**KATHLEEN A. MILLER**

Senior Research Associate

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**ACADEMIC BACKGROUND**

1985 Ph.D. Economics, University of Washington

1976 M.A. Economics, University of Washington

1974 B.A. Anthropology, University of Washington

**DISSERTATION RESEARCH**

"The Right to Use vs. the Right to Sell: Water Rights in the Western United States."

**APPOINTMENTS**

2017-present Senior Research Associate, Research Applications Lab, National Center for Atmospheric Research

1985-2017 Scientist I-II-III, Climate Science and Applications Program, National Center for Atmospheric Research; Interim Head, ESIG (4/97-8/99);

1999-2000 Instructor, Policy Responses to Global Environmental Change, Environmental Certificate Program, University of Colorado

1986-1987 Adjunct Associate Professor, Natural Resources Economics, Department of Economics, University of Colorado

**RESEARCH INTERESTS**

Assessment of climate vulnerability, impacts and adaptive capacity for social and natural systems; adaptation planning methodology; governance institutions for climate-sensitive natural resources; risk management; decision-making under uncertainty; interactions between human strategic behavior and dynamic natural systems

**SELECTED PUBLICATIONS**

**Books**

Miller, Kathleen A., Alan F. Hamlet, Douglas S. Kenney, and Kelly T. Redmond (Eds.), 2016. *Water Policy and Planning in a Variable and Changing Climate.* CRC Press - Taylor & Francis Group, (Boca Raton, FL) ISBN: 978-1-4822-2797-0. <http://www.crcnetbase.com/isbn/978-1-4822-2797-0>

<http://dx.doi.org/10.1201/b19534>

Miller, Kathleen and David Yates, 2006. *Climate Change and Water Resources: A Primer for Municipal Water Providers.* AWWA Research Foundation, Denver, CO, 83 pp. [Climate Change and Water Resources: A Primer for Municipal Water Providers](https://ral.ucar.edu/sites/default/files/public/product-tool/Primer_2006_cr_project_2973_Climate_Change_and_Water_Resources.pdf)

**Peer Reviewed Journal Articles and Book Chapters**

Vano, Julie A., Michael D. Dettinger, Rob Cifelli, David Curtis, Alexis Dufour, Kathleen Miller, J. Rolf Olsen, And Anna M. Wilson, 2019. Hydroclimatic Extremes as Challenges for the Water Management Community: Lessons from Oroville Dam and Hurricane Harvey, https://doi.org/10.1175/BAMS-D-18-0219.1 [in “Explaining Extremes of 2017 from a Climate Perspective”]. *Bull. Amer. Meteor. Soc*., **100 (1)**, S9–S14, <https://doi.org/10.1175/BAMS-D-18-0135.1>

Dilling, Lisa, Meaghan E. Daly, Douglas A. Kenney, Roberta Klein, Kathleen Miller, Andrea J. Ray, William R. Travis, Olga Wilhelmi, 2019. Drought in urban water systems: Learning lessons for climate adaptive capacity, *Climate Risk Management*, (In Press), <https://doi.org/10.1016/j.crm.2018.11.001>

Haupt, Sue Ellen, Branko Kosović, Scott W. Mcintosh, Fei Chen, Kathleen Miller, Marshall Shepherd, Marcus Williams, Sheldon Drobot, 2019. (In Press). AMS Monograph, A Century of Progress in Atmospheric and Related Sciences: Celebrating the American Meteorological Society Centennial, 100 years of Progress in Applied Meteorology,Part III: Additional Applications. <https://doi.org/10.1175/AMSMONOGRAPHS-D-18-0012.1>

Miller, Kathleen A., 2017*.* “Extreme Drought and California's Water Economy: Challenges and Opportunities for Building Resilience,” Ch. 10, pp. 164-182 in K.N. Ninan and M. Inoue (Eds.), *Building a Climate Resilient Economy and Society – Challenges and Opportunities.* Edward Elgar.ISBN: 978 1 78536 844 8.

