

Naoki Mizukami

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RESEARCH INTEREST

- Hydrologic model parameterization and calibration
- Distributed hydrologic modeling
- Seasonal snowpack climatology
- Spatial interpolation technique of hydro-meteorological variables
- Remote sensing for hydrology

EDUCATION

8/2004-6/2011: **University of Utah, Ph.D. in Civil Engineering (Emphasis on Water Resources).**

PhD dissertation: Spatial and temporal snow distribution estimates over the mountainous regions in the western United States.

8/2000-5/2003: **University of Utah, M.S. in Civil Engineering (Emphasis on Water Resources).**

Thesis: Modeling of snow water equivalent distribution in a meso-scale mountainous watershed with GIS.

4/1998-3/2000: **Hokkaido University, M.S. in Environmental Earth Science (Emphasis on Cryosphere Science).**

Thesis: Normal stress dependency on ice-ice friction

4/1994-3/1998: **Hokkaido University, B.S. Geophysics.**

PROFESSIONAL EXPERIENCE

11/2013-present: **Associate Scientist III (National Center for Atmospheric Research).**

Project: Funded by USBR and USACE. Hydrologic model parameter estimations with transfer function and upscaling methods, River routing tool development for continental wide streamflow estimates.

11/2011-11/2013: **Post-doctoral researcher (National Center for Atmospheric Research).**

Project: Sensitivity of hydrologic impact assessment to downscaling methodology and spatial resolution.

11/2007-11/2011: **Research Hydrologist (LEN Technologies),** Hydrology group, Office of Hydrologic Development, National Weather Service, NOAA, USA. Developed snow accumulation and ablation model parameterization over the United States, Contributed to Distributed Model Inter-comparison II (Sierra Nevada basin experiments); Contributed to hydrologic modeling and analysis for NOAA Hydrometeorology Testbed. Assisted in calibration training (lumped and distributed model) for NWS River Forecast Center.

03/2003-11/2007: **Water Resources Engineer (Michael Baker Jr. Inc. Salt Lake City, UT),** Designed storm

drainage systems for various highway, railway and roadway design projects; Contributed to hydrologic and hydraulic analyses (floodplain, river) for various bridge design projects.

01/2003-05/2003: **Teaching Assistant - Hydrology (University of Utah, Salt Lake City, UT)**, Designed and led weekly discussion session; Led HEC-HMS lab session. Assisted students with homework.

09/2002-12/2002: **Teaching Assistant –Statics (University of Utah, Salt Lake City, UT)**, Assisted student with homework. Graded homework.

05/2001-01/2002: **Student Intern (Utah Department of Transportation, Salt Lake City, UT)**, Assisted in CAD drawing for drainage design.

PUBLICATIONS

Melsen, L., N. Addor, **N. Mizukami**, A. J. Newman, P.J.J.F. Torfs, M. P. Clark, R. Uijlenhoet, and A. J. Teuling: Mapping (dis)agreement in hydrologic projections, *Hydrol. Earth Syst. Sci.*, 22, 1775-1791, <https://doi.org/10.5194/hess-22-1775-2018>, 2018.

Addor, N., A.J. Newman, **N. Mizukami**, and Clark, M. P.: The CAMELS data set: catchment attributes and meteorology for large-sample studies, *Hydrol. Earth Syst. Sci.*, 21, 5293-5313, <https://doi.org/10.5194/hess-21-5293-2017>.

Wobus, C., Gutmann, E., Jones, R., Rissing, **M.**, **Mizukami**, N., Lorie, M., Mahoney, H., Wood, A. W., Mills, D., and Martinich, J., 2017: Modeled changes in 100 year Flood Risk and Asset Damages within Mapped Floodplains of the Contiguous United States, *Nat. Hazards Earth Syst. Sci.* 17, 2199-2211, <https://doi.org/10.5194/nhess-17-2199-2017>.

Mizukami, N., M. Clark, A. Newman, A. Wood, E. Gutmann, B. Nijssen, O. Rakovec, L. Samaniego, 2017: Towards seamless large domain parameter estimation for hydrologic models. *Water Resources Research*, 53, 8020–8040, doi:[10.1002/2017WR020401](https://doi.org/10.1002/2017WR020401).

