

ROBERT N. BUCHSBAUM

Conservation Scientist, Massachusetts Audubon Society
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EDUCATION:

B.S. June 1969: Cornell University (Natural Resources)
Ph.D. Boston University Marine Program (Marine Ecology), 1985, Woods Hole, MA, 02543
Dissertation: Feeding ecology of geese: The effect of plant chemistry on feeding selection and digestion of salt marsh plants.
Advisor: Ivan Valiela
POST DOCTORAL: Boston University Biology Department. 1985-1987, Boston, MA 02215
Topic: Effect of chemistry of estuarine plants on detrital decomposition
Advisor: Tony Swain

RECENT EMPLOYMENT HISTORY

1987-now: **Conservation Scientist**, Massachusetts Audubon Society. **Co-Director** of North Shore Office, 1993 to 2001
1991: **Visiting Assistant Professor**, Salem State College. Ecology.
1986: **Visiting Assistant Professor** at Wheaton College, Norton, MA. Biometry

PROFESSIONAL ORGANIZATIONS

Estuarine Research Federation (Governing Board, 2005-2007; Editorial Board of Coastal and Estuarine Science News, 2005-2007)
New England Estuarine Research Society (Secr.-Treasurer 1992-94, Treasurer 94-96, President 2006-2008)
Society of Wetlands Scientists (Associate Editor of *Wetlands*, Jan. 1998-Dec. 2000)

OTHER PROFESSIONAL ACTIVITIES

Habitat Monitoring Committee, Gulf of Maine Council on the Marine Environment
Great Marsh (Massachusetts) Salt Marsh Restoration Team
Organizing Committee, New England Sudden Wetland Dieback Symposia
Marsh Management Subcommittee, US EPA Science Advisory Board
Scientific Advisor, Salt Marsh Science Project (K-12 Education Program)

RECENT AND RELEVANT PUBLICATIONS

Buchsbaum, R., F.T. Short, and D.P. Cheney. 1990. Phenolic-nitrogen interactions in eelgrass, *Zostera marina*: Possible implications for disease resistance. *Aquatic Bot.* 37: 291-297.
Buchsbaum R., I. Valiela, T. Swain, M. Dzierzeski, S. Allen. 1991. Available and refractory nitrogen in detritus of coastal vascular plants and macroalgae. *Marine Ecol. Prog. Ser.* 72: 131-143
Buchsbaum, R. 2000. Management of coastal marshes. In: D. Kent (ed.) *Applied Wetlands Science and Technology*, 2nd Ed. Lewis Publishing Co. pp. 331-362.
Holt, E. and R. Buchsbaum. 2000. Bird use of *Phragmites australis* in coastal marshes of northern Massachusetts. In: J. Pederson (ed.) Proceedings of the 1st National Conf. on Marine Bioinvasions, Jan 24-27, 1999, MIT Sea Grant Cambridge, MA. pp 232-240.
Burdick, D., R. Buchsbaum, and E. Holt. 2001. Variation in soil salinity associated with expansion of *Phragmites australis* in salt marshes. *Environmental and Physiol. Botany.* 46:247-261
Williams, W., G.C. Noblitt IV, and R. Buchsbaum. 2001 The effects of salt marsh haying on benthic algal biomass. *Biological Bulletin* 201:287-288

- Buchsbaum, R., T. Purinton, and B. Magnusson (eds.). 2002. *The marine resources of the Parker River-Plum Island Sound estuary: An update after 30 years*. MCZM publication.
- Buchsbaum, R., L. Deegan, and H. Garritt. 2002. Changes in the fish community of Plum Island Sound from 1965 through 1994. pp. 75-102. In: Buchsbaum, R., T. Purinton, and B. Magnusson (eds.) *The marine resources of the Parker River-Plum Island Sound estuary: An update after 30 years*. MCZM publication. Boston, MA. 162 pp.
- Neckles, H., M. Dionne, D. Burdick, R. Buchsbaum, E. Hutchins, and C. Roman. 2002. A monitoring protocol to assess tidal restoration of salt marshes on local and regional scales. *Restoration Ecology*. 10:556-563
- Ludlam, J.P., D.H. Shull, and R. Buchsbaum. 2002. Effects of haying on salt marsh surface invertebrates. *Biol. Bull.* 203:250-251
- Agnew, A.M., D.H. Shull, and R.N. Buchsbaum. 2003. Growth of a salt marsh invertebrate on several species of marsh grass detritus. *Biological Bulletin* 205: 238-239
- Kerry, J., D. Boorse, and R. Buchsbaum. 2004. The effect of nutrient enrichment and salinity on salt marsh invertebrates in the Plum Island Estuary. *Biol. Bulletin* 207: 174
- Buchsbaum R. The role of overfishing, pollution, and habitat degradation on marine fish and shellfish populations in New England. Summary and conclusions. In: Buchsbaum,R., J. Pederson, and W. E. Robinson, (eds). 2005. *The Decline of Fisheries Resources in New England: Evaluating the Impact of Overfishing, Contamination, and Habitat Degradation*. MIT Sea Grant College Program Publication 05-5, Cambridge, MA. pp. 149-162.
- Deegan, L. and R. Buchsbaum. 2005. Effect of habitat loss and degradation on coastal fish populations in New England. In: Buchsbaum,R., J. Pederson, and W. E. Robinson, (eds). *The Decline of Fisheries Resources in New England: Evaluating the Impact of Overfishing, Contamination, and Habitat Degradation*. MIT Sea Grant College Program Publication 05-5, Cambridge, MA. pp. 67-96.
- Bell, R., R. Buchsbaum, C. Roman, and M. Chandler. 2005. Inventory of intertidal marine habitats, Boston Harbor Islands, Massachusetts. *Northeastern Naturalist* 12 (Special Issue 3): 169-200
- Buchsbaum, R. J. Catena, E. Hutchins, and M.J. James-Pirri. 2006. Changes in salt marsh vegetation, *Phragmites australis*, and nekton in response to increased tidal flushing in a New England salt marsh. *Wetlands* 26: 544-557
- Buchsbaum, R., J. Horowitz, et al. Effects of regular salt marsh haying on marsh plants, algae, invertebrates and birds at Plum Island Sound, Massachusetts. In prep.

LINDA A. DEEGAN

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EDUCATION

1985. Ph.D. Louisiana State University, Baton Rouge, LA.
1979. M.S. University of New Hampshire, Durham, NH.
1976. B.S. Northeastern University, Boston, MA.

EXPERIENCE

1989 – present. The Ecosystems Center, Marine Biological Laboratory, Woods Hole.
2004 – present. Professor, Dept. of Ecology and Evolutionary Biology, Brown University, Providence, RI
1988 -present. Adjunct Professor; 1985-1988 - Assistant Professor, Dept. of Natural Resource Conservation and Management, University of Massachusetts, Amherst.

Synergistic Activities

Ecological Society of America; Editorial Board of *Ecological Applications*, 2002-present; Member 1979-present; Estuarine Research Federation, Scientific Co-Chair, 2007 Meeting; Awards Committee 2003, 2005-2007; Member-at-large 1993-1995; Governing Board 2000-2004; *Estuaries*, Editorial Board 1987-1992, Co-Editor of Special Issue on Florida Bay 2000. Member 1976 – present. New England Estuarine Research Society, President 2000-present; President-Elect 1998-2000; Executive Committee 1988-1989; Member 1977-present. American Fisheries Society, National Strategy Planning Committee 1993-1994; Member 1976-present. Southern New England Chapter, American Fisheries Society President 1988-1989; President-elect 1987-1988; Secretary-Treasurer 1986-1987; Member 1985 – present. State and local advisory boards including the Town of Falmouth Conservation Commission, Massachusetts Audubon Society, Waquoit Bay National Estuarine Research Reserve and the EPA Buzzards Bay Project. Non-traditional education including the MBL Science Writers course, the development of four videos on environmental issues that have been broadcast on local TV stations, and “Women in Science” sponsored by the New England Aquarium. I have mentored over 45 undergraduate and 15 graduate students in research projects. I have published a12 articles with undergraduate and 15 with graduate student authors.

