

Vermont Envirothon – Aquatics Resources

Required Resources:

Johnson, Charles W., *The Nature of Vermont: Introduction and Guide to a New England Environment*
An overview of Vermont's geological, natural, and land use histories, in the context of past, present, and future human interactions with the landscape.

ISBN 0-87451-856-3 University Press of New England, © 1998

<http://www.upne.com/0-87451-856-3.html>

Thompson, Elizabeth H., and Eric R. Sorenson, *Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont*

A field guide to all of Vermont's natural communities.

ISBN 1-58465-077-X University Press of New England, © 2005

<http://www.vtfishandwildlife.com/cms/One.aspx?portalId=73163&pageId=216868>

Recommended References:

Caduto, Michael, *Pond And Brook: A Guide To Nature In Freshwater Environments*

A complete guide to the plants and animals of ponds, lakes, streams, rivers, and wetlands.

ISBN 0-87451-509-2 University Press of New England, © 1990

<http://www.upne.com/0-87451-509-2.html>

Johnson, Charles W. & Ian Worley, asst., *Bogs of the Northeast*

The first popular book to deal with bogs in a comprehensive yet authoritative manner.

ISBN 0-87451-331-6 University Press of New England, © 1985

<http://www.upne.com/0-87451-325-1.html>

Kegley, Susan E. & Joy Andrews, *The Chemistry of Water*

ISBN: 0-935702-44-X University Science Books, © 1997

<http://www.uscibooks.com/kegley2.htm>

Mitchell, Mark K., Stapp, William B. & Bixby, Kevin, *Field Manual for Water Quality Monitoring* - 12th Edition
The latest edition of the GREEN manual.

Catalog # ISBN - 1-6801

<http://www.lamotte.com/pages/edu/3-1508.html>

McCafferty, W. Patrick, *Aquatic Entomology: The Fishermen's Guide and Ecologists' Illustrated Guide to Insects and Their Relatives*

Provides identification keys for insect families, detailed descriptions of orders, extensive information on life histories and habitats, illustrated with line drawings. The most complete and accessible work on the aquatic entomology of North America north of Mexico.

ISBN: 0-86720-017-0 Jones & Bartlett Publishers Inc © 1981

Downloadable at: <https://www.book-info.com/isbn/0-86720-017-0.htm>

Vermont Volunteer Surface Water Quality Monitoring Guide, available from the VT DEC, Watershed Management Division, 1 National Life Drive, Main 2, Montpelier, VT 05620-3522 Tele: 802-828-1535, or Downloadable at: <http://dec.vermont.gov/watershed/lakes-ponds/monitor/lay-monitoring/monitoring-guide>

Barlow, V. & Long, S. Editors, *The Place You Call Home: A Guide to Caring for Your Land in Vermont*

Center for Northern Woodlands Education, Corinth, VT © Autumn 2008

On Line at: http://northernwoodlands.org/programs/place_you_call_home/

Field Guides:

Langdon, R., Ferguson, M. & Cox, K., *Fishes of Vermont*

ISBN: 0-9772517-1-3 Vermont Fish & Wildlife Department, Waterbury, VT © 2006

<http://www.vtfishandwildlife.com/cms/One.aspx?portalId=73163&pageId=216868>

Newcomb, Lawrence, *Newcomb's Wildflower Guide*

ISBN: 0-316-60442-9 Little, Brown and Company © 1977

Petersons Field Guide Series:

Conant, Roger, Collins, Joseph T. *A Field Guide to Reptiles & Amphibians of Eastern & Central North America* ISBN: 0-395-19977-8 Houghton Mifflin Co.

McKenny, Margaret & Peterson, Roger Tory *A Field Guide to Wildflowers: Northeastern and North-Central North* Houghton Mifflin Co.

Peterson, Roger Tory *A Field Guide to the Birds: A Completely New Guide to All the Birds of Eastern and Central North America* Houghton Mifflin Co.

Petrides, George A. *A Field Guide to Trees and Shrubs: Northeastern and North-Central United States and Southeastern and South-Central Canada* ISBN: 0-395-17579-8 Houghton Mifflin Co.

Page, Lawrence, et al, *Peterson Field Guide to Freshwater Fishes* ISBN-10: 0547242069 Houghton Mifflin Co.

Available from:

Nongame and Natural Heritage Program

Fish and Wildlife Department

<http://www.vtfishandwildlife.com/cms/One.aspx?portalId=73163&pageId=83787> - Learn More

offers books, fact sheets report and other information on many wildlife topics

VT Department of Environmental Conservation

Watershed Management Division

<http://dec.vermont.gov/watershed/training> offers information on all areas covered by the Department – water quality, lakes and ponds, wetlands, stormwater, wastes, etc.

Vermont Geological Survey

<http://dec.vermont.gov/geological-survey>

information on the geology of Vermont

Vermont Reptile & Amphibian Atlas

<http://community.middlebury.edu/~herpatlas/>

Macroinvertebrate Keys available on-line:

<http://www.dec.ny.gov/animals/35772.html>

Pictorial Key Box to Macroinvertebrates uses photographs. Compare the macroinvertebrate you are trying to identify with the on-screen images of pages one through six. The pages are linked in the Pictorial Key box. When you find an image or group of images that are similar to your organism click on the name shown below. This will take you to another page with a brief written description of the organism you have selected and additional images.

