Scott W. Horsley

Water Resources Consultant and University Lecturer
Curriculum Vitae

Areas of Expertise

- Targeted Watershed Planning
- Wastewater & Stormwater Management
- Water Quality Impacts & Restoration
- Green Infrastructure & Nature-Based Solutions
- Hydrologic Modeling & Assessment
- Integrated Water Management
- Smart Growth/ Low Impact Development
- Education & Training

Professional Affiliation

- Tufts University, Graduate Department of Urban and Environmental Planning and Policy
- Harvard University, Extension, Graduate Department of Sustainability
- Massachusetts Stormwater Advisory Committee
- Massachusetts Sustainable Water Management Initiative Advisory Committee
- Massachusetts Climate Change Adaptation Advisory Committee
- MADEP Title 5 Advisory Committee
- Charles River Watershed Association Advisory Board

Scott Horsley has over 30 years of professional experience as a consultant to federal, state, and local government agencies, non-profit organizations, and private industry throughout the United States, Bulgaria, Nicaragua, the Caribbean, the Pacific Islands, and China. Scott has been an innovator in the environmental profession and thrives on bringing innovative and interdisciplinary approaches to challenging projects. Scott has a strong understanding of the full range of technical, planning, and policy issues associated with water resources and land use management projects. Scott has served as an expert witness in the field of hydrology in numerous state and federal court cases. He has served as an instructor for a nationwide series of U.S. Environmental Protection Agency (EPA) workshops on water resource management. He has also served on numerous advisory boards and committees to the EPA, the National Academy of Public Administration, Massachusetts Department of Environmental Protection (MADEP), Massachusetts Executive Office of Energy and Environmental Affairs (EEA), National Groundwater Association, and Massachusetts Audubon Society. Scott has received national (EPA) and local awards (Mashpee Conservation Commission) for his work in the wetlands and stormwater management fields. Scott Horsley serves as Adjunct Faculty at Tufts University in the Graduate Department of Urban & Environmental Policy & Planning and at the Harvard Extension School in the Graduate Department of Sustainability.

REPRESENTATIVE PROJECTS

Lake Tashmoo Targeted Watershed Plan – Town of Tisbury (Martha's Vineyard), MA: Working with the Tisbury Water Resources Committee to develop a restoration plan for Lake Tashmoo. According to the Massachusetts Estuaries Project (MEP) Lake Tashmoo is receiving nitrogen loading from wastewater, stormwater and fertilizers and requires a 32% reduction to achieve compliance with the Clean Water Act. The plan will include a sewer collection system, advanced septic systems that use a woodchip bioreactor system, fertigation wells, and stormwater retrofits. A responsible management entity (RME) is being developed to manage the operation, maintenance, and monitoring of the plan.

Wellfleet Targeted Watershed Management Plan – Town of Wellfleet, MA: As a consultant to the Town of Wellfleet prepared a Targeted Watershed Plan including an adaptive management plan integrating non-traditional (nature-based) and traditional (wastewater treatment facilities) nutrient reduction technologies. The plan includes a permeable reactive barrier (PRB), shellfish and aquaculture, ecosystem restoration, stormwater remediation, fertilizer management, and the use of decentralized, on-site septic systems that utilize innovative and alternative technologies. The overall goal of the project is to provide the town guidance in obtaining a MADEP Watershed Permit and compliance with the Clean Water Act. The Targeted Watershed Plan was unanimously approved by the Wellfleet Select Board, was confirmed to be consistent with the Cape Cod 208 Plan by the Cape Cod Commission. The

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Awards

- Harvard University, Petra Shattuck Excellence in Teaching Award (2023)
- Mashpee (MA) Conservation Commission Annual Environmental Achievement Award (2002)
- EPA Environmental Technology Innovator Award for Stormwater Treatment Design (1999)

Patent

United States Patent Number 5,549,817 for Stormwater Treatment System/Apparatus

Academic Background

Master of Arts, Marine Affairs - Environmental Protection, University of Rhode Island (1981)

Marine Ecosystems Research Laboratory, University of Rhode Island (1980)

Princeton Groundwater Pollution & Hydrology Course with David Miller, John Cherry, and Robert Cleary (1985)

Bachelor of Science, Biology, Southeastern

advanced septic system program was approved by the Massachusetts Clean Water Trust for SRF funding and placed on the Intended Use Plan (IUP).