Miller, Kathleen A., Alan F. Hamlet, and Douglas S. Kenney, 2016. “Introduction: The Context for Western Water Policy and Planning” in Miller, K.A., A.F. Hamlet, D.S. Kenney, and K.T. Redmond (Eds.), *Water Policy and Planning in a Variable and Changing Climate.* pp. 3-15. Boca Raton, FL: CRC Press - Taylor & Francis Group.

Yates, David N., Kathleen A. Miller, Robert L. Wilby and Laurna Kaatz, 2015. Decision-centric adaptation appraisal for water management across Colorado’s Continental Divide, *Climate Risk Management*, **10**: 35-50. <http://dx.doi.org/10.1016/j.crm.2015.06.001>.

Miller, Kathleen A. and Valerie Belton, 2014. Water resource management and climate change adaptation: a holistic and multiple criteria perspective, *Mitigation and Adaptation Strategies for Global Change,* **19**(3): 289-308. [http://hdl.handle.net/10.1007/s11027-013-9537-0](http://econpapers.repec.org/scripts/redir.pf?u=http%3A%2F%2Fhdl.handle.net%2F10.1007%2Fs11027-013-9537-0;h=repec:spr:masfgc:v:19:y:2014:i:3:p:289-308)

Maury, O., K. Miller, L. Campling, H. Arrizabalaga, O. Aumont, Ö. Bodin, P. Guillotreau, A. J. Hobday, F. Marsac, Z. Suzuki & R. Murtugudde, 2013. A global science-policy partnership for progress towards sustainability of oceanic ecosystems and fisheries, *Current Opinion in Environmental Sustainability (COSUST)*, **5**: 314-319. <http://dx.doi.org/10.1016/j.cosust.2013.05.008>

Miller, Kathleen A., Gordon R. Munro, U. Rashid Sumaila and William W.L. Cheung, 2013. Governing Marine Fisheries in a Changing Climate: A Game-Theoretic Perspective. *Canadian Journal of Agricultural Economics*, **61**: 309-334. <http://dx.doi.org/10.1111/cjag.12011>

Yates, David and Kathleen A. Miller, 2013. Integrated Decision Support for Energy/Water Planning in California and the Southwest. *The International Journal of Climate Change: Impacts and Responses* **4**(1): 49-63. <http://ijc.cgpublisher.com/product/pub.185/prod.179>

Miller, Kathleen A., 2011. Conservation of Migratory Species in a Changing Climate: Strategic Behavior and Policy Design, *Environmental Law,* **41**: 573-598*.* *Available at:* <https://law.lclark.edu/live/files/8696-412miller>

Miller, Kathleen, 2011. Adaptation Theme Report: Improving Water Resource Management. Contribution to the MCA4climate initiative. *MCA4climate: A practical framework for planning pro-development climate policies.* UNEP, Paris.

Rasmussen, R., C. Liu, K. Ikeda, D. Gochis, D. Yates, F. Chen, M. Tewari, M. Barlage, J. Dudhia, W. Yu, K. Miller, K. Arsenault, V. Grubišic', G. Thompson, E. Gutmann, 2011. High-Resolution Coupled Climate Runoff Simulations of Seasonal Snowfall over Colorado: A Process Study of Current and Warmer Climate. *Journal of Climate,* **24** (12): 3015-3048. DOI: 10.1175/2010JCLI3985.1

Miller, Kathleen, Peter Golubtsov and Robert McKelvey, 2011. “Fleets, Sites and Conservation Goals: Game Theoretic Insights on Management Options for Multinational Tuna Fisheries.”in Rosemary Ommer, Ian Perry, Kevern Cochrane, Philippe Cury (Eds.), *World Fisheries: a Social-Ecological Analysis*, Chapter 4, pp.60-89, Wiley-Blackwell, Oxford, UK.

