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
- Identify similar features on rivers of different scale
- 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 timeliness of daily assignment submissions
- the quality and completeness of your field notebook

Equipment to bring

<table>
<thead>
<tr>
<th>Hiking shoes or boots</th>
<th>Waterproof field notebook</th>
</tr>
</thead>
<tbody>
<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>
</tr>
<tr>
<td>Clothes to get dirty, wet, and sweaty</td>
<td></td>
</tr>
<tr>
<td>Fan for room</td>
<td></td>
</tr>
<tr>
<td>Sun hat</td>
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</tbody>
</table>
Class schedule

Day 1 – Landscape History through your eyes and the eyes of long-dead Vermonters
In the morning, we will be doing a knowledge survey and introductions followed by training
on handheld GPS units and some map reading/plotting of points. In the afternoon, we will
visit mill sites in Jericho and West Bolton to see mountain landscape process and human
interaction with steep watersheds. We will use of GPS equipment in field conditions.
   Evening activity: Introduction to the Landscape Change Program
   Evening assignment: Learning Landscapes, "Why" and “Shapes” modules

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.
   Assignment due:  Day 1 field worksheet
   Evening assignment: Data reduction and calculations

Day 3 – What’s dirt got to do with it?
We will begin the day with a tour of the glacial history of northwestern Vermont as seen
through sites in the Winooski Valley. We will then study the soils and river terraces of the
Huntington river by digging soil pits and working toward understanding what we see in
those pits.
   Assignment due:  Day 2 worksheet
   Evening assignment: prepare drafted log of soil pit with one paragraph description

Day 4 - Time for Big Rivers
All day canoe trip down the Winooski River, Salmon Hole to Lake Champlain. We will
make stops to consider stream-bank behavior, river history, and river management.
   Assignment due: drafted log of soil pit with one paragraph description
   Evening assignment: work with a partner to prepare a one page site description for a
canoe guide to the river

Day 5 Lake Champlain, the end of the line
Today we will take a research cruise on the UVM research vessel, RV Melosira, to collect
lake water quality and physical parameters data.
   Assignment due: one page site description for a canoe guide to the river

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 nationally-know experts as you
work with faculty, graduate students, and staff associated with the UVM initiative for
Research in Water and the Environment (uvm.edu/irwe).