Paul J. Block, PhD, PE

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PROFESSIONAL PREPARATION:

Ph.D. in Civil Engineering, University of Colorado, 2006
Thesis: *Integrated Management of the Blue Nile Basin in Ethiopia: Precipitation Forecast, Hydropower, and Irrigation Modeling*
Advisors: Dr. Kenneth Strzepek & Dr. Balaji Rajagopalan

M.S. in Civil Engineering, University of Colorado, 2004
Thesis: *Inclusion of Climate Variability in an Agro-Economic Model: Analytic Applications in Ethiopia*
Advisor: Dr. Kenneth Strzepek

B.S. in Civil Engineering, Valparaiso University, 1995
Independent Study Project: *Determining the Dimensions of a Discharge Well's Capture Zone*
Graduated Magna cum Laude

APPOINTMENTS:

2019-	Associate Professor, Civil and Environmental Engineering, University of Wisconsin - Madison
2013-2019	Assistant Professor, Civil and Environmental Engineering, University of Wisconsin - Madison
2011-	Affiliate, Columbia Water Center, Columbia University
2011-2013	Assistant Professor, Civil, Architectural, and Environmental Engineering, Drexel University
2009-2011	Associate Research Scientist, IRI, Columbia University; Researcher, Columbia Water Center, Columbia University
2007-2009	Postdoctoral Research Scientist, IRI, Columbia University
2006-2007	Assistant Professor Adjunct, Civil, Environmental, and Architectural Engineering, University of Colorado
2005-2006	Research Assistant, Civil, Environmental, and Architectural Engineering, University of Colorado, and International Food Policy Research Institute, Washington DC
2005	Research Assistant, National Center for Atmospheric Research, Boulder, Colorado and Electric Power Research Institute, Palo Alto, California
2003-2004	Teaching Assistant, Civil, Environmental, and Architectural Engineering, University of Colorado
2001-2003	Project Engineer, Short Elliot Hendrickson Inc., Rochester, Minnesota
2001-2003	Instructor, Rochester Community and Technical College, Rochester, Minnesota
1997-1999	Project Manager and Engineer, Environmental Concepts and Design, St. Paul, Minnesota
1993-1994	Staff Engineer (Co-op), Harza Engineering Company, Chicago, Illinois

RESEARCH PROPOSALS & FUNDING AWARDED:

1. *CAREER: Leveraging Hydro-climatic Processes to Advance Season-ahead Cyanobacteria Prediction and Beach Management*, NSF, PI, 2019-2024; $510,000

2. *Development of a Forecast-based Flood and Health Risk Management System to Support Advanced Disaster Preparedness,* Wisconsin Alumni Research Foundation, PI, 2018-2019; $439,000

3. *Independent Review of Study quantifying the effects of water conservation practices and other field characteristics on on-farm water use in the Garwood Irrigation Division*, Lower Colorado River Authority, PI, 2018; $15,000

4. *Leveraging satellite-derived products and physically-based models to develop cyanobacteria predictions for Lake Mendota*, University of Wisconsin, PI, 2017-2019; $39,000

5. *Building precipitation and groundwater forecast tools for Wisconsin's Central Sands,* University of Wisconsin System Applied Research Grant, PI, 2017-2018; $49,000

6. *INFEWS/T1: Understanding Multi-scale Resilience Options for Climate-Vulnerable Africa*, NSF, co-PI (B. Zaitchik, JHU, PI), 2016-2020; $3,000,000

7. *Seasonal Prediction of HKH Hydrological Extremes with the South Asia Land Data Assimilation System*, NASA, co-PI, (B. Zaitchik, JHU, PI), 2016-2019; $480,000

8. *Index Insurance as a Climate Risk Management Tool*, Center for Climatic Research at UW-Madison, PI, 2016-2017; $9,000

9. *NILE_NEXUS: Opportunities for a sustainable food-energy-water future in the Blue Nile Mountains of Ethiopia*, Belmont Forum, co-PI (B. Zaitchik, JHU, PI), 2016-2019; $1,000,000

10. *Taming water in Ethiopia: An interdisciplinary approach to improve human security in a water-dependent emerging region*, NSF PIRE, co-PI (E. Anagnostou, UConn, PI), 2016-2020; $4,275,000

11. *Flood Prediction to Support Advanced Disaster Preparedness and Public Health Risks: Understanding, Development, and Application*, Global Health Institute (University of Wisconsin), PI, 2016-2017; $50,000

12. *The Sands of Time: Developing and evaluating groundwater forecasts in Wisconsin's Central Sands*, University of Wisconsin, PI, 2016-2017; $55,000

13. *Season-ahead Drought Prediction in Southern Peru to Support Water Resources Management*, Southern Peru Copper Corporation, PI, 2015-2016: $232,000; supplement 2017-2018; $20,000

14. *Agroecosystem-based Climate Resilience Strategies in the Blue Nile Headwaters of Ethiopia – FEW Supplemental Request*, NSF, co-PI (B. Zaitchik, JHU, PI), 2015-2016; $297,000.

15. *Projecting Nile Basin Climate for GERD Reservoir Filling and Downstream Impacts*, United Nations – WIDER, PI, 2015-2016; $12,000

16. *Flood prediction: Can a global scale analysis be informative?*, University of Wisconsin, PI, 2015-2016; $39,000

17. *Predicting Water Quality Extremes using Season-ahead Climate Information,* NOAA SARP, PI, 2014-2015; $100,000

18. *Historic and Future Flows of Wisconsin Rivers and Associated Impacts on River Island Resources,* Wisconsin Department of Natural Resources, PI, 2014-2015; $90,000

19. *Seasonal Prediction of Hydro-Climatic Extremes in the Greater Horn of Africa under Evolving Climate Conditions to Support Adaptation Strategies*, NOAA IDS (T. Tadesse, UNL, PI), 2013-2016; $1,400,000

20. *Integrated Seasonal Drought Forecast-Adaptive Management System for the Lower Colorado River Basin in Texas*, NOAA SARP, co-PI (D. Watkins, Mich Tech, PI), 2013-2015; $285,000

21. *Predicting Change: A mentorship and collaboration plan to foster knowledge advancement across physical and social science systems,* Drexel Career Development Award, PI, 2012-2013; $7,500