Newman, A. J., **N. Mizukami**, M. P. Clark, A. W. Wood, B. Nijssen, and G. Nearing, 2017: Benchmarking of a physically based hydrologic model. *J. Hydrometeorol*, 18,2215-2225. doi: <http://dx.doi.org/10.1175/JHM-D-16-0284.1>.

Mizukami, N., Clark, M. P., Sampson, K., Nijssen, B., Mao, Y., McMillan, H., Viger, R. J., Markstrom, S. L., Hay, L. E., Woods, R., Arnold, J. R., and Brekke, L. D. (2016): mizuRoute version 1: a river network routing tool for a continental domain water resources applications, *Geosci. Model Dev.*, 9, 2223-2238, doi:10.5194/gmd-9-2223-2016.

Mendoza, P. A., **N. Mizukami**, K. Ikeda, M. P. Clark, E. D. Gutmann, J. R. Arnold, L. D. Brekke, and B. Rajagopalan, 2016: Effects of different regional climate model resolution and forcing scales on projected hydrologic changes. *Journal of Hydrology*, **541**, S0022169416304899, doi:10.1016/j.jhydrol.2016.08.010.

Melsen, L., A. Teuling, P. Torfs, M. Zappa, **N. Mizukami**, M. Clark, and R. Uijlenhoet. (2016): Representation of spatial and temporal variability in large-domain hydrological models: case study

for a mesoscale pre-Alpine basin, *Hydrol. Earth Syst. Sci.*, 20, 2207-2226, doi:10.5194/hess-20-2207-2016.

Melsen, L., A. Teuling, P. Torfs, R. Uijlenhoet, **N. Mizukami**, and M. P. Clark, (2016): HESS Opinions: The need for process-based evaluation of large-domain hyper-resolution models, *Hydrol. Earth Syst. Sci.*, 20, 1069-1079, doi:10.5194/hess-20-1069-2016.

Mizukami, N., M. P. Clark, E. D. Gutmann, Mendoza, P. A. J. Newman, B. Nijssen, B. Livneh, L. Hay, L. D. Brekke, and J. R. Arnold, (2015): Implications of the methodological choices for hydrologic portrayals of climate change over the Contiguous United States: statistically downscaled forcing data and hydrologic models. *J. Hydrometeorol.*, 17, 73–98. doi: <http://dx.doi.org/10.1175/JHM-D-14-0187.1>

Newman, A. J., M. P. Clark, J. Craig, B. Nijssen, A. Wood, E. Gutmann, **N. Mizukami**, L. Brekke, and J. R. Arnold, (2015): Gridded Ensemble Precipitation and Temperature Estimates for the Contiguous United States. *Journal of Hydrometeorology*, 16, 2481–2500, doi: 10.1175/JHM-D-15-0026.1.

Mendoza, P. A., Clark, M. P., **Mizukami, N.**, Gutmann, E. D., Arnold, J. R., Brekke, L. D., and Rajagopalan, B. (2016) How do hydrologic modeling decisions affect the portrayal of climate change impacts?. *Hydrol. Process.*, 30: 1071–1095. doi: 10.1002/hyp.10684

Mendoza, P, M. P. Clark, **N. Mizukami**, A. J. Newman, M. Barlage, E. D. Gutmann, R. M. Rasmussen, B. Rajagopalan, L. D. Brekke, and J. R. Arnold, (2015): Effects of Hydrologic Model Choice and Calibration on the Portrayal of Climate Change Impacts. *J. Hydrometeorol.*, 16, 762–780. doi: <http://dx.doi.org/10.1175/JHM-D-14-0104.1>

Elsner, M., S. Gangopadhyay, L. Pruitt, T. Brekke, **Mizukami, M.** Clark, (2014) How does the choice of distributed meteorological data affect hydrologic model calibration and sensitivity analysis? *J. Hydrometeorol.* 15. 1384-1403. doi: <http://dx.doi.org/10.1175/JHM-D-13-083.1>.

