Presentation Abstracts

2014 CT Volunteer Water Quality Monitoring Conference

River & Stream Monitoring - From Getting Started to Growing with Intention

July 25, 2014
Goodwin College
East Hartford, CT

Preferred citation format: Last Name, Initials, (2014). Presentation title. 2014 Connecticut Volunteer Water Quality Monitoring Conference, Hartford, CT. July 25, 2014.

Example: Danila, D (2014). Water quality monitoring in the Latimer Brook watershed: What you can do with your data. 2014 Connecticut Volunteer Water Quality Monitoring Conference, Hartford, CT. July 25, 2014.

NUTRIENT MONITORING

WATER QUALITY MONITORING IN THE LATIMER BROOK WATERSHED: WHAT YOU CAN DO WITH YOUR DATA

Donald Danila
Niantic River Watershed Committee
abcfish@ct.metrocast.net

The Niantic River, an estuarine water body discharging into Long Island Sound, has a geographical watershed area of 31.3 mi2 located within four towns of southeastern Connecticut: East Lyme, Waterford, Montville, and Salem. The Niantic River Watershed Committee (NRWC) was formed in 2009 by members of these four towns. Due to concerns about excess nutrient input into the Niantic River estuary potentially affecting eelgrass beds and promoting algal blooms and a lack of water quality information, the NRWC initiated a monitoring program in April of 2012 that continues to the present. This sampling occurs primarily in Latimer Brook, the largest freshwater tributary of the Niantic River, as well as in Cranberry Meadow Brook (CMB), a tributary to Latimer Brook in East Lyme.

Basic water quality parameters, including temperature, dissolved oxygen, pH, and conductivity are measured monthly at stations throughout the watersheds of these brooks. Water samples are also taken to determine the concentration of nitrate, a key nutrient to the Niantic River estuary. The

sampling plan is adaptive and several modifications have been made since work began to enhance our data collection. A brief summary of findings to date and the rationale for programmatic changes will be given. In addition to the routine water quality sampling, the NRWC has also placed long-term water temperature monitoring devices at several locations in CMB to investigate the influence of storm-water runoff from a solar energy project on this coldwater trout stream. The temperature data recorded encompassed several severe rainstorms, precipitation data for which were obtained from the nearby USGS rain gage in Flanders Village. Insights gained from the temperature monitoring during episodic storm events on the contribution of water from the tributary into mainstem CMB and effects on water temperature will be discussed.

INTERIM REPORT ON THE LATIMER BROOK WATERSHED: NITRATE CONCENTRATIONS AND STREAM MIXING

John P. Jasper
Niantic River Watershed Committee
JPJasper@naturesfingerprint.com

The transport of excess nitrogen to the Niantic River Estuary (NRE) from its tributary brooks (particularly, the Latimer Brook) likely contributes to episodic late-summer eutrophication and hypoxia in the upstream reaches of the estuary. We are in the midst of quantifying the fluxes of both water and nitrogen from- and within the Latimer Brook (LB) watershed to the NRE. There are presently three scales at which we have measured these fluxes: (i) absolute fluxes of water and nitrogen emanating from the LB watershed as quantified by water fluxes measured at the pre-existing USGS water gage and measured nitrate concentrations (which show a factor of 5 variation between April and September of 2012). Where water-flow gages were not present, estimation of *relative* water and/or nitrate fluxes by temperature-based two end member mixing models: (ii) The Upper LB water fluxes (which represent ~69 $\pm$ 12% of the combined flow) varies by a factor of ~2 over that interval. By contrast, the CMB water fluxes (which represent ~31 $\pm$ 12% of the combined flow) vary by a factor of ~5.5 over the same interval. Relative nitrate fluxes in the Upper LB vary by a factor of ~6 in the extreme while those of the CMB vary by a factor of ~7 over the same interval; and (iii) Further upstream, a short-term (four-day) investigation of the CMB / UT confluence with an unnamed tributary (UT) *preliminarily* shows a diel variation in relative water fluxes, initially related to precipitation. Large (~0-90%) diel variations in the relative (UT vs CMB) water flows indicate large potential for short-term episodic scouring of the CMB by rain events and presumably the transmission of marked bursts of suspended and dissolved materials into the CMB-LB system. In summary, various periodic oscillations of the flux or relative fluxes of water and nitrate pulse through the Latimer Brook watershed at increasing timescales upstream from the downstream (NRE) end of the LB (annual variation), the LB / CMB confluence (~biannual variation), and CMB / UT confluence (indication of diel variation).