Miller, Kathleen A., 2010*.* Grappling with Uncertainty: Water Planning and Policy in a Changing Climate, *Environmental & Energy Law & Policy Journal*, **5**: 395-416. <https://www.law.uh.edu/eelpj/publications/5-2/06Miller.pdf>

Miller, Kathleen, Anthony Charles, Manuel Barange, Keith Brander, Vincent F. Gallucci, Maria A. Gasalla, Ahmed Khan, Gordon Munro, Raghu Murtugudde, Rosemary E. Ommer, and R. Ian Perry, 2010*.* Climate change, uncertainty, and resilient fisheries: Institutional responses through integrative science, *Progress in Oceanography,* **87**: 338-346*.* <http://dx.doi.org/10.1016/j.pocean.2010.09.014>

Ikeda, K., R. Rasmussen, C. Liu, D. Gochis, D. Yates, F. Chen, M. Tewari, M. Barlage, J. Dudhia, K. Miller , K. Arsenault, V. Grubišic', G. Thompson, and E. Gutmann, 2010. Simulation of seasonal snowfall over Colorado, *Atmospheric Research*, **97**: 462-477. <http://dx.doi:10.1016/j.atmosres.2010.04.010>

Schulte, Stacey and Kathleen A. Miller, 2010. Wildfire Risk and Climate Change: The Influence on Homeowner Mitigation Behavior in the Wildland–Urban Interface. *Society and Natural Resources,* **23:** 417-435. <http://dx.doi.org/10.1080/08941920903431298>

Kundzewicz, Z.W., L.J. Mata, N.W. Arnell, P. Döll, B. Jimenez, K. Miller, T. Oki and Z. Şen, 2009. Reply to “Climate, hydrology and freshwater: towards an interactive incorporation of hydrological experience into climate research” – Water and climate projections. *Hydrological Sciences Journal,* **54**(2): 406-415.

Bates, B.C., Z.W. Kundzewicz, S. Wu and J.P. Palutikof, Eds.; (Lead Authors: N. Arnell, V. Burkett, P. Döll, D. Gwary, C. Hanson, B. Heij, B.E. Jiménez, G. Kaser, A. Kitoh, S. Kovats, P. Kumar, C.H.D. Magadza , D. Martino, L. J. Mata, M. Medany, K. Miller, T.Oki, B. Osman, J. Palutikof, T. Prowse, R. Pulwarty, J. Räisänen, J. Renwick, F.N. Tubiello, R. Wood and Z.-C. Zhao), 2008. Climate Change and Water. Technical Paper of the Intergovernmental Panel on Climate Change, IPCC Secretariat, Geneva, 210 pp. Available at: <http://www.ipcc.ch/pdf/technical-papers/climate-change-water-en.pdf>

Miller, Kathleen A., 2008. Climate Change and Water Resources: The Challenges Ahead. *International Affairs*. Spring/Summer 2008, **61**(2): 35-50.

Kundzewicz, Z.W., L.J. Mata, N.W. Arnell, P. Döll, B. Jimenez, K. Miller, T. Oki, Z. Şen, and I. Shiklomanov, 2008. The implications of projected climate change for freshwater resources and their management, *Hydrological Sciences Journal*, **53**(1): 3-10.

Miller, Kathleen A., 2007. “Fish Stew: Uncertainty, Conflicting Interests and Climate Regime Shifts,” Chapter 13 – pp. 207-221 in T. Bjørndal, D. V. Gordon, R. Arnason and U. R. Sumaila (eds.) *Advances in Fisheries Economics: Festschrift in Honour of Professor Gordon R. Munro*. Blackwell, Oxford, U.K.

McKelvey, Robert, Peter V. Golubtsov, Greg Cripe and Kathleen A. Miller, 2007*.* “The Incomplete Information Stochastic Split-Stream Model: An Overview.” Chapter 10 – pp.159-183 in T. Bjørndal, D. V. Gordon, R. Arnason and U. R. Sumaila (eds.) *Advances in Fisheries Economics: Festschrift in Honour of Professor Gordon R. Munro*.Blackwell, Oxford, U.K.