<http://www.stroudcenter.org/education/MacroKeyPage1.shtm>

The macroinvertebrate identification key is an example of a dichotomous key. At each step you choose between two mutually exclusive statements about a characteristic. This key starts with the choice between “jointed legs” and “no jointed legs”. After you make that choice you move to the next pair of choices in the key. Follow the page reference (e.g. “Go to Page 3”) to jump to the next part of key. Continue until you arrive at an identification.

<http://cfb.unh.edu/StreamKey/html/index.html>

UNH Center for Freshwater Biology: An Image-Based Key To Stream Insects
Diagrams of Morphological Characteristics of Seven Major Orders of Aquatic/Semiaquatic Macroinvertebrates; An Interactive Key to the Families of the Seven Orders of Macroinvertebrates; In-depth Descriptions of Ecological Information of the Families; How to Use Macroinvertebrates to Infer Water Quality; Introductions to Streams and Stream Ecology

Introduction to the Biotic Water Quality of a Stream: Teacher’s Guide

<http://www.esf.edu/outreach/k12/edunits/watershedadd.pdf>

Good Web Sites:

<https://plus.google.com/communities/104222142956349260930>

GREEN: Global Rivers Environmental Education Network

This award-winning program is aimed at teaching middle and high school-aged youth essential academic skills including critical thinking, teamwork, problem solving and decision making. GREEN teaches young people how to assess watershed health with the proper tools and then undertake projects to improve environmental quality based on their findings.

<http://www.rivernetnetwork.org/>

River Network, a national non-profit organization, offers consulting, publications, acquisition of riverlands and small grants to help people raise money, build organizations, and monitor and protect rivers and watersheds. River Network’s Mission is to help people understand, protect and restore rivers and their watersheds. Extensive list of resources.

<http://www.epa.gov/owow/>

EPA Office of Wetlands, Oceans, & Watersheds

<http://cfpub.epa.gov/surf/locate/index.cfm>

Surf Your Watershed is a service to help you locate, use, and share environmental information about your state and watershed.

<http://www.crjc.org/information.htm>

Connecticut River Joint Commissions From this page you can access useful links and publications to learn more about the Upper Connecticut River and its watershed.

<http://www.lcbp.org/education/>

The Lake Champlain Basin Program provides numerous opportunities for the public of all ages to learn about Lake Champlain, Lake stewardship and implementing the Plan, Opportunities for Action.

<http://www.vtinvasives.org/>

Information and resources on the threat of, identification of and management of invasives. This website provides a landing page for Vermonters interested in learning more about invasive insects, plants and pathogens. In addition, the website is designed to guide visitors to the appropriate place to learn more and become involved in various monitoring, management and outreach efforts.

<http://www.cln.org/themes/water.html>

Water Quality Theme Page

A number of links to Internet sites which contain information and/or other links related to the specific theme of water quality.

On Topographical Maps

How To Read Topographical Maps

By Boris Vasilev M.S., , Professor of Geography, Paradise Valley Community College, Phoenix Arizona
<http://www.ghostowns.com/topotmaps.html>

How To Read A Map & Contour Lines

<https://www.youtube.com/watch?v=AsQoY48i6z0>

Water Curricula

The Project WET Curriculum and Activity Guide

<http://www.projectwet.org/>

The Project WET Curriculum and Activity Guide is a collection of over 90 science-based, interdisciplinary activities and lesson plans that are teacher-tested and classroom ready for K-12 students.

Healthy Water, Healthy People Water Quality Educators Guide

<http://store.projectwet.org/water-quality-educators-guide.html>

25 hands-on, science-based activities are cross-referenced to the testing kits, testing kit manual, Web sites, and National Science Education Standards for grades 6-12.

Healthy Water, Healthy People Test Kit Manual

- In-depth background information on 10 water quality parameters
- Test kit activities and demonstrations
- Case studies relate concepts to real-world applications
- Helpful water monitoring information and specifics about sources and remedies
- Works with all types of test kits

The 3 above are available through Vermont's Project WET Coordinator

Michaela Stickney
Dept. of Environmental Conservation
103 S. Main St, Bldg. 10 North
Waterbury, VT 05671-0408
michaela.stickney@vermont.gov

Aquatic WILD K-12 Curriculum and Activity Guide

<http://www.projectwild.org/aquatic/>

(developed through a cooperative agreement with the U.S. Fish and Wildlife Service) emphasizes aquatic wildlife and aquatic ecosystems. It is organized in topic units and is based on the Project WILD conceptual framework. Because these materials are designed for integration into existing courses of study, instructors may use one or many Project WILD activities or the entire set of activities may serve quite effectively as the basis for a course of study.

Available through Vermont's Project WILD Coordinator

Alison Thomas, Project WILD Coordinator
Vermont Fish & Wildlife Department
1 National Life Drive, Davis 2
Montpelier, VT 05620-3702
Tel: (802) 371-9975
Fax: (802) 828-1250

E-mail: Alison.Thomas@vermont.gov
Website: www.vtfishandwildlife.com

Heimlich, Joe E., M. Claire Oberst & Lisa Spitzer, *Two H's and an O: A teaching resource packet on water education*

A book of activities on water quality issues compiled from 32 different sources. The activities are arranged into five sections: (a) the science of water, (b) the hydrologic cycle, (c) using water, (d) water conservation, and (e) water pollution.

1993, 132 pages

Free Download at: <http://eric.ed.gov/?id=ED359074>

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