

Paul H. Kirshen
Battelle Memorial Institute
Lexington MA
Telephone (781) 869-1402
kirshenp@battelle.org

Education

- Ph.D. Civil Engineering, Massachusetts Institute of Technology, Division of Water Resources, 1975 (Thesis – “Spatial and Temporal Aggregation Issues in a Water Supply Planning Model for West Africa”, advisors David Marks and David Major).
- M.S. Civil Engineering, Massachusetts Institute of Technology, Division of Water Resources, 1972 (Thesis – “Screening Model for Management of Combined Sewer Overflows”, advisors David Marks, John Schaake, and Frank Perkins).
- Sc.B. Engineering, Brown University, 1970 (Engineering Project – “Possible Use of Ferro Magnetism to Measure Stress in Structures”, advisor Barton Roessler).

Experience

June 2009 – Present

Research Leader, Battelle Memorial Institute (Battelle). Consulting and research on climate change adaptation and also water resources management.

Visiting Scientist, Department of Civil and Environmental Engineering, Tufts University.

2002- May 2009

Tufts University, Medford, MA. Director and Co-founder of the Water: Systems, Science, and Society (WSSS) Interdisciplinary Graduate Education Program. One of four Co-Directors of the Tufts Institute of the Environment (TIE, the coordinating organization for environmental research and education at Tufts University). Research Professor, Civil and Environmental Engineering Department, Affiliated Faculty, Department of Urban and Environmental Policy and Planning, and Adjunct Professor, Friedman School of Nutrition Science and Policy. Conducting research in developed and developing countries on integrated water resources management, climate change impacts and adaptation, water resources operations, decision support systems, public health, coastal watersheds, and urban water systems. Teaching of water resources engineering and integrated water resources management.

UCOWR Visiting Scholar Program Fellow to support the US Army Corps of Engineers Institute for Water Resources in Integrated Water Resources Management (2007-2009).

1996- 2002

Tufts University, Medford, MA. Research Associate Professor, Civil and Environmental Engineering Department and the International Environment and Resource Policy Program of the Fletcher School of Law and Diplomacy. Co-Founder and Director of Tufts Water, Sustainability, Health, and Ecological Diversity (WaterSHED) Center. Co-Founder and Steering Committee Member of Mystic Watershed Collaborative.

1994- 1996

Stockholm Environment Institute-Boston/Tellus Institute. As Water Program Manager, responsible for coordinating all water projects, and managing and developing water research and consulting program. Provided expertise in global climate change and water resources, watershed/river basin planning and analysis, water quality assessment, decision support systems, water resources engineering, policy analysis, hydropower systems, hydrology, optimization and simulation modeling, and global water issues.

1986-1994

Private Consultant. Provided consulting services and management of other consultants and projects. Projects included decision support systems for reservoir operations, application of computer tools to manage sewer systems and restoration of Boston Harbor, impacts of global climate change on water resources, and environmental site assessment. Much of the reservoir operations consulting was proprietary. International consulting.

1984-1986

Principal Engineer, Environmental Research and Technology. Inc. Developed decision support tools for real time reservoir operations and designed real time hydrologic data collection systems and applications for water resources and environmental management.

1981-1984

Private Consultant. Projects included decision support tools for real time reservoir operations, real time hydrologic data collection systems and applications, small-scale hydropower assessment, water resources planning. International consulting. Part-time teaching at Clark University.

1980-1981

Assistant Professor, Civil and Environmental Engineering Department, Virginia Polytechnic Institute and State University. Research on social impact assessment, and on-farm water management. Teaching undergraduate and graduate courses. Advising students. Consulting on water resources planning. International consulting.

1978-1980

Assistant Research Professor, Thayer School of Engineering and Resource Policy Center, Dartmouth College. Research on water resources planning methodologies, and small-scale hydropower policy analysis. Teaching graduate course on water resources systems. Consulting

on water resources.

1976-1978

Senior Engineer, Environmental Research and Technology, Inc. Manager, Water and Wastewater Engineering Group. Conducted water quality and water resources studies.

1975-1976

Research Associate, Massachusetts Institute of Technology. Field manager for development of simulation model for Vardar/Axios River Basin in Macedonia and Greece.

Professional and Other Memberships

American Geophysical Union, American Society of Civil Engineers (Member and Past, and Present Chair of Operations Management Committee, Chair of the 1996 Operations Management Workshop, Steering Committee of several Operations Management Workshops including for 2006 and 2010, Member of Water Resources and Environmental Systems Committee), Sigma Xi, Advisory Board for Brown University Civil Engineering Program, Class Agent Roxbury Latin School

Journal Reviewing

Environmental Management, Water International, various journals of American Society of Civil Engineers, Environment International, Journal of Coastal Research, Journal of Applied Meteorology, Water Policy, Agricultural Systems, Water Resources Research, Natural Resources Forum, Climatic Change, Conservation & Recycling, Environmental Modeling and Software, Proceedings of the National Academy of Sciences (USA), Journal of Hydrology, Computers, Environment, and Urban Systems, Environmental Science & Technology, Journal of Environmental Management, Coastal Management Journal

Other

Steering Committee Member and Co-Principal Investigator, USGS Communities and Climate Change (CCC) Project, 2009-Present. CCC is an international group of government agencies developing adaptation actions for climate change impacts in urban areas. The goal is structured information and experience sharing.

Member of Massachusetts Climate Change Adaptation Advisory Committee and Coastal Zone and Ocean Subcommittee, 2009- Present.

Project Associate, Urbanization and Global Environmental Change (UGEC) Project- an IHDP Core Project, 2008-Present.

Contributing Author to US Synthesis and Assessment Product (SAP) 4.6, Effects of Global

Change on Human Health and Welfare and Human Settlements, US EPA, July 2008.

Justice Stevens of the US Supreme Court cited my research on impacts of climate change induced sea level rise on metro Boston several times in the majority Supreme Court opinion (No. 05-1120, decided April 2, 2007) that the US Environmental Protection Agency has the authority to regulate greenhouse gases in automobile emissions. Provided invited briefings on climate change to staffs of US Congress Select Committee on Energy Independence and Global Warming and of some Senators and Representatives, 2007.

Lead of Coastal Flooding Team for Union of Concerned Scientists Northeast Climate Impacts Assessment Report, 2007.

Member, Hazards Information Working Group, for report on Preparing for the Storm, Recommendations for Management of Coastal Hazards in Massachusetts, Massachusetts Coastal Hazards Commission, March 2007.

Expert Reviewer, Working Group II, Fourth Assessment, Intergovernmental Panel on Climate Change (IPCC), 2006. My own research is cited in at least 3 chapters of the final WG2 report.

Undergraduate citations as “influential faculty member who made impacts on their educational experience” (2005 (2), 2002).

Received 2004 award from the Mystic Watershed Collaborative (the former partnership of Tufts University and the Mystic River Watershed Association) for “demonstrated qualities of leadership, active citizenship and community engagement in his work in the Mystic River Watershed”.

Received 2004 award from the Journal of Water Resources Planning and Management for best practice oriented paper (Westphal, K., Vogel, R., Kirshen, P., and Chapra, S., An Integrated Real Time Water Supply Decision Support System, Journal of Water Resources Planning and Management, May 2003).

Proposal Reviewing for US NSF, US EPA, US NOAA, other organizations.

Married with 3 sons, ages 12, 15, and 22. Excellent health. Also enjoy running, cross-country skiing, and sailing.

Recent Research Grants and Projects

Integration of the Natural and Built Environments in Coastal Climate Change Adaptation Planning, internal R&D sponsored by Battelle Memorial Institute. (Principal Investigator, 2010, ~\$300,000).

Scenario-Based Risk Assessment for Adaptation of Coastal Municipalities to Climate Change, the New England Environmental Finance Center. (Principal Investigator, 2009-Present, \$20,000).

Coastal Flooding and Environmental Justice: Developing Strategies for Adapting to Climate Change, subcontract to University of Massachusetts-Boston, (Co-PI, ~\$35,000, total grant is ~\$300,000).

Guidance Tools for Planning and Management of Urban Drainage Systems under a Changing Climate, NOAA, (Principal Investigator, 2007-2010, ~\$300,000 with University of Colorado).

Keeping Water Local- Cost Benefit Analysis of Water Resource Planning, Application of W.E.A.P. for Holistic Water Resources Management in Massachusetts: A Pilot Study in the Town of Sharon, Riverways Program of the Massachusetts Department of Fish and Game, subcontract to Stockholm Environment Institute-US Center, (Tufts PI, 2007-2008, Tufts share is ~\$25,000, total value is \$100,000).

Improved Water Resources Management in the Sahel-Sudan, a Case Study of Burkina Faso, NOAA, (Principal Investigator, 2006-2009, \$340,000 with others at Tufts and University of Georgia).

Training Program in Water and Health from National Institute for Diabetes and Digestive and Kidney Diseases, NIH, (Co-Director, 2004-2009, \$1.1 million with others at Tufts).