22. *Elucidating near-term climate change information to guide water resources decisions and foster sustainability,* Earth Institute at Columbia University, PI, 2010; $34,000

23. *Continuation and Expansion of the Water Capture System in Koraro, Ethiopia*, Pulitzer Family Foundation, Co-PI (U. Lall, Columbia, PI), 2010; $250,000

24. *Tailoring Extreme Weather and Climate Information Products in Preparedness for Climate Change*, IFRC, Co-PI (S. Mason, Columbia, PI), 2010; $120,000

25. *Nile Basin Initiative training and model development*, World Bank, PI, 2009; $20,000

26. *Economics of Adaptation to Climate Change in Ethiopia*, World Bank, PI, 2009; $50,000

27. *Water and Climate Risk Management Training*, UNESCO, PI, 2009; $15,000

28. *Coming Down the Mountain: Understanding the Vulnerability of Andean Communities to Hydroclimatologic Variability and Global Environmental Change*, Inter-American Institute for Global Change Research, Co-PI (C. Brown, Columbia, PI), 2007-2009; $50,000

29. Joint Assembly Student Grant, 2006; $300

30. *Integrated Management of the Blue Nile Basin in Ethiopia*, U.S. Agency for International Development (USAID) through the International Food Policy Research Institute (IFPRI), PI, 2005-2006; $30,000

31. *Model for the Assessment of Greenhouse Gas Induced Climate Change*, Electric Power Research Institute (EPRI), PI, 2005; $20,000

PEER-REVIEWED PUBLICATIONS:

Alexander, S., G. Wang, G. Addisu, and P. Block, 2020: Forecast-informed reservoir operations to guide hydropower and agriculture allocations in the Blue Nile Basin, Ethiopia, *International Journal of Water Resources Development* (accepted.)

Delorit, J., and P. Block, 2020: Cooperative water trade as a hedge against scarcity: Accounting for risk attitudes in the uptake of forecast-informed water option contracts, *Journal of Hydrology* 583:124626, doi.org/10.1016/j.jhydrol.2020.124626.

Yang, G., S. Guo, P. Liu, and P. Block, 2020: Integration and evaluation of forecast-informed multi-objective reservoir operations, *Journal of Water Resources Planning and Management* (accepted.)

Moradi, A., A. Dariane, G. Yang, and P. Block, 2020: Long-range reservoir inflow forecasts using large-scale climate predictors, *International Journal of Climatology*, doi.org/10.1002/joc.6526 (published online.)

Delorit, J., D. Parker, and P. Block, 2019: An Agro-economic approach to framing perennial farm-scale water resources demand management for water right markets, *Agricultural Water Management* 218:68-81, doi.org/10.1016/j.agwat.2019.03.029.

Giulaiani, M., M. Zaniolo, A. Castelletti, G. Davoli, and P. Block, 2019: Detecting the state of the climate system via artificial intelligence to improve seasonal forecasts and inform reservoir operations, *Water Resources Research*, doi.org/10.1029/2019WR025035 (published online.)

Zhang, Y., L. You, D. Lee, and P. Block, 2019: Integrating Climate Prediction and Regionalization into an Agro-economic Model to Guide Agricultural Planning, *Climatic Change* 158:435-451, doi.org/10.1007/s10584-019-02559-7.

Blum, A., B. Zaitchik, S. Alexander, S. Wu, Y. Zhang, S. Shukla, T. Yimanie Alemneh, and P. Block, 2019: A Grand Prediction: Communicating and evaluating 2018 summertime Upper Blue Nile rainfall and streamflow forecasts in preparation for Ethiopia's new dam, *Frontiers in Water* 1:3, https://doi.org/10.3389/frwa.2019.00003.

Delorit, J., and P. Block, 2019: Using seasonal forecasts to inform water market-scale option contracts, *Journal of Water Resources Planning and Management* 145(5), doi.org/10.1061/(ASCE)WR.1943-5452.0001068. *Winner of 2020 Best Research-Oriented Paper Award.*

Alexander, S., S. Wu, and P. Block, 2019: Model selection based on sectoral application scale for increased value of hydroclimate prediction information, *Journal of Water Resources Planning and Management* 145(5), doi.org/10.1061/(ASCE)WR.1943-5452.0001044.

Delorit, J. and P. Block, 2018: Promoting competitive water resource use efficiency at the water-market scale: An inter-cooperative demand equilibrium-based approach to water trading, *Water Resources Research* 54(8):5394-5421, doi.org/10.1029/2017WR022323.

Lee, D., P. Ward, and P. Block, 2018: Identification of symmetric and asymmetric responses in seasonal streamflow globally to ENSO phase, *Environmental Research Letters* 13(4), doi.org/10.1088/1748-9326/aab4ca.

Mortensen, E. and P. Block, 2018: ENSO index-based insurance for agricultural protection in southern Peru, *Geosciences (invited, special issue)* 8(2), 64, doi.org/10.3390/geosciences8020064.

Lee, D., P. Ward, and P. Block, 2018: Attribution of large-scale climate patterns to seasonal peak-flow and prospects for prediction globally, *Water Resources Research* 54: 916-938, doi.org/10.1002/2017WR021205.

Wu, S., M. Notaro, S. Vavrus, E. Mortensen, R. Montgomery, J. De Pierola, P. Block, 2018: Efficacy of tendency and linear inverse models to predict southern Peru's rainy season precipitation, *International Journal of Climatology* 38:2590-2604. doi.org/10.1002/joc.5442.

Mortensen, E., S. Wu, M. Notaro, S. Vavrus, R. Montgomery, J. De Pierola, C. Sanchez, and P. Block, 2018: Regression-based season-ahead drought prediction for southern Peru conditioned on large-scale climate variables, *Hydrology and Earth Systems Sciences* 22:287-303, doi.org/10.5194/hess-22-287-2018.

Zhang, Y., S. Moges, and P. Block, 2018: Does objective cluster analysis serve as a useful precursor to seasonal precipitation prediction at local scale? Application to western Ethiopia, *Hydrology and Earth Systems Sciences* 22:143-157, doi.org/10.5194/hess-22-143-2018.

