of New Hampshire

Groundwater availability in the Seacoast Region was analyzed through a cooperative effort among the Seacoast's communities, the DES Coastal Program and Geological Survey, and the USGS. The USGS developed ground-water-flow models for a 160-mi² area of coastal New Hampshire to assess groundwater resources and the potential effects of climate change on groundwater resources. The models simulated average monthly groundwater flows for 2000-04 and future climate changes estimated for 2025. Forecasts of changes in climate over the next 100 years include higher temperatures, longer growing seasons, and precipitation changes that include possible increases in winter precipitation and more frequent occurrences of intense precipitation events. Of these potential changes, increasing temperatures are considered to be most likely to occur.

Thomas J. Mack, Hydrologist, US Geological Survey

B. Shoreland Buffer Protection Analysis and Implementation along the Upper Merrimack River

The Upper Merrimack River Local Advisory Committee is working with the Central New Hampshire Regional Planning Commission to strengthen local shoreland protection measures. A significant portion of the 2007 Upper Merrimack Management and Implementation Plan focused on setbacks and buffers. This implementation project analyzes local and state regulatory protections to identify gaps and propose effective buffer and setback requirements. The outcome for this project is to identify protection needs and influence local decision makers to increase levels of protection for the Upper Merrimack River.

Michele L. Tremblay, Chair, Upper Merrimack River Local Advisory Committee; Steve Landry, Vice Chair, Upper Merrimack River Local Advisory Committee; Matthew Monahan, Regional Planner, Central NH Regional Planning Commission; and Vanessa Bittermann, Regional Planner, Central NH Regional Planning Commission

SATURDAY INFORMATIONAL SESSIONS AND WORKSHOPS

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

SESSION I-A (10:10 AM – 10:40 AM) (UNLESS OTHERWISE NOTED)

A. GIS on Pennies a Day: GIS Software Everyone Can Afford (10:10-11:10)

While the power of geographic information systems (GIS) to manage, analyze and share information about watersheds is widely recognized, it is commonly believed that GIS software is too expensive for most small towns or non-profit organizations. This is no longer the case! This session will introduce participants to various free GIS software packages and detail their strengths and weaknesses. We will also cover basic GIS concepts to understand the features of the software discussed.

Shane Bradt, Geospatial Extension Specialist, UNH Cooperative Extension

B. Fond of Our Lawns (10:10-11:10)

Much of New Hampshire's land has been converted from forest and field to residential homes. Residential properties, including lawns, are considered potential contributors of non-point source pollution especially nutrients from fertilizer. This presentation will share the results of a project combining social and environmental science to explore possibilities for reducing nutrient losses from lawns into local waters.

Julia Peterson, Extension Specialist, NH Sea Grant; Brian Eisenhauer, Associate Director, Plymouth State University Center for the Environment; and Nick Stevenson, Graduate Student, Plymouth State University

C. LID Practices as a Means of Resilience and Short-Term Adaptation to Climate Change (10:10-11:10)

Many surface water bodies have been severely degraded by runoff from continuous human development without regard to the impacts of stormwater. Local governments are responding by adopting local low impact development (LID) ordinances. The purpose of this study was to evaluate the hydrologic abilities of LID development. The results show that the LID site design: generated much lower runoff volumes than conventional and pre-development site conditions; infiltrated more than the recharge volumes required by current regulations; and attenuated the impacts of extreme storms modified for climate change.

Thomas Ballestero, Senior Scientist, UNH Stormwater Center

D. America's Next Top Volunteer (10:10-11:10)

They say that a good volunteer is hard to find. Not true! There are great people out there who want to be part of something meaningful and it should be your program. By being visible, asking the right questions, listening, and observing, you CAN find—and retain—the volunteers that you need AND get them to help you find—and retain—more! This fun and fast-paced session will include role-playing and plenty of other interaction so that you can start “dancing with the volunteers” right away!

Michele L. Tremblay, Principal, naturesource communications

E. The Newfound Watershed Master Plan – Science-based Policy for Environmental Economic Sustainability

The purpose of this session is to summarize key actions and lessons learned from completing a watershed master plan for the Newfound Lake region. Attendees will learn about a science-based approach to policy development and top-down /bottom-up collaboration to unite individual towns in a regional effort to protect the environment and local economy.

