

Institute of Water Resources

Annual Technical Report

FY 1998

Introduction

Research Program

Emphasis and Accomplishments of the Program

Water Resources Research Program

The focus of research in Connecticut for this reporting period was determined by the joint activities of the Connecticut Institute Advisory Board and the Connecticut Institute Technical Committee (Tables 1 and 2). Joint meetings of these two groups were held in June and December. They were involved in the review and selection of research proposals forwarded for the regional competition.

104B Water Resources Research -The Institute received \$20,000 for core funding. This supported the general administration of the Institute for 20% of the Associate Director's salary, supplies, travel, postage, poster displays, and other miscellaneous expenses.

The Connecticut Institute was awarded one grant in the regional competition for \$51,796. The Project is "An Assessment of the Transferability of Habitat Suitability Criteria for Brown Trout in Southern New England Streams", with Robert Neumann as the Principal Investigator. Subsequently, Dr. Neumann received an additional \$15,000 from the National Park Service to support this study.

A three-year regional grant for \$51,135 (9/1/96-8/31/99), entitled "Using a Paleolimnological Approach as a Tool for Protecting, Restoring and Understanding Aquatic Ecosystems" (PI: Peter Siver, Connecticut College), began its third year.

Non-federally Supported Research – Through the IWR collaboration with ERI, water-related research continues to be supported at UCONN. Mercury and Airshed/Watershed Modeling projects have grown into very robust programs. Also this year IWR/ERI have provided administrative support to four NEMO (Non-point Education for Municipal Officials) projects. Currently, about 25 research projects are being facilitated under this arrangement. Plans are underway with DEP to propose the establishment of an Environmental Research Fund next year by the Connecticut General Assembly.

USGS/WRD Connecticut District Office Internship Program

This year IWR & USGS initiated an internship program in Connecticut. Four positions were made available for qualified students from any college or university in the state. The USGS District Office and IWR worked together to identify and select students to work at the District Office. IWR received supplementary funding to its Core

Grant, and UCONN hires the students. This is a good opportunity for the students to get professional experience with the USGS and to extend their academic training.

Other Institute Activities for the Director and Associate Director

1. Hydrologic Modeling Committee with CT DEP
2. Source Water Assessment Program (SWAP) Advisory Committee with CT DPH and CT DEP
3. Earth Partner Grant Program with United Illuminating Company
4. Collaborative Research Facilitation with the Connecticut Environmental Research Institute (ERI)
5. UCONN College of Agriculture and Natural Resources Water Quality Group
6. Connecticut River Basin Airshed/Watershed Consortium consisting of the 4 Land Grant Schools in Connecticut, Massachusetts, New Hampshire and Vermont.
7. National Research Council Committee on the Future Role, Challenges and Opportunities for the USGS
8. Connecticut Zebra Mussel Task Force (coordinated by SeaGrant)

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TABLE 1. Institute of Water Resources

STATE ADVISORY BOARD, 1998-99

Ms. Terry Bertinuson, Connecticut Environmental Roundtable, 227 Melrose Rd., Melrose, CT 06016, TEL 623-6507

Ms. Virginia deLima, District Chief and USGS State Representative (Biologic Unit Division), Connecticut District Office, Water Resources Division, U.S. Geological Survey, 101 Pitkin St., East Hartford, CT 06108, TEL 860-291-6741, FAX 860-291-6799, email: vdelima@usgs.gov

Mr. William Hyatt, Fisheries Biologist, Inland Fisheries Division, Bureau of Natural Resources, Conn. Department of Environmental Protection, 79 Elm St., Hartford, CT 06106-1632, 860-424-3474

Mr. Roy Jeffrey, Extension Educator, Cooperative Extension System, U-36, University of Connecticut, Storrs, CT 06269, TEL 860-486-5428, e-mail: rjeffrey@uconnvm.uconn.edu

Dr. Milan Keser, Northeast Utilities Environmental Lab, PO Box 128, Waterford, CT 06385, TEL 860-739-6341 or 860-444-4238, FAX 860-444-5240

Dr. Robert Kortmann, President, Ecosystem Consulting Service, Inc., 430 Talcott Hill Rd., Coventry, CT 06238, TEL 860-742-0744, FAX 860-742-0715

Mr. Steven Ladd Transportation Supervising Planner, Department of Transportation, 2800 Berlin Turnpike, P.O. Box 317546, Newington, CT 06131-7546, TEL 860- 594-2930, FAX 860-594-3028

Mr. Tom Marston, Connecticut Water Co., 93 W. Main St., Clinton, CT 06413, TEL 860-669-8636, FAX 860-669-9326, email: 105033.1211@compuserve.com

Mr. Thomas A.J. McGowan, President, Lake Waramaug Task Force, P.O. Box 631, Litchfield, CT 06759, TEL 860-868-0331, 567-0555, FAX 860-567-3250

Mr. Robert E. Moore, Senior Associate, Malcolm Pirnie, Inc. 100 Roscommon Drive, Suite 100, Middletown,