Recent Publications (OUT OF 80 JOURNAL PUBLICATIONS)

2007. **Deegan**, L.A. J. L. Bowen, D. Drake, J. W. Fleeger, C. T. Friedrichs, K. A. Galván, J. E. Hobbie, C. Hopkinson, J. M. Johnson, D. S. Johnson, L. E. Lemay, E. Miller, B. J. Peterson, C. Picard, S. Sheldon, J. Vallino, R. S. Warren. Susceptibility of salt marshes to nutrient enrichment and predator removal. *Ecological Applications* 17(5):S42-S63.
2007. Plant N dynamics in fertilized and natural New England saltmarshes: A paired ^{15}N tracer study. D.C. Drake, L.A. **Deegan**, L.A. Harris, E.E. Miller, B.J. Peterson, and R.S. Warren. In Press. *Marine Ecology Progress Series*.
2006. Neill, C., L. A. **Deegan**, S. M. Thomas, C. L. Hauptert, A. Krusche, V. Ballester, R. Victoria. Deforestation alters the hydraulic and biochemical characteristics of small lowland Amazonian streams. *Hydrologic Processes*. 20:2563-2580.
2006. Logan, J., H. Haas, L. A. **Deegan**, and E. Gaines. Turnover rates of nitrogen stable isotopes in the salt marsh mummichog, *Fundulus heteroclitus*, following a laboratory diet switch. *Oecologia* 147:391-395.
- ^U2005. **Deegan**, L., H. Golden, J. Harrison, K. Kracko. Swimming ability and metabolism of 0+ Arctic grayling (*T. arcticus*). *J. Fish Biology*. 67(4): 910 – 918.

2005. **Deegan**, L. A., and R. N. Buchsbaum. The Effect of Habitat Loss and Degradation on Fisheries. In: R. N. Buchsbaum, J. Pederson and W. E. Robinson (eds.). The decline of fisheries resources in New England: Evaluating the impact of overfishing, contamination, and habitat degradation. MIT SeaGrant Press, Cambridge.
- ^G2004. Salgado, J., M-J. Costa, H. Cabral & L. **Deegan**. Nekton use of salt marsh creeks in the upper Tejo Estuary. *Estuaries*. 27(5): 818-825.
- ^G2004. Salgado, J., M-J. Costa, H. Cabral & L. **Deegan**. Comparison of fish assemblages in tidal salt marsh creeks and in adjoining mudflat areas in the Tejo estuary. *Cahiers de Biologie Marine* 45 (3): 213-224.
2004. Buzby, K., and L. A. **Deegan**. Long-term survival of adult Arctic grayling in the Kuparuk River, Alaska. *Canadian J. Aqua. Fish. Science*. 61(10): 1954 – 1964.
2003. Tobias, C. R., M. Cieri, B.J. Peterson, L. A. **Deegan**, J. Vallino, J. Hughes. Processing watershed-derived nitrogen in a well-flushed New England estuary. *Limnol. Oceanogr.* 48(5):1766 – 1778. .
2003. Kratz, T. K., L. A. **Deegan**, M. E. Harmon, and W. K. Lauenroth. Understanding Ecological Variability in Space and Time from Long-Term Observations. *BioScience* 53:57 – 67. .
2002. **Deegan**, L. A. Lessons learned: the effects of nutrient enrichment on the support of nekton by seagrass and saltmarsh ecosystems. Invited. *Estuaries* 25(4b):585-600.
- ^U2002. **Deegan**, L. A., A. Wright, S. G. Ayvazian, J. T. Finn, H. Golden, R. R. Merson, and J. Harrison. Nitrogen loading alters seagrass ecosystem structure and support of higher trophic levels. *Aquatic Conservation: Marine and Freshwater Ecosystems* 12:193-212.
2002. Hughes, J. E., L. A. **Deegan**, M. J. Weaver, and J. E. Costa. Regional application of an index of Estuarine Biotic Integrity based on fish communities. *Estuaries* 25:250-263.
2001. Neill, C., L. A. **Deegan**, S. M. Thomas, and C. Cerri. Deforestation for pasture alters nitrogen and phosphorous in soil solution and stream water of small Amazonian watersheds. *Ecological Applications* 11(6):1817-1828.
- ^G2001. **Deegan**, L. A., J. Kremer, T. Webler, and J. Brawley. The use of models in integrated resource management in the coastal zone, pp. 295-306. In: Von Bodungen, B., and R. K. Turner, (eds.), Science and Integrated Coastal Management, 378 pp. Dahlem University Press, Berlin.
2000. **Deegan**, L. A., J. E. Hughes, and R. A. Rountree. Salt marsh ecosystem support of marine transient species, pp. 333-365. Invited chapter In: M. P. Weinstein and D. A. Kreeger, (eds.), Concepts and Controversies in Tidal Marsh Ecology. Kluwer Academic Publisher, The Netherlands
2000. Hughes, J. E., L. A. **Deegan**, B. J. Peterson, R. M. Holmes, and B. Fry. Nitrogen flow through the food web in the oligohaline zone of a New England estuary. *Ecology* 81:433-452.
2000. Holmes, R. M., B. J. Peterson, L. A. **Deegan**, J. E. Hughes, and B. Fry. Nitrogen biogeochemistry in the oligohaline zone of a New England estuary. *Ecology* 81:416:432.

ANNE E. GIBLIN

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Phone: (508) 289-7488

Professional Preparation:

Rensselaer Polytechnic Institute, Troy, NY, Biology, B.S., 1975
Boston University Marine Program, Woods Hole, MA, Ecology, Ph.D., 1982

Awards:

Phi Lambda Upsilon Chemical Honor Society
Aldo Leopold Leadership Fellowship 2001
Estuaries – recognized for outstanding contributions to peer review 2005

Appointments:

Senior Scientist, Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA, 2003-
Graduate Faculty, Graduate School of Oceanography, University of Rhode Island 2005-Present
Adjunct Professor, Brown University, 2007-Present
Associate Scientist, Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA, 1990-2003
Adjunct Associate Professor, Boston University, Boston, MA, 1991-Present
Assistant Scientist, Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA, 1983-1990
Postdoctoral Investigator, Woods Hole Oceanographic Institution, Woods Hole, MA, 1982-1983
Coordinator, Summer Marine Ecology Course, Marine Biological Laboratory, Woods Hole, MA, Summer
1981
Research Assistant, Boston University Marine Program, Woods Hole, MA, 1977 - 1981
Teaching Fellow, Boston University Marine Program, Woods Hole, MA, 1975 - 1977
Taught Freshman Chemistry Lab, Rensselaer Polytechnic Institute, Summer 1975

Selected Publications:

- Giblin, A. E., and A. G. Gaines. 1990. Nitrogen dynamics in a marine embayment: the importance of groundwater. *Biogeochemistry* 10:309-328.
- Giblin, A. E., K. H. Foreman, G. T. Banta. 1995. Biogeochemical processes and marine benthic community structure: Which follows which? In: Jones, C. G. and J. H. Lawton (eds.) pp 37-44. *Linking Species and Ecosystems*. Chapman and Hall, New York.
- Seitzinger, S. P., and A. E. Giblin. 1996. Estimating denitrification in North Atlantic continental shelf sediments. *Biogeochemistry* 35:235-260.
- Giblin, A.E., C.S. Hopkins, and J. Tucker. 1997. Benthic metabolism and nutrient cycling in Boston Harbor, Massachusetts, U.S.A. *Estuaries* 20:346-364.
- Hopkinson, C.S., A.E. Giblin, J. Tucker, R.H. Garritt. 1999. Benthic metabolism and nutrient cycling along an estuarine salinity gradient. *Estuaries* 22: 863-881.
- Tucker, J, N. Sheats, A.E. Giblin, C.S. Hopkins. 1999. Using stable isotopes to trace sewage derived material through Boston Harbor and Massachusetts Bay. *Marine Environmental Research* 48:353-375.
- LaMontagne, M.G., A.E. Giblin, and I. Valiela. 2002. Denitrification and the stoichiometry of nutrient regeneration in Waquoit Bay, MA. *Estuaries* 25: 272-281.
- Tobias, C., A. E. Giblin, J. McClelland, J. Tucker, and B. Peterson. 2003. Sediment DIN fluxes and preferential recycling of benthic microalgal nitrogen in shallow macrotidal estuary. *Marine Ecological Progress Series* 257:25-36.

- Giblin, A.E. and J. Vallino. 2003. The role of models in addressing coastal eutrophication problems. pp. 327-341, In: Canham, C.D., J. J. Cole, and W. K. Lauenroth (eds) *The Role of Models in Ecosystem Science*. Princeton University Press.
- Bernhard, A.E., Thomas Donn, Anne E. Giblin, and David A. Stahl. 2005. Loss of Diversity of Ammonia-Oxidizing Bacteria Correlates with Increasing Salinity in an Estuary System. *Environmental Microbiology* 7: 1289-1297.
- Groffman, P.M., M.A. Altabet, J.K. Böhlke, K. Butterbach-Bahl, M. B. David, M. K. Firestone, A. E. Giblin, T. M. Kana, L-P Nielsen and M. A. Voytek. 2006 Methods for measuring denitrification: Diverse approaches to a difficult problem. *Ecological Applications* 16:2091-2122.
- Hobara, S. C. McCalley, K. Koba, A.E. Giblin M.S. Weiss, G.M. Gettel, G.R. Shaver. (2006) Nitrogen fixation in an arctic tundra watershed: a key atmospheric N source. *Arctic, Antarctic and Alpine Research* 38:363-372.
- Bernhard, A.E., J. Tucker, A.E. Giblin, D.A. Stahl. 2007. Functionally different communities of ammonia oxidizing bacteria along an estuarine salinity gradient. *Environmental Microbiology* 9: 1439-1447.
- Gettel, G.M., A.E. Giblin, R.W. Howarth. The effects of grazing by the snail *Lymnaea elodes* on benthic N-fixation and primary production in oligotrophic arctic lakes. *Limnol. Oceanogr.* In press
- Hopkinson, C.S. and A.E. Giblin. Nitrogen Dynamics in Salt Marsh Ecosystems. In: (Eds.) D. Capone, D. Bronk, M. Mulholland, E. Carpenter) *Nitrogen in the Marine Environment*. Accepted
- Gettel, G.M., A.E. Giblin, R.W. Howarth, D. Steniberg. Light and nutrient controls of benthic nitrogen fixation in oligotrophic, arctic lakes: Results from whole-lake fertilizations and sediment-core experiments. (Submitted)

Synergistic Activities:

- Estuarine Research Society: Governing Board 1988-1990; President-Elect 1997-1999, President 1999-2001, Past President 2001-2003
- Member, Science Board for the National Parks Service, Cape Cod National Seashore, 1997-2002
- Member, Advisory Board, Cornell Research Training Grant in Biogeochemistry, 1997-2002
- Chair, Cooperative Institute for Coastal and Estuarine Environmental Technology Advisory Board, 1999-2006
- Co-Organizer: ERF 2002 workshop: Estuarine Response to Climate Change and Variability. April 7-9.
- Member, Biogeosciences Working Group, AGU-NSF, 2004
- Steering Committee: Workshop on Advanced Approaches to Quantify Denitrification, May 2004.
- Steering Committee: Denitrification Research Coordination Network. 2005-Present.
- Co-Chair, Nutrients and Contaminants Working Group, Workshop on Planning Coordinated Research on Ecosystems, Climate, and Policy in the Northeast. Sponsored by WHOI and NMFS Jan 11-13, 2005.
- Teacher in the Semester in Environmental Sciences Program, Marine Biological Laboratory
- Member, NSF Panel, Biocomplexity, coupled human and natural systems, 2005
- Member, NSF Panel Ecosystems Studies, April 2005, April 2006

CHARLES S. HOPKINSON, JR.

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Professional Preparation:

Ursinus College, Collegeville, Pennsylvania, Biology, B.S., 1970
Louisiana State University, Baton Rouge, Marine Science, M.S., 1973
Louisiana State University, Baton Rouge, Marine Science, Ph.D., 1979

Appointments:

1997-Present, Senior Scientist, The Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA
2004-Present, Professor Brown University, Providence, RI
1990-1996, Associate Scientist, The Ecosystems Center, MBL, Woods Hole, MA
1988, Visiting Professor, Askö Laboratory, University of Stockholm, Stockholm, Sweden
1986-1989, Associate Marine Scientist, Marine Institute, University of Georgia
1979-1986, Assistant Marine Scientist, Marine Institute, University of Georgia

Recent and Relevant Publications:

1. Hopkinson, C. S. and J. Vallino. 1995. The nature of watershed perturbations and their influence on estuarine metabolism. *Estuaries* 18:598-621.
2. Hopkinson, C. S., A. E. Giblin, J. Tucker and H. Garritt. 1999. Benthic metabolism and nutrient cycling along an estuarine salinity gradient. *Estuaries* 22:825-843.
3. Driscoll, C., D. Whitall, J. Aber, E. Boyer, M. Castro, C. Cronan, C. Goodale, P. Groffman, C. Hopkinson, K. Lambert, G. Lawrence, and S. Ollinger. 2003. Nitrogen pollution in the northeastern United States: Sources, effects and management options. *BioScience* 53:357-374.
4. Pellerin, Brian A., W. Wollheim, C. Hopkinson, W. McDowell, M. Williams, C. Vörösmarty, and M. Daley. 2004. Role of wetlands and developed land use on dissolved organic nitrogen concentrations and DON/TDN in northeastern U.S. rivers and streams. *Limnol. Oceanogr.* 49: 910-918.
5. Filoso, S., J. Vallino, C. Hopkinson, E. Rastetter and Claessens, L. 2004. Modeling Nitrogen Transport in the Ipswich River Basin, Massachusetts, using HSPF. *Journal of the American Water Resources Association.* 40:1365-1384.
6. Williams, M. C. Hopkinson, E. Rastetter, and J. Vallino. 2004. N budgets and aquatic uptake in the Ipswich River Basin, northeastern Massachusetts. *Water Resources Research* 11:1-12.
7. Crump, B. C., C. Hopkinson, M. Sogin and J. Hobbie. 2004. Microbial biogeography along and estuarine salinity gradient: the combined influences of bacterial growth and residence time. *Applied and Environmental Microbiology* 70: 1494-1505.
8. Hopkinson, C. S. and J. Vallino. 2005. Efficient export of carbon to the deep ocean through dissolved organic matter. *Nature* 433:142-145.
9. Vallino, J.J., Hopkinson, C.S., and Garritt, R.H. 2005. Estimating estuarine gross production, community respiration and net ecosystem production: A nonlinear inverse technique. *Ecological Modeling* 187:281-296.
10. Hopkinson, C. and E. Smith. 2005. Estuarine respiration, pages 122-146. In- P. delGiorgio and P.J.leB. Williams. *Respiration of Aquatic Ecosystems of the World.* Academic Press, NY.
11. Wollheim, W., B. Pellerin, C. Vörösmarty and C. Hopkinson. 2005. N retention in urbanizing headwater catchments. *Ecosystems* 8:871-884.
12. Fagherazzi, S., R. Torres, C. Hopkinson and D. van Proosdij. 2005. Salt marsh geomorphology: physical and ecological effects on landform. *EOS - AGU Transactions* 8: 57-58