Boyd Smith, Executive Director, Newfound Lake Region Association

F. Stream Ecosystems and their Restoration (10:10-11:10)

Streams are unique ecosystems in that they are long and narrow, water flows in one direction, and they are susceptible to dramatic and frequent changes in habitat. John will present an overview of stream ecology, and potential activities, both active and passive, that can improve the health of streams. Jim will present a case study from Nash Stream that shows active restoration treatments to improve the health and function of streams. Nash Stream has been greatly impacted by historic logging practices, a catastrophic dam failure and resulting flood. Jim will describe the more significant impacts, present examples of restoration activities at Nash Stream, and what is planned for the future.

John Magee, Fish Habitat Biologist, NH Fish and Game Department and Jim MacCartney, River Restoration Specialist, Trout Unlimited

SESSION I-B (10:40 AM – 11:10 AM)

A. Acton Wakefield Watersheds Alliance Bi-State Watershed Based Management Plan

The Acton Wakefield Watersheds Alliance is currently completing a bi-state watershed based management plan through a high quality waters grant from the NH Department of Environmental Services. The project focuses on five high-quality lakes that comprise the headwaters of the Salmon Falls River, which forms the border for much of southern Maine

and New Hampshire. This stakeholder-driven and supported plan utilizes several traditional analytical techniques including pollutant load modeling, shoreline surveys and watershed surveys. The AWWA watershed assessment included three unique tools for quantifying and predicting future pollutant loads.

Forrest Bell, Principal, FB Environmental and Linda Schier, Executive Director, Acton Wakefield Watersheds Alliance

SESSION II (11:30 AM – 12:30 PM)

A. Learning to Google Your Watershed: An Overview of Google Tools for Creating Interactive Maps

Many computer users are familiar with Google Maps and Google Earth for recreational use, but few people realize the full potential of these tools for creating and sharing maps. This session will review the basics of map creation using the free version of Google Earth and Google Maps, providing a quick and easy way for anyone to share information about their community or watershed.

Shane Bradt, Geospatial Extension Specialist, UNH Cooperative Extension

B. Stormwater Management in New Hampshire: What Is and What Should Be

New Hampshire's surface waters are a valuable natural resource that provide vital habitat, supply drinking water, offer recreational opportunities, and support our economy and quality of life. As population growth and development pressures increase, it is becoming increasingly difficult to protect and maintain the quality of our surface waters. This workshop will provide an overview of the current hot topics in stormwater and the activities that aim to protect the state's surface waters from the impacts of stormwater pollution. Significant time will be spent discussing continued areas for improvement in managing stormwater and drawing upon expertise in the room to prioritize current and future stormwater management needs, and to brainstorm potential solutions to address these needs.

Jillian McCarthy, Stormwater Coordinator, DES

C. Climate Change Adaptation for a NH Coastal Watershed: Identifying Risk and Costs for Culvert Infrastructure

The Piscataqua Region Estuaries Partnership

(PREP) is one of 28 National Estuary Programs administered by the US EPA. The National Estuary Program is developing climate change adaptation strategies through its "Climate Ready Estuaries" initiative. The study utilized GIS watershed modeling techniques to examine the hydrologic impact of climate change and land use scenarios on existing culvert infrastructure. Utilizing the model results, recommendations for culvert improvements based on risk, cost, and infrastructure lifespan considerations were developed. This study demonstrates the implementation of a quantified, local-scale protocol for maintaining historical risk levels for communities facing significant impacts from climate change and population growth.

Derek Sowers, Project Coordinator, Piscataqua Region Estuaries Partnership

D. Framing the Issue: How Science Leads to Watershed-Friendly Changes in the Law

How much does science influence policy? Do our legislative representatives need to be scientists to understand the process of protecting the state's approximately 1,000 lakes and ponds and 12,000 miles of rivers and streams? By examining the legislative process, attendees will develop a better understanding of how sound science can be reprocessed into a "policy idea" and become "good" law that will serve to better protect the water resources that contribute to the quality of life in New Hampshire. Jared will focus on the passage of recent bills aimed specifically at protecting water resources, including the passage of the phosphorus bill which adds automatic dishwashing detergents to the list of banned household cleaning products containing phosphorus.

Jared Teutsch, President and CEO, NH LAKES

E. Merrimack River Watershed Wetland Restoration Strategy

The recent development of the Aquatic Resource Mitigation Fund (ARM) has provided a promising new source of grant money to help with wetland restoration efforts. These funds are available to cities and towns to implement programs to restore, protect or create aquatic habitats. Funds are pooled together on a watershed basis and managed by the NH Department of Environmental Services and a Site Selection Committee made up of watershed stakeholders. Because of the large scale of this watershed (1,672 square miles), the development and application of an automated geospatial model to identify and prioritize potential wetland restoration sites was determined necessary. The overall goal was to build a GIS model of the Merrimack River watershed to identify wetlands that may be impacted by past land uses and understand which wetlands may benefit from restoration.

