

## KEI YOSHIMURA

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### RESEARCH INTERESTS

- Study of stable water isotope (HDO and H<sub>2</sub><sup>18</sup>O) circulation
- Data assimilation, particularly for stable water isotopes with the ensemble Kalman filter
- Reconstruction of past climate using isotopic proxies
- Dynamical downscaling and development of a Regional Earth System Model
- Study on terrestrial hydrologic cycles and development of river and land surface models

### REMARKS ON RESEARCH

My current research is focused on various interdisciplinary areas including global and regional meteorology, land surface and atmospheric hydrology, and paleoclimatology, all of which are bridged by natural isotopic tracers. The main thrust of my work is toward better understanding of the Earth climate system, and this is explored both by utilizing additional information obtained from isotopic records and by developing models that simulate the observed processes. Moreover, I would emphasize that, by being an intensive climate system modeler with great knowledge of isotopic tracers myself, I am fully capable of bridging the divide between retrospective and forward modeling efforts in paleo- and current/future climate studies.

### EDUCATION

February 2006 Ph.D. Civil Engineering from The University of Tokyo, Tokyo, Japan  
September 2002 M.S. Civil Engineering from The University of Tokyo, Tokyo, Japan  
March 2000 B.S. Civil Engineering from The University of Tokyo, Tokyo, Japan

### PROFESSIONAL EXPERIENCE

April 2016 to present *Associate Professor* at Institute of Industrial Science, The University of Tokyo, Japan  
March 2010 to March 2016 *Associate Professor* at Atmosphere and Ocean Research Institute, The University of Tokyo, Kashiwa, Japan  
August 2008 to March 2010 *Project Scientist* at Scripps Institution of Oceanography, UCSD, La Jolla, CA, USA (*Visiting Scholar* during June 2006 to May 2008)  
October 2002 to July 2008 *Assistant Professor* at Institute of Industrial Science, The University of Tokyo, Tokyo, Japan (*Research Associate* during May 2004 to March 2007)

### HONORS AND AWARDS

August 2016 *Outstanding Discussion Award* from Japan Society of Civil Engineering  
March 2014 *Thesis Award* from Japan Society of Civil Engineering  
April 2012 *The Young Scientists' Prize, The Commendation for Science and Technology* from the Minister of Education, Culture, Sports, Science and Technology  
October 2011 *Innovation Award for ACRS2011* from AARS Foundation  
August 2008 *Thesis Award for Young Scientists* from Japan Society of Hydrology and Water Resources Engineering  
June 2006 *Postdoctoral Fellowships for Research Abroad* from Japan Society for the Promotion of Science  
March 2004 *Thesis Award for Young Scientists* from Japan Society of Civil Engineering

## KEI YOSHIMURA

September 2002 *Furuichi Award* (upper 10% of master course graduates) from Civil Engineering Department, The University of Tokyo Graduate School

### GRANTS

- 2016-2018 *PI*: Detailed investigation on hydrologic cycles in atmosphere and land surface using isotope data assimilation system, JSPS, \$100K.
- 2015-2016 *PI*: Development of weather data assimilation system, JSPS, \$50K.
- 2014-2016 *PI*: Detailed investigation on hydrologic cycles in atmosphere and land surface using isotope data assimilation system, JSPS, \$200K.
- 2012-2016 *PI*: Improvement in Cost-Efficiency of Dynamical downscaling for Ensemble data, Program for Risk Information on Climate Change, MEXT, \$1,000K
- 2011-2016 *PI*: A tracer simulator of fallout radionuclides for safe and sustainable water use, CREST on "Innovative Technology and System for Sustainable Water Use", JST, \$500K
- 2011-2013 *PI*: "Development of isotope-CGCM for comprehensive understanding of climate proxy data", JSPS, \$300K.
- 2010-2011 *PI*: "20<sup>th</sup> century Reanalysis with stable water isotope information," Japan Society for the Promotion of Science, \$30,000.
- 2010-2013 *Co-PI*: "Is the current drought affecting the Western US unique from earlier droughts of the 20th Century and therefore attributable to anthropogenic climate change?" NOAA/CPO, \$544,022.
- 2006-2008 *PI*: "Study on processes of Earth hydrological cycle with stable water isotopes," Japan Society for the Promotion of Science, \$88,000.
- 2005-2006 *PI*: "Development of a stable water isotope circulation model with land surface process," Japan Society for the Promotion of Science, \$30,000.