Delorit, J. and P. Block, 2017: Evaluation of model-based seasonal streamflow and water allocation forecasts for the Elqui Valley, Chile, *Hydrology and Earth System Sciences* 21:4711-4725, doi.org/10.5194/hess-21-4711-2017.

Zhang, Y., S. Erkyihun, and P. Block, 2016: Filling the GERD: Evaluating hydroclimatic variability and impoundment strategies on Blue Nile riparian countries, *Water International (invited, special issue)* 41(4):593-610, doi.org/10.1080/02508060.2016.1178467.

Taye, M., T. Tadesse, G. Senay, and P. Block, 2016: The Grand Ethiopian Renaissance Dam: a Source of Cooperation or Contention?, *Journal of Water Resources Planning and Management* 142(11):02516001, doi.org/10.1061/(ASCE)WR.1943-5452.0000708.

Zimmerman, B., D. Vimont, and P. Block, 2016: Utilizing the State of El Nino/Southern Oscillation as a Means for Season-Ahead Precipitation Predictor Selection, *Water Resources Research* 52(5):3761-3774, doi.org/10.1002/2015WR017644.

Zhang, Y., S. Moges, and P. Block, 2016: Optimal Cluster Analysis for Objective Regionalization of Seasonal Precipitation in Regions of High Spatial-Temporal Variability: Application to Western Ethiopia, *Journal of Climate* 39:3697-3717, doi.org/10.1175/JCLI-D-15-0582.1.

Reis, J., T. Culver, P. Block, and M. McCartney, 2016: Evaluating the impact and uncertainty of reservoir operation for malaria control as the climate changes in Ethiopia, *Climatic Change* 136(3-4):601-614, doi.org/10.1007/s10584-016-1639-8.

Taye, M., P. Willems, and P. Block, 2015: Implications of climate change on hydrological extremes in the Blue Nile basin: A review, *Journal of Hydrology: Regional Studies* 4 (2015):280-293, doi.org/10.1016/j.ejrh.2015.07.001.

Lee, D., P. Ward, and P. Block, 2015: Defining Flood Seasons Globally using Temporal Streamflow Patterns, *Hydrology and Earth System Sciences* 19:4689-4705, doi.org/10.5194/hess-19-4689-2015.

Gyawali, R., S. Greb, and P. Block, 2015: Temporal changes in streamflow and attribution of changes to climate and land use in Wisconsin watersheds, *Journal of the American Water Resources Association* 51(14):1138-1152, doi.org/10.1111/jawr.12290.

Zhang, Y., P. Block, M. Hammond, and A. King, 2015: Ethiopia's Grand Renaissance Dam: Implications for Downstream Riparian Countries, *Journal of Water Resources Planning and Management* 141(9):05015002, doi.org/10.1061/(ASCE)WR.1943-5452.0000520.

Dinku, T., P. Block, J. Sharoff, K. Hailermariam, D. Osgood, J. Del Corral, R. Cousin, and M. Thomson, 2014: Bridging critical gaps in climate services and applications in Africa, *Earth Perspectives* 1:15, doi.org/10.1186/2194-6434-1-15.

Robertson, A., W. Baethgen, P. Block, U. Lall, A. Sankarasubramanian, F. Souza Filho, and K. Verbist, 2014: Climate risk management for water in semi-arid regions, *Earth Perspectives* 1:12, doi.org/10.1186/2194-6434-1-12.

King, A, and P. Block, 2014: An Assessment of Reservoir Filling Policies for the Grand Ethiopian Renaissance Dam, *Journal of Water and Climate Change* 5(2): 233-243, doi.org/10.2166/wcc.2014.043.

Baker, J., P. Block, *K. Strzepek*, R. de Neufville, 2013: Power of Screening Models for Developing Flexible Design Strategies in Hydropower Projects: Case Study of Ethiopia, *Journal of Water Resources Planning and Management* 140(12):04014038, doi.org/10.1061/(ASCE)WR.1943-5452.0000417.

Block, P., and L. Goddard, 2012: Statistical and Dynamical Climate Predictions to Guide Water Resources in Ethiopia, *Journal of Water Resources Planning and Management* 138(3):287-298, doi.org/10.1061/(ASCE)WR.1943-5452.0000181.

Block, P., and K. Strzepek, 2012: Power Ahead: Meeting Ethiopia's Energy Needs Under a Changing Climate, *Review of Development Economics* 16(3):476-488, doi.org/10.1111/j.1467-9361.2012.00675.x.

Kwon, H-H, F.A. Souza Filho, P. Block, L. Sun, U. Lall, D.S. Reis Jr., 2012: Uncertainty Assessment of Hydrologic and Climate Forecast Models in Northern Brazil, *Hydrological Processes* 26(25):3875-3885, doi.org/10.1002/hyp.8433.

Block, P., 2011: Tailoring seasonal climate forecasts for hydropower operations, *Hydrology and Earth System Sciences* 15:1355-1368, doi.org/10.5194/hess-15-1355-2011.

Block, P., and K. Strzepek, 2010: Economic Analysis of Large-scale Upstream River Basin Development on the Blue Nile in Ethiopia Considering Transient Conditions, Climate Variability, and Climate Change, *Journal of Water Resources Planning and Management* 136(2):156-166, doi.org/10.1061/(ASCE)WR.1943-5452.0000022.

Block, P., A. Souza Filho, L. Sun, and H. Kwon, 2009: A Streamflow Forecasting Framework using Multiple Climate and Hydrological Models, *Journal of the American Water Resources Association* 45(4):828-843, doi.org/10.1111/j.1752-1688.2009.00327.x.

Block, P., and B. Rajagopalan, 2009: Statistical-Dynamical Approach for Streamflow Modeling at Malakal, Sudan, on the White Nile River, *Journal of Hydrologic Engineering* 14(2):185-196, doi.org/10.1061/(ASCE)1084-0699(2009)14:2(185).

Block, P., K. Strzepek, M. Rosegrant, and X. Diao, 2008: Impacts of Considering Climate Variability on Investment Decisions in Ethiopia, *Journal of Agricultural Economics* 39:171-181, doi.org/10.1111/j.1574-0862.2008.00322.x.