Smith, M. B., and Co-authors, (2013) The Distributed Model Intercomparison Project - Phase 2: Experiment Design and Summary Results of the Western Basin Experiments. *J. Hydrology*, doi:10.1016 /j.jhydrol.2013.08.040.

Mizukami, N. M. Clark , A.G. Slater, . L. Brekke, M. Elsner, J. Arnold, S. Gangopadhyay, (2014) Hydrologic implications of different large-scale meteorological model forcing data sets in mountainous regions. *J. Hydrometeorology*. doi:10.1175/JHM-D-13-036.1.

Mizukami, N. V. Koren , M. Smith, D. Kingsmill, Z. Zhang, B. Cosgrove, Z. Cui , (2013) The impact of precipitate on type discrimination on hydrologic simulation - rain-snow partitioning derived from HMT-West radar-detected bright- band height versus surface temperature data. *J. Hydrometeorology*. 14, 1139-1158. doi:10.1175/JHM-D-12-035.1.

Yatheendradas, S., C. D. Peters-Lidard, V. I. Koren, B. Cosgrove, L. G. G. de Gonçalves, M. B. Smith, J. Geiger, Z. Cui, J. Borak, S. Kumar, D. Toll, G. A. Riggs, and **N. Mizukami** (2012), Distributed assimilation of satellite-based snow extent for improving simulated streamflow in mountainous, dense forests: An example over the DMIP2 western basins, *Water Resources Research*, doi:10.1029/2011WR011347.

Mizukami, N. and M. Smith (2012) Analysis of inconsistencies in multi-year gridded quantitative

precipitation estimate over complex terrain and its impact on hydrologic modeling. *Journal of Hydrology*, doi:10.1016/j.hydrol.2012.01.030.

Smith, M., V. Koren, Z. Zhang, Y. Zhang, S. Reed, Z. Cui, F. Moreda, B. Cosgrove, **N. Mizukami**, and E. Anderson (2011) Results of the DMIP 2 Oklahoma Experiments. *Journal of Hydrology*, 418-419, 8,17-48,doi:10.1016/j.hydrol.2011.08.056.

Mizukami, N. and S. Perica (2011) Towards improved snow water equivalent retrieval algorithms for satellite passive microwave data over the mountainous basins of the western United States. *Hydrological Processes*, doi:10.1002/hyp.8333.

Mizukami, N., S. Perica and D. Hatch (2011) Regional approach for mapping climatological snow water equivalent over the mountainous regions of western United States. *Journal of Hydrology*, 400,1-2,72-82. doi:10.1016/j.hydrol.2011.01.019.

Mizukami, N., and S. Perica (2008) Spatio-temporal characteristics of snowpack density in the mountainous regions of western United States. *Journal of Hydrometeorology* 9, 1416–1426.

Maeno, N., M. Arakawa, A. Yasutome, **N. Mizukami**, and S. Kanazawa (2003) Ice-ice friction measurements, and water lubrication and adhesion-shear mechanism. *Canadian Journal of Physics*, 81 (6), 241 – 249.

Mizukami, N., and N. Maeno (2000). Normal stress dependence of ice-ice friction coefficients. *Journal of Japanese Society of Snow and Ice (SEPPYO)*, 62 (6), 515 - 521 (In English).

CONFERENCE PRESENTATIONS (only first Author)

Mizukami, N., M. Clark, A. Newman, A. Wood, B. Nijssen (2017). Attaining insight into interactions between hydrologic model parameters and geophysical attributes for national-scale model parameter estimation. Poster presentation. AGU Fall Meeting, December, 2017, New Orleans.

Mizukami, N., M. Clark, A. Newman, A. Wood, B. Nijssen (2016). CONUS domain application of Multi-scale Parameter Regionalization for spatially distributed model parameter estimates. Oral presentation. AGU Fall Meeting, December, 2016, San Francisco.

Mizukami, N., M. Clark, A. Newman, A. Wood, B. Nijssen (2016). Continental-domain hydrologic model parameter estimations with Multi-scale Parameter Regionalization: Application to VIC. Oral presentation, EGU General Assembly Conference, Vienna.