Water Resources Management - Manchester-by-the Sea, MA: Scott is serving as a consultant to the town of Manchester-by-the-Sea and their Water Resources Protection Task Force. He is advising on drinking water supply management issues including sustainable yield, source water protection, future water sources, and water rates. Scott has supervised a thermal survey to determine groundwater discharge areas to Gravelly Pond, the town's surface water reservoir and has prepared a hydrologic budget.

Watershed Restoration Research Project: Scott is currently working as a member of a research team that includes USEPA Office of Research & Development, United States Geological Survey (USGS), The Nature Conservancy, the Town of Barnstable and the Barnstable Clean Water Coalition. The project is designed to research, develop, and pilot-test multiple nature-based technologies to reduce nutrient loads to the coastal embayment known as Three Bays. Scott assisted in the design of a woodchip-based bioreactor/ permeable reactive barrier (PRB) and is now working with the research team to construct and monitor it as part of a wetland restoration project in a cranberry bog at the headwaters of the watershed. He is also advising on a project to evaluate the use of a new class of innovative and alternative septic systems that utilize a woodchip-based bioreactor. Preliminary data from these systems indicate nutrient reductions of 90%. The project includes the development of a Responsible Management Entity (RME) to oversee the operation, maintenance, and monitoring of the systems.

Expert Witness, Hydrologist - United States Environmental Protection Agency and United States Department of Justice – United States v. Charles Johnson (437 F.3d 157, First Circuit Court, 2006): Expert Witness for U.S. Environmental Protection Agency (EPA) and U.S. Department of Justice (DOJ) in a federal Clean Waters Act enforcement case involving the filling of wetlands in Carver, MA by the construction and operation of cranberry bogs. Scott served as the Hydrology Expert Witness and provided testimony regarding the hydrologic interactions (or "nexus") between the subject wetlands, groundwater, and the adjacent stream. He provided advice on the application of the guidance from the Rapanos U.S. Supreme Court decision relative to the jurisdiction of wetlands in the Weweantic River watershed. He also developed a nutrient-loading and attenuation model and has provided expert witness testimony regarding the nutrient attenuation capabilities of wetlands and their nexus to the Weweantic River. Scott has also prepared a wetland restoration plan for the cranberry bogs to enhance the nutrient attenuation capabilities of wetlands (abandoned cranberry bogs) in the watershed. The case resulted in two favorable decisions for the United States enforcing the Clean Water Act.

Cape Cod 208 Water Quality Management Plan: Consultant to the Cape Cod Commission for the preparation and implementation of the Cape Cod 208

Massachusetts University (1976)	Water Quality Plan. Fifty-three estuaries are impacted by excessive nutrient loading derived from wastewater, stormwater, fertilizers and natural sources. The Cape Cod 208 Plan presents an innovative alternative approach that includes a broad range of traditional (sewage collection and treatment plants) and non-traditional (or nature-based) technologies including fertigation wells, shellfish restoration, permeable reactive barriers, fertilizer management, innovative & alternative septic system technologies, ecotoilets and other decentralized solutions. An adaptive management plan provides a practical framework to implement and optimize an integrated array of strategies to attain compliance with the Clean Water Act. Mr. Horsley led a team of scientists and engineers in the development of a non-traditional/nature-based approach and conducted dozens of public stakeholder workshops. **Expert Witness, Hydrologist - Massachusetts Supreme Judicial Court - Reynolds v. Stow Zoning Board of Appeals:** Mr. Horsley served as an expert witness on wastewater impacts and groundwater hydrology. He conducted an assessment of water quality impacts associated with a proposed Chapter 40B high-density affordable housing project on neighboring private drinking water supplies. The case involved a proposed waiver of a local regulation governing wastewater impacts that the Court upheld the finding that the local board of health requirements were valid and the project was not permitted. **Massachusetts Department of Environmental Protection (MADEP) Title 5 (Septic System) and Groundwater Discharge Permitting Advisory Committee and Designation of Nitrogen Sensitive Areas:** Mr. Horsley was invited by MADEP to participate in an advisory group tasked with updating and revising Title 5 Regulations and the associated Groundwater Discharge Permit program. This includes the designation of "Nitrogen Sensitive Areas", the development of wastewater loading standards, the use of alternative septic system technologies, and the roles of local Boards of Health in regulating wastewater and septic systems.