13. Williams, M., C. Hopkinson, E. Rastetter, J. Vallino and L. Claessens. 2005. Relationships of land use and stream solute concentrations in the Ipswich River Basin, northeastern Massachusetts. *Water, Air, and Soil Pollution* 161:55-74.
14. Claessens, L., C. Hopkinson, E. Rastetter, and J. Vallino. 2006. Evaluating the effect of historical changes in land use and climate on the waterbudget of the Ipswich River Basin, Massachusetts, USA. *Water Resources Res.* 42: WO3246, doi:10.1029/2005WR004131,2006.
15. Fedorko, E., G. Pontius, S. Aldrich, L. Claessens, C. Hopkinson and W. Wollheim. 2006. Spatial distribution of land-type in regression models of pollutant loading. *Spatial Hydrology Journal of Spatial Hydrology* 5:61-80.
16. Farber, S., R. Costanza, D. Childers, J. Erikson, K. Gross, M. Grove, C. Hopkinson, J. Kahn, S. Pincetl, A. Troy, P. Warren, and M. Wilson. 2006. Linking ecology and economics for ecosystem management. *BioScience* 56: 117-129.
17. Torres, R., S. Fagherazzi, D. van Proosdij and C. Hopkinson. 2006. Salt marsh geomorphology: physical and ecological effects on landform. *Est. Coastal Shelf Sci.* 69: 309-310.
18. Wollheim, W. M., C. Vörösmarty, B. Peterson, S. Seitzinger, and C. Hopkinson. 2006. Relationship between river size and nutrient removal. *Geophysical Research Letters* 33: LO6410, doi:1029/2006GL025845.4 p.

Synergistic Activities

Editor-in-Chief, *Wetlands Ecology and Management*. Springer. 2000-TBD.

Member of the Committee on the Causes and Management of Coastal Eutrophication. National Research Council, Commission on Geosciences, Environment and Resources, Ocean Studies Board. 1998 – 2000. Lead to publication of the book - *Clean Coastal Waters – Understanding and reducing the effects of nutrient pollution*. Ocean Studies Board and Water Science and Technology Board, Commission on Geosciences, Environment, and Resources, NRC, NAS, Washington, D.C. 405 p. 2000

Member of the Hubbard Brook Research Foundation “Science Links” Nitrogen Project examining sources and effects of nitrogen pollution in Northeastern Ecosystems. 2001 – 2003.

Member of the Carbon Cycle Science Ocean Interim Implementation Group that prepared the report “Ocean Carbon and Climate Change, an implementation strategy for U.S. Ocean Carbon Research”. 2002-2004.

Chapman Conference Organizing Committee. The conference, supported by the American Geophysical Union, was titled *Salt Marsh Geomorphology, Physical and Ecological Effects on Landform*. It was held in Halifax, Nova Scotia in October 2004.

Member of the NCEAS working group *Valuation of Ecosystem Services*. June 2004-July 2005.

Advisory Committee Member for the Georgia Coastal Ecosystems LTER. University of Georgia. 2001-2006.

Advisory Committee for the Florida Coastal Everglades LTER. Florida International University. 2006-TBD.

Member of the LTER Executive Board, 2006-2008.

MARTHA E. MATHER

USGS, Massachusetts Cooperative Fish and Wildlife Research Unit,
Department of Natural Resources Conservation,
University of Massachusetts, Amherst, MA 01003; mather@forwild.umass.edu

Professional Preparation

B.S.	Denison University	1978	Biology
M.S.	The Ohio State University	1985	Zoology
Ph.D	The Ohio State University	1990	Zoology
Post-doctoral fellow	Miami University	1991	Zoology

Appointments

Research Scientist, Massachusetts Cooperative Fish and Wildlife Research Unit; 1991-
Adjunct Associate Professor, Department of Natural Resource Conservation, University of
Massachusetts, Amherst, MA; 1991-present
Faculty, UMASS School of Marine Sciences, 2004-present

Areas of Specialization

My research interests relate to ecological interactions of estuary, coastal marine, stream, and lake fish including: (a) what abiotic and biotic factors drive community structure, (b) how and why these interactions vary through space and time, (c) the role of spatial scale in determining ecological patterns and processes, and (d) bio-social interactions needed to achieve sustainability.

Select Publications

- Mather, M.E., D. L. Parrish, C. L. Folt, and D. M. DeGraaf. 1998. Integrating across scales: effectively applying science for the successful conservation of Atlantic salmon (*Salmo salar*). *Can. Journal of Fisheries and Aquatic Sciences* 55:1-8.
- Mather, M. E. 1998. The role of context specific predation in understanding patterns exhibited by anadromous salmon. *Canadian Journal of Fisheries and Aquatic Sciences* 55: 232-246.
- Wilzbach, M. A., M. E. Mather, C. L. Folt, A. Moore, R. J Naiman, A. F. Youngson, and J. McMenemy. 1998. Proactive responses to human impacts that balance development and Atlantic salmon conservation (*Salmo salar*): an integrative model. *Canadian Journal of Fisheries and Aquatic Sciences* 55:288-302.
- Whalen, K. G, D. L. Parrish, and M.E. Mather. 1999. Effect of ice formation on selection of habitats and winter distribution of post young-of-year Atlantic salmon parr. *Canadian Journal of Fisheries and Aquatic Sciences* 56:87-96.
- Yako, L. A., M. E. Mather, and F. Juanes. 2000. Assessing the contribution of anadromous herring to largemouth bass growth. *Transactions of the American Fisheries Society*: 150: 2-17.
- Whalen, K.G, D. L. Parrish, M.E. Mather, and J. McMenemy. 2000. Cross-tributary analysis of parr to smolt recruitment of Atlantic salmon. *Canadian Journal of Fisheries and Aquatic Sciences* 57:1607-1616.
- Kosa, J. T., and M. E. Mather. 2001 Processes contributing to variability in regional patterns of juvenile river herring abundance across small coastal systems. *Transactions of the American Fisheries Society* 130: 600-619.
- Nitschke, P., M. E. Mather, and F. Juanes. 2002. The role of anthropogenic disturbance, density, habitat, and abiotic factors on recruitment of a temperate reef fish, cunner (*Tautoglabrus adspersus*), in Cape Cod Bay. *Marine Ecology Progress Series* 226:165-178.
- Yako, L. A., M. E. Mather, and F. Juanes. 2002. Mechanisms for migration of anadromous herring; providing an ecological basis for an effective conservation plan. *Ecological Applications* 12: 521-534.

