



# Monitoring the White River:

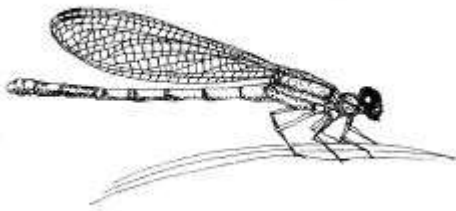
## A School-Based Watershed Education Program

### Fall 2013 Newsletter

The White River Partnership's Monitoring the White River (MWR) Program is now in its 4th year working with White River watershed educators and it's shaping up to be a great year! The Wellborn Ecology Fund generously renewed their funding this year, allowing us to bring watershed education free of charge to schools within their Upper Valley service area. We'll keep you posted as we pursue additional funding sources that would allow us to offer MWR to White River watershed schools outside of the WEF service area in the near future.



This fall we'll be studying crayfish and waterbugs with teachers from Dothan Brook School in Hartford, South Royalton School, Bethel Elementary School, Randolph Elementary School, The Pomfret School, and the Newton School in Strafford. During the winter we'll look at wildlife tracks and signs with students from the Ottauquechee School in Hartford, Chelsea Public School, Sharon Elementary School, South Royalton School, and Bethel Elementary School. And next spring we'll be expanding our Watershed Education Network even further! We like to encourage collaboration among teachers and schools – please let us know if you're interested in having your students share what they learn with another school or group in the watershed.

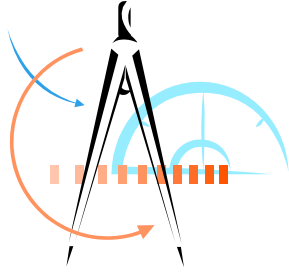


Illustrated by Susan Sawyer © WRP

The **MWR units** listed below can be tailored to address individual school goals.

- *Waterbugs* (benthic macroinvertebrates) – indicators of river health and water quality
- *Crayfish* – key members of river and riparian food webs
- *Riparian Trees* – planted to improve water quality and fish & wildlife habitat
- *Riparian Track & Sign* – evidence of wildlife activities along river corridors
- *Watershed Restoration* – projects implemented to improve water quality and habitat (culvert replacement and retrofits, riparian tree plantings, and more)

We developed written modules for four MWR units during the 2012-2013 school year. All four modules are available for download at <http://whiteriverpartnership.org/index.php/resources/resources-for-teachers>. The modules include many beautiful illustrations, like this one, by Susan Sawyer. Check them out and let us know what you think. A module for the new Watershed Restoration unit will be added this year.



## A Natural Fit: MWR and the New Science Standards

In the spring of 2013, Vermont and 25 other states adopted the Next Generation Science Standards (NGSS), which are built on the Framework for K-12 Science Education developed by the National Research Academy in 2011. NGSS introduces a new approach to teaching standards. Three dimensions - Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts - are intertwined to help students learn knowledge and gain skills. These science standards are also cross-referenced with Common Core Standards (focused on Math and Language Arts) to foster a comprehensive approach to learning and doing.

Starting in the spring of 2013, the Vermont Agency of Education will launch a plan to implement NGSS in 2016-2017. The first phase, which will take place during the 2013-2014 school year, will focus on raising teachers' awareness of NGSS with emphasis on the Science and Engineering Practices. The Vermont Agency of Education (<http://education.vermont.gov/>) has created a website called Vermont Education Exchange that includes a section on NGSS ([http://ve2.vermont.gov/vt\\_science/n\\_g\\_s\\_s](http://ve2.vermont.gov/vt_science/n_g_s_s)), more information about the Next Generation Science Standards can also be found at <http://www.nextgenscience.org>.

The hands-on, experiential, real-world features of the MWR units represent powerful ways to address NGSS. Each unit can weave together the three dimensions of NGSS and directly address certain NGSS performance expectations. If you would like to learn more about MWR and NGSS, please contact Jenna Guarino, Watershed Education Specialist, at [jguarino556@gmail.com](mailto:jguarino556@gmail.com).