Morin, J., P. Block, B. Rajagopalan and M. Clark, 2008: Identification of Large Scale Climate Patterns Affecting Snow Variability in the Eastern United States, *International Journal of Climatology* 28(3):315-328, doi.org/10.1002/joc.1534.

Block, P., and B. Rajagopalan, 2007: Interannual Variability and Ensemble Forecast of Upper Blue Nile Basin Kiremt Season Precipitation, *Journal of Hydrometeorology* 8(3):327-343, doi.org/10.1175/JHM580.1.

OTHER PUBLICATIONS:

Teferi Taye, M., Semu Moges, and P. Block, 2020: Evaluation of the CMIP5 climate model for precipitation projections over the upper Blue Nile basin in *Climate Variability and Change in Africa: Perspectives, Experiences, and Sustainability.* J. Matondo, B. Alemaw, and W. Sandwidi, editors. Sustainable Development Goals Series, Springer; ISBN 9783030315429.

Alexander, S., P. Block, A. Blum, S. Shukla, S. Wu, T. Yimane, B. Zaitchik, and Y. Zhang, 2018: *Average to above average Blue Nile River flow expected in 2018*, Climate Hazards Group, University of California – Santa Barbara. http://blog.chg.ucsb.edu/?p=364.

Zhang, Y., S.T. Erkyihun, and P. Block, 2017: From projecting hydroclimate variability to filling the GERD: Upstream hydropower generation and downstream releases in *The Grand Ethiopian Renaissance Dam and the Nile Basin: Implications for transboundary water cooperation.* Z. Yihdego, A. Rieu-Clarke, and A. Cascao, editors. Earthscan Studies in Water Resource Management; ISBN 9781138064898.

Block, P. 2016: Tailoring Seasonal Climate Forecasts for Hydropower Operations in *Meteorology and Energy Security: Simulations, Projections, and Management*. P.S. Samuel, editor. CRC Press; ISBN 9781771883863.

Attendees at MIT workshop, 2015: The Grand Ethiopian Renaissance Dam: An Opportunity for Collaboration and Shared Benefits in the Eastern Nile Basin, MIT, Cambridge, MA, 17 pages.

Cervigni, R. and co-authors, 2010: The Economics of Adaptation to Climate Change: Ethiopia, The World Bank: Washington D.C., 96 pages.

Block, P. and C. Brown, 2008: Does Climate Matter? Evaluating the Effects of Climate Change on Future Ethiopian Hydropower, *Planning for an uncertain future - Monitoring, integration, and adaption. Proceedings of the Third Interagency Conference on Research in the Watersheds,* United States Geological Survey, R. Webb and D. Semmens, editors.

Baroang, K. M., M. Hellmuth, and P. Block, 2009: Identifying uncertainty and defining risk in the context of the WWDR-4. *Discussion Paper prepared for the United Nations World Water Assessment Program*, Perugia, Italy, 33 pages.

Block, P., 2008: Mitigating the Effects of Hydrologic Variability in Ethiopia: An Assessment of Investments in Agriculture and Transportation Infrastructure, Energy, and Hydroclimatic Forecasting, R4d paper 1, The CGIAR Challenge Program on Water and Food, Colombo, Sri Lanka, 53 pages.

Block, P., U. Lall, Y. Kaheil, A. Khalil, and M. Hellmuth, 2008: Applications of Insurance Mechanisms in Water Resources. Paper presented at a workshop on 'Technical Issues in Index Insurance', held 7–8 October 2008 at IRI, Columbia University, New York.

Block, P., 2008: An Assessment of Investments in Agriculture and Transportation Infrastructure, Energy, and Hydroclimatic Forecasting to Mitigate the Effects of Hydrologic Variability in Ethiopia, *CPWF Working Paper 01,* The CGIAF Challenge Program on Water and Food, Colombo, Sri Lanka*,* 53 pages.

Brown, C., A. Greene, P. Block, and A. Giannini, 2008: Review of downscaling methods for Africa climate applications, IRI Technical Report 08-05, Columbia University Academic Commons.

Block, P., K. Strzepek, and B. Rajagopalan, 2007: Integrated management of the Blue Nile Basin in Ethiopia: Hydropower and irrigation modeling, *IFPRI Discussion Paper 700*, International Food Policy Research Institute (IFPRI): Washington, D.C., 25 pages.

Sadoff, C. and co-authors, 2006: Ethiopia: Managing water resources to maximize sustainable growth, *A World Bank Water Resources Assistance Strategy for Ethiopia*, The World Bank: Washington D.C., 73 pages.

Block, P., K. Strzepek, M. Rosegrant, and X. Diao, 2006: Impacts of considering climate variability on investment decisions in Ethiopia, *EPT Discussion Paper 150*, International Food Policy Research Institute (IFPRI): Washington, D.C., 38 pages.

SELECTED PRESENTATIONS *(2015-PRESENT)*:

Block, P., G. Yang, Y. Zhang, and B. Zaitchik: Reservoir management at multiple scales: Where should we focus most? (Invited.) *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 2019.

Block, P., and B. O'Reilly: Leveraging satellite products for enhanced season-ahead water quality prediction. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 2019.

Alexander, S., P. Block, D. Brossard, E. Atsbeha, S. Negatu, K. Kirksey, and E. Holzer: A multi-method approach to communication and integration of seasonal climate information in the Blue Nile Basin, Ethiopia. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 2019.

Zaniolo, M., M. Giuliani, P. Block, and A Castelletti: Neuro-Evolutionary Policy Search for Identifying Key Inputs to Operate Multi-objective Reservoirs Exhibiting Variable Dynamics. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 2019.

Yang, G., and P. Block: Forecast-informed reservoir operations using a Bayesian approach. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 2019.

Delorit, J., and P. Block: Season-ahead hydrologic forecasts for end-users: Tailoring optimized sectoral water rights trade to account for heterogeneous risk attitudes. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 2019.

Dokou, Z., P. Block, and co-authors: Seasonal forecasting in the Blue Nile Basin, Ethiopia for ensuring food and water security. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 2019.

Lala, J., S. Alexander, and P. Block: Statistical forecasts of Ethiopia's Kiremt rainy season for rainfed agricultural planning. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 2019.