- Walter, J. F. A. S. Overton, K.H. Ferry, and M. E. Mather. 2003. Atlantic coast feeding habits of striped bass: a synthesis of data supporting a comprehensive coast-wide understanding of the trophic biology. *Fisheries Management and Ecology*. 10-1-13.
- Muth, R. M., R. R. Zwick, M. E. Mather, J. F. Organ, J. J. Daigle, S. A. Jonker . 2006 Unnecessary source of pain and suffering or necessary management tool: examining the attitudes of conservation professionals toward outlawing the leghold trap. *Wildlife Society Bulletin*
- Odell, J., M. E. Mather, and R. M. Muth. 2005. Use of an interaction web to identify underlying causes and diagnose potential solutions of natural resource conflicts: an example using allocation of horseshoe crabs. *Bioscience* 55:735-748
- Carey, M. P., and M. E. Mather. 2007. An ecological based approach for tracking anthropogenic threats in a human dominated landscape: a gradient approach to conservation planning using freshwater fish. *Accepted Aquatic Conservation: Freshwater and Marine*
- Carey, M. P., and M. E. Mather. 2007. Correlates of size-specific patterns of relative abundance of yellow perch, a widespread generalist. Submitted: *Transactions of the American Fisheries Society*
- Mather, M. E., C. A. Campbell, J. McMenemy, D. L. Parrish . 2007. Scope of temperature variation in the Connecticut River and implications for juvenile Atlantic salmon survival and growth. Submitted: *Hydrobiologia*
- Ferry, K. H. and M. E. Mather. 2007. It's migration season, do you know where the teenagers are?; diets of young, adult migratory striped bass on the Massachusetts foraging grounds. In revision.

Recent Presentations

- Mather, M. E., J. Finn, R. M. Muth, K. Ferry, H. Frank, J. Smith. 2006. Stopping the bleeding: a case study for managing estuarine fish in the face of multiple adverse human impacts. Invited Symposium: *Death by a Thousand Cuts: Cumulative Impacts of Human Activities in Estuarine Environments*. American Fisheries Society, Lake Placid, New York, September, 2006
- Ferry, K. F., J. Smith, M. E. Mather, J. Smith, J. Finn, R. Muth. 2006. In search of "the right side of the tracks:" identifying desirable habitat for river herring restoration. American Fisheries Society, Lake Placid, New York, September, 2006
- Pautzke, S., M. E. Mather, J. Finn, L. Deegan, R. M. Muth. 2006 Spatially defining predator impacts on estuarine food webs: assessing striped bass movements via acoustic tracking. American Fisheries Society, Lake Placid, NY September, 2006

MORRIS, JAMES T.

Director, Belle W. Baruch Institute for Marine and Coastal Sciences and Distinguished Professor of Marine Studies, University of South Carolina, Columbia, SC 29208, USA;
Phone: 803-777-5288; Fax: 803-777-4002; Email: morris@biol.sc.edu; web: ww.biol.sc.edu/~morris

a. Professional Preparation:

B.A. 1973 Environmental Sciences, University of Virginia
M.S. 1975 Biology, Yale University
Ph.D. 1979 Forestry and Environmental Studies, Yale University
1979-1981 Postdoctoral Fellowship, Ecosystems Center, MBL, Woods Hole
M.Cert. 2005 Project Management, George Washington University

b. Appointments

2006-present: Director, Belle W. Baruch Institute for Marine and Coastal Sciences
2003-2005: Program Officer, DEB-NSF
1992-present: Professor of Biological and Marine Sciences, University of South Carolina
1993: Visiting Professor, Botanik Inst., Aarhus University, Denmark
1990: Visiting Associate Professor, Botanik Inst., Aarhus University, Denmark
1987-1992: Associate Prof. of Biology and Marine Science, University of South Carolina
1981-1987: Assistant Prof. of Biology and Marine Science, University of South Carolina
1979-1981: Postdoctoral Fellow, Ecosystems Center, MBL, Wood Hole

c. Significant Publications

- Morris, J.T., B. Kjerfve, J.M. Dean. 1990. Dependence of estuarine productivity on anomalies in mean sea level. *Limnol. Oceanogr.* 35: 926-930.
- Bradley, P.M. and J.T. Morris. 1990. Influence of oxygen and sulfide concentration on nitrogen uptake kinetics in *Spartina alterniflora*. *Ecology* 71:282-287.
- Morris, J.T. and B. Haskin. 1990. A 5-yr record of aerial primary production and stand characteristics of *Spartina alterniflora*. *Ecology* 71:2209-2217.
- Bradley, P.M. and J.T. Morris. 1991. The influence of salinity on the kinetics of NH₄⁺ uptake in *Spartina alterniflora*. *Oecologia* 85:375-380.
- Morris, J.T. 1991. Effects of nitrogen loading on wetland ecosystems with particular reference to atmospheric deposition. *Annual Review of Ecology and Systematics* 22:257-279.
- Paludan, C. and J.T. Morris. 1999. Distribution and speciation of phosphorus along a salinity gradient in intertidal marsh sediments. *Biogeochemistry* 45: 197-221
- Morris, J.T. and P.M. Bradley. 1999. Effects of nutrient loading on the preservation of organic carbon in wetland sediments. *Limnology and Oceanography*, 44:699-702.
- Mendelssohn, I.A. and J.T. Morris. 2000. Ecophysiological controls on the growth of *Spartina alterniflora*, pp. 59-80. In: *Concepts and Controversies in Tidal Marsh Ecology*. N.P. Weinstein and D.A. Kreeger (eds.). Kluwer Academic Publishers.
- Morris, J.T., P.V. Sundareshwar, C.T. Nietch, B. Kjerfve, D.R. Cahoon. 2002. Responses of coastal wetlands to rising sea level. *Ecology* 83:2869-2877.
- Morris, J.T., D. Porter, M., Neet, P. A. Noble, L. Schmidt, L. A. Lapine, and J. Jensen. 2005. Integrating LIDAR, multispectral imagery and neural network modeling techniques for marsh classification. *Int. J. Remote Sensing* 26:5221-5234.
- Sundareshwar, P.V., J.T. Morris, P.J. Pellechia, H.J. Cohen, D.E. Porter and B.C. Jones. 2001. Occurrence and ecological implications of pyrophosphate in estuaries. *Limnol. Oceanogr.* 46:1570-1577.

- Sundareshwar, P.V., J.T. Morris, E.K. Koepfler, and B. Fornwalt. 2003. Phosphorus limitation of coastal ecosystem processes. *Science* 299:563-565.
- Morris, J.T., R.R. Christian, and R.E. Ulanowicz. 2005. Analysis of size and complexity of randomly constructed food webs by information theoretic metrics. pp. 73-85, In: *Aquatic Food Webs: an Ecosystem Approach*; A. Belgrano, U. M. Scharler, J. Dunne and R. E. Ulanowicz (Eds), Oxford University Press.
- Morris, J.T. 2006. Competition among marsh macrophytes by means of geomorphological displacement in the intertidal zone. *Estuarine and Coastal Shelf Science* 69:395-402.
- Morris, J.T. 2007. Ecological engineering in intertidal saltmarshes. *Hydrobiologia* 577:161-168.
- Morris, J.T. 2007. Estimating net primary production of salt-marsh macrophytes, pp. 106-119. In Fahey, T.J. and Knapp, A.K (eds). *Principles and Standards for Measuring Primary Production*. Oxford University Press.

d. Recent Synergistic Activities

- Subject Editor, *Wetlands Ecology and Management*, 1997-present.
- Member, Louisiana Board of Regents Program Review, Baton Rouge, 1998
- Member, Brown Marsh Panel, Office of the Governor, State of Louisiana; Sep. 2000
- Member, Scientific & Technical Advisory Comm. Panel on Present Status and Future Trends in Estuarine and Watershed Monitoring using Remote Sensing Technology, Chesapeake Bay Program, Annapolis, Jan. 2002.
- Chair, Scientific Advisory Board, Consortium of Estuarine Ecoindicator Research – Gulf of Mexico Program, Mar. 2003.
- Member, SERDP-Defense Estuarine Ecosystem Management Research Center workshop, Atlantic Beach, NC, Feb. 2004.
- Member, NOAA Effects of Sea Level Rise Workshop, Beaufort, NC, 2004
- Member, Finance Committee, Estuarine Research Federation, 2004-present.
- Member, Mercer Award Committee, Ecological Society of America, 2003-2006
- Panel Member, *Envisioning the Future of the Gulf Coast*, New Orleans, 2007
- Panel Member, NRC Comm. Rev. of the Louisiana Coastal Protection Restoration Program, 2007

BRUCE J. PETERSON

The Ecosystems Center
Marine Biological Laboratory
Woods Hole, Massachusetts 02543
(508) 289-7484

Birthplace: Chicago, Illinois
Birthdate: 9 April 1945
Citizenship: U.S.A.