GETTING STARTED

DEEP'S THREE TIERED APPROACH: SUPPORTING VOLUNTEER MONITORING OF WADEABLE STREAMS & RIVERS

Meghan Ruta
CT DEEP Water Monitoring & Assessment Program
meghan.ruta@ct.gov

The CT DEEP Monitoring and Assessment Program collects and evaluates water quality data each year in order to determine whether the State's waterbodies are meeting water quality standards. These evaluations are referred to as 'water quality assessments' and the results, often referred to as determining whether the streams are 'fishable or swimmable', are reported in a biennial 'Integrated Water Quality Report' to EPA and Congress. Those waterbodies that are evaluated as meeting water quality standards are guaranteed certain protections to prevent their degradation, while those that are assessed as not meeting the standards are designated 'impaired' and a plan for their restoration is enacted. Despite expanded CT DEEP monitoring activities over the past several decades, there are still a large number of waterbodies for which limited or no water quality data exist. In order to fill these information gaps and increase the number of assessments made during each reporting cycle, in particular on these small headwater streams, DEEP relies on external data sources, including those of researchers and NGOs.

This presentation will review DEEP's three-tiered approach to supporting and evaluating volunteer water quality data. We will review the various levels of time investment, cost, expertise, and training required of programs in each tier. Attendees will hopefully leave this presentation with a better understanding of how DEEP is able to utilize volunteer monitoring data, and what steps groups need to take prior to monitoring if they wish to insure that their data will lead to a definitive water quality assessment on a local water body.

NEED HELP GETTING YOUR PROGRAM OFF THE GROUND? ASK THE SEASONED SAMPLERS!

Jane Brawerman
CT River Coastal Conservation District
jbrawerman@conservect.org

Alisa Phillips-Griggs
Farmington River Watershed Association
river@frwa.org

Carol Haskins
Pomperaug River Watershed Coalition
chaskins@pomperaug.org

Jean Pillo
The Last Green Valley
jean.pillo@conservect.org

Are you new to the world of water quality sampling? Would you like to run your monitoring program idea by individuals with years of experience conducting volunteer water quality monitoring? If so, then this is the session for you! Members of the conference steering committee will be available to answer questions and discuss your ideas for getting a new program started.

Jane Brawerman is Executive Director of the Connecticut River Coastal Conservation District. She has worked for the Conservation District since 1992, initially as director of the Connecticut River Watch Program, a citizen water quality monitoring, protection and improvement program for the Connecticut River and tributaries. Jane has planned and conducted a variety of studies of water

quality and stream health, including surface water sampling, visual stream corridor assessments (stream walks and track down surveys), and macroinvertebrate assessments. Her current water sampling activities are focused on bacteria, but she has also monitored streams for other water quality indicators, such as temperature, dissolved oxygen, pH and alkalinity, turbidity, and nutrients.

Carol Haskins currently serves as the Outreach Director for the Pomperaug River Watershed Coalition. Carol's experience includes monitoring temperature, flow, and other physical characteristics of rivers and streams, along with conducting streamwalks and macroinvertebrate assessments on rivers and streams. Carol also has experience conducting groundwater assessments to characterize local contamination plumes.

Alisa Phillips-Griggs is Water Quality & Projects Coordinator for the Farmington River Watershed Association. Since joining the FRWA staff in 2006 she has expanded the FRWA water monitoring program to include an in-house laboratory for analyzing bacteria and macroinvertebrates. Alisa also manages FRWA's monitoring for chemistry, metals, nutrients, temperature, and the streamwalk program.

Jean Pillo serves as a Watershed Conservation Project Manager for the Eastern Connecticut Conservation District. Since 2006 she has been under contract to coordinate the volunteer water quality monitoring program for The Last Green Valley, a National Heritage Corridor that includes 26 Connecticut and 9 Massachusetts towns that encompass the majority of the upper Thames River basin watershed. Over 100 volunteer "watershed detectives" a year help to collect various forms of water quality data in streams, lakes and ponds using QAPP qualified procedures.

DEVELOP YOUR OWN WATER QUALITY REPORT CARD WORKSHOP

CALCULATING WATER QUALITY INDICATOR SCORES FOR ECOSYSTEM HEALTH REPORT CARDS*

**Note: This talk will span two break-out sessions. Session 1 will include a 20 minute presentation followed by 15 minute Q&A. Session 2 will involve an audience activity to learn how to choose indicators and integrate them into an overall report card.*

Alexandra S. Fries
University of Maryland Center for Environmental Science
Integration and Application Network
afries@umces.edu

Ecosystem health report cards can be a tool to communicate the status of and progress toward achieving water quality management objectives. They synthesize large amounts of information into public friendly communication products, which inform the general public, decision makers, and managers on current ecosystem health. Report cards use quantitatively robust data that link directly to management objectives. Management objectives are reflected in several aspects of the report card process, including indicator selection and the thresholds against which those indicators are scored, e.g., do you want your river or stream to meet water quality criteria set through the Clean Water Act? Do you want the river to be swimmable (meet regulatory bacteria standards) and fishable (meet contaminant guidelines)? Report cards use straight-forward and transparent data analysis methods so that stakeholders have a clear understanding of how report card scores are determined. Several examples of report cards and data analysis are discussed, including Old

Woman Creek and Pipe Creek Report Cards near Erie, Ohio (non-tidal watershed); Rookery Bay Report Card near Naples, Florida (tidal watershed); and Norwalk Harbor Report Card in Connecticut.