### EDITORIAL SERVICE

- 2013 to present *Associate Editor* for Progress in Earth and Planetary Science
- 2010 to present *Associate Editor* for Asia-Pacific Journal of Atmospheric Sciences
- 2008 to present *Associate Editor* for Hydrological Research Letters

### INTERNATIONAL COLLABORATIVE RESEARCH ACTIVITIES

- 2013 to 2016 *Member*: GEWEX Hydrological Panel, WCRP
- 2008 to 2012 *Co-chair*: The second phase of the Stable Water Isotope Intercomparison Group (SWING2)
- 2007 to 2010 *Project Planning Committee Member*: Coordinated Energy and Water Cycle Observations Project (CEOP)
- 2004 to 2007 *Core Member*: Stable Water Isotope Intercomparison Group (SWING)
- 2004 to 2006 *Core Member*: Isotopes in Project for Intercomparison of Land-surface Parameterization Schemes (iPILPS)

### SELECTED PUBLICATIONS

1. Okazaki, A. and K. Yoshimura, 2017: Development and evaluation of a system of proxy data assimilation for paleoclimate reconstruction, *Clim. Past*, doi:10.5194/cp-2016-12.
2. Wei, Z., K. Yoshimura, L. Wang, D. Miralles, S. Jasechko, X. Lee, 2017: Revisiting the contribution of transpiration to global terrestrial evapotranspiration, *Geophys. Res. Lett.*, doi:10.1002/2016GL072235.
3. Takakura, T., R. Kawamura, T. Kawano, K. Ichiyangi, M. Tanoue, K. Yoshimura, 2017: An

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- estimation of water origins in the vicinity of a tropical cyclone's center and associated dynamic processes, *Clim. Dyn.*, doi:10.1007/s00382-017-3626-9.
4. Ramzan, M., S. Ham, M. Amjad, E.-C. Chang and K. Yoshimura, 2017: Sensitivity evaluation of spectral nudging schemes in historical dynamical downscaling for South Asia, *Advances in Meteorology*, doi:10.1155/2017/7560818.
  5. Steen-Larsen, H.C., C. Risi, M. Werner, K. Yoshimura, V. Masson-Delmotte, 2017: Evaluating the skills of isotope-enabled general circulation models against in situ atmospheric water vapor isotope observations, *J. Geophys. Res. Atmos.*, **122**, doi:10.1002/2016JD025443.
  6. Rahul P., P. Ghosha, S.K. Bhattacharya and K. Yoshimura, 2016: Controlling factors of rainwater and water vapor isotopes at Bangalore, India: Constraints from observations in 2013 Indian mon- soon, *J. Geophys. Res. Atmos.*, **121**, doi:10.1002/2016JD025352.
  7. Yoshikane, T., K. Yoshimura, E.-C. Chang, A. Saya, and T. Oki, 2016: Long-distance transport of radioactive plume by nocturnal local winds, *Scientific Reports*, **6**, doi:10.1038/srep36584.
  8. Bhattarai, R., K. Yoshimura, S. Seto, S. Nakamura, T. Oki, 2016: Statistical model for economic damage from flood inundation in Japan using rainfall data and socio-economic parameters, *Natural Hazards and Earth System Sciences*, **16**, 1063-1077.
  9. Wei, Z., K. Yoshimura, A. Okazaki, K. Ono, W. Kim, M. Yokoi, C.-T. Lai, 2016: Understanding the variability of water isotopologues in near-surface atmospheric moisture over a humid subtropical rice paddy in Tsukuba, Japan, *J. Hydrol.*, **533**, 91-102.
  10. Ham, S., K. Yoshimura(cor.), H. Li, 2016: Historical dynamical downscaling for East Asia with the atmosphere and ocean coupled regional model, *J. Meteor. Soc. Japan*, **94**, doi:10.2151/jmsj.2015-046.
  11. Chang, E.-C. and K. Yoshimura, 2015: A semi-Lagrangian advection scheme for radioactive tracers in the NCEP Regional Spectral Model (RSM), *Geosci. Model Dev.*, **8**, 3247-3255, doi:10.5194/gmd-8-3247-2015.
  12. Urakawa, S., M. Kurogi, K. Yoshimura, and H. Hasumi, 2015: Modeling low salinity waters along the coast around Japan using a high resolution river discharge data set, *J. Oceanography*, doi:10.1007/s10872-015-0314-4.
  13. Yoshimura, K., 2015: Stable water isotopes in climatology, meteorology, and hydrology: A review. *J. Meteor. Soc. Japan*, **93**, doi:10.2151/jmsj.2015-036.
  14. Wei, Z., K. Yoshimura, A. Okazaki, W. Kim, Z. Liu, M. Yokoi, 2015: Partitioning of evapotranspiration using high frequency water vapor isotopic measurement over a rice paddy field, *Water Resour. Res.*, **51**, doi:10.1002/2014WR016737.
  15. Nitta, T., K. Yoshimura, K. Takata, R. O'ishi, T. Sueyoshi, S. Kanae, T. Oki, A. Abe-Ouchi, and G. E. Liston, 2014: Representing variability in subgrid snow cover and snow depth in a global land model: Offline validation, *J. Clim.*, **27**, 3318–3330.
  16. Hatono, M., K. Noda, H.-J. Kim, S. Baimoung, K. Yoshimura, K. Oki, and T. Oki, 2014: Analysis of the relation between surface water coverage and water volume using satellite data, *Hydrol. Res. Let.*, **8**(1), 15–19.
  17. Yoshimura, K., T. Miyoshi, M. Kanamitsu, 2014: Observation System Simulation Experiments using Water Vapor Isotope Information, *J. Geophys. Res. Atmos.*, **119**, doi:10.1002/2014