Duc Dang, T., K. Chowdhury, P. Block, and S. Galelli: Improving the performance of transnational water-energy systems through the use of seasonal rainfall forecasts: a case study in the Mekong River basin. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 2019.

Lee, D., J. Bazo, and P. Block: Prediction of flood-health vulnerability and risk to support pre-disaster management in Peru. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 2019.

Giuliani, M., M. Zaniolo, A. Castelletti, G. Davoli, and P. Block: Do we really need inflow forecasts to improve reservoir operations? *American Geophysical Union (AGU) Fall Meeting*, San Francisco, CA, December 2019.

Block, P.: Addressing vulnerability to variability: exploring novel techniques to support advanced disaster preparedness. *Demography Seminar*, UW-Madison, November 2019.

Block, P.: Seasonal climate forecasts for water and disaster management. *Climate Variability, Climate Change, and Impacts on Health in Peru Conference*, Universidad Peruana Cayetano Heredia, Lima, Peru, June 2019.

Block, P.: Novel risk management tools and strategies. *Managing Financial Risk in Environmental Systems Workshop*, Stanford University, May 2019.

Block, P., J. Lala, D. Lee, V. Anand, and J. Sydnor: Hydroclimatic and social factors for forecast-based financing programs. *World Environmental and Water Resources Congress (ASCE),* Pittsburgh, PA, May 2019.

Lala, J., D. Lee, V. Anand, J. Sydnor, and P. Block: Shifting the burden: Preparing for disasters with forecast-based financing mechanisms. *World Environmental and Water Resources Congress (ASCE),* Pittsburgh, PA, May 2019.

Yang, G. and P. Block: Impacts of climate change on reliability-based multi-objective reservoir operating rules for the Grand Ethiopian Renaissance Dam. *World Environmental and Water Resources Congress (ASCE),* Pittsburgh, PA, May 2019.

Block, P., S. Wu, B. Zaitchik, S. Shukla, A. Blum, S. Alexander, and Y. Zhang: Uncovering a regime shift in Ethiopian highland summertime precipitation with implications for seasonal prediction. *European Geophysical Union (EGU)*, Vienna, Austria, April 2019.

Block, P.: Building Resiliency: Infrastructure in the Age of Climate Change Panel. *Earth Day Conference*, Madison, WI, April 2019.

Block, P.: Planetary Health: Recognizing Earth's Limits To Advance Health for All Panel. *Global Health Institute Symposium*, UW-Madison, April 2019.

Wirz, C., D. Brossard, and P. Block: Development of A Forecast-based Flood and Health Risk Management System to Support Advanced Disaster Preparedness in Peru, *CALS Go-Global Symposium* (winner of best poster award), UW-Madison, April 2019.

Block, P., S. Wu, B. Zaitchik, S. Shukla, A. Blum, S. Alexander, and Y. Zhang: Uncovering a regime shift in Ethiopian highland summertime precipitation with implications for seasonal prediction. *American Geophysical Union (AGU) Fall Meeting*, Washington, DC, December 2018.

Castelletti, A., M. Zaniolo, M. Giuliani, and P. Block: Improving seasonal forecasts through the state of multiple large-scale climate signals to inform water management. *American Geophysical Union (AGU) Fall Meeting*, Washington, DC, December 2018.

Lee, D. and P. Block: Assessment of a flood-induced health risk prediction system. *American Geophysical Union (AGU) Fall Meeting*, Washington, DC, December 2018.

Alexander, S. and P. Block: Coupling Local-scale Hydroclimate Forecasts with Multi-purpose Reservoir Models for Enhanced Water Management in the Blue Nile Basin, Ethiopia. *American Geophysical Union (AGU) Fall Meeting*, Washington, DC, December 2018.

Zhang, Y., L. You, D. Lee, and P. Block: Integrating Climate Prediction and Regionalization into an Agro-economic Model to Guide Agricultural Planning. *American Geophysical Union (AGU) Fall Meeting*, Washington, DC, December 2018.

Estep, M., J. Delorit, J. Kasprzyk, and P. Block: Informing Many-Objective Decision-Making for Water Rights Allocations and Trading Dynamics Conditioned on a Streamflow Prediction Regime in the Elqui River Basin. *American Geophysical Union (AGU) Fall Meeting*, Washington, DC, December 2018.

Simane, B., B. Zaitchik, D. Mueller-Mahn, G. Gilioli, A. Sciarretta, P. Block, and J. Foltz: Options for building resilience and food security in the highlands of Ethiopia. *American Geophysical Union (AGU) Fall Meeting*, Washington, DC, December 2018.

Blum, A., B. Zaitchik, S. Wu, Y. Zhang, S. Alexander, S. Shukla, P. Block, and T. Yimanie: Forecast for Blue Nile river flow in 2018: evaluation and regional responses. *American Geophysical Union (AGU) Fall Meeting*, Washington, DC, December 2018.

Block, P. and D. Lee: Ten Days for Flood Protection: a game exploring risk, uncertainty, and probability in the context of forecasts and flood management. *Climate, People, and the Environment Program Seminar Series,* UW-Madison, October 2018.

Block, P. and E. Mortensen: Exploring forecast-based financing options to mitigate agricultural losses. *World Environmental and Water Resources Congress (ASCE),* Minneapolis, MN, June 2018.

Delorit, J. and P. Block: Water-coloring inside the lines: Developing demand-based inter-growers' cooperative water market interaction rulesets to promote market-scale economic efficiency within existing water law. *World Environmental and Water Resources Congress (ASCE),* Minneapolis, MN, June 2018.

Lee, D. and P. Block: Development of a flood-induced health risk prediction model: A case study for Africa. *World Environmental and Water Resources Congress (ASCE),* Minneapolis, MN, June 2018.

Alexander, S. and P. Block: Coupling local-scale hydroclimate forecasts with reservoir operation models for enhanced water management in the Blue Nile Basin, Ethiopia. *World Environmental and Water Resources Congress (ASCE),* Minneapolis, MN, June 2018.