Education: Ph.D., Cornell University, Ithaca, NY, 1971
B.S., Bates College, Lewiston, ME, 1967, Biology (with honors)

Research Experience:

January 1976 - Present: The Ecosystems Center, Marine Biological Laboratory, Woods Hole, Massachusetts. Senior Scientist, December 1987 to Present. Research on biological processes at the ecosystem level with emphasis on cycling of nitrogen, phosphorus, sulfur and carbon. Associate Scientist, January 1980 to December 1987; Assistant Scientist, January 1977 to January 1980; Postdoctoral Associate, January 1976 to January 1977

Honors and Professional Societies:

Phi Beta Kappa, Bates College, 1967
Member, American Society of Limnology and Oceanography
Member, American Association for the Advancement of Science
Fellow, American Association for the Advancement of Science
Member, Marine Biological Laboratory Corporation
Member, Estuarine Research Federation
Member, American Geophysical Union

Selected Publications

Peterson, B. J., B. Fry, M. Hullar, S. Saupe and R. Wright. 1994. The distribution and stable carbon isotopic composition of dissolved organic carbon in estuaries. *Estuaries* 17(1B):111-121.

Hullar, M. A. J., B. Fry, B. J. Peterson, and R. T. Wright. 1996. Microbial utilization of estuarine dissolved organic carbon: A stable isotope tracer approach tested by mass balance. *Applied and Environmental Microbiology* 62(7):2489-2493.

Wollheim, W. M., B. J. Peterson, L. A. Deegan, M. Bahr, D. Jones, W. B. Bowden, A. E. Hershey, G. W. Kling, and M. C. Miller. 1999. A coupled field and modeling approach for the analysis of nitrogen cycling in streams. *Journal of the North American Benthic Society*. 18:199-221.

Vorosmarty, C. J. and B. J. Peterson. 2000. Macro-scale models of water and nutrient flux to the coastal zone, pp. 43-79, Chapter 3. In: J. E. Hobbie (ed.), *Estuarine Science. A Synthetic Approach to Research and Practice*. Island Press, Washington, DC.

Hughes, J. E., L. A. Deegan, B. J. Peterson, R. M. Holmes, and B. Fry. 2000. Nitrogen flow through the food web in the oligohaline zone of a New England estuary. *Ecology*. 81:433-452.

Holmes, R. M., B. J. Peterson, L. A. Deegan, J. E. Hughes, and B. Fry. 2000. Nitrogen biogeochemistry in the oligohaline zone of a New England estuary. *Ecology*. 81:416-432

Peterson, B. J., W. Wollheim, P. J. Mulholland, J. R. Webster, J. L. Meyer, J. L. Tank, N. B. Grimm, W. B. Bowden, H. M. Valett, A. E. Hershey, W. B. McDowell, W. K. Dodds, S. K. Hamilton, S.

Gregory and D. J. D'Angelo. 2001. Control of Nitrogen Export from Watersheds by Headwater Streams. *Science* 292:86-90.

Tobias, C., A. Giblin, J. McClelland, J. Tucker and B. J. Peterson. 2003. Sediment DIN fluxes and preferential recycling of benthic microalgal nitrogen in a shallow macrotidal estuary. *Mar. Ecol. Prog. Ser.* 257: 25-36.

Tobias, C. R., M. Cieri, B. J. Peterson, L. A. Deegan, J. Vallino, and J. Hughes. 2003. Processing watershed-derived nitrogen in a well-flushed New England estuary. *Limnol. Oceanog.* 48: 1766-1778.

Wollheim, W. M., C. J. Vorosmarty, B. J. Peterson, S. P. Seitzinger, and C. S. Hopkins. 2006, Relationship between river size and nutrient removal. 2006. *Geophys. Res. Lett.*, L06410, doi:10.1029/2006GL025845.

Peterson, B.J., J. McClelland, M. Holmes, R. Curry, J. Walsh and K. Aagaard. 2006. Trajectory Shifts in the Arctic and Subarctic Freshwater Cycle. *Science* 313: 1061-1066.

Synergistic Activities:

Lecturer in Semester in Environmental Science Program for Undergraduates at the Marine Biological Laboratory.

Lecturer and student advisor in new Brown-MBL graduate teaching and research program

Member of the NSF Arctic System Science (ARCSS) Committee for the Fresh Water Initiative.

Mentor for NSF Research Experience for Undergraduates (REU) students at the Arctic and Plum Island LTER sites.

Member of LINX 2 steering committee for an 8 site comparison study of denitrification in stream ecosystems.

ROBERT GILMORE PONTIUS JR

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EXPERTISE

Geographic Information Science (GIS)
Quantitative Environmental Modeling
Ecological Sustainability
Land Use
Statistics

PROFESSIONAL PREPARATION

University of Pittsburgh, Pittsburgh, PA, USA. B.S. Mathematics, 1984.
The Ohio State University, Columbus, OH, USA. M.A.S. Applied Statistics, 1989.
State University of New York, Syracuse, NY, USA. Ph.D. Environmental Science, 1994.

APPOINTMENTS

Associate Professor 2004 - present
Assistant Professor 1998 - 2004
Department of International Development, Community, and Environment
Graduate School of Geography
Clark University, 950 Main Street, Worcester MA 01610-1477

Associate Scientist 1995-1997
Tellus Institute & Stockholm Environment Institute, Boston MA

Assistant Professor 1994-1995
Department of Geography and Center for Energy and Environmental Studies
Boston University, Boston MA

FIVE RECENT PUBLICATIONS RELATED TO PROPOSED ACTIVITY

Pontius Jr, Robert Gilmore, Wideke Boersma, Jean-Christophe Castella, Keith Clarke, Ton de Nijs, Charles Dietzel, Duan Zengqiang, Eric Fotsing, Noah Goldstein, Kasper Kok, Eric Koomen, Christopher D. Lippitt, William McConnell, Bryan Pijanowski, Snehal Pithadia, Alias Mohd Sood, Sean Sweeney, Tran Ngoc Trung, A. Tom Veldkamp, and Peter H. Verburg. 2007. Comparing the input, output, and validation maps for several models of land change. *Annals of Regional Science*, in press.

Pontius Jr, Robert Gilmore, Robert Walker, Robert Yao-Kumah, Eugeino Arima, Stephen Aldrich, Marcellus Caldas and Dante Vergara. 2007. Accuracy assessment for a simulation model of Amazonian deforestation. *Annals of the Association of American Geographers*, in press.

Pontius Jr, Robert Gilmore, Anna J Versluis and Nicholas R Malizia. 2006. Visualizing certainty of extrapolations from models of land change. *Landscape Ecology* 21(7) p.1151-1166.

Pontius Jr, Robert Gilmore and Jeffrey Malanson. 2005. Comparison of the structure and accuracy of two land change models. *International Journal of Geographical Information Science* 19(2) p.243-265.

Pontius Jr, Robert Gilmore and Joseph Spencer. 2005. Uncertainty in extrapolations of predictive land change models. *Environment and Planning B: Planning and Design* 32 p.211-230.