Mizukami, N., M. Clark, B. Nijssen, K.M. Sampson, A. Newman, L.Samaniego (2014). Generalized Continental Scale Hydrologic Model Parameter Estimates: Application to a VIC model implementation for the Contiguous United States (CONUS). Oral presentation. AGU Fall Meeting, December, 2013, San Francisco.

Mizukami, N., M. Clark, E.D. Gutmann, P.A. Mendoza, J.Arnold, L.Brekke (2013). Addressing impacts of different statistical downscaling methods on large scale hydrologic simulations. AGU Fall Meeting, December, 2013, San Francisco.

Mizukami, N, M Clark, E Gutmann, P Mendoza (2013). Impact of methodological choices in the portrayal of hydrological impacts of climate change. Poster presentation, EGU General Assembly Conference, Vienna.

Mizukami, N., and M. Clark (2012). Simulated Hydrologic sensitivity to climate variability, Poster presentation. AGU Fall Meeting, December, 2012, San Francisco.

Mizukami, N., and M. Clark (2012). Simulated Hydrologic sensitivity to climate variability, Poster presentation. NOAA's 37th Climate Diagnostics and Prediction Workshop, 2012, Ft Collins, CO.

Mizukami, N. (2011). Spatial and Temporal snow distribution over the mountainous regions of the western United States, NOAA OneScience Seminars, Silver Spring, MD.

Mizukami, N., and M. Smith (2010). Diagnosis of inconsistencies in multi-year gridded precipitation data over mountainous areas and related impacts on hydrologic simulation, Poster presentation. AGU Fall Meeting, December, 2010, San Francisco.

Mizukami, N., V. Koren and M. Smith (2008). SNOW-17 a prior parameterization update, Oral presentation. National DOH Workshop, July 15-17, 2008, Silver Spring, MD.

Mizukami, N., and V. Koren (2008). [Methodology and evaluation of melt factor parameterization for distributed SNOW-17](#), Oral presentation. AGU Fall Meeting, December, 2008, San Francisco.

Mizukami, N., and S. Perica (2006). Development of passive microwave snow water equivalent retrieval algorithms for mountain regions in the western United States. Poster presentation. AGU Fall Meeting, San Francisco, CA, U.S.A.

Mizukami, N., S. Perica, and D. Hatch (2006). Statistical analysis of temporal and spatial variations of snowpack density using SNOTEL data. Poster presentation. *Proceedings of the 74th Western Snow Conference*, Las Cruces, NM, U.S.A.

Perica S., N. Mizukami, and A. Merrill (2003). Regional flood frequency equations: What level of complexity is rational?," *AGU Fall Meeting*, San Francisco, CA, U.S.A.

Mizukami, N., R. Decker, and R. Julander (2003). Modeling of snow water equivalent distribution in meso-scale mountainous watershed with geographic information system. Oral presentation *Proceedings of the 71st Western Snow Conference*, Scottsdale, AZ, U.S.A.

Mizukami N., and N. Maeno. (1999), Normal stress dependence of ice-ice friction. Oral presentation (in Japanese) *Annual meeting of Japanese society of snow and ice*, Yonago, Japan.

PFOFFESIONAL ACTIVITIES

Journal reviewer: *Journal of Applied meteorology and climatology* (5), *Advances in water resources* (2); *Journal of Hydrology* (4), *Journal of Climate* (1), *Journal of hydrometeorology* (2), *Water Resources Research* (4), *Journal of Hydrologic Engineering* (3).

Proposal reviewer: National Oceanic Atmospheric Administration.

Proposal panel reviewer: NASA (2).

Membership: American Geophysical Union (since 2004), Japanese Society of Snow and Ice (since 2000).

Other: Co-convenor: AGU 2010 Fall Meeting Session: Advances in Hydrologic Modeling and Prediction.

Other: Mentoring undergraduate scholar from NOAA Educational Partnership Program

SKILL

Proficient in following computer languages: MATLAB, Fortran 90 or later, Perl, Python, Linux Bash scripts.

Experienced with Visual Basic, C++

Proficient with geographic information system (ArcGIS, GRASS), NCL, NCO, CDO

Experienced with remote sensing image processing with ENVI.