FISH & THEIR HABITAT

STREAM HABITAT CONTINUITY EVALUATION: CULVERT ASSESSMENTS

Scott Jackson, Ph D.
University of Massachusetts Amherst
sjackson@umass.edu

As long linear ecosystems, rivers and streams are particularly vulnerable to fragmentation. There is growing concern about the role of road crossings – and especially culverts – in altering habitats and disrupting river and stream continuity. The River and Stream Continuity Project is a network of agencies and organizations working to assess the barrier effects of road-stream crossings on aquatic organism movement. The Project provides assessment protocols, training, technical assistance and an online database that houses, scores and makes assessment data available to cooperators and others working to restore stream continuity. Field assessments are being conducted throughout New England, New York and New Jersey and will soon be expanding to the entire North Atlantic region of the U.S.

WHERE DO ALL THE DATA GO? A REGIONAL DATA/MODELING SYSTEM FOR IDENTIFYING RESILIENT STREAMS

Ben Letcher
Silvio O. Conte Anadromous Fish Research Center, U.S. Geological Survey
ben_letcher@usgs.gov

Researchers from the USGS Silvio Conte Anadromous Fish Research Center are working with New England states to collect stream temperature and fish community data to develop a regional database and modeling application. Data being submitted for inclusion includes volunteer stream temperature data collected in CT. The final product will include a GIS-Based application that displays stream temperature and fish data layers as well as model predictions regarding future stream temperature and fish communities based upon changes in factors such as development/forested land shifts, climate change (including precipitation pattern changes), and others. The application is presently in development and the researchers would like your input regarding how to design the application to best meet the needs of watershed groups, towns, and other interested organizations.

MONITORING METHODS

BACTERIA MONITORING: FROM POOP TO NUTS

Jane Brawerman
CT River Coastal Conservation District
jbrawerman@conservect.org

Judy Rondeau
Eastern CT Conservation District
judy.rondeau@comcast.net

Alisa Phillips-Griggs
Farmington River Watershed Association
river@frwa.org

Learn the why's and how's of stream bacteria monitoring from three experienced monitoring programs in the Farmington River Watershed, the lower Natchaug River Watershed, and the lower CT River Watershed. Drawing from their own experiences, presenters will touch on the many important things to consider for a successful bacteria monitoring program, such as monitoring study goals, site selection, sample collection, analytical methods and how to choose from among them, quality assurance/quality control, and how to put the data to good use.

INTEGRATING FRESH WATER MUSSEL REPORTING INTO YOUR WATER QUALITY MONITORING PROGRAM

Laura Saucier
CT DEEP Sessions Woods Wildlife Management Area
laura.saucier@ct.gov

This hands-on presentation will include an overview of CT's freshwater mussel populations and their relationship to water quality. Participants will learn how volunteer water quality monitors can document fresh water mussels observed during routine monitoring activities in order to contribute data to the State's freshwater mussel atlas. A hands-on practice ID workshop will follow the presentation.

PROGRAM GROWTH & MANAGEMENT

WATERSHED DATA MANAGEMENT

Joseph C. Hovious
Pootatuck Watershed Association (PWA)
jchovious@yahoo.com

Timothy N. Wasielewski, LEP, CHMM
Advanced Environmental Interface, Inc.
tim_aei@sne.net

The Pootatuck Watershed Association (PWA) collected several years of chemical, physical, and biological data. Use of the data was limited due to the lack of an adequate management system. Funding through a United States Environmental Protection Agency (US EPA) grant, an Excel database was prepared for chemical data from four different watersheds. Data plots are automatically generated via programmed links with data input tables.

The main focus of this presentation is to: 1) describe the problems of not having organized data, 2) presentation of a viable solution to the problem via generation of a data management system or Excel database, and 3) an overview of where PWA goes from here in regard to data management.

BEYOND THE BASICS: CREATIVELY ENGAGING VOLUNTEERS & USING DATA

Carol Haskins
Pomperaug River Watershed Coalition
chaskins@pomperaug.org

Jean Pillo
The Last Green Valley
jean.pillo@conservect.org

Jacqueline Talbot
Connecticut River Watershed Council
jtalbot@ctriver.org

We have data, now what do we do with it? How can we best work together with volunteers? Join us for a collaborative discussion on how groups creatively share data and engage volunteers for studied, safe, cleaner waters. Please feel free to bring up examples/questions from your own experience. Our efforts are stronger through collaboration!