FIVE ADDITIONAL RECENT RELEVANT PUBLICATIONS

Pontius Jr, Robert Gilmore, Diana Huffaker and Kevin Denman. 2004. Useful techniques of validation for spatially explicit land-change models. *Ecological Modelling* 179(4) p.445-461.

Pontius Jr, Robert Gilmore, Aditya Agrawal and Diana Huffaker. 2003. Estimating the uncertainty of

- land-cover extrapolations while constructing a raster map from tabular data. *Journal of Geographical Systems* 5(3) p.253-273.
- Pontius Jr, Robert Gilmore and Kiran Batchu. 2003. Using the relative operating characteristic to quantify certainty in prediction of location of land cover change in India. *Transactions in GIS* 7(4) p.467-484.
- Pontius Jr, Robert Gilmore, Joseph Cornell and Charles A S Hall. 2001. Modeling the spatial pattern of land-use change with GEOMOD2: application and validation for Costa Rica. *Agriculture, Ecosystems & Environment* 85(1-3) p.191-203.
- Pontius Jr, Robert Gilmore and Laura Schneider. 2001. Land-use change model validation by a ROC method for the Ipswich watershed, Massachusetts, USA. *Agriculture, Ecosystems & Environment* 85(1-3) p.239-248.

SYNERGISTIC ACTIVITIES

Since 2000, Pontius has performed research in two NSF-funded programs: Long Term Ecological Research (LTER) and Human Environment Regional Observatory (HERO). He has used both programs as a means to train undergraduates, especially women and minorities, through coordination with NSF's Research Experience for Undergraduates (REU) program. Pontius has also been an active member of the NSF-funded Center for the Integrated Study of the Human Dimensions of Global Environmental Change at Carnegie Mellon University, through which he has advised doctoral research assistants. With previous NSF-funding, Pontius has created methods of analysis that have been incorporated into the GIS software Idrisi, which reaches 35000 users worldwide. Many of his techniques have become the standard for model validation in the international community of scientist who study land-use and land-cover change (LUCC).

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Professional Preparation University of California, Berkeley, CA	Chemical Engineering	B.S., 1983
California Institute of Technology, Pasadena, CA	Chemical Engineering	M.S., 1985
Massachusetts Institute of Technology, Cambridge, MA	Chemical Engineering	Ph.D., 1991
Scripps Institution of Oceanography, San Diego, CA	Marine Biogeochemistry	1991-1993
Marine Biological Laboratory, Woods Hole, MA	Marine Biogeochemistry	1993-1994
Marine Biological Laboratory, Woods Hole, MA	Marine Biogeochemistry	1994-1997

Professional Appointments

2005-Present	Associate Scientist, The Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA.
2004-Present	Assistant Professor (MBL), Brown University, Providence, RI.
1997-2005	Assistant Scientist, The Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA.
1997-1997	Research Associate, The Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA.
1994-1997	Postdoctoral Research Associate, The Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA.
1993-1994	Lakian Postdoctoral Scholar, The Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA.
1991-1993	Mellon Postdoctoral Fellow, Scripps Institution of Oceanography, San Diego, CA

Relevant Publications (**pdf's available at http://eco37.mbl.edu/cv_vall.htm**)

Wan, Z., **Vallino, J.J.**, and Peterson, B.J., (In Press) Study of the inter-annual food web dynamics in the Kuparuk River with a first order approximation inverse model. *Ecol. Model.*

Claessens, L., Hopkinson Jr, C., Rastetter, E. and **Vallino, J.** (2006). Effect of historical changes in land-use and climate on the water budget of an urbanizing watershed. *Water Resources Research*, **42** (3), W03426, doi:10.1029/2005WR004131

Wan, Z., **Vallino, J.J.** (2005). An inverse ecosystem model of year-to-year variations with first order approximation to the annual mean fluxes. *Ecol. Model.* **187** (4), 369-388.

Hopkinson, C.S. and **Vallino, J.J.** (2005). Efficient export of carbon to the deep ocean through dissolved organic matter. *Nature* **433**, 142-145.

- Vallino, J.J.**, Hopkinson, C.S., and Garritt, R.H. (2005). Estimating estuarine gross production, community respiration and net ecosystem production: A nonlinear inverse technique. *Ecol. Model.* **187** (2-3), 281-296.
- Filoso, S., **Vallino, J.**, Hopkinson, C., Rastetter, E., and Claessens, L. (2004). Modeling Nitrogen Transport in the Ipswich River Basin, Massachusetts, using HSPF. *Journal of the American Water Resources Association* **40** (5), 1365-1384.
- Williams, M., Hopkinson, C., Rastetter, E., **Vallino, J.** (2004). N Budgets and Aquatic Uptake in the Ipswich River Basin, Northeastern Massachusetts. *Water Resources Research*, **40** (11), W11201, 12 pp.
- Vallino, J.J.** (2003). Modeling microbial consortiums as distributed metabolic networks. *Biol. Bull.* **204**, 174-179.
- Vallino, J.J.** (2000). Improving marine ecosystem models: use of data assimilation and mesocosm experiments. *J. Mar. Res.* **58**, 117-164.
- Vallino, J.J.** and Stephanopoulos, G. (2000). Metabolic Flux distributions in *Corynebacterium glutamicum* during growth and lysine overproduction. *Biotechnol. Bioeng.* **67**, 872-885.
- Vallino, J.J.** and Hopkinson, C.S. (1998). Estimation of Dispersion and Characteristic Mixing Times in Plum Island Sound Estuary. *Estuarine, Coastal and Shelf Science* **46**, 333-350.
- Vallino, J.J.**, Hopkinson, C.S., and Hobbie, J.E. (1996). Modeling Bacterial Utilization of Dissolved Organic Matter: Optimization Replaces Monod Growth Kinetics. *Limnology and Oceanography* **41**, 1591-1609.

Synergistic Activities

Synergistic activities include application of numerical algorithms developed in the field of computational science to advance ecosystem modeling research and the dissemination of these models and techniques on the WWW (see <http://eco37.mbl.edu/>). I have taught Methods in Microbial Ecology course over last 9 years as part of MBL's Semester in Environmental Science (SES) undergraduate program. In addition to methods development, this course exposes students to metabolic network concepts for microbial communities. I have also served as undergraduate student research project advisor for last 9 years in SES and have mentored 12 NSF REU students as part of PIE-LTER project.

CHARLES J. VÖRÖSMARTY

Research Professor / Director, Water Systems Analysis Group
Complex Systems Research Center, Institute for the Study of Earth, Oceans, and Space
University of New Hampshire, Durham NH 03824-3525
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EDUCATION

Cornell University, B.S., Biology, Ecology and Systematics, 1977
University of New Hampshire, M.S., Civil and Environmental Engineering, 1983
University of New Hampshire, Ph.D., Engineering Systems Design, 1991

PROFESSIONAL EXPERIENCE

2001 – Present Research Professor (University of New Hampshire)
1998 – 2001 Research Associate Professor (University of New Hampshire)
1991 – 1998 Research Assistant Professor (University of New Hampshire)
1977 – 1991 Research Scientist (University of New Hampshire)

PUBLICATIONS – MOST CLOSELY RELATED

- Wollheim, W.M., C.J. Vörösmarty, B.J. Peterson, S.P. Seitzinger, and C.S. Hopkinson (2006). Relationship between river size and nutrient removal. *Geophysical Research Letters* 33: doi:10.1029/2006GL025845.
- Ericson, J.P., C.J. Vörösmarty, S.L. Dingman, L.G. Ward, and M. Meybeck (2006). Effective sea-level rise in deltas: sources of change and human-dimension implications. *Global and Planetary Change* 50: 63-82.
- Boyer E.W., R.W. Howarth, J.N. Galloway, F.J. Dentener, P.A. Green, C.J. Vörösmarty (2006). Riverine nitrogen export from the continents to the coasts. *Global Biogeochemical Cycles* 20, GB1S91, doi:10.1029/2005GB002537.
- Syvitski, J.P.M., C.J. Vörösmarty, A.J. Kettner, and P. Green (2005). Impact of humans on the flux of terrestrial sediment to the global coastal ocean. *Science* 308: 376-380.
- Wollheim, W.M., B.A. Pellerin, C.J. Vörösmarty, and C.S. Hopkinson (2005). N retention in urbanizing headwater catchments. *Ecosystems* 8: 871-884.