CT 06457-1553, TEL: 860-635-3400, ext. 113, FAX 860-632-0036, email: rmoore@pirnie.com

Mr. Thomas Morrissey, Director, Division of Planning & Standards, Water Quality Bureau, Conn. Department of Environmental Protection, 79 Elm St., Hartford, CT 06106, TEL 860-424-3704

Mr. Ed Parker, Bureau Chief, Bureau of Natural Resources, Water Resources Division, Conn. Department of Environmental Protection, 79 Elm St, Hartford, CT 06106, TEL 860-424-3010

Mr. Phillip Renn, Natural Resources Conservation Service, 16 Professional Park Road, Storrs, CT 06268, TEL 860-429-9361

Ms. Kathleen M. Shanley, United Illuminating, 157 Church St., P.O. Box 1564, New Haven, CT 06506, TEL 203-499-2562

Mr. William Toomey, Tidelands Program Director, The Nature Conservancy, 55 High Street, Middletown, CT 06457, TEL 860-344-0716, FAX 860-344-1334

Ms. Carol Youell, Director of Education and Natural Resources Program, Connecticut Forest & Park Association, 16 Meriden Rd., Rockfall, CT 06481-2961, TEL 860-346-2372, FAX 860-347-7463, email: conn.forest.assoc@snet.net

**TABLE 2. Institute of Water Resources
Technical Committee
1998**

Mr. Robert Carley, Associate Director, Environmental Research Institute, U-5210, 486- 2732; FAX 486-5488, e-mail: rcarley@eri.uconn.edu

Dr. John Clausen, Dept. of Natural Resources and Management Engineering, College of Agriculture and Natural Resources, U-4087, 486-2840, e-mail: jclausen@canr1.cag.uconn.edu

Dr. Kenneth Demars, Dept. of Civil Engineering, School of Engineering, U-2037, 486-2339, e-mail: demars@eng2.uconn.edu

Dr. Gary Epling, Dept. of Chemistry, College of Liberal Arts & Sciences, U-3060, 486-3215

Dr. Fred Ogden, Dept. of Civil Engineering, School of Engineering, U-2037, 486-2771, e-mail: ogden@eng2.uconn.edu

Dr. Peter Rich, Dept. of Ecology and Evolutionary Biology, College of Liberal Arts and Sciences, U-3043, 486-4054, e-mail: phrich@uconnvm.uconn.edu.

Dr. Robert Thorson, Dept. of Geology and Geophysics, College of Liberal Arts and Sciences, U-2045, 486-1396, e-mail: thorson@geol.uconn.edu

Dr. Thomas Torgersen, Dept. of Marine Sciences, UCONN Avery Point, 1084 Shennecossett Rd., Groton, CT 06340-6097, TEL 860-405-9094, FAX: 860-405-9153, e-mail: torgerse@uconnvm.uconn.edu (On Storrs campus, U-2045)

Information Transfer Program

Seminar Series Five seminars were conducted during from March 1997 through April 1998. The topics are listed in Table 3. The attendance was good and the audience varied considerably for each seminar. This probably was a reflection of this year's theme being "water-related topical subjects", rather than a single theme as in the recent past seminars. The IWR seminar series still can be identified as a unique forum in Connecticut to bring together the academic, government, private and public sectors to discuss state water-related issues.

TABLE 3.

SEMINARS.

March 1, 1998 – February 28, 1999.

March 11, 1998. **Ground Water: Remediation of Contaminated Sites: Licensed Environmental Professional (LEP) Program** – How does it work and how well is it working? *Moderator:* Elsie Patton, DEP

April 8, 1998. **Long Island Sound Clean-up Benefits for Living Marine Resources.** *Moderator:* Paul Stacey, DEP; *Speakers:* David Simpson, DEP, and John Volk, Conn. Dept. of Agriculture. Seminar series wrap-up or 1997-98: Connecticut's Clean Water Agenda – The Next Generation, *Speaker:* Robert Smith, DEP

October 14, 1998. **National Water Quality Assessment (NAWQA): Connecticut, Housatonic, and Thames River Basins. A summary and findings of the 3-year intensive phase of the study.** *Speaker:* Steve Garabedian, USGS

November 11, 1998. **Airshed-Watershed Modeling: The Connecticut Mercury Project. A review of the development, verification and mercury deposition/emission application of the Connecticut Air Quality Model.** *Speaker:* David Miller, University of Connecticut

February 10, 1999. **Vernal Pools: Our Hidden Wetlands. A discussion on the science and regulation of vernal pools.** *Speakers:* Eileen Jokinen, Institute of Water Resources, and Douglas Hoskins, DEP.

[Note: All of above seminars were videotaped and are available on loan to the public.]