## Need Equipment? Try the MWR Lending Library!

Our Lending Library gives teachers easy access to the specialized equipment used in river studies. Teachers participating in MWR are welcome to borrow materials from our library. Depending on availability, we also try to accommodate requests from other watershed teachers who are not otherwise participating in MWR. The Lending Library includes kits for the following MWR Units:

- **Crayfish:** traps, hand nets, basins, invasive species info, guide books, and field sheets.
- **Waterbugs:** kick nets, 2-way viewers, hand lenses, basins, forceps, pipettes, guide books, information and a DVD.
- **Riparian Trees:** transect lines, stakes, guides, and id markers.
- **Riparian Tracks and Sign:** rulers, track stencils, track and scat guides.



The S-shaped dactyl of a rusty crayfish (Emma Kimball).

Other equipment available to teachers includes WRP water quality equipment (turbidity tubes and conductivity pens), VINS *Trout in the Classroom* and *Water Quality* kits, and the Vermont Department of Fish & Wildlife's *Furbearer's Kit*. Please contact us for more information!



Students from the Hartford Middle School put their heads together to measure and identify crayfish.

## Science to Service: Sharing MWR Data

MWR is designed to provide students with authentic science-to-service opportunities. Toward that end we are working to improve how MWR data are shared among schools and with interested partners like the Vermont Agency of Natural Resources, US Fish and Wildlife Service, and Green Mountain National Forest.

Data from fall 2013 Crayfish Unit programs can be submitted to the White

River Partnership (ideally in Excel) and we will add them to the website (<http://whiteriverpartnership.org/index.php/resources/mwr-data-sharing>) and distribute them to partners. Through this process schools can compare their own crayfish data to those of other schools – the more schools that share data, the more interesting the data will be!



### Fall Workshop & Networking Meeting October 10th from 3:30-6pm Sharon Elementary School

We're excited to introduce our new Watershed Restoration unit to teachers this fall!

The unit explores on-the-ground WRP restoration projects and we'll start by looking at culverts. Undersized culverts and bridges were responsible for extensive flood damages during Tropical Storm Irene in August 2011, and have become a hot topic in the two years since the storm swept through the watershed.

With WRP Project Manager Greg Russ as our guide, we will walk through the new Watershed Restoration unit. The workshop will include a culvert/bridge site visit, a chance to explore web and print resource materials, and answers to all your questions!

We'll provide a snack to keep you sharp. Please RSVP to Emily Miller at 802-763-7733 or [emily@whiteriverspartnership.org](mailto:emily@whiteriverspartnership.org). *Dress for the weather* – boots are strongly recommended.



### Snapshot of MWR's Watershed Education Network (participants since 2012)

<u>MWR Schools</u>	<u>Supporting Organizations &amp; Agencies</u>
Bethel Elementary School Braintree Elementary School Brookfield Village School Chelsea Public School Dothan Brook School (Hartford) Hartford Middle School Mid-Vermont Christian School (Quechee) Newton School (Strafford) Ottauquechee School (Hartford) Randolph Elementary School Randolph Union Middle School Sharon Elementary School South Royalton School The Pomfret School The Sharon Academy Tunbridge Central School Whitcomb High School (Bethel)	Canaday Family Charitable Trust Clear Water Carbon Fund Four Winds Nature Institute Friends of the Winooski Green Mountain National Forest Mascoma Savings Bank Foundation Ottauquechee Natural Resources Conservation District Upper Valley Linkages for Environmental Literacy U.S. Fish and Wildlife Service Verdana Ventures Vermont Department of Fish and Wildlife Vermont Water Quality Division Wellborn Ecology Fund
<p><b>Questions about MWR?</b>            Emily Miller, WRP Monitoring Coordinator  <a href="mailto:emily@whiteriverpartnership.org">emily@whiteriverpartnership.org</a>            (802) 763-7733</p>	<p>Visit the White River Partnership's website for White River watershed information and maps, links to Water Quality Reports and other resources, and more: <a href="http://www.whiteriverpartnership.org">www.whiteriverpartnership.org</a>.</p>