Lori Sommer, Wetland Mitigation Coordinator, DES Wetlands Bureau; Peter J. Walker, CWS, Director of Environmental Services for Northern New England, Vanasse Hangen Brustlin, Inc.; and Dale E. Abbott, GIS Analyst, Vanasse Hangen Brustlin, Inc.

F. The Use of Log Jams in Bank Stabilization Efforts in Colebrook

Bank erosion threatens roads, homes and farms along rivers and streams throughout the state. Bank erosion has been treated through the use of riprap, but this approach often does not address the cause of the erosion. Geomorphic assessments are useful to identify the root causes for erosion. An assessment identified channel straightening of the Mohawk River in the 1960s as the cause for increased sedimentation and bank erosion along the Connecticut River. The Connecticut River Joint Commissions sponsored an innovative two-part project to address this – 1) utilize log jams on the Mohawk River to divert water into old abandoned meanders and 2) install six flow deflector log jams on the Connecticut River that push water away from the eroding bank. These projects represent the first large scale use of log jams in New Hampshire and provide an example of how to develop sustainable bank stabilization by addressing the root causes for erosion.

Maeve McBride, PhD, Ecological Engineer, SEEDS and Adjunct Assistant Professor, University of Vermont; Sharon Francis, Executive Director, Connecticut River Joint Commissions; and Adair Mulligan, Conservation Director, Connecticut River Joint Commissions

WORKSHOP I-A (1:30 PM – 2:00 PM) (UNLESS OTHERWISE NOTED)

A. Bringing GPS into Maps: Free Tools to Put Points on the Map (1:30-3:30) (add \$20 fee)

Global positioning systems have long been used by professionals to create geographic information systems data, but is of growing importance as a tool used by volunteer groups and municipal organizations to map their watersheds. These groups often coordinate GPS data collection events, but wind up handing off the GPS units to consultants for map composition due to a lack of technical ability. Fortunately, there are several free and user-friendly software packages that provide an easy way to turn data collected with handheld GPS units into maps in GIS or Google Earth. We will use a hands-on approach to cover the process of creating a map from GPS points, starting with GPS data collection in the field and wrapping up by having each participant create a map of the points they collect.

Shane Bradt, Geospatial Extension Specialist, UNH Cooperative Extension

B. LID Applications in NH: From Retrofit Case Studies to Everything You Wanted to Know About Rain Gardens (1:30-3:30)

Low impact development has been promoted to reduce stormwater impacts in New Hampshire for several years and yet there are still many questions. How can an existing site be retrofitted with LID? How have earlier installments held up? When would you use and how do you install and maintain a rain garden? Matt will provide two case studies of retrofits of existing storm water systems: A 2005 commercial LID project with rain gardens, bio-filter/bio-retention areas, leaching catch basins and permeable pavers/porous asphalt areas at Merrimack Pennichuck Square; and LID stormwater BMPs installed in downtown Peterborough to address non-point source pollution entering the Contoocook River. Steve will focus on installation of rain gardens: where they work best, what soils, slopes, plants to use, and drainage and maintenance issues.

Matthew Lundsted, P.E., Principal, Comprehensive Environmental, Inc. and Steven Roy, LEED, AP, Principal, Geosyntec Consultants

**C. The NH Climate Action Plan:
Opportunities to Preserve and Protect
Water Quality and Watersheds (1:30-
2:30)**

New Hampshire's rich natural resources provide a high quality of life and play a vital role sustaining our economy. However, these forest lands, rivers and lakes, and coastal areas are threatened by the current and future effects of climate change. As a result, there is growing concern regarding the significant detrimental effects that a changing climate could have on our local economy and the quality of our lives. This workshop will provide a broad overview of the risks associated with climate change in New Hampshire and the Northeast as well as the contents of the Climate Action Plan, which was submitted to Gov. Lynch in March 2009. Significant time will be spent on the recommendations in the plan that affect water and watersheds and the essential ecosystem services that they provide. A facilitated discussion will follow the presentation to draw upon the expertise in the room to identify specific vulnerabilities, opportunities and solutions, and to develop a set of action steps that can be taken following the workshop.
Chris Skoglund, Energy and Transportation Analyst, DES