Three Bays Watershed Implementation Plan – Cape Cod Commission and Barnstable Clean Water Coalition, Inc.: Consultant for the design and implementation of integrated watershed restoration plan designed to reduce excessive nutrient loads. Mr. Horsley prepared conceptual designs for wetland restoration, pond restoration, alternative septic system technologies, stormwater bioretention, woodchip bioreactors, and permeable reactive barriers. He designed a Watershed Calculator tool to track the incremental and cumulative nutrient reductions associated with these projects.

Massachusetts Sustainable Water Management Initiative (SWMI): Mr. Horsley was asked by MADEP and MAEEA to serve as an advisor to an interdisciplinary panel to develop guidelines to implement the Massachusetts Water Management Act for the restoration of stream flow in Massachusetts Rivers. The Massachusetts Water Management Act provides the regulatory structure for water withdrawals in the state. The guidance was developed to provide ecological criteria for the decision making related to water withdrawal permit issuance. The criteria were based upon scientific relationships between flow characteristics and two indicator fish species - trout and black dace. The guidance includes

a series of possible mitigation measures and offset practices that are designed to either reduce consumptive withdrawals and/or provide return flows to balance the hydrologic budget.

River Restoration for the Atlantic Salmon – United States Army Corps of Engineers and State of Maine: Served as a consulting hydrologist to the U.S. Army Corps of Engineers and the State of Maine for a hydrologic study of river systems in northeastern Maine to assess the relative impacts of various water users including irrigation pumping associated with the blueberry industry on the flow regime of the Narragaugus and Pleasant Rivers. The project included numerous meetings with a broad range of stakeholders including the U.S. Army Corps of Engineers, the State of Maine, blueberry industry representatives, and local government officials. The project resulted in a decision-making model and adaptive management plan to restore natural flows within the rivers for the purpose of providing an adequate habitat for the Atlantic Salmon.

California Water Code – Department of Water Resources: Served as Facilitator and Trainer for the implementation of Assembly Bill (AB) 3030. This project integrated groundwater and surface waters and provides the framework to develop local groundwater management plans to balance water withdrawals and recharge projects to mitigate impacts water resources. Mr. Horsley facilitated a series of workshops with stakeholders throughout the State of California.

Ipswich River Watershed Management Plan: Project Manager to develop a Management Plan for restoration of the Ipswich River. The Ipswich River is one of the most impacted rivers in the United States with significant flow alterations caused by excessive water withdrawals and inefficient land use practices. This Plan provides an analysis of the development patterns within the study area and the resulting hydrologic impacts of water supply withdrawals, sewerage systems, and stormwater management. The project included coordination with an interpretation of a USGS watershed modeling project. It also provides an "Integrated Water Management" approval to a series of recommendations designed to balance the hydrologic budget. These include water conservation, alternative water supplies, stormwater management, and land use planning. Mr. Horsley provided facilitation at a series of meetings with a broad range of stakeholders including federal and state agencies, water suppliers, local government officials and others.

Smart Growth and Smart Energy Toolkit, Massachusetts Executive Office of Environmental and Energy Affairs (EEA): Served as a consultant to the EEA to design an outreach tool for local governments and the development community. The Toolkit includes descriptions of twenty techniques, including transfer of development rights (TDR), transit-oriented development (TOD), village center zoning districts, open space residential design (OSRD), LID, agricultural preservation, integrated water, and wastewater management, brownfields redevelopment, and the newly-legislated Chapter 40R smart growth overlay districts. It also includes case studies and model bylaws on the twelve subject areas.

Massachusetts Climate Change Advisory Committee: Scott served as a member of the Coastal Zone and Oceans Subcommittee of the Climate Change Advisory Committee convened by the Secretary of Massachusetts Environtal and Energy Agency. The Committee was assembled to develop recommendations, strategies, and criteria to implement the *Global Warming Solutions Act* passed by the Massachusetts legislature last year. The main task of the subcommittee is to analyze strategies for adapting to the predicted impacts of climate change in the Commonwealth of Massachusetts. Among other recommendations, Scott proposed regulatory changes to accommodate the landward migration of wetland systems that will result from sea level rise.

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Nicaragua Source Water Protection Project: As a consultant to U.S. Environmental Protection Agency (USEPA) and U.S. Agency for International Development (USAID), Scott conducted at two-year case study of three communities (Matagalpa, Esteli, and Ocotal) designed to strengthen the sustainability and resilience of local public drinking water supplies. The project included delineation of wellhead protection areas, identification of contaminant sources and the development of management strategies. It included numerous public hearings and the development of a comprehensive training manual.