Delorit, J. and P. Block: Do season-ahead water right allocation forecast informed option contracts improve water market-scale economic performance? An application to the Elqui Valley, Chile. *World Environmental and Water Resources Congress (ASCE),* Minneapolis, MN, June 2018.

Zhang, Y., D. Lee, and P. Block: Integrating predictive information into an agro-economic model to guide agricultural planning. *World Environmental and Water Resources Congress (ASCE),* Minneapolis, MN, June 2018.

Montgomery, R., P. Block, M. Notaro, S. Vavrus, S. Wu, E. Mortensen, J. DePierola: Using predictive and global climate models to improve understanding of droughts in southern Peru. *World Environmental and Water Resources Congress (ASCE),* Minneapolis, MN, June 2018.

Delorit, J. and P. Block: The value of season-ahead forecast information: Can season-ahead water right allocation forecasts inform option contracts and improve water market-scale economic efficiency in agriculture dominated basins? *European Geophysical Union (EGU) General Assembly*, Vienna, Austria, April 2018.

Zaniolo, M., M. Giuliani, A. Castelletti, and P. Block: Improving the management of extreme weather events using teleconnection-based seasonal hydroclimatic forecasts. *European Geophysical Union (EGU) General Assembly*, Vienna, Austria, April 2018.

Block, P.: Approaches to reducing vulnerability to variability: seasonal forecasts, financial tools, and water markets. *University of Iowa*, Iowa City, Iowa, March 2018.

Block, P.: Approaches to reducing vulnerability to variability: seasonal forecasts, financial tools, and water markets. *University of Colorado – Boulder,* Boulder, Colorado, February 2018.

Block, P.: Addressing vulnerability to variability: forecasts to support flood preparedness and public health risks, *Global Health Track Seminar, Department of Pediatrics,* February 2018.

Block, P., S. Alexander, and S. Wu: Development and Evaluation of Season-ahead Precipitation and Streamflow Predictions for Sectoral Management in Western Ethiopia. *American Geophysical Union (AGU) Fall Meeting*, New Orleans, LA, December 2017.

Delorit, J. and P. Block: Water Market-scale Agricultural Planning: Promoting Competing Water Resource Use Efficiency Through Agro-Economics. *American Geophysical Union (AGU) Fall Meeting*, New Orleans, LA, December 2017.

Lee D., and P. Block: Development of a flood-induced health risk prediction model for Africa. *American Geophysical Union (AGU) Fall Meeting*, New Orleans, LA, December 2017.

Zaitchik, B., P. Block and authors: Multi-scale Food Energy and Water Dynamics in the Blue Nile Highlands (Invited.) *American Geophysical Union (AGU) Fall Meeting*, New Orleans, LA, December 2017.

Ng, J., D. Lee, S. Galleli, and P. Block: Determining the effect of key climate drivers on global hydropower production. *American Geophysical Union (AGU) Fall Meeting*, New Orleans, LA, December 2017.

Giuliani, M., A. Castelletti, and P. Block: Improving seasonal forecasts of hydroclimatic variables through the state of multiple large-scale climate signals. *American Geophysical Union (AGU) Fall Meeting*, New Orleans, LA, December 2017.

Block, P.: Nile hydropolitics and the GERD: Current and future challenges. *Politecnico di Milano,* Milan, Italy, July 2017.

Block, P.: State of the art uncertainty analysis in hydroclimate modeling Panel. World Environmental and Water Resources Congress (ASCE), Sacramento, CA, May 2017.

Delorit, J., D. Parker, and P. Block: An agro-economic approach to farm-scale water resources management for water rights markets. *World Environmental and Water Resources Congress (ASCE),* Sacramento, CA, May 2017.

Lee, D., P. Ward, and P. Block: Using season-ahead streamflow predictions to estimate flood-induced health risks for early warning. *World Environmental and Water Resources Congress (ASCE),* Sacramento, CA, May 2017.

Mortensen, E. and P. Block: Exploring ENSO-based index insurance for agricultural protection in southern Peru. *World Environmental and Water Resources Congress (ASCE),* Sacramento, CA, May 2017.

Alexander, S. and P. Block: Evaluation of season-ahead precipitation predictions at various scales: Koga watershed, Blue Nile Basin, Ethiopia. *World Environmental and Water Resources Congress (ASCE),* Sacramento, CA, May 2017.

McGuire, C. and P. Block: Exploring precipitation forecasts to guide decision-making in Wisconsin's Central Sands. *World Environmental and Water Resources Congress (ASCE),* Sacramento, CA, May 2017.

Lee, D. and P. Block: A flood-induced health risk prediction model: understanding and development. *Global Health Institute (UW-Madison) Symposium,* April 2017.

Zaitchik, B., J. Foltz, M. Ozdogan, B. Simane, S. Siddiqui, and P. Block: Multi-scale Food, Energy, and Water Dynamics in the Blue Nile Highlands. *American Meteorological Society Annual Meeting*, Boston, Massachusetts, January 2017.

Zaitchik, B., D. Ghatak, S. Kumar, F. Policelli, and P. Block: Opportunities and Challenges for Hydrological Analysis in the HKH: Emerging experiences from the South Asia Land Data Assimilation System. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, California, December 2016.

Block, P. and Y. Zhang: Integrating predictive information into an agro-economic model to guide agricultural planning. *European Geophysical Union (EGU) Annual Meeting,* Vienna, Austria, April 2017.

Samale, C., P. Block, M. Giuliani, and A. Castelletti: Improving seasonal forecasts through the state of large-scale climate signals. *European Geophysical Union (EGU) Annual Meeting,* Vienna, Austria, April 2017.

McGuire, C. and P. Block: Exploring groundwater forecasts to guide decision-making in Wisconsin's Central Sands. *Wisconsin section of the American Water Resources Association,* Elkhart Lake, Wisconsin, March 2017.

Tassew Erkyihun, S., D. Lee, and P. Block: Streamflow Simulation Conditioned on Global Scale Sea Surface Temperatures. *American Geophysical Union (AGU) Fall Meeting*, San Francisco, California, December 2016.

Lee, D., P. Ward, and P. Block: A Preliminary Season-ahead Prediction of Global Flood Risks. *World Environmental and Water Resources Congress (ASCE)*, West Palm Beach, FL, May 2016.