**D. Designing Stronger Projects and
Proposals for Watershed Protection
(1:30-3:30)**

Grant project planning involves more than having a good idea. This facilitated interactive training is designed to introduce techniques that will improve your ability to design strong projects and turn your ideas into winning grant proposals. Participants will go through a step-by-step planning process to clearly identify the situation your project addresses and create measurable and reasonable outcomes. Participants are encouraged to bring their own project ideas.
Julia Peterson, Extension Specialist, NH Sea Grant and Barbara McMillan, Watershed Outreach Coordinator, Watershed Assistance Section, DES

**E. The Active River Area: A Framework for
River Conservation and Restoration**

The concept of the Active River Area can be used as a framework for protecting aquatic ecosystems. "Active" indicates the dynamic and disturbance-driven processes that form habitat. "River area" represents the spatially explicit lands within which these physical and ecological processes occur. There are five key components of the active river area: the meander belt, floodplain, riparian wetlands, terraces, and material contribution zones. Each contributes to habitat forming and maintenance processes and can provide important ecosystem services, such as flood storage. GIS techniques are readily available for spatially identifying the active river area at the scale of watersheds or multiple watersheds, this information can be used as the basis for designing comprehensive freshwater protected area networks and for identifying opportunities for conservation and restoration activities.

Douglas Bechtel, Director of Freshwater Science, The Nature Conservancy

**F. Protecting Surface Water Through Land
Conservation: Why, How and Whom to
Work With (1:30-3:30)**

For those who are concerned with protecting local water resources, this workshop will provide a rationale for land conservation, and an understanding of land conservation tools (easements, etc.), potential partners, and funding sources. The workshop will include a panel discussion including experienced watershed-oriented land conservation practitioners, and time for participants to brainstorm in groups about land conservation opportunities in their regions/watersheds.

Holly Green, Water Supply Land Protection Grant Coordinator and Rules Coordinator, Drinking Water and Groundwater Bureau, DES; Brenda Lind, Land Protection Specialist, Society for the Protection of NH Forests; Eric Masterson, Executive Director, Piscataquog Land Conservancy; and Jeff Winders, Regular Member, Rochester Conservation Commission

WORKSHOP I-B (2:00 PM – 3:00 PM)

**A. NH's New River Management and
Hazard Mitigation Approach: Science
and Planning for Fluvial Erosion Hazards**

Floods are the most frequent disaster in New Hampshire, resulting in significant damage to private property and public infrastructure. While inundation-related flood loss is a significant component of flood events, a substantial amount

of damage results from fluvial erosion, or erosion caused by flowing water. Fluvial erosion problems result from historic channel alterations, and encroaching development that alters local river form and hydrology. In response, the New Hampshire Geological Survey, Rockingham Planning Commission, and DES initiated assessments for the Ammonoosuc,

Exeter, and Isinglass Rivers to provide data and tools to identify and manage local fluvial erosion hazards (FEHs). NHGS and RPC developed maps that delineate lands most vulnerable to fluvial erosion and identify specific FEHs. Concurrently, the Legislature passed HB 290 authorizing the adoption of local FEH ordinances. RPC developed a model FEH ordinance that provides a cost-effective strategy

for protecting citizens, and reducing property and infrastructure damages. RPC is currently working with several towns in the Exeter River watershed to develop customized FEH ordinances.

Sally Soule, Coastal Watershed Supervisor, DES; Shane Csiki, Fluvial Geomorphologist, DES; Julie LaBranche, Senior Planner, Rockingham Planning Commission

WORKSHOP I-C (3:00 PM – 3:30 PM)

A. Holistic Assessment and Mitigation of the Bacteria-Impaired Furnace Brook Watershed

Furnace Brook is a small (3.9 square mile) watershed draining to the Souhegan River and is impaired due to the presence of elevated bacteria levels. Like many bacterial impaired waters, Furnace Brook receives bacteria loads from a variety of sources, such as septic systems, roads, and farms, and also receives excessive loadings of other pollutants. An innovative approach was developed and applied to identify and prioritize pollutant sources. New Hampshire's Nonpoint Source (NPS) Management Plan and associated NPS priority listing approach was utilized to

support the development of a targeted pollutant source list. The project team worked with stakeholders, including the board of selectmen, conservation commission, and volunteer monitoring team, to secure funding required for the implementation of mitigative actions. This project is important because it links Total Maximum Daily Loads development with holistic, on-the-ground watershed restoration and provides a template for watershed restoration projects in other impaired watersheds throughout the New Hampshire.

Ken Hickey, Senior Scientist, FB Environmental and Stephen Landry, Merrimack Watershed Supervisor, DES