PROFESSIONAL EXPERIENCE

2014 - Present	Scott Horsley, Water Resources Consultant
2014 - Present	Harvard University, Adjunct Faculty
1986 - Present	Tufts University, Adjunct Faculty
1988 - 2019	Horsley Witten Group, Inc., Founder and President
1984 - 1988	IEP, Inc., Senior Environmental Scientist
1981 - 1984	Cape Cod Commission, Water Resources Coordinator
1979 - 1981	Barnstable County Health Department, Environmental Research Director

PUBLICATIONS

Horsley, S. 2023, "Colorado River Compact – Seven Western States Compete for Water", Harvard Gazette.

Horsley, S. 2022, Wellfleet Harbor Targeted Watershed Plan, prepared for Town of Wellfleet, MA and approved unanimously by the Select Board, submitted to MADEP for a Watershed Permit.

Twichell JH., Mulvaney KK, Hubbell B, Erban LE, Berry W, Chintala MM, Crocker Z, Gleason TR, Horsley S, Munns, Jr. WR, Rea AW, Amith SN, Soto Reves S. 2019 "Solutions-Driven Research Pilot Problem Formulation Workshop: Report and Evaluation ", U.S. Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Laboratory, Atlantic Ecology Division, Narragansett, RI, EPA 600-R-19/107.

Liss, E., Harrigan, K., Horsley, S., 2018 "Marstons Mills Cranberry Bog Wetland Restoration Master Plan", prepared for the Barnstable Clean Water Coalition and the Town of Barnstable in collaboration with The Nature Conservancy.

Horsley, S., Durant, J., Nugent, K., Goodman, J., Monahan, K., Zhong, Y.,Hung, R, 2015 "Urine Diversion – An Opportunity for Nutrient Recycling on Cape Cod", Prepared with a grant from the Kelly Foundation.

Horsley, S., Perry, E. and Counsell, L, 2016, "Three Bays Estuary Watershed Restoration Plan: A Green Infrastructure Approach, Green Building Journal, Volume 11, No. 2, pp. 22-38.

Parece, T; Owen, M; Shreve-Bibb, Betsey; Niedzwiecki, Paul; Senatori, Kristy; Perry, Erin; and Horsley, Scott; 2015; Tools to Assist Cape Cod Communities Reach Sustainable Nitrogen Reduction Goals – Technology Matrix and Adaptive Management Practices, Journal of the New England Water Environment Association.

Horsley, S., 2013, "Low Impact Development – A Climate Adaptation Strategy", Massachusetts Audubon Society Lecture Series.

Horsley, S., 2011. "Balancing Water Supply Withdrawals, Wastewater Returns and Stormwater Recharge", New England Water Works Association.

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Horsley, S. November 17, 2010. "Building to Code – Protecting Homes in Coastal Floodplains," StormSmart Coasts Program, Massachusetts Coastal Zone Management, Plymouth Town Hall, MA.

Horsley, S. 2009. "Low-Impact Development: A More Sustainable Approach to Site Design," Association of Massachusetts Wetlands Scientists (AMWS) Newsletter, January 2009.

Horsley S. 2006. "Planning and Urban Design Standards" American Planning Association; Sections on Water, Hydrologic Cycle; Aquifers, Groundwater Movement and Recharge, Wiley Graphic Standards.

Horsley, S. 2005. Smart Growth Toolkit, Massachusetts Executive Office of Environmental Affairs, Boston, MA.

Horsley, S. 2004. Low impact development strategies: approaches to smart growth, presented to the Annual Meeting of the Massachusetts Association of Land Surveyors and Engineers, Plymouth, MA, September 20, 2004.

Horsley, S. 2004. Hydrology and groundwater management, in Planning and Urban Design Standards, prepared by the American Planning Association,

John Wiley & Sons.

Horsley, S. 2003. Integrated coastal zone management in the Bahamas, prepared for the Inter-American Development Bank (IDB), Washington, DC.

Horsley, S. 2002. Groundwater, drinking water and stormwater protection: science and policy, in 2002

National CLE Conference, Environmental and Land Use Law, Law Education Institute, Steamboat,

Colorado, January 4-9, 2002.

Horsley, S. 2000. Stormwater Management, in Proceedings of the 19th Annual Pacific Islands Conference, Protecting Our Environmental Island Style: Success Stories, Continuing Challenges, Realistic Solutions, June 20-23, 2000, American Samoa.

