K-8 Teacher Enrichment, *Hands on a Watershed, summer 2008*

Paul Bierman, Professor of Geology, University of Vermont  
[pbierman@uvm.edu](mailto:pbierman@uvm.edu)  
[http://www.uvm.edu/~pbierman/](http://www.uvm.edu/~pbierman/)

802 656 4411 (o)  
802 863 3609 (h)  
802 238 6826 (cel)

**Course Learning Goals:** The broad goal of the course is to involve K-8 teachers in the process of watershed study, in particular the behavior, characteristics, and history of rivers including river corridors, and the water that flows through them. We will stress learning and doing in the field. Specific learning goals include:

- Use GPS to collect location data
- Plot GPS data on maps and orthophotographs
- Read locations from maps and find them in the field with GPS
- Use pH, conductivity, and dissolved oxygen meters in the field
- Know different techniques used to measure the velocity of flowing water
- Describe stream geometry and major stream elements
- Calculate discharge, the flux of water past a point over time
- Recognize ways in which land-use history affects the shape and behavior of landscapes
- Describe soils and terraces and know how they reflect the history of a watershed’s landscape
- Be able to describe the basic glacial history of Vermont
- Document landscape change over time
- Identify similar features on rivers of different scales
- Understand the watershed continuum
- Take accurate and informative field notes
- Measure and understand the distribution of physical parameters in a lake
- Understand how knowledge survey data can be used to hone content delivery

**Grading Criteria:** The grade for this part of the course will be determined by:
- your participation in all field activities
- completion of daily worksheets
- the quality and completeness of your field notebook

<table>
<thead>
<tr>
<th>Equipment to bring</th>
<th>Gear we will provide</th>
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<tbody>
<tr>
<td>Hiking shoes or boots</td>
<td>Waterproof field notebook</td>
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<tr>
<td>Old tennis shoes or closed-toe water shoes</td>
<td>Watershed monitoring equipment</td>
</tr>
<tr>
<td>Day pack</td>
<td>Computing facilities</td>
</tr>
<tr>
<td>Sun block</td>
<td>GPS equipment</td>
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<tr>
<td>Clothes to get dirty, wet, and sweaty</td>
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<tr>
<td>Fan for room</td>
<td></td>
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<tr>
<td>Sun hat</td>
<td></td>
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<tr>
<td>Insect repellent</td>
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<td>Swim suit</td>
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Class schedule

Day 1 – Getting warmed up and seeing where the water goes
After moving in, we’ll have lunch together and get to know each other. In the afternoon, we will be doing a knowledge survey followed by training on handheld GPS units including some map reading and plotting of points. After dinner, we will take a cruise on the UVM research vessel, RV Melosira, to learn about Lake Champlain by collecting lake water quality and physical parameters data.

*Evening activity: Melosira Research Cruise*

Day 2 – Just how does a river work?
Today we will be measuring stream flow in small and large streams at the Huntington Audubon center. We will be wading in streams today so prepare to get wet. Please wear shorts and old shoes or closed-toe water shoes. We will be using field monitoring equipment.

*Evening activity: Intro to the Landscape Change Program (Delehanty Computer Lab)*

Day 3 – Documenting what people have done to the landscape
Today, we will visit mill sites in Winooski, Jericho and West Bolton to see landscape process in both lowland and upland settings and to better understand human interaction with watersheds. We will use GPS equipment in field conditions and try to re-shoot historic photographs to document landscape change.

*Evening activity: Upload re-shot images to LCP website (Delehanty Computer Lab)*

Day 4 – What’s dirt got to do with it?
We will begin and end the day with a tour of the glacial history of northwestern Vermont as seen through sites in the Winooski Valley. In between, we will study the soils and river terraces of the Huntington River by digging soil pits and working toward understanding what we see in those pits.

Day 5 – Time for Big Rivers
As a capstone for the course, we will take a half-day canoe trip down the Winooski River, from Salmon Hole to the Ethan Allen Homestead. We will make stops to consider stream-bank behavior, river history, and river management.

Class Objectives and Design Philosophy

The workshop is designed to immerse you in the way that practicing, University-level scientists learn and teach about watersheds. For five days we will be in the field, getting our hands and feet wet and dirty and learning how watersheds work by becoming part of them. By the end of the week, you will gain an appreciation for how the Vermont landscape functions and how people and the landscape have interacted. We will use both simple observational techniques that are readily transferred to the K-8 classroom as well as state-of-the-art instrumentation. You will have daily contact with faculty, graduate students, and staff associated with the UVM initiative for Research in Water and the Environment (uvm.edu/irwe).