OTHER SELECTED PUBLICATIONS

- Vörösmarty, C.J. and M. Meybeck (2004). Responses of continental aquatic systems at the global scale: New paradigms, new methods. In: P. Kabat, M. Claussen, P.A. Dirmeyer, J.H.C. Gash, L. Bravo de Guenni, M. Meybeck, R.A. Pielke Sr., C.J. Vörösmarty, R.W.A. Hutjes, and S. Lutkemeier (eds), *Vegetation, Water, Humans and the Climate*. Springer, Heidelberg, Germany, pp. 375-413.
- Green, P., C. J. Vörösmarty, M. Meybeck, J. Galloway, and B.J. Peterson (2004). Pre-industrial and contemporary fluxes of nitrogen through rivers: A global assessment based on typology. *Biogeochemistry* 68: 71-105.
- Vörösmarty, C.J., M. Meybeck, B. Fekete, K. Sharma, P. Green, and J. Syvitski (2003). Anthropogenic sediment retention: Major global-scale impact from the population of registered impoundments. *Global and Planetary Change* 39: 169-190.
- Vörösmarty, C.J. (2002). Global water assessment and potential contributions from earth systems science. *Aquatic Sciences* 64: 328-351. (Invited).
- Vörösmarty, C.J. and B.J. Peterson (2000). Macro-scale models of water and nutrient flux to the coastal zone. In: J. Hobbie (editor), *Estuarine Science: A Synthetic Approach to Research and Practice*, pp. 43-80. Island Press, Washington DC.

SYNERGISTIC ACTIVITIES

(1) Support for Unrestricted Biogeophysical Data Sets: I have been active in articulating the need for the widespread and unrestricted use of monitoring data for the Earth Systems Sciences. This includes organization of a workshop on global hydrological data bases (IUGG scientific symposium in

Birmingham UK) which resulted in an article published in AGU-EOS (January 2001). In addition, I have lead efforts to create regional hydrographic data bases including R-ArcticNET, consisting of more than 3700 individual station entries. See www.watsys.sr.unh.edu for our other regional and global holdings.

(2) National Outreach and Committee Work: In the US, I serve as a Presidential-appointed Commissioner of the US Arctic Research Commission, and I serve as a member of the Oak Ridge National Laboratory NASA - Distributed Active Archive Center (ORNL-DAAC) User Working Group. I was an invited contributor to a US Scientific Committee on Problems of the Environment (SCOPE) book on estuarine synthesis. I am also part of an International SCOPE Nitrogen Project on global river fluxes. I am a major contributor to the NASA Land Surface Hydrology Program to design a satellite system to remotely sense inland water systems. Further, I serve as leader of an NSF scientific steering committee to develop a new research initiative on Arctic system hydrology. I also was a member of a National Research Council Committee to evaluate NASA's geophysical data sets for the pan-Arctic.

(3) International Outreach and Committee Work: I actively participate in a variety of international agency activities. Through these collaborations (such as through the International Geosphere-Biosphere Programme, UNESCO, and International Association of Hydrological Sciences) I am called upon for advice on emerging research opportunities and on strategies for effecting coordination across international programs, for example, by drafting the Sixth Phase of UNESCO's International Hydrological Programme, serving as an invited rapporteur for the 2nd Int'l Conference on Climate and Water, in the joint French/US National Academy of Sciences workshop on Hydrology and Water Resources. I serve as the IGBP Chair of the newly formed Global Water System Project of the Earth System Science Partnership (IGBP/WCRP/IHDP/DIVERSITAS).

(4) Software Copyright: My staff and I hold a copyright for the Global Hydrological Archive and Analysis System (GHAAS), Version 3.0. The system is an interactive database and scientific visualization software package. It has supported work across multiple scales, from regional to continental to global domains. Many of the GHAAS Products can be found at www.watsys.sr.unh.edu

(5) Educational Synergy: Although my focus has been on research I am committed as well to the educational mission of the University. I have participated in the UNH Teaching Excellence Program and applied to the classroom an innovative blending of research and formal instruction. This has included preparation of peer-reviewed publications (to AMBIO and Science) by class members at the graduate level and hands-on hydrological modeling for undergraduates. Student advising is also a growing element of my educational contribution. Additionally, I have hired, trained, and supervised dozens of hourly work study (mainly undergraduate) students. Throughout all of these teaching and advisory activities, I have actively tried to link research with education.

GRADUATE STUDENTS

David Bjerklie, PhD (UNH); Manoel Cardoso, PhD (UNH); Cassiano D'Almeida, PhD (UNH); Balazs Fekete, PhD (UNH); Brian Pellerin, PhD (UNH); Wil Wollheim, PhD (UNH).

WILFRED M. WOLLHEIM

Professional Preparation

Institution and location	Area of Specialization	
	Degree	Year
Cornell University	Natural Resources	
B.S.(honors) 1989		
University of Wyoming	Wetland Ecol. (Dept of Zool)	M.S 1994
University of New Hampshire	Earth Science	PhD
2005		

Professional Experience

Research Scientist III

Jan. 2007 - present

Complex Systems Research Center, University of New Hampshire, Durham, NH

Research Scientist II

Aug. 1999 – Dec 2006

Complex Systems Research Center, University of New Hampshire, Durham, NH

Research Assistant I and II

May 1994 – Aug. 1999

Ecosystems Center, Marine Biological Laboratory, Woods Hole, MA

Graduate Research Assistant

Sept 1991 - May 1994

Dept. of Zoology and Physiology, University of Wyoming, Laramie, WY

Publications

- Wollheim, W. M., C. J. Vorosmarty, B. J. Peterson, S. P. Seitzinger, and C. S. Hopkins. 2006. Relationship between river size and nutrient removal. *Geophysical Research Letters* **33**:doi:10.1029/2006GL025845
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- Wollheim, W. M., C. J. Vorosmarty, A. F. Bouwman, P. A. Green, J. Harrison, E. Linder, B. J. Peterson, P. A. Green, S. Seitzinger, and J. P. M. Syvitski. In Review. Global N removal by freshwater aquatic systems: a spatially distributed, within-basin approach. *Global Biogeochemical Cycles*.
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Synergistic Activities

Membership National Organizations – North American Benthological Society, American Society of Limnologists and Oceanographers, American Geophysical Union

Database development – Ongoing contributions to the Plum Island LTER database. Gulf of Maine Watershed Information and Characterization System GM-WICS, NOAA/CICEET)

Service to other organizations – Reviewer over last 2 years: Limnology and Oceanography, Geophysical Research Letters, Water Research, Water Resources Research, J. North American Benthological Society, Biogeochemistry, Ecology. Panelist for Nasa Earth System Science Fellowship Program.

Graduate Students Advised

Jody Potter – current Masters Student at UNH (committee member)

Joe Thouin - current Masters Student at UNH (committee member)

Rob Stewart – current Masters Student at UNH (committee member)