Horsley, S. 1997. Watershed '97 Conferences. The StormTreat System: An Innovative Stormwater Treatment Technology, Baltimore, MD.

Horsley, S. and J. Witten. 1997. Tools for Watershed Protection, US Environmental Protection Agency.

Horsley, S. and J. Witten. 1996. Coastal Watershed Protection: Tools for Local Governments, prepared under contract to U.S. EPA.

Horsley, S. 1994. Septic Systems and Coastal Water Quality - Technical Assistance Document, U.S. Environmental Protection Agency.

River Basin, prepared by CME Associates, Inc. for the New England River Basins Commission.

Horsley, S. 1992. Buttermilk Bay – A Case Study: Nitrogen Loading Assessment, presented to U.S. EPA-sponsored Nitrogen Loading Workshop at the University of Rhode Island, Graduate School of Oceanography.

Horsley, S. and J. Moser. 1990. Monitoring Ground Water for Pesticides at a Golf Course-A Case Study on Cape Cod, Massachusetts, National Water Well Association Ground Water Monitoring Review.

Horsley, S. 1990. Nantucket Water Resources Management Plan—A Case Study, Key Note Paper, National Water Well Association, Eastern Regional Ground Water Conference.

Horsley, S., S. Roy, and M. Nelson. 1990. Golf Courses and Water Quality. Seminars.

Nelson, M., S. Horsley and S. Roy. 1990. Delineation of Aquifer vs. Wellhead Protection Areas, National Water Well Association—National Convention Association of Ground Water Scientists and Engineers.

Horsley, S. and J. Witten. 1989. Aquifer Protection. Horsley & Witten, Inc. Seminars.

Cambareri, T., M. Nelson, S. Horsley, M. Giggey and J. Pinette. 1989. Solute Transport - A Simulation of Non-Point Source Nitrogen Impacts to Ground Water and Calibration of A Predictive Analytical Model. Accepted for publication with National Water Well Association, Proceedings - Solving Ground Water Problems with Models, Indianapolis, Indiana.

Nelson, M., S. Horsley, T. Cambareri and M. Giggey. 1988. Predicting Nitrogen Concentrations in

Ground Water - An Analytical Model, in Proceedings of the FOCUS Conference on Eastern Regional Ground Water Issues, National Water Well Association, Stamford, Connecticut.

Horsley, S. and J. Witten. 1988. Land Planning and Development in Massachusetts, Horsley & Witten, Inc. Seminars.

Horsley, S. and J. Witten. 1988. Comprehensive Permits for Affordable Housing Development in Massachusetts. Horsley & Witten, Inc. Seminars.

Horsley, S. and J. Witten. 1988. Small Sewage Treatment Plants (Package Plants). Horsley & Witten, Inc. Seminars.

Horsley, S. and J. Witten. 1988. Land Development in the Coastal Zone: Impacts Upon Water Quality, Horsley & Witten, Inc. Seminars.

Kerfoot, W. and S. Horsley. 1988. Private Well Protection, Informational Bulletin No. 10 Association for the Preservation of Cape Cod.

Horsley, S. and J. Witten. 1986. The Town of Duxbury, Massachusetts, Aquifer Protection Plan: A Case Study in Innovative Water Quality

Blackmar, D., S. Horsley, L. Segal and Wolfe. 1984. Results of a Regional Household Hazardous Waste Collection Program, in Hazardous Waste Journal, Mary Anne Liebert Publishers, New York, Vol. I, Number 1.

Horsley, S. 1983. Delineating Zones of Contribution for Public Supply Wells to Protect Groundwater, in Proceedings of the National Water Well Association Eastern Regional Conference of Groundwater Management, Orlando, Florida.

Horsley, S. 1983. Regional Ground Water Management Needs for Cape Cod, Massachusetts. Prepared by Cape Cod Planning and Economic Development Commission for the United States Environmental Protection Agency.

Horsley, S. 1982. Beyond Zoning, Municipal Ordinances to Protect Ground Water, in Proceedings of the Sixty National Groundwater Symposium, National Water Well Association, Atlanta, Georgia.

Magnuson, P. and S. Horsley. 1981. Comprehensive Water Resources Monitoring Program for Cape Cod. Prepared by Cape Cod Planning and Economic Development Commission for the United States Environmental Protection Agency.

Cheney, P. and S. Horsley. 1980. Nonstructural Flood Plain Management Planning in the Connecticut River Basin, New England River Basins Commission.