The Quito Integrated Environment and Policy Study for the National Institute of Health, (Co-Principal Investigator, 2003-2005, approximately \$317,000 with others at Tufts).

Improved Science and Decision Support for Managing Watershed Nutrient Loads for US Environmental Protection Agency, (Co-Principal Investigator, 2003-2005, approximately \$750,000, with others at Tufts and Massachusetts Institute of Technology).

Pilot Studies to Evaluate Interpretation Methods, Intermediary Effectiveness, and Appropriate Levels of Intervention in the Provision of Climate Forecasts in the Sahel-Sudan: Climate Forecasting for Agricultural Resources (CFAR) Project-Phase 2, for Economics and Human Dimensions Program, Office of Global Programs, US National Oceanic and Atmospheric Administration (Principal Investigator and Project Manager, 2002-2005, approximately \$500,000, with others at Tufts and University of Georgia).

EMPACT Grant: Real-Time Water Quality Monitoring and Modeling for Equitable Recreation on the Mystic River, US EPA, subcontract to the City of Somerville, (Technology and Science Manager, 2001-2003, with others at Tufts, Tufts share is \$339,000, total value is approximately \$359,000).

The Natural Cities Program: Restoring Critical Ecosystems Resources in the Greater Boston Harbor Region, US Department of Agriculture, subcontract to The Urban Ecology Institute at Boston College (2001-2003, with others at Tufts, Tufts share is \$27,305, total value is \$180,000).

Impact of the Delivery of the Year 2000 Climate Forecast to Farmers and Pastoralists in Burkina Faso for Economics and Human Dimensions Program, Office of Global Programs, US National Oceanic and Atmospheric Administration (Principal Investigator and Project Manager, 2001, \$46,166, with others at Tufts and University of Georgia).

Infrastructure Systems, Services and Climate Change: Integrated Impacts and Response Strategies for the Boston Metropolitan Area for US Environmental Protection Agency (Co-Principal Investigator and Project Manager, 1999-2004, \$899,000, with others at Tufts, University of Maryland, Boston University and others).

A Hydro-Economic Approach to Representing Water Resources Impacts in Integrated Assessment Models for US Department of Energy (Co-Principal Investigator and Project Manager, 1998-2003, \$450,000, with others at Tufts, University of Colorado and others).

Opportunities and Constraints to Using Seasonal Precipitation Forecasting to Improve Agricultural Production Systems and Livelihood Security in the Sahel-Sudan Region, West Africa: Climate Forecasting for Agricultural Resources (CFAR) Project-Phase1, for Economics and Human Dimensions Program, Office of Global Programs, US National Oceanic and Atmospheric Administration (Principal Investigator and Project Manager, 1997- 2002, \$440,000, with University of Georgia).

Teaching at Tufts University

Spring 2009 CEE 294W WSSS Research Practicum

Spring 2008 CEE 294W WSSS Research Practicum

Fall 2007 CEE 294K Integrated Water Resources Management - Policy Review and the Planning Process

Spring 2007 CEE 294W WSSS Research Practicum

Spring 2007 CEE 294K Integrated Water Resources Management - Policy Review and the Planning Process

Spring 2006 CEE 294K Integrated Water Resources Management - Policy Review and the Planning Process

Fall 2005 CEE 193K Water Science and Technology

Spring 2005 CEE 294K, DHP P255 Public Policy of Water

Fall 2004 CEE 193K Water Science and Technology

Spring 2004, 2002, 2001, 2000, 1999 CEE 294/UEP 294 Integrated Assessment of Water Resources.

Summer 2003, 2001, 2000 Center for Interdisciplinary Studies (CIS) 99A/100A, The New Century Environmental Leadership Institute: An Experiential Inquiry into Watershed Restoration, with Dale Bryan.

Spring 2003 Independent Study on Integrated Resources Water Management (resulted in paper being submitted to Water International Journal and presentation in Netherlands).

Spring 2001 CEE 81, CEE Senior Capstone Design Project, The Effects of Climate Change on Bridge Scour.

Fall 1999 EC-17F, Bringing the Real World to High School Science: Water Pollution Issues of the Mystic River, with J. Durant and assistance of D. Bryan.

Spring 1999 CEE 81, CEE Senior Capstone Design Project, Management of Arsenic Contamination in Spy Pond, with J. Durant.

Spring 1998 CEE 81, CEE Senior Capstone Design Project, Rain Harvesting System for Tufts University, with R. Vogel (students won ASCE award).

Supervision/Reading of Tufts Theses (ongoing)

Gao, X., Impacts of Small Reservoirs on Environmental Flows, Ghana, Tufts University CEE PhD Thesis. (Co-Advisor)

Moonan, J., Combined Wastewater, Stormwater and Water Supply Management in Massachusetts: Two Case Studies, Tufts University CEE MS Thesis. (Co-Advisor)

Ray, P., Robust Optimization of Water Supply Systems in the Middle East, Tufts University CEE PhD Thesis. (Co-Advisor)

Spang, E., The Water-Energy Nexus: A Case Study of São Miguel Island, Fletcher School of Law and Diplomacy PhD Thesis. (Co-Advisor)

Supervision/Reading of Theses (completed)

Sylvester, S., Environmental Protection on Cape Cod, UEPP MA. (Reader)

Elwell, H., Defining Capacity: Community-Based Watershed Management and Climate Change Adaptation Planning, UEPP MA, 2009. (Reader)

Jagai, J., Seasonality in Waterborne Diseases: Global, National, and Local Watershed Assessments, Tufts University School of Nutrition PhD Thesis, 2009. (Committee Member)

Odeh, N., Towards Improved Partnerships in the Water Sector in the Middle East: A Case Study of Partnerships in Jordan's Water Sector, MIT Department of Urban Studies and Planning PhD Thesis, 2009. (Committee)

Etkin, D., Stochastic Optimization for Seasonal Reservoir Management in Burkina Faso, Tufts University CEE MS Thesis, 2009. (Advisor)

Gerstner, C., Imperviousness and the Urban Elasticity of Design Floods, Tufts University CEE MS Thesis, 2009. (Committee)

Kleyman, Alexandra, Growing Cities and Shrinking Rivers? An Investigation of Local Approaches to Balancing Rapid Urban Growth, Limited Water Supplies, and the Long-Term Ecological Health of Rivers, UEPP MA, 2008. (Reader)

Milou, A., Stormwater Low-Impact Development Best Management Practices in Low Income Settlements in Latin America: Policies Promoting Implementation, UEPP MA, 2008. (Reader)

Berkowitz, J., Into the Mystic, CSOs and Environmental Justice Communities in the Mystic River Watershed, UEPP MA, 2008. (Reader)

Sergeant, K., Analysis of Developing a Maximum Contaminant Level for Perchlorate: How Science, Policy, State and National Politics Influence Drinking Water Policy, UEPP MA, 2008. (Reader)

Lautze, J., Incorporating Malaria Control into Reservoir Management: A Case Study from Ethiopia, Tufts University CEE PhD Thesis, 2007. (Advisor)

Limbrunner, J., Watershed Models for Nonpoint Source Pollution Management Decision Support, CEE Ph.D Thesis, 2007. (Co-Advisor)

Zoltay, V., Integrated Watershed Management Modeling: Optimal Decision for Natural and Human Components, CEE MS Thesis, 2007. (Co-Advisor)

Hanson, Lars, On the Statistical Nature of Daily Rainfall and the Storage-Reliability-Yield Behavior of Rainwater Harvesting Systems in the United States, CEE MS Thesis, 2007. (Co-Advisor)

Yenco, Abby, Role of Adaptation to Climate Change in Local Water Resources Management, UEPP MA, 2007. (Reader)

Hall, P., Getting with the Program: Rural Radio and Water Resource Planning in Sub-Saharan Africa, UEPP MA, 2006. (Reader)

Schilz., B., Does Integrated Water Resources Management Need Private Sector Participation in Developing Countries? UEPP MA, 2006. (Reader)

Walsh, S., DCRA: Formulation of a Cost-Risk Tradeoff Model for Selection of Environmental Dredging Operations, CEE MS Thesis, 2006. (Advisor)

Ray, Patrick, Least Cost Water Supply Planning for Lebanon, CEE MS Thesis, 2005. (Advisor)

Fernandes, Ana Martha, Management of Domestic Fecal Sludge: St. Elizabeth, Jamaica, CEE MS Thesis, 2005. (Advisor)

Rader, M., Incorporating Risk into a Decision Support System for Burkina Faso Farmers , CEE MS Thesis, 2005. (Advisor)

Curtis, L., Watershed Management, UEPP MA, Summer 2005. (Reader).

Kossida, M., Effect of Sea Level Rise on Groundwater Resources: A Case Study of Southwest Coastal Rhode Island, CEE MS Thesis, 2005. (Advisor)

Moore, David, Thirst for Certainty: Adapting to Climate Change in Water Supply Planning, UEP MA Thesis, 2003. (Advisor)

Heberger, Matthew, Modeling Nonpoint Source Bacteria in Urban Rivers, CEE MS Thesis, 2003. (Committee).