Block, P.: ENSO & Floods. *Understanding Risk*, Venice, Italy, May 2016.

Lee, D., P. Ward, and P. Block: A Preliminary Season-ahead Prediction of Global Flood Risks. *World Environmental and Water Resources Congress (ASCE)*, West Palm Beach, FL, May 2016.

Zhang, Y. and P. Block: Predicting Seasonal Precipitation and Integrating Predictive Information into an Agro-economic Model to Guide Agricultural Management. *World Environmental and Water Resources Congress (ASCE)*, West Palm Beach, FL, May 2016.

Delorit, J. and P. Block: Multi-stage Season-ahead Streamflow Forecasts to Inform Water0rights Based Reservoir Allocation Strategies. *World Environmental and Water Resources Congress (ASCE)*, West Palm Beach, FL, May 2016.

Mortensen, E. and P. Block: Season-ahead Drought Prediction for Enhanced Water Resources Management in Southern Peru. *World Environmental and Water Resources Congress (ASCE)*, West Palm Beach, FL, May 2016.

Lee, D., P. Ward, and P. Block: A Preliminary Evaluation of Season-ahead Flood Prediction Conditioned on Large-scale Climate Drivers. *European Geophysical Union General Assembly*, Vienna, Austria, April 2016.

Block, P.: Water for Development: The Utility of Precipitation and Streamflow Forecasts in Sectoral Decision-Making. *American Meteorological Society Annual Meeting*, New Orleans, Louisiana, January 2016.

Zhang, Y., S. Moges, and P. Block: Comparison of Season-ahead Prediction Techniques on Regionalized Grid-level Precipitation: Application to Western Ethiopia. *American Geophysical Union (AGU) Fall Meeting,* San Francisco, California, December 2015.

Lee, D., P.Ward, and P. Block: A Preliminary Evaluation of Season-ahead Flood Risks Globally. *American Geophysical Union (AGU) Fall Meeting,* San Francisco, California, December 2015.

Zimmerman, B. and P. Block: Utilizing the State of ENSO as a Means for Season-ahead Predictor Selection. *American Geophysical Union (AGU) Fall Meeting,* San Francisco, California, December 2015.

Block, P.: Precipitation Forecasts and Water Resources Management in Ethiopia. *Africa and the Environment Symposium,* October 2015.

A Look at Ethiopia's Grand Dam Plan: Implications for Downstream Countries. *Global Science at the Wisconsin Science Festival,* October 2015.

Block, P.: A Look at Ethiopia's Grand Dam Plan: Implications for Riparian Countries. *Wednesday Nite @ The Lab Public Science Series*, September 2015.

Block, P.: Filling the Grand Ethiopian Renaissance Dam and Implications for Riparian Neighbors. *World Water Congress XV (IWRA)*, Edinburgh, Scotland, May 2015.

Zimmerman, B. and P. Block: Utilizing the State of ENSO as a Means for Season-ahead Predictor Selection. *World Environmental and Water Resources Congress (ASCE)*, Austin, TX, May 2015.

Grzegorzewski, M., D. Watkins, and P. Block: Coupling Reservoir Inflow Forecasts and Decision Tools: Bolstering Decision-making in the Lower Colorado River Basin. *World Environmental and Water Resources Congress (ASCE)*, Austin, TX, May 2015.

Zhang, Y. and P. Block: Regionalization and Prediction of Seasonal Precipitation in Ethiopia. *World Environmental and Water Resources Congress (ASCE),* Austin, TX, May 2015.

Lee, D., P. Ward, and P. Block: Flood Prediction: Can a Global Scale Analysis be Informative? *World Environmental and Water Resources Congress (ASCE),* Austin, TX, May 2015.

Gyawali, R., S. Greb, and P. Block: Application of hydraulic and regression based models to assess hydrologic impacts on Wisconsin River Islands. *World Environmental and Water Resources Congress (ASCE),* Austin, TX, May 2015.

Block, P.: Filling the Grand Ethiopian Renaissance Dam: Implications for Riparian Countries. *Blue Nile Water Institute 2nd National Symposium*, Bahir Dar, Ethiopia, April 2015.

RESEARCH EXPERIENCE:

Associate Research Scientist, 2009-2011 & Postdoctoral Research Scientist, 2007-2009
International Research Institute for Climate and Society (IRI), Columbia University
Researcher, 2008-2011
Columbia Water Center, Columbia University
Advisors*:* Dr. Upmanu Lall & Dr. Casey Brown

- Sustainability and climate risk management of water resources
- Effect of climate variability and change on water systems, particularly in developing countries
- Hydrologic forecasting and uncertainty
- Index insurance for flooding and agriculture
- Policy and mechanisms for increased reliability and poverty reduction through water management

Doctoral Research Assistant, 2005-2006
Department of Civil, Environmental, and Architectural Engineering, University of Colorado, and the International Food Policy Research Institute (IFPRI), Washington, DC
Advisors: Dr. Balaji Rajagopalan (UCB), Dr. Mark Rosegrant (IFPRI) & Dr. Kenneth Strzepek (UCB)

- Assessment of interannual variability and ensemble forecast of precipitation in Ethiopia
- Stochastic analysis of hydropower and irrigation investments in Ethiopia under climate change, considering implications to downstream riparian countries.

Research Assistant, 2005
National Center for Atmospheric Research, Boulder, Colorado, and Electric Power Research Institute, Palo Alto, California
Advisers**:** Dr. Tom Wigley (NCAR) & Dr. Allen Manne (Stanford)

- Creation of a climate model depicting appropriate life cycles and impacts of greenhouse gases, dependent upon emission levels, to mimic MAGICC

- Aggregation of climate model with the energy policy model MERGE to form a complete integrated assessment model for emission optimization.