WORKSHOPS

March 11. **Workshop on using the U.S. Geological Survey's website.** Virginia deLima, USGS Connecticut District Office

USGS Internship Program

Student Support

Student Support					
Category	Section 104 Base Grant	Section 104 RCGP Award	NIWR-USGS Internship	Supplemental Awards	Total
Undergraduate	5	0	0	0	5
Masters	2	0	0	0	2
Ph.D.	0	0	0	0	0
Post-Doc.	0	0	0	0	0
Total	7	0	0	0	7

Awards & Achievements

Publications from Prior Projects

Articles in Refereed Scientific Journals

Anderson, M.R., R.M. Neumann and R.J. Carley. In review, Organochlorine compounds in fish tissue from Connecticut lakes. *Northeastern Naturalist*.

Hanten, R.P., Jr., R.M. Neumann, S.M. and R.J. Carley, C. Perkins and R. Pirrie. 1998. Relationships between concentrations of mercury in Largemouth bass and physical and chemical characteristics of Connecticut lakes. *Transactions of the American Fisheries Society* 127:807-818

Jokinen. E.J., J. Morrison and E. Kosnicki. In prep. Animal Community structure and succession in ten vernal pools in southern New England.

Lie, T.J., J.R. Leadbetter and E.R. Leadbetter. 1998. Metabolism of sulfonic acids and other organosulfur compounds by sulfate-reducing bacteria. *Geomicrobiology Journal* 15:135-149.

Lie, T.J., W. Godchaux and E.R. Leadbetter. In review. Sulfidogenesis From sulfonates and sulfonates as terminal electron acceptors for growth of sulfite reducing bacteria (*Desulfitobacterium* spp.) and sulfate-reducing. bacteria. *Environmental Microbiology*.

Lie, T.J., M. Clawson, W. Godchaux and E.R. Leadbetter. In review. Sulfidogenesis from 2-aminosulfonate (taurine) fermentation by a morphologically unusual sulfate reducing bacterium, (*Desulforhopalus Singaporensis* sp. *Novum*. *Applied and Environmental Microbiology*.

Newman, J.M., J.C. Clausen and J.A. Neafsey. In press. Seasonal performances of a wetland constructed to process dairy milkhouse wastewater in Connecticut. *Ecological Engineering*.

Nguyen, T.N., K. Chandran, K.M. Noll and B.F. Smets. In prep. Molecular and kinetic characterization of new dichloromethane degrading bacterial strains.

Nikolaidis, N.P., L.A. Helerich and J.A. Lackovic. In review. Methodology for site-specific, mobility-based cleanup standards for heavy metals in glaciated soils. *Environmental Science and Technology*.

Sawyer, C.S. and K.K. Lieuallen-Dulam. 1998. Productivity comparison of horizontal and vertical ground water remediation scenarios. *Ground Water* 36:98-103.

Siver, P.A. 1999. Morphological observations of synurophycean algae From some acidic habitats, including the description of a sub-specific taxon. *Nordic Journal of Botany* 18:1-7

Siver, P.A., A.M. Lott, E. Cash, J. Moss and L.J. Marsicano. In review. GR-02661-1 Century changes in Connecticut, U.S.A., lakes as inferred from algal remains and their relationships to land use change. *Limnology and Oceanography*.

Ward, S.M. and R.M. Neumann. 1998. Seasonal and site-related food habits of largemouth bass in two Connecticut lakes. *Journal of Freshwater Ecology* 13: 213-220.

Ward, S.M. and R.M. Neumann. In press. Seasonal variations in concentrations of total mercury in axial muscle tissue of largemouth bass. *North American Journal of Fisheries Management*.

Book Chapters

Ryan, J.A. and L.E. Hightower. In press. Heat shock proteins as Molecular biomarks of effect, *In A. Puga and K.B. Wallace, eds. Molecular Biology in Toxicology*, Taylor and Francis, Publ., Washington, D.C.

Dissertations

Lie, Tom. 1998. Sulfidogenesis from sulfonates and anaerobic sulfonate Dissimilation by sulfate reducing bacteria and *Desulfitobacterium*. Ph.D. Dissertation. Department of Molecular and Cell Biology, University of Connecticut, Storrs, CT. 143pp.

Kosnicki, Ely. In progress. Life cycles and natural history of mayflies (Ephemeroptera) inhabiting vernal pools in Connecticut. M.S. Thesis. Department of Natural Resources Management and Engineering, University of Connecticut, Storrs, CT.

Water Resources Research Institute Reports

Conference Proceedings

Jokinen, E.H. 1998. Invertebrate community structure in vernal pools. GR-02661-02 *In Fellman, B., ed., Our Hidden Wetlands, The Proceedings of a Symposium on Vernal Pools in Connecticut*, Center for Coastal and Watershed Systems of the Yale University School of Forestry and Environmental Studies and the Wetland Management Section of the Conn. Dept. of Environmental Protection, New Haven, CT. pp. 6-8

Pyle, C. 1998. Vernal pool ecosystems: Similarities and differences - At what scale? *In Fellman, B., ed., Our Hidden Wetlands, The Proceedings of a Symposium on Vernal Pools in Connecticut*, Center for Coastal and Watershed Systems of the Yale University School of Forestry and Environmental Studies and the Wetland Management Section of the Conn. Dept. of Environmental Protection, New Haven, CT, pp. 9-11

Other Publications