Forrester, R.N., Indicators of Regional Water Stress in Massachusetts, CEE MS Thesis, 2003. (Committee)

Knee, K., The Impacts of Climate Change on Coastal Metro Boston, CEE MS Thesis, 2003. (Advisor)

Wilson, C.R., The Impacts of Global Climate Change on Water Quality in the Boston Metropolitan Area: A Case Study of the Assabet River, CEE MS Thesis, 2002. (Advisor)

Luftig, J.L., Paving the Way: Urban Adaptation to Climate Change, UEPP MA Thesis, 2002. (Reader)

Levine, T.T., The Columbia River Basin Tribes and the All-H Paper, A Critique of a Government-to-Government Consultation Process, UEPP MA Thesis, 2002. (Advisor)

Douglas, E.M., The Behavior of Floods and Low Flows in the United States, CEE PhD Thesis, 2002. (Committee)

Alonge, J., Modeling the Effects of Soil-Structure Interaction on a Fifty Story Building, CEE M.S. Thesis, 2001. (Committee)

Sankarasubramanian, A., Annual Hydro-Climatology of the Continental United States, CEE Ph.D. Thesis, 2001. (Committee)

Ney, L., An Empirical Assessment of Virtual Water: The Impact of Liberalization of Agricultural Subsidies and International Trade on Irrigation Water Demand, Fletcher School Ph.D. Thesis, 2001. (Reader).

Higgins, E., Development of a Pathogen Model for Alewife Brook, CEE M.S. Thesis, 2001. (Committee)

Westphal, K., A Real-time Decision Support System for Operating the Eastern Massachusetts Water Supply System, CEE M.S. Thesis, 2001. (Committee)

Berhanu, H., An Evaluation of the Occurrence of Trihalomethanes in the Greater Boston Drinking Water Supply, CEE M.S. Thesis, 2000. (Committee).

Zafirakou-Koulouris, A., Statistical Analysis Techniques in Water Resources Engineering, CEE Ph.D. Thesis, 2000. (Committee)

Fernandez, W., Optimal Allocation of Regional Water Resources Under Climate Change, CEE M.S. Thesis, 2000. (Advisor)

McCluskey, M., Development of River Basin Water Supply Cost Curves for Integrated Assessment Models: A Case Study of China, CEE M.S. Thesis, 2000. (Advisor)

Pak, D., A Pilot Study to Investigate the Relationships of Selected Hydrological, Meteorological, and Environmental Variables That May Affect the Frequency of Cryptosporidium Oocysts in the Merrimack River Watershed, CEE M.S. Thesis, 1999. (Committee)

Lane, M., The Use of Indicators to Evaluate Climate Change Impacts on the Water Resources of the United States, CEE M.S. Thesis, 1998. (Advisor)

Larsen, A., Relationships Among Water Supply Cost, Quantity, and Climate for the United States, CEE M.S. Thesis, 1998. (Advisor)

Goonasekere, K., A Case Study of Irrigation Water Management at Kaudulla Irrigation Scheme and Development of Water Management Alternatives for the Dry Zone of Sri Lanka, Environmental Sciences and Engineering Ph.D. Thesis, 1985. (Co-Chair)

Journal Articles and Book Chapters

Yohe, G., Kirshen, P. and Knee, K., On the Economics of Coastal Adaptation Solutions in an Uncertain World, *in preparation* for Climatic Change, 2010.

Etkin, D., Kirshen, P., Watkins, W., Diallo, A.A., Hoogenboom, G., Roncoli, M.C., Sanfo, J., Sanon, M., Somé, L., and Zoungrana, J., Risk Based Decision Support for Reservoir Scheduling in West Africa, *in preparation* for Journal of Water Resources Planning and Management, 2010.

Kirshen, P., Foltz, K., Carlson, C., Barreteau, O., Stakeholders and Stormwater Management under a Changing Climate; A Case Study of Somerville MA, *in preparation* for Climatic Change, 2010.

Kirshen, P., Merrill, S., Slovinsky, P., and Richardson, N., Simplified Method for Scenario-Based Risk Assessment Adaptation Planning in the Coastal Zone, *submitted to* Climatic Change, 2009.

Kleyman, A., Hollander, J., and Kirshen P., Growing Cities and Shrinking Rivers: Local Approaches to Balancing Growth, Limited Water, and River Ecology, *submitted to* Water Policy, 2009.

Jagai, J., Griffiths, J., Kirshen, P., Webb, P., And Naumova, E., Patterns of Protozoal Infections: Spatiotemporal Associations With Cattle Density, *accepted*, Environmental Health Perspectives, 2010.

Zoltay, V., Vogel, R., Kirshen, P., and Westphal, K., Integrated Watershed Management Modeling: A Generic Optimization Model Applied to the Ipswich River Basin, *accepted with revisions*, Journal of Water Resources Planning and Management, 2010.

Ray, P., Kirshen, P., and Vogel, R., Integrated Optimization of a Dual Quality Water and Wastewater System, Journal of Water Resources Planning and Management, January/February 2010.

Roncoli, C., Kirshen, P., Etkin, D., Sanon, M., Somé, L., Sanfo, J., Zoungrana, J., Hoogenboom, G., From Management to Negotiation: Technical and Institutional Innovations for Integrated Water Resource Management in the Upper Comoé River Basin, Burkina Faso. Environmental Management 40(4):695-711, 2009.

Ruth, M., Kirshen, P., and Coelho, D., Climate Change and Cities: Differential Impacts and Adaptation Options in Industrialized Countries in M. Ruth and M. Ibarraran (eds.), Differential Impacts of Climate Change, Edward Elgar, Cheltenham, UK, 2009.

Rader, M., Kirshen, P., Roncoli, C., Hoogenboom, G., and Ouattara, F., A Decision Support

System for Resource Poor Farmers in Burkina Faso, *Journal of Water Resources Planning and Management*, October/September 2009.

Lautze, J. and Kirshen, P., Water Allocation, Climate Change, and Sustainable Water Use in Israel/Palestine: The Palestinian Position, *Water International*, June 2009.

Roncoli, C., Jost, C., Kirshen, P., Sanon, M., Ingram, K., Woodin, M., Somé, L., Ouattara, F., Sanfo, B., Sia, C., Yaka, P., and Hoogenboom, G., From Accessing to Assessing Forecasts: An End-to-End Study of Participatory Forecast Dissemination in Burkina Faso (West Africa), *Climatic Change*, 92(3-4), February, 2009.

Kirshen, P.H., Knee, K., Ruth, M., Adaptation to Sea Level Rise in Metro Boston, *Climatic Change*, 90(4), pages 453-473, October 2008.

Kirshen, P., Watson, C., Douglas, E., Gontz, A., Lee, J., and Tian, Y., Coastal Flooding in the Northeastern USA due to Climate Change, *Mitigation and Adaptation Strategies for Global Change*, 13(5-6), June 2008.

Kirshen, P., Ruth, M., and Anderson, W., Interdependencies of Urban Climate Change Impacts and Adaptation Strategies: A Case Study of Metropolitan Boston USA, *Climatic Change*, 86:105-122, January, 2008.

Fernandes, A.M., Kirshen, P.H., Vogel, R., Optimal Siting of Regional Fecal Sludge Treatment Facilities: St. Elizabeth, Jamaica, *Journal of Water Resources Planning and Management*, January/February, 2008.

Heberger, M., Oriel, K., Kirshen, P., and Durant, J., Regression Models for Forecasting Beach Closures in Urban Rivers and Lakes, *Journal of Water Resources Planning and Management*, January/February, 2008.

Lautze, J., and Kirshen, P., Dams, Health, and Livelihoods: Lessons from the Senegal, Suggestions for Africa, *International Journal of River Basin Management*, 5(3) September 2007.

Lautze, J., McCartney, M., Kirshen, P., Olana, D., Jayasinghe, G., and Spielman, A., The Effect of a Large Dam on Malaria Risk: The Koka Reservoir, Ethiopia. *Tropical Medicine and International Health* 12(8): 982-989, 2007.

Ruth, M., Donaghy, K., and Kirshen, P.H., (eds.) Climate Change and Variability: Local Impacts and Responses, Edward Elgar Publishers, Cheltenham, England, 2006.

Kirshen, P., Donaghy, K., and Ruth, M., Conclusion: Assessing Impacts and Responses, Chapter 8 of Ruth, M., Donaghy, K., and Kirshen, P.H., (eds.) Climate Change and Variability: Local Impacts and Responses, Edward Elgar Publishers, Cheltenham, England, 2006.

Kirshen, P., Ruth, M., and Anderson, W., Climate's Long-term Impacts on Urban Infrastructures and Services: The Case of Metro Boston, Chapter 7 of Ruth, M., Donaghy, K., and Kirshen, P.H., (eds.) Climate Change and Variability: Local Impacts and Responses, Edward Elgar Publishers, Cheltenham, England, 2006.

Ruth, M., Amato, A., and Kirshen, P., Potential Impacts on Heat Related Mortality of Changing Temperatures in Urban Areas: Methodology and Application to Metropolitan Boston, in Smart Growth and Climate Change: Regional Development, Infrastructure and Adaptation, M. Ruth (editor), Edward Elgar, 2006.

Kirshen, P., Ruth, M., and Anderson, W., Integrated Impacts of and Adaptation Strategies to Climate Change in Metropolitan Areas; A Case Study of the Boston Metropolitan Area, in Urban Dimensions of Environmental Change: Science, Exposures, Policies, and Technologies, H. Feng, L. Yu, and W. Solecki (editors), Science Press USA Inc, New Jersey, 2005.

Kirshen, P., Ruth, M., and Anderson, W., Responding to Climate Change in Metropolitan Boston: The Role of Adaptation, *New England Journal of Public Policy*, Spring/Summer 2005.

Amato, A., Ruth, M., Kirshen, P., and Horwitz, J., Regional Energy Demand Responses to Climate Change: Methodology and Application to the Commonwealth of Massachusetts, *Climatic Change*, 71(175-201), 2005.

Lautze, J., Reeves, M., Vega, R., and Kirshen, P.H., "Climate" for Peace: Climate Change and Sustainable Peace in Israel/Palestine, *Water International*, June 2005.

Kirshen, P., McCluskey, M., Vogel, R., and Strzepek, K., Global Analysis of Changes in River Basin Water Supply Yields and Costs under Climate Change: A Case Study of China, *Climatic Change*, 68:303-330, 2005.

Kirshen, P.H., Larsen, A., Vogel, R., and Moomaw, W., Influence of Climatic Factors on the Present Cost of Water Supply in the USA, *Water Policy*, Volume 6, pages 269-279, 2004.

Kirshen, P.H., Vogel, R., and Rogers, B., Challenges in Graduate Education in Integrated Water Resources Management, Editorial, *Journal of Water Resources Planning and Management*, 130(3), 185-186, 2004

Hurd, B., Callaway, M., Smith, J., and Kirshen, P., Climatic Change and US Water Resources: From Modeled Watershed Impacts to National Estimates, *Journal of the American Water Resources Association*, pages 129-148, February, 2004.

Roncoli, C., Ingram, K., Jost, C., and Kirshen, P., Meteorological Meanings: Farmers' Interpretations of Seasonal Rainfall Forecasts in Burkina Faso. In Sarah Strauss and Benjamin Orlove eds. Weather, Climate, Culture, Berg, 2004.

Sanayei, M., Edgers, L., Alonge, J., and Kirshen, P., Effects of Increased Wind Loads On a Tall Building, *Civil Engineering Practice*, 18(2), Fall/Winter, 2003.

Westphal, K., Vogel, R., Kirshen, P., and Chapra, S., Decision Support System for Adaptive Water Supply Management, *Journal of Water Resources Planning and Management*, May 2003.

Kirshen, P.H., Potential Impacts of Climate Change on Groundwater in Eastern Massachusetts: A Case Study of the Upper Charles River Basin, *Journal of Water Resources Planning and Management*, May/June 2002.

Ingram, K., Roncoli, C., and Kirshen, P., Opportunities and Constraints for Farmers of West Africa to Use Seasonal Precipitation Forecasts with Burkina Faso as a Case Study, *Agricultural Systems*, 74, 331-349, 2002.

Roncoli, C., Ingram, K., and Kirshen, P., Reading the Rains: Local Knowledge and Rainfall Forecasting among Farmers of Burkina Faso, *Society and Natural Resources*, 15, pp. 411-430. 2002.

Roncoli, C., Ingram, K., and Kirshen, P.H., The Costs and Risks of Coping with Drought: Livelihood Impacts and Farmers' Responses in Burkina Faso, *Climate Research*, 19, 2, pp. 119-132, 2001.

Roncoli, C., Ingram, K., Kirshen, P., and Jost, C., Integrating Indigenous and Scientific Rainfall Forecasting in Burkina Faso, *Indigenous Knowledge Notes, IK Notes*, n. 39, December, 2001.

Ruth, M., and Kirshen, P., Integrated Impacts of Climate Change upon Infrastructure Systems and Services in the Boston Metropolitan Area, *World Resource Review* 13(1), pgs 106-122, 2001.

Roncoli, C., Ingram, K. and Kirshen, P., Can Farmers of Burkina Faso Use Rainfall Forecasts? *Practicing Anthropology*, 22 (4), pp. 24-28, 2000.

Kirshen, P.H. and Flitcroft, I., Use of Seasonal Forecasting to Improve Agricultural Production in West Africa – An Institutional Analysis of Burkina Faso, *Natural Resources Forum*, August 2000.

Kirshen, P.H., Assessing Climate Change Implications for Water Resources Planning: A Comment on a paper by A.W. Wood et al., *Climatic Change*, 44(4), March 2000.

Vogel, R.M., Lane, M., Ravindiran, R., and Kirshen, P.H., Storage Reservoir Behavior in the United States, *Journal of Water Resources Planning and Management*, September/October 1999.

Lane, M., Kirshen, P.H., and Vogel, R.M., Indicators of Impacts of Global Climate Change on U.S. Water Resources, *Journal of Water Resources Planning and Management*, July/August 1999.

Hurd, B., Callway, M., Smith, J., and Kirshen, P., Economic Effects of Climate Change on US Water Resources, Chapter 6 of Economic Impacts of Climate Change on the US, Mendelsohn, R. and Neumann, J., editors, Cambridge University Press, 1998.

Kirshen, P.H., and Fennessey, N., Possible Climate-Change Impacts on Water Supply of Metropolitan Boston, *Journal of Water Resources Planning and Management*, January/February 1995.

Gutowski, W.J., McMahon, G.G., Schluchter, S.S., and Kirshen, P.H., Effects of Global Warming on Hurricane-Induced Flooding, *Journal of Water Resources Planning and Management*, March/April, 1994.

Fennessey, N.M., and Kirshen, P.H., Evaporation and Evapotranspiration under Climate Change in New England, *Journal of Water Resources Planning and Management*, January/February, 1994.

Kirshen, P.H., Book Review of Computerized Decision Support Systems for Water Managers (by Labadie et al), *Water Resources Bulletin*, October, 1990.

Kirshen, P., Lettenmaier, D., and Puri, A., Punching it up Through Automated Generation. *Hydro Review*, Winter 1985.

Heidell, P., and Kirshen, P., Organization and Political Processes in Community Small-hydro Development, *Water Resources Bulletin*, February 1982.

Kirshen, P., Small-scale Hydro in New England: 1960-1980. *Journal of the Energy Division, ASCE*, May 1981.

Kirshen, P., and Amlin, J., Computer Model for Small-Scale Hydropower Policy Analysis, *Journal of Water Resources and Planning*, March 1981.

Lynch, D., and Kirshen, P., Role of Optimization Techniques in the Operation and Management of Land Treatment Systems. Chapter 25 of Modeling Wastewater Renovation: Land Treatment. I.K. Iskandar, Ed., John Wiley & Sons, 1981.

Lynch, D., and Kirshen, P., Impact of Economic and Financial Policies on Development of

Small-Scale Hydroelectric Facilities in New England. Vermont Law Review, Fall 1980.

Kirshen, P., Spatial and Temporal Effects in a Regional Water Supply Planning Model, Water Resources Research, June 1980.

Kirshen, P., A Regional Water Supply Planning Model for the Sahel-Sudan Region, West Africa, Journal of Water Resources Planning and Management, September 1979.

Kirshen, P., and Marks, D., Mathematical Model for Screening Storm Water Control Alternatives, Journal of Environmental Engineering, August 1974.

Proceedings and Presentations

Kirshen, P., Richardson, N., Maxemchuk, A., Wisneski, C., Dragos, P., Gulbransen, T., Baker-Hart, L., Tinianow, M., and Barrows, E., Integration of Adaptation Planning of the Built and Natural Environments in the Coastal Zone under Sea Level Rise, abstract accepted for ASCE World Environmental and Water Resources Congress, Providence RI, May 16-20, 2010.

Kirshen, P., Strzepek, K., Carlson, C., Barreteau, O., and Foltz, K., Urban Drainage Management under a Changing Climate; A Case Study of Somerville MA, abstract accepted for ASCE World Environmental and Water Resources Congress, Providence RI, May 16-20, 2010.

Kirshen, P., Roncoli, C., Etkin, D., Sanon, M., Somé, L., Sanfo, J., Zoungrana, J., and Hoogenboom, G., Introducing Reservoir Management Decision Support Tools in a Multi-User Context in Burkina Faso, abstract accepted for ASCE World Environmental and Water Resources Congress, Providence RI, May 16-20, 2010.

Ray, P., Kirshen, P., Rosenberg, D., Hagan, R., An Overview of the Water Situation in Amman, Jordan, abstract accepted for ASCE World Environmental and Water Resources Congress, Providence RI, May 16-20, 2010.

Ray, P., Vogel, R., Kirshen, P., and Watkins, D., Robust Optimization of the Water System in Amman, Jordan, abstract accepted for ASCE World Environmental and Water Resources Congress, Providence RI, May 16-20, 2010.

Douglas, E., Kirshen, P., Watson, C., and Paolisso, M., Coastal Flooding and Environmental Justice: Identifying Vulnerable Communities and Feasible Adaptation Strategies for the Boston metro are, abstract accepted for ASCE World Environmental and Water Resources Congress, Providence RI, May 16-20, 2010.

Kirshen, P., Foote, E., Thomas, A., and Richardson, N., Integrated Climate Change Adaptation Planning for Infrastructure Systems and Ecosystems in the Great Lakes Region, presentation at Engineering in a Climate of Change: Making the Lakes Great, Ontario Society of Professional Engineers, Toronto, Canada, April 29, 2010.

Kirshen, P., Climate Change and Water Resources, lecture for Global Climate Change class, Harvard Extension School, March 10, 2010.

Carlson, C., Barreteau, O., Foltz, K., and Kirshen, P., A Tale of Two Models: How Agent Based Modeling Filled in the Human Variables of Hydrologic Modeling for Low Impact Development in Somerville, MA, Proceedings of Cities of the Future 2010, Water Environment Federation, Boston MA, March 7 – 10, 2010.

Kirshen, P., Integrated Water Resources Management and Planning for Climate Change, invited lecture at the Tufts University Water Systems, Science and Society Workshop on Integrated

Water Resources Management, Medford MA, January 28-29, 2010.

Kirshen, P., Sea Level Rise, Cambridge Forum on “After Copenhagen”, Cambridge MA, January 28, 2010.

Kirshen, P., Climate Change Impacts in the Northeast, invited paper at Groton Climate Adaptation Workshop, Groton, Connecticut, January 27, 2010.

Kirshen, P., Climate Change and Extreme Events, presentation to City of Cambridge Climate Advisory Committee, January 14, 2010.

Kirshen, P., The Process of Climate Adaptation Planning, presentation to City of Boston GHG Adaptation Working Group, January 13, 2010.

Jagai, J, Naumova, E., Griffiths, J., Webb, P., Kirshen, P., Variations in Seasonal Patterns of Gastrointestinal Infections within a Watershed, presented at the Environment program of the 137th APHA Annual Meeting, Philadelphia, PA, November 7-11, 2009.

Kirshen, P., Maxemchuk, A., Richardson, N., Wisneski, C., Hunt, C., Thom, R., and Gulbransen, T., Scenario-Based Risk Assessment Climate Change Adaptation Planning For Estuaries, presented at Coastal and Estuarine Research Federation 20th Biennial Conference, Portland OR, 1-5 November 2009.

Kirshen, P., Risk Scenarios: What Are We Adapting To ?, invited presentation at Lincoln Land Institute and Consensus Building Institute workshop on climate change adaptation, Cambridge, MA October 29, 2009.

Sanon, M., Roncoli, M.C., Kirshen, P., Somé, L., Sanfo, J., Zoungrana, J., and Hoogenboom, G., Involving Multiple Users in the Participatory Development of Water Resources Management Tools in the Comoé River Basin, Burkina Faso, abstract submitted to AGRHYMET workshop on Information Sharing with Farmers, Niamey, Niger, 2009.

Kirshen, P., Significant Findings from the Climate’s Long-Term Impacts on Metro Boston (CLIMB) Case Study and Follow-on Research, invited paper at Energy Modeling Forum Adaptation Meeting, Snowmass CO, July 29, 2009.

Douglas, E., Kirshen, P., Watson, C., Wiggin, J., and Goodwin, S., Coastal Flooding and Environmental Justice: Identifying Vulnerable Communities and Feasible Adaptation Strategies for the Boston Metro Area, Proceedings of Coastal Zone 2009, Boston MA, July 19-23, 2009.

Kirshen, P., Slovinsky, P., Neuman, J., and Merrill, S., Community Planning for Adaptation to Sea Level Rise due to Climate Change, presented at Maine Beaches Conference, Portland ME, 10 July 2009.

Hanson, L., Vogel, R., Kirshen, P., and Shanahan, P., Generalized Storage-Reliability-Yield Relationships for Rainwater Harvesting Systems, Proceedings, EWRI Annual Meeting, ASCE, Kansas City, Missouri, May 17 - May 21, 2009.

Kirshen, P., and Strzepek, K., Guidance Tools for Planning and Management of Urban Drainage Systems under a Changing Climate, Proceedings, EWRI Annual Meeting, ASCE, Kansas City, Missouri, May 17 - May 21, 2009.

Gao, Y., Kirshen, P., Vogel, R., and Walker, P., Environmental Flows in the Context of Small Reservoirs in Ghana, EGU General Assembly 2009, Vienna, Austria 19 – 24 April 2009.

Kirshen, P., Scenario-Based Risk Assessment: Climate Change Adaptation Planning in the Urban Coastal Zone, invited paper at APA Annual Meeting, Minneapolis, 28 April 2009.

Kirshen, P., Scenario-Based Risk Assessment for Planning for Climate Change Adaptation Planning in the Coastal Zone, invited presentation at the UNH Sustainability Speaker Series, Durham NH, 16 April 2009.

Kirshen, P., Richardson, N., and Knee, K., Integrated Climate Change Adaptation Planning for the Natural and the Built Environments in the Coastal Zone; Example of Wetlands and Storm Surges, paper presented at MA Water Resources Conference, Amherst MA, 7 April 2009.

Douglas, E., Kirshen, P., Watson, C., Wiggin, J., Gontz, A., Ruth, M., Paolisso, M., and Goodwin, S., Coastal Flooding and Environmental Justice: Identifying Vulnerable Communities and Feasible Adaptation Strategies in the Boston metro area and Maryland's Eastern Shore, SFAA Annual meeting, 17-21 March 2009. Also presented at AAG Annual Meeting, Las Vegas, 22-27 March 2009.

Kirshen, P., Scenario-Based Risk Assessment for Climate Change Adaptation Planning, invited presentation at US EPA Water Security Retreat, Office of Ground Water and Drinking Water, Shepherdstown, WV, 25 March 2009.

Kirshen, P., Adaptation to Climate Change, invited presentation at New England Water Environment Association Meeting, Boston MA, 26 January 2009.

Kirshen, P., Risk and Management Analysis for Progressive Adaptation of Water Supply in Metro Boston, invited paper at the First National Expert and Stakeholder Workshop on Water Infrastructure Sustainability and Adaptation to Climate Change, US EPA, Crystal City, VA, 6-8 January 2009.

Sanon, M., Roncoli, C., Hoogenboom, G., Kirshen, P., Some, L., Sanfo, J., Jost, C., Communicating Climate Forecasts to Rural Producers: Perspectives from Participatory Research, Invited paper presented at a workshop on Adaptation to Climate Change: Strengthening

Capacities in Africa, German Development Institute and Stockholm Environment Institute, Bonn, Germany, November 26.-27, 2008.

Kirshen, P., Use of Seasonal Forecasting as a Climate Change Adaptation Tool for the Sahel-Sudan, West Africa, invited talk at UNDP, New York, NY, November 18, 2008.

Kirshen, P., and Strzepek, K., Guidance Tools for Planning and Management of Urban Drainage Systems under a Changing Climate: Example of Collaborative Risk Analysis with Stakeholders, paper presented at EMF Adaptation Workshop, Wesleyan University, October 30, 2008.

Kirshen, P., Climate Change and Water Resources, Council of Infrastructure Financing Meeting, Invited paper, Providence, RI, 20-21 October, 2008.

Kirshen, P., Infrastructure Adaptation Planning under Climate Change Using a Risk-Based, Scenario Approach; A Case Study of Coastal Flooding and SLR in Metro Boston, Invited Paper, Indian Entrepreneur Association, Boston University, Boston, October 1, 2008.

Kirshen, P., Impacts of Climate Change on Coastal Flooding of Infrastructure in New England and Adaptation Policy, Invited speaker, EPA New England Climate Change Forum, UNH, Durham NH, June 19, 2008.

Kirshen, P., Climate Change and Freshwater Impacts in New England, Invited speaker, ICLEI Municipal Adaptation Workshop, Northeastern University, May 30, 2008.

Kirshen, P., Climate Models and Decision Making in the Context of Adaptation to Climate Change, Invited speaker, Tufts Faculty Workshop on Climate Change, May 19, 2008.

Kirshen, P., and Cardwell, H., The Role of Shared Vision Planning/Participatory Modeling in Integrated Water Resources Management, Proceedings ASCE World Environmental and Water Resources Congress, Honolulu, Hawaii, 13-16 May 2008.

Kirshen, P., Water Supply National Strategies and Costs for African Adaptation to Climate Change, Proceedings ASCE World Environmental and Water Resources Congress, Honolulu, Hawaii, 13-16 May 2008.

Lautze, J., Kirshen, P., and Griffiths, J., Reservoir Management to Improve Malaria Management in East Africa, Proceedings ASCE World Environmental and Water Resources Congress, Honolulu, Hawaii, 13-16 May 2008.

Etkin, D., Kirshen, P., Watkins, W., Diallo, A.A., Hoogenboom, G., Roncoli, M.C., Sanfo, J., Sanon, M., Somé, L., and Zoungrana, J., Risk Based Decision Support for Reservoir Scheduling in West Africa, Proceedings ASCE World Environmental and Water Resources Congress, Honolulu, Hawaii, 13-16 May 2008.

Kirshen, P., Water Supply and Climate Change in the Middle East North Africa Region, Invited paper presented to the World Bank, April 17, 2008.

Kirshen, P., Responding to Climate Change Impacts on Water Resources in the Massachusetts, Invited paper for Massachusetts Water Resources Research Center Fifth Annual Conference, Integrating Water Resources Management, Amherst MA, April 8, 2008.

Joyce, B., Sieber, J., and Kirshen, P., A Model for Combined Wastewater, Stormwater and Water Supply for Massachusetts, paper presented at Massachusetts Water Resources Research Center Fifth Annual Conference, Integrating Water Resources Management, Amherst MA, April 8, 2008.

Roncoli, C., Kirshen, P., Etkin, D., Some, L., Sanon, M., Sanfro, J., Zoungrana, J., and Hogenboom, G., Managing Water or Mediating among Users: Introducing Climate-Based Decision Support Tools in A Multi-Stakeholder Context in Southwest Burkina Faso, paper presented at SfAA 2008 Annual Meeting, Memphis, Tennessee, March 25-29, 2008.

Kirshen, P., Climate Change and Water Resources in Massachusetts, Invited talk to the Massachusetts Water Resources Commission, February 14, 2008.

Kirshen, P., Rethinking Engineering Design Under Climate Change, Invited facilitated session at the Workshop on Climate Change Adaptation for (Western) Water Managers, Oracle, AZ, February 5, 2008.

Kirshen, P., Urban Adaptation to Climate Change: A Case Study of Metro Boston, Civil and Environmental Engineering Seminar, Northeastern University, December 6, 2007.

Kirshen, P., Terrestrial Impacts, Feedbacks, and Adaptation; The Issues of Sea Level Rise and Coastal Flooding, invited talk at 50th Anniversary of the Global Carbon Dioxide Record Symposium and Celebration, Kona, Hawaii, 28-30 November, 2007.

Roncoli, M.C., Hoogenboom, G., Kirshen, P.H., Orlove, B., The Role of Participation in Climate Services, presented at World Bank, Washington DC, November 29, 2007.

Kirshen, P. Climate Change in New England: What Can We Expect, invited talk at New England Smart Growth Leadership Forum, Federal Reserve Bank, Boston, MA, November 1, 2007.

Roncoli, C., L. Some, M. Sanon, C. Jost, P. Kirshen, G. Hogenboom., Communication et Utilisation des Prévisions Saisonnières dans 3 Zones du Burkina Faso. Paper presented at a Stakeholder Workshop on Communication of Climate Information to Rural Communities, Ouagadougou, Burkina Faso, June 12-13, 2007.

Quattrochi, D., Wilbanks, T., Kirshen, P., Romero-Lankao, P., Rosenzweig, C., Ruth, M., Solecki, W., and Tarr, J., Effects of Global Change on U.S. Urban Areas: Vulnerabilities, Impacts, and Adaptation, presented at session on Remote Sensing of the Urban Environment, 2007 American Geophysical Union (AGU) Joint Session, Acapulco, Mexico, 22-25 May 2007.

Limbrunner, J., Kirshen, P., Vogel, R., and Chapra, S., Comparison of Linear and Non-Linear Optimization Models for Storm Water and Non-Point Source Pollution Best Management Practice Decision Support, Proceedings of ASCE EWRI World Environmental and Water Resources Congress, Tampa FL, 15-19 May 2007.

Kirshen, P., Vogel, R., and Zoltay, V., Management Options for Water Supply Planning: Optimizing within a Watershed Context, Proceedings of ASCE EWRI World Environmental and Water Resources Congress, Tampa FL, 15-19 May 2007.

Limbrunner, J., Kirshen, P., and Chapra, S., Optimization of BMP Selection using Linear Programming, Proceedings of ASCE EWRI World Environmental and Water Resources Congress, Tampa FL, 15-19 May 2007.

Kirshen, P., Pedagogies of the Science Policy Interface: Challenges in Graduate Education in Integrated Water Resources Management, invited paper, Numerical Modeling – Policy Interface (MNPI) Workshop 2007, University of Stuttgart, 12-13 March 2007.

Kirshen, P., Climate Change Impacts on Metro Boston, invited talk at Belmont Hill School, Belmont MA, February 14, 2007.

Kirshen, P., Jost, C., Roncoli, M.C., Hoogenboom, G., Opportunities and Challenges in Using Hydrologic Information and Decision Support Tools to Improve Livelihoods in Burkina Faso, West Africa, Invited Paper, AGU Fall Meeting, 11-15 December 2006.

Lautze, J. and Kirshen, P., Dams, Health, and Livelihoods in Africa: Operational Lessons from the Senegal, Suggestions for the Nile, Proceedings of 2006 ASCE Operations Management Conference, Sacramento, California. August 14-16, 2006.

Ray, P., Kirshen, P., and Vogel, R., Optimization of Water and Wastewater Systems, Case Study of Beirut, Lebanon, ASCE World Environmental and Water Resources Congress, Omaha, Nebraska, May 21-25, 2006.

Zoltay Titcomb, V., Kirshen, P., and Vogel, R., Optimizing Management Efforts for Sustainable Long Range Water Supply Planning, ASCE World Environmental and Water Resources Congress, Omaha, Nebraska, May 21-25, 2006.

Limbrunner, J., and Kirshen, P., Nutrient Management Models, presentation to Environmental and Water Resources Group, Boston Society of Civil Engineers, ASCE, Boston MA, March 21,

2006.

Lautze, J., and Kirshen, P., Dams, Livelihoods, and Health in Africa: Lessons from the Senegal, Suggestions for the Nile, CGIAR Challenge Program on Water and Food Working Conference Enhancing Equitable Livelihood Benefits of Dams Using DSS, Nazareth, Ethiopia, 23-26 January 2006.

Kirshen, P., Climate Change Impacts and Adaptation Strategies for Coastal Metro Boston, Environmental, Earth and Ocean Sciences (EEOS) Department, University of Massachusetts, Boston, October, 26, 2005.

Vogel, R., Limbrunner, J., Chapra, S., and Kirshen, P., A Distributed Decision Support System for Watershed Quality Management, EWRI Watershed Management Conference, Williamsburg, VA July 19-22, 2005.

Limbrunner, J., Chapra, S., Vogel, R., and Kirshen, P., Decision Support System for Optimal Watershed Nutrient Management, EWRI Watershed Management Conference, Williamsburg, VA July 19-22, 2005.

Kirshen, P. H., Use of Indicators in Integrated Water Resources Management, Proceedings of the ASCE World Water and Environmental Resources Congress, Anchorage Alaska, May 15-19, 2005.

Kirshen, P., Ruth, M., and Anderson, Integrated Impacts of Climate Change on and Adaptation Strategies for Metropolitan Areas; A Case Study of Metropolitan Boston, Proceedings of the ASCE World Water and Environmental Resources Congress, Anchorage Alaska, May 15-19, 2005.

Limbrunner, J., Chapra, S., Vogel, R., and Kirshen, P., Tufts Watershed Loading Function: Best Management Practice Model For Decision Support, Proceedings of the ASCE World Water and Environmental Resources Congress, Anchorage Alaska, May 15-19, 2005.

Fernandes, A.M., Kirshen, P., and Vogel, R., Linear Optimization of Faecal Sludge Management, St. Elizabeth, Jamaica, Proceedings of the ASCE World Water and Environmental Resources Congress, Anchorage Alaska, May 15-19, 2005.

Jost, C., Roncoli, M.C., Kirshen, P., Hoogenboom, G., Ouattara, F., Sanon, M., Incorporation of Seasonal Climate Forecasts into Decision Making by Pastoralists in Burkina Faso – Findings from the Climate Forecasting for Agricultural Resources Project. *Vetérinaires Sans Frontières Europa Symposium*, Belgium, April 15, 2005.

Roncoli, M.C., Jost, C., Hoogenboom, G., and Kirshen, P.H., Risk Management and Social Learning in Farmers' Responses to Seasonal Climate Forecasts in Burkina Faso, AAG meeting, Denver April 5-9, 2005.

Kirshen, P., Rader, M., Hoogenboom, G., Jost, C., Roncoli, C., Use of Decision Support Computer Tools to Improve Communication of Climate Forecast Information to Farmers in Burkina Faso, paper presented at Climate Prediction Applications Science Workshop, International Research Institute for Climate Prediction, New York, 15-17 March 2005.

Kirshen, P., Vogel, R., Griffiths, J., Naumova, E., Rogers, B., Durant, J., Reed, R.M., and Gute, D., Incentives and Challenges in Graduate Education in Integrated Water Resources Management (IWRM), Proceedings of ASCE World Water and Environmental Resources Congress 2004, Salt Lake City Utah, June 2004.

Kirshen, P., Ruth, M., and Anderson, W., Climate Change and Urban Infrastructure: A Case Study of Metropolitan Boston in the Northeastern USA, invited paper at the International Conference on Urban Dimensions of Environmental Change: Science, Exposures, Policies, and Technologies, Shanghai China, 25-28 May 2004.

Ruth, M., Amato, A., and Kirshen, P., Potential Effects of Climate Variability and Change on Temperature-related Mortality in Metropolitan Boston, Centennial Meeting of the Association of American Geographers, Philadelphia, Pennsylvania, March 14-19, 2004.

Ruth, M., and Kirshen, P., Climate Impacts on Urban Infrastructure: Regional Cost and Adaptation Strategies, Annual Meeting of the Western Regional Science Association, Maui, Hawaii, February 23-28, 2004.

Kirshen, P., Adaptation of Urban Water Infrastructure to Long-Term Climate Change: A Case Study of Metro Boston, Invited talk at the Smart Growth and the Environment Lecture Series, University of Maryland, 2 December, 2003.

Kirshen, P., Ingram, K., Hoogenboom, G., Jost, C., Roncoli, C., Ruth, M., and Knee, K., Lessons Learned for Climate Change Adaptation; Part 1 - Implementation of Seasonal Climate Forecasting in West Africa; Part 2 - Impacts from and Adaptation to Climate Change in Metro Boston, USA. Invited. Insights and Tools for Adaptation: Learning from Climate Variability, NOAA Workshop, 18-20 November 2003, Washington, DC.

Kirshen, P., Long-Term Climate Change; Global and Local Issues, Weather Observers Conference, Boston Museum of Science, Keynote address, October 18, 2003.

Kirshen, P., Ingram, K., Hoogenboom, G., Jost, C., Roncoli, C., Taking Stock and Moving Forward; the Role of Seasonal Forecasting in Adaptation to Long-Term Climate Change, What the CFAR Project in Burkina Faso Has Learned, invited panel presentation at 2003 Open Meeting of the Human Dimensions of Global Environmental Change Research Community, Montreal Canada, 16-18 October 2003.

Lautze, J, Reeves, M., Vega., R., and Kirshen, P.H., "Climate" for Peace: Climate Change and Sustainable Peace in Israel/Palestine, Proceedings, Information to Support Sustainable Water Management: From Local to Global Levels, Monitoring Tail-Made IV, The Netherlands, 15-18 September 2003.

Ruth, M., and Kirshen, P., Urban Infrastructure and Sustainability in a Changing Environment, paper presented at the Second International Society for Industrial Ecology Conference, Ann Arbor MI, 29 June -2 July 2003.

Kirshen, P., Wilson, C., Knee, K., Suarez, P., Ruth, M., Anderson, W., and Lakshmanan, T.R., Integrated Impacts of Long-Term Climate Change on the Water Resources Systems in the Boston Metropolitan Area and Adaptation Responses, abstract for ASCE World Water and Environmental Resources Congress, Philadelphia, PA, June 23-26, 2003.

Kirshen, P.H., Knee, K., Ruth, M., and Suarez, P., Infrastructure Impacts of Climate Change on Coastal Metro Boston, AAAS Special Symposium on "Cities in Transition: Climate Change Impacts, Adaptation, and Mitigation", AAAS Annual Meeting and Science Innovation Exposition, Denver CO, 13-18 February 2003.

Ruth, M., Kirshen, P.H., Anderson, W., Lakshmanan, T.R., Amato, A., Suarez, P., Knee, K., Gute, D., and Horowitz, J., Synergies between Mitigation and Adaptation to Climate Change in Cities, AAAS Special Symposium on "Cities in Transition: Climate Change Impacts, Adaptation, and Mitigation", AAAS Annual Meeting and Science Innovation Exposition, Denver CO, 13-18 February 2003.

Roncoli, C., Hoogemboom, G., Ingram, K., Jost, C., and Kirshen, P., Scientific Discourse and Social Meanings in the Dissemination of Seasonal Rainfall Forecasts in the Sudan-Sahel Region of West Africa, paper presented the Conference on the Human Dimensions of Global Environmental Change, Berlin, Germany, December 6-7, 2002.

Roncoli, C., Ingram, K., Kirshen, P., and Jost, C., Packaging Predictions: Experiences in the Communication of Climate Information to Farmers of Burkina Faso, paper presented at the Meetings of the African Studies Association, Washington, DC, December 5-9, 2002.

Ruth, M. and Kirshen, P., Climate's Long-term Impacts on Metro Boston, U.S. Environmental Protection Agency, 5th State and Local Climate Change Partner's Conference, Annapolis, Maryland, November 20 - 22, 2002.

Kirshen, P., Edgers, L. , Edelmann, J., Percher, M., Bettencourt, B., Lewandowski, E., and Limbrunner, J., A Case study of the Possible Effects of Climate Change on Bridge Scour, Proceedings of First International Conference on Scour of Foundations, Texas A&M University, College Station TX, 17-20 November, 2002.

Roncoli, C., Ingram, K.T., Jost, C. and Kirshen, P. and Yaka, P., Farmers' Behavioral Responses to Seasonal Rainfall Forecasts in the Sudan-Sahel Region, paper presented at 17th Symposium of the International Farming Systems Association (IFSA), Orlando, Florida, November 17-20, 2002.

Kirshen, P.H., Integrated Impacts of Climate Change on the Infrastructure Services of Metro Boston and Policy Options for Adaptation, invited paper at US EPA Region 1 Environmental Research Seminar, Boston MA November 14, 2002.

Kirshen, P.H., Ingram, K., Hoogenboom, G., Jost, C., Roncoli, C., Value of Short Term Coping Strategies for Adapting to Long Term Climate, Environmental, and Socio-Economic Changes ?, invited presentation for NOAA Human Dimensions of Global Change Principal Investigator Meeting, Seabrook Island SC, October 23-25, 2002.

Roncoli, C., Ingram, K., Kirshen, P., Jost, C., and Hoogenboom, G., Saliency and Meaning in Knowledge Encounters: Anthropological Perspectives on Eliciting Users' Needs, invited paper for the NOAA-Office for Global Program Principal Investigators' meeting, Seabrook Island, SC, October 22-25, 2002.

Swan, C., Kirshen, P., and Durant, J., Environmental Engineering Education and Community Service: A Synergistic Partnership, Proceedings of American Society of Engineering Education Annual Meeting, 2002.

Kirshen, P., Ruth, M., Knee, K., Wilson, C., and Amato, A., Preliminary Findings of Climate Impacts on Metro Boston, invited paper at Energy Modeling Forum, Snowmass, CO, August 1-2 2002.

Kirshen, P., Jost, C., Ingram, K., Roncoli, C., and Hoogenboom, G., Integrated Analysis of Impacts of and Adaptation to Climate Change in the Sahel-Sudan, A Case Study of Farmers and An Urban Area in Burkina Faso, invited paper at Spring American Geophysical Union Meeting, 28-31 May 2002.

Kirshen, P.H., Coastal Impacts of Climate Change on Metro Boston, presentation to Meet the Scientists Program, Tufts University, March 19, 2002.

Kirshen, P.H., The Impacts and Costs of Climate Change to the Boston Region, presentation to the Boston Area Solar Energy Association, March 14, 2002.

Roncoli, C., Ingram, K., Kirshen, P., and Jost, C., Climate Information and Gender Negotiations: Domestic Budgeting among Farmers of Burkina Faso, paper presented at the Meetings of the Society for Applied Anthropology, Atlanta, Georgia, March 6-9, 2002.

Kirshen, P.H., Impact of Global Warming-Induced Climate Change on the Hydrology of Massachusetts, invited paper at 2002 Annual Meeting of the Association of Massachusetts Wetland Scientists (AMWS), Boxboro MA, March 23, 2002, also presented the Waste Water Advisory Committee of the Massachusetts Water Resources Authority, March 1, 2002.

Ruth, M. and Kirshen, P.H., Dynamic Investigations into Climate Change Impacts on Urban Infrastructure: Background, Examples, and Lessons, Proceedings of Western Regional Science Association Annual Meeting, Monterey, California, Feb. 18 - 20, 2002.

Roncoli, C., Ingram, K., Kirshen, P., and Jost, C., Meteorological Meanings: Farmers' Interpretations and Applications of Seasonal Rainfall Forecasts in Burkina Faso. Paper presented at the Annual Meetings of the American Anthropological Society, Washington DC, November 28-December 2, 2001.

Kirshen, P., Invited discussant of "Bostonians and Their Weather", talk by William Meyer at Boston Environmental History Seminar, Massachusetts Historical Society, 11 December 2001.

Roncoli, C., Ingram, K., Kirshen, P., and Jost, C., Gender Dimensions of Climate Forecasting: How Rainfall Information May Shape Resource Management and Decision Making within Rural Households of Burkina Faso. Paper presented at the Women and Development Office of the United States Agency for International Development, Washington DC, November 30, 2001.

Roncoli, C., Ingram, K., Kirshen, P., and Jost, C., Figuring Forecasts: Perceptions and Predictions of Seasonal Rainfall among Rural Producers of Burkina Faso. Paper presented at the Bureau of Applied Research in Anthropology, University of Arizona, Tucson, Arizona, November 9, 2001.

Kirshen, P. and Ruth, M., The CLIMB Project – Update and Progress, presented at Climate Change and Action in the Region, An Update on Activities to Reduce and Prepare for Climate Change, Metropolitan Area Planning Council, Boston MA, 1 October, 2001.

Kirshen, P., Roncoli, C., Ingram, K., and Jost, C., What Adaptation to Climate Variability in West Africa Tells Us about Adaptation to Long-Term Climate Change. Invited paper at Energy Modeling Forum, Snowmass, CO, 30 July 2001.

Roncoli, C., Ingram, K., Kirshen, P., and Jost, C., Meteorological Meanings: Indigenous and Scientific Rainfall Forecasting in Burkina Faso. Paper presented at the Workshop on Communication of Climate Forecasts, International Research Institute for Climate Prediction, Palisades, New York, June 6-8, 2001.

Roncoli, C., Ingram, K., Kirshen, P., and Jost, C., Évaluation d'une Expérience de Diffusion des Prévisions Saisonnières: le Cas du Burkina Faso. Paper presented at a Workshop on Communication and Application of Climate Information in Rural Areas, Nouakchott,

Mauritania, May 29-31, 2001.

Westphal, K.S., Vogel, R., and Kirshen, P., A Decision Support Model for Operating the Eastern Massachusetts Water Supply System, Proceedings of ASCE World Water Resources and Environmental Congress, 20-24 May 2001, Orlando, FL, also presented at Decision Support Systems for Water Resources Management, American Water Resources Association Specialty Conference, Snowbird, UT, 27-30 June 2001.

Kirshen, P.H., and Ruth, M., Integrated Impacts of Climate Change on the Infrastructure Systems and Services of the Boston Metro Area, invited for Proceedings of ASCE World Water Resources and Environmental Congress, 20-24 May 2001, Orlando, FL.

Kirshen, P., Integrated Water Resources Management: The Process, Models, and Stakeholders, paper presented at Mauritius Environmental Resource Management and Industrial Management (MERMAID) Meeting, University of Maryland and University of Mauritius, Reduit, Mauritius, May, 2001.

Kirshen, Paul H., Coastal Infrastructure and Climate Change in Metro Boston, invited paper for The Conference of New England Governors and Eastern Canadian Premiers Climate Change Workshop, Fredericton, New Brunswick, 29-30 March 2001.

Pak D., Vogel R., Kirshen P., Griffiths J.K., Naumova E.N., Morris R.D., Occurrence of Cryptosporidium Oocysts in a Multi-use Watershed in Relation to Land Use and Rainfall. In the Proceedings of the Microbial/Disinfection By-Products Health Effects Symposium. AWWA, Lisle, IL. March 24-26, 2001.

Roncoli, C., Ingram, K.I., Jost, C. and , Kirshen, P., Modernity Meets Marginality: Impacts of Seasonal Rainfall Forecasts on Rural Livelihoods in Burkina Faso, Presented at Society for Applied Anthropology Annual Meeting, Merida, Mexico, March 2001.

Kirshen, Paul H., The CLIMB Project, presented at Winter Council Meeting of the Metropolitan Area Planning Council, Boston MA, 28 February 2001.

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Synapse Energy Economics, Inc (externalities of climate change and water resources)

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2007

ICF Consulting Inc. (climate change and water resources)

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HydroAnalysis Inc (CSO impacts)

2006

Stratus Consulting (climate change and water resources)

HydroAnalysis Inc (coastal flooding, CSO impacts)

Swanee River Water Management District (river modeling)

2005

National Environmental Trust (climate change)

2004

Mystic River Watershed Association (water quality assessment)

2003

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Mystic River Watershed Association (water quality assessment)

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2001

Synapse Energy Economics, Inc. (hydropower evaluation)

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2000

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Charles River Watershed Association, Tellus Institute and US EPA, (ground and surface

water interactions in the Charles River basin under climate change)
HydroAnalysis, Inc. (combined sewer modeling, Fitchburg MA)
Hagler Bailly, Inc. (water resources indicators for climate change impacts)
1997
Charles River Watershed Association, Tellus Institute, and US EPA, (ground and surface water interactions in the Charles River basin)
HydroAnalysis, Inc. (combined sewer modeling, Fitchburg MA)
1996
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HydroAnalysis, Inc. (combined sewer modeling, Fitchburg MA)
1994
Massachusetts Water Resources Authority, Boston, MA (software design, interceptor modeling, project design, support to the combined sewer overflow control project, project management)
RCG/Hagler Bailly, Boulder, CO (economic impacts of climate change upon water resources in the United States, for the Electric Power Research Institute (EPRI), Palo Alto, CA)
1993
Massachusetts Water Resources Authority, Boston, MA (software design, interceptor modeling, project design, support to the combined sewer overflow control project, project management)
US Environmental Protection Agency, Washington, DC (potential impacts of climate change on yield of Quabbin Reservoir, Massachusetts)
RCG/Hagler Bailly, Boulder, CO (economic impacts of climate change upon water resources in the United States, for the Electric Power Research Institute (EPRI), Palo Alto, CA)
1992
Massachusetts Water Resources Authority, Boston, MA (software design, interceptor modeling, project design, support to the combined sewer overflow control project, project management)
US Environmental Protection Agency, Washington, DC (potential impacts of climate change on yield of Quabbin Reservoir, Massachusetts)
Electric Power Research Institute/Tennessee Valley Authority (Multi-Objective Reservoir Scheduling)
1991
Massachusetts Water Resources Authority, Boston, MA (needs assessment for computer tools for interceptor modeling and management and state-of-art review)
US Environmental Protection Agency, Washington, DC (potential impacts of climate change on yield of Quabbin Reservoir, Massachusetts)
1990
US Agency for International Development, Cairo, Egypt (evaluation of planning models for water resources management, Egypt)

Massachusetts Water Resources Authority, Boston, MA (needs assessment for computer tools for interceptor modeling and management and state-of-art review)
 1983
 Environmental Research and Technology, Inc (ERT) (real-time operation of hydropower systems)
 Institute for Development Anthropology, Binghamton, NY (design and evaluation of forest irrigation systems, Pakistan)
 Virginia Polytechnic Institute (VPI) (farm level irrigation management, Sri Lanka)
 Webster College, Vienna, Austria (workshop on managerial and technical issues in small hydro)
 White Current Corporation (expert testimony on small hydro)
 World Bank, Washington, DC (design of watershed monitoring program, Pakistan)
 1982
 ERT (real-time collection and use of hydrologic data)
 Louis Berger International, Inc., E. Orange, NJ (small hydro potential for irrigation, Nepal)
 National Rural Electric Cooperative Association (NRECA), Washington, DC (speaker on hydrologic, environmental, and geologic factors in mini hydro site selection, mini hydro workshop, Ivory Coast)
 VPI (farm level irrigation management, Sri Lanka)
 1981
 Curran Associates, Inc., Northampton, MA (small hydropower assessment of Togo, West Africa)
 ERT (real-time collection and use of hydrologic data)
 1980
 ERT (real-time collection and use of hydrologic data)
 New England Renewables, Augusta, ME (small hydropower)
 White Current Corp., No. Hartland, VT (small hydropower)
 New England River Basins Commission (assessment methodologies)
 Cold Regions Research Laboratory (CRREL), Hanover, NH (land treatment of wastewater)
 1979
 ERT (community water planning)
 1978
 ERT (community water planning)
 1975
 Dr. Hans Guggenheim, Boston, MA (grazing strategies for the Sahel-Sudan, Africa)
 Environmental Defense Fund (Tocks Island Dam)
 1973
 Resource Analysis, Inc., Cambridge, MA (stormwater management)
 1972
 Resource Analysis, Inc., Cambridge, MA (flood management)
 1971

New England Rivers Basin Commission (NERBC), Boston, MA (coastal zone management)