Masters Research Assistant, 2004
Department of Civil, Environmental, and Architectural Engineering, University of Colorado
Advisor: Dr. Kenneth Strzepek

- Hydroclimatic and water resources modeling evaluating viable trade-offs between investment in agricultural irrigation and/or road construction in Ethiopia

TEACHING EXPERIENCE:

Assistant/Associate Professor, *University of Wisconsin – Madison, 2013-*
- Fluid Mechanics, Hydroclimatology for Water Resources, Water Resources Systems Analysis, Civil and Environmental Decision-Making

Assistant Professor, *Drexel University, 2011-2013*
- Open Channel Flow, Watershed Analysis, Hydroclimatology, Fluid Mechanics

Co-Instructor, *Columbia University, 2009-2011*
- Management and Development of Water Systems

Assistant Professor Adjunct, *University of Colorado, 2006-2007*
- Modeling of Hydrologic Systems, Senior Design, Introduction to Geomatics (co-instructor)

Teaching Assistant, *University of Colorado, 2003-2004*
- Undergraduate Fluid Mechanics

Instructor, *Rochester Community and Technical College, Rochester, Minnesota, 2001-2003*
- Introduction to Engineering and Fluid Mechanics for civil engineering technology students

Instructor, *Liberian Refugee School, Toulepleu, Ivory Coast, 1999-2000*
- Math and physics courses for high school level refugee students

ADDITIONAL PROFESSIONAL EXPERIENCE:

Project Engineer, *Short Elliott Hendrickson Inc., Rochester, Minnesota, 2001-2003*
- Civil and municipal engineering work, primarily utility extension design, storm water design, site grading plans, and construction observation

Project Manager and Engineer*, Environmental Concepts and Design, St. Paul, Minnesota, 1997-1999*
- Environmental, civil, and hydrogeologic engineering, primarily subsurface conditions, groundwater monitoring and analysis, landfill design, monitoring, and construction oversight.

Staff Engineer, *Harza Engineering Company, Chicago, Illinois, 1993-1994*
- Cooperative engineering opportunity in water, structural, and geotechnical divisions

AWARDS AND RECOGNITION:

UW-Madison Emil Steiger Distinguished Teaching Award	2020
Fulbright Scholar	2020-2021
Winner of Best Research-Oriented Paper Award, *Journal of Water Resources Planning and Management*	2020
Polygon Outstanding Engineering Faculty Teaching Award	2014
Drexel University Career Development Award	2012
Best Reviewer Award, Journal of Water Resources Planning and Management	2010
DISCCRS Scholar (Dissertation Initiative for the Advancement of Climate Change Research) for early career professionals; NSF sponsored	2008
NCAR Colloquium on Climate & Health Invited Participant	2006
Joint Assembly Student Grant Awardee	2006
IFPRI/USAID Fellowship	2005-06
Graduate Teacher Program Teacher Training Certificate, University of Colorado at Boulder	2005
Tau Beta Pi – National Engineering Honor Society, Valparaiso University	1995
Distinguished Student Award, Valparaiso University	1995

LICENSURE:

Licensed Professional Engineer in Colorado

PROFESSIONAL AFFILIATIONS:

American Geophysical Union
American Society of Civil Engineers, EWRI
Tau Beta Pi National Engineering Society

UNIVERSITY OF WISCONSIN - MADISON AFFILIATIONS:

Center for Climatic Research	Freshwater and Marine Sciences
Latin American, Caribbean & Iberian Studies Program	African Studies Program
Gaylord Nelson Institute for Environmental Science	Wisconsin Energy Institute

TRAININGS AND CURRICULUM DEVELOPMENT:

Short Course on Hydroclimatic Prediction (UPV, Valencia, Spain)	2019
Development of Serious Games for NASA workshop	2017, 2018
Training Institute on Adaptive Management of Water Resources	2012
Hydrologic outlooks for hydrologists (training trainers)	2010
Water and climate risk management for NOAA Africa Desk scientists	2010
Water and climate risk management for Ethiopian water professionals	2009
Hydroclimatic forecast tools for Chilean scientists	2007

SERVICE:

Associate Editor, Journal of Water Resources Planning and Management (ASCE)

Journal Reviewer: Advances in Water Resources, Bulletin of the American Meteorological Society, Climatic Change, Earth Science Informatics, Energy Science and Engineering, Environmental Modelling &

Software, Geophysical Research Letters, Hydrological Processes, Hydrology and Earth System Sciences, International Journal of Climatology, Journal of Hydrologic Engineering, Journal of Hydrology, Journal of Hydrometeorology, Journal of Water Resources Planning & Management, Theoretical and Applied Climatology, Water, Water Resources Research

Proposal Reviewer: National Science Foundation, National Academy of Sciences, NOAA Climate Program Office, Department of Energy, US Bureau of Reclamation, Sea Grant, UW-Madison

Engineers without Borders Faculty mentor, UW-Madison, 2014-2019

Water Resources Management Program Faculty Committee, UW-Madison, 2017-

Advisory board member for UW-Madison Global Health Institute (co-chair 2019-2021) and Wisconsin Without Borders, 2017-

Center for Climatic Research Science Council, UW-Madison, 2018-

Civil and Environmental Engineering Innovation Competition Judge, UW-Madison, 2019

College of Engineering NSF CAREER proposal panel, UW-Madison, 2019

WMO Climate and Hydrology Expert Group on Seasonal Streamflow Forecasting

ASCE EWRI International Council Technical Executive Committee; track chair for past conferences

ASCE EWRI Environmental and Water Resources Systems Committee past-chair; task committee lead

International Federation of the Red Cross Forecast-based Financing Dialogue Platform

Session convener/moderator for 2012-2019 AGU Fall Meetings and EWRI Congress

Session convener/moderator for 2017-2018, 2020 EGU Annual Meeting

Session convener/moderator for 2017 XVI World Water Congress

Session convener/moderator for 2018 CUAHSI Conference

Session convener/moderator for 2018 Nelson Institute Earth Day Conference

Energy Summit 2014 (UW) panel organizer, chair, moderator

Session chair for January 2010 Conference on Water Resources in Ethiopia, Addis Ababa, Ethiopia

Panel participant: *Adapting to climate change: the water challenge*, Earth Institute, Columbia University 2010

Postdoctoral search committee, Columbia University

REU summer internship mentor at Drexel University 2012

IRI/International Federation of the Red Cross summer internship mentor 2009, 2010

Hosted undergraduate student from Ecole Nationale Supérieure des Mines de Nancy (France), Mar-Aug 2011

A+ Freshman Engineering Council (pedagogical committee)