MONITORING URBAN WATERSHEDS

MAPPING SEDIMENT TRACE METAL CONTAMINATION WITH TRINITY UNDERGRADUATES IN THE PARK RIVER WATERSHED, GREATER HARTFORD

Jonathan Gourley PhD
Trinity College Environmental Science program
jonathan.gourley@trincoll.edu

Since 2008 Trinity students have engaged in the field collection and analysis of trace metal contaminated sediments in the Park River watershed. These studies have focused on the metals lead, cadmium copper and zinc, and mercury. The combination of storm water runoff from impervious surfaces and waste water discharge from various metal finishing industries within the south Branch of the Park River has significantly impacted the sediments of the stream. Contamination is often locally acute near outfalls but can be highly variable in sections with no direct point source. Therefore mapping at both small scale (entire watershed), as well as large scale (high sample density outfall maps), has proven to be a very useful method to identify problem locations throughout the Park River watershed. Periodic sediment dredging of certain sections of the Park River allows for monitoring studies that investigate the accumulation of metals in sediment over relatively short time scales.

OBSERVING DRAGONFLY EMERGENCE AS AN INDICATOR OF STREAMBANK ALTERATION

Kirsten Martin, PhD.
University of Saint Joseph Biology Department
KirstenMartin@usj.edu

While many of us conduct regular streamwalks and benthic macroinvertebrate assessments of our targeted rivers, we often overlook the opportunity to gather data from the edges of these areas. Dragonfly nymphs are often used as indicators of moderate water quality, but their emergence and eclosure stage provides an additional opportunity to access the health of our rivers. In this presentation, you will learn about some of the more commonly found dragonfly

nymphs in Connecticut rivers, and discover how changes in riverbank characteristics may be detrimental to their health.

LONG-TERM MONITORING EFFORTS

CASE STUDY - NEW HAVEN HARBOR WATER QUALITY MONITORING PROGRAM

Hollie J. Brandstatter
Werth Center for Coastal and Marine Studies
Southern Connecticut State University
hbrandst@gmail.com

This presentation will address select water quality results to date and issues surrounding the establishment and long-term water quality monitoring program in New Haven harbor. Long Island Sound coastal embayments have historically not been the focus of long-term water quality monitoring programs. Faculty and students at the Werth Center for Coastal and Marines Studies (WCCMS) at Southern Connecticut State University initiated and maintained a weekly water quality monitoring program at Long Wharf pier in New Haven harbor since January 2012. Water quality at this location is influenced by the tributary rivers (Mill, West and Quinnipiac), tidal circulation, stormwater runoff, and municipal and industrial discharges. Parameters including salinity, conductivity, pH, chlorophyll-a, dissolved oxygen, turbidity, and weather conditions are measured at a one meter depth twice weekly (12 noon Wednesday; High tide Friday). Sampling twice a week at two separate times is both unique and deliberate in that the influence of the tributary rivers on the harbor can be quantified through water quality measurements performed at different tidal stages. Student participants are recruited for the monitoring program through field courses at SCSU that introduce water quality monitoring and as paid Werth Fellows during the summer months. Faculty guidance, senior student mentoring, and regular instrument calibrations assure continuity in the quality of the measurements, data handling and reporting. Water quality data from the tributary rivers, via USGS stations and other sources, will be used to assess observed trends in salinity, turbidity, chlorophyll-a concentrations, in the New Haven Harbor data. This data will become available for public use through the WCCMS website (http://www.southernct.edu/research/research-centers/ccms/index.html) to facilitate data accessibility and collaboration among user groups.

MONITORING THE HEALTH OF THE SHEPAUG

Gary L. Steinman
Conservation Commission of the Town of Roxbury
Shepaug River Association
garysteinman@charter.net

The preservation of the quality of Roxbury's wetlands, watercourses and aquifers has been a primary goal of the Roxbury Conservation Commission since its establishment in 1999. For several years, the Commission approached this goal largely through educational endeavors. Since 2008, however, the Commission also has led and/or participated in a number of collaborative efforts to monitor the health of the Shepaug River, its tributaries and its watershed: a review of historical data concerning the Shepaug, spring and fall macroinvertebrate sampling (Rapid Bioassessment by Volunteers) on the Shepaug and its tributaries, geomorphological studies on the Shepaug,

continuous water quality monitoring on the Shepaug, streamwalking on the Battleswamp Brook. The presentation will present the results of these activities and discuss the importance of collaboration among organizations in organizing and carrying them out.