Miller, Kathleen A., 2007. Climate Change and Water in the West: Complexities, Uncertainties and Strategies for Adaptation, *Journal of Land, Resources and Environmental Law* **27**(1): 87-96*.*

Kundezewicz, Z.W., L.J. Mata (Coordinating Lead Authors); N. Arnell, P. Döll, P.Kabat, B. Jimenez, K. Miller, T. Oki, Z. Sen and I. Shiklomanov (Lead Authors), *et. al.*, 2007. Chapter 3 – Freshwater Resources and their Management. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge University Press, Cambridge, UK, 173-210.

Available at: <http://www.ipcc-wg2.gov/AR4/website/03.pdf>

Miller, Kathleen A., 2007. Climate Variability and Tropical Tuna: Management Challenges for Highly Migratory Fish Stocks, *Marine Policy*, **31**(1): 56-70. <http://dx.doi.org/doi:10.1016/j.marpol.2006.05.006>

Faurès J.-M., et al. (K. Miller contributing author), 2007. “Reinventing Irrigation,” Chapter 9, pp. 353- 394 in D. Molden (ed.), *Water for Food Water for Life: A Comprehensive Assessment of Water Management in Agriculture.* Earthscan, London and International Water Management Institute, Colombo.

**Other Publications**

Yates, David and Kathleen Miller, 2011. *Climate Change in Water Utility Planning: Decision Analytic Approaches*. The Water Research Foundation, Denver, 80pp. <http://www.ral.ucar.edu/staff/miller/Yates-Miller-%20WRF-3132-published.pdf>

Miller, Kathleen and Valerie Belton, 2011. Case Study: Water Resources Management and Climate Change Adaptation in the Sana’a Basin, Yemen. Contribution to the MCA4climate initiative. *MCA4climate: A practical framework for planning pro-development climate policies.* UNEP, Paris.

Miller, Kathleen, Peter Golubtsov and Robert McKelvey, 2010. Asset Ownership, Climate Variability and Policy Design: Game Theoretic Insights on Tuna Management Outcomes. 12 pp. In: Proceedings of the Fifteenth Biennial Conference of the International Institute of Fisheries Economics & Trade, July 13-16, 2010, Montpellier, France: Economics of Fish Resources and Aquatic Ecosystems: Balancing Uses, Balancing Costs. Compiled by Ann L. Shriver. International Institute of Fisheries Economics & Trade, Corvallis, Oregon, USA. CD ROM. ISBN 0-9763432-6-6

**RECENT PROFESSIONAL PRESENTATION**

April 2018 University of California, Irvine, Water UCI Scholar in Residence presentation, “Balancing on a Rollercoaster: Water Policy and Planning in a Changing Climate.”

March 2017 Arkansas Technical University, Symposium on Collaborative Solutions to Contemporary Challenges: Climate Change, Russellville AR. “Understanding Climate Change and its Implications for Water Resources.”

January 2017 AMS Annual Meeting - 12th Symposium on Societal Applications, Seattle, WA. “The Role of Climate Observations in Complex Water Policy Settings.”

June 2016 Democratic Party of Douglas County, Highlands Ranch, CO. “Understanding Climate Change: A Global to Regional View.”

April 2016 NCAR Day of Networking and Discovery, Boulder, CO. “Water Policy in a Changing Climate: Insights from the US West.”

January 2016 AMS Annual Meeting - 11th Symposium on Societal Applications: Policy, Research and Practice, New Orleans, LA. “Decision-Centric Adaptation Appraisal for Water Management Across Colorado's Continental Divide.”

May 2015 North Central CSC Open Science Conference, Fort Collins, CO. “Decision-centric Adaptation Appraisal for Water Management across Colorado’s Continental Divide.”

May 2015 Front Range Conference on Environmental Governance Research, Fort Collins, CO. “Institutional and Physical Dimensions of Climate Adaptation at the Headwaters of the Colorado River.”

April 2015 University of Colorado 10th Annual Hydrologic Sciences Research Symposium, Boulder, CO. “An Approach for Assessing the Drought-Resilience of Colorado’s Transbasin Water Diversions.”

January 2015 Colorado Water Congress Annual Convention, Denver, CO. “Integrated Water Resources Modeling and Analysis: WEAP applications.”

May 2013 Global Water System Project Conference: Water in the Anthropocene: Challenges for Science and Governance, Bonn, Germany. “Colorado’s Transbasin Diversions under Climate Change: Governance and Sustainability.”

May 2012 Adaptation Futures Conference, University of Arizona, Tucson, AZ. “Integrated decision support for energy/water planning in California and the Southwest.”

May 2012 Iowa State University, Nutrition and Wellness Center Symposium on Sustaining Health in a Changing Environment Ames, IA. “Governance Challenges for Sustainable Marine Fisheries in a Changing Climate.”

March 2012 IMBER-CLIOTOP Special Session: Global science for global governance of oceanic ecosystems and fisheries. Planet Under Pressure, London UK. “Game Theoretic Insights on Cooperation and Conflict in Oceanic Ecosystem Governance.”

**GRANTS/CONTRACTS**

2013-16 NOAA SARP Grant NA13OAR4310118, “Managing Drought in the Apalachicola-Chattahoochee-Flint (ACF) River Basin through the Development of Improved Drought Indicators and Policy Alternatives” [Funding to UCAR $95,000]

2012-16 USDA-NSF-WSC Interagency Grant 11145621, “Snowpack and Ecosystem Dynamics: The Sustainability of Inter-basin Water Transfers under a Changing Climate.” (PIs Molotch and Gochis) Miller: Co-I in charge of socioeconomics and governance aspects. [Funding to UCAR $130,080]

2008-09 American Water Works Association Research Foundation, “Navigating Climate Change Information and Data: A Guide for Water and Wastewater Utilities.” AwwaRF project 4204, with Rob Wilby, Loughborough University, U.K. [Funding to UCAR $28,000]

2008-09 CADMUS Consulting, “Support of the Development of a National Vulnerability Atlas.” [Funding to UCAR $38,786]

2006-09 American Water Works Association Research Foundation, “Incorporating climate change information in water utility planning: A collaborative, decision analytic approach,” with David Yates, Research Applications Program, NCAR. [Funding to UCAR $265,000]

2005-08 National Science Foundation, “Workshop on Climate, Uncertainty, and Multilateral Management of Harvested Highly-Migratory Marine Fish Stocks,” with Peter Jacques, Robert McKelvey, and Gail Osherenko. [Funding to UCAR $114,091]

2003- 08 National Science Foundation, “Collaborative Research: Sustaining Cooperative Multinational Management of Marine Fisheries in the Face of Environmental Variability,” with Robert McKelvey (*Emeritus*, University of Montana). [Funding to UCAR $ 75,164]

2003-06 American Water Works Association Research Foundation, “Workshop on the Impacts of Global Climate Change on Water Utilities,” with David Yates, Research Applications Program, NCAR.

1998-03 NOAA Office of Global Programs, “Climatic Variations and the International Management of the North American Pacific Salmon Fishery: A Game Theoretic Perspective,” with Robert McKelvey (*Emeritus*, University of Montana) and Gordon R. Munro (University of British Columbia).

1997-98 NAFTA Commission for Environmental Cooperation, “Climate Variability and Transboundary Freshwater Resources in North America," with Linda O. Mearns.

1996-97 Western Water Policy Review Advisory Commission, "Climate Change Climate Variability and Western Water.”

1994-95 NOAA Office of Global Programs, “Institute on the Economics of the Climate Resource.”

1992-94 U.S. Geological Survey, “Using Water Banks to Promote more Flexible Water Use,” in conjunction with Lawrence J. MacDonnell, Charles Howe, Sarah Bates, and Teresa Rice (University of Colorado).

1981-84 Sloan Foundation Grant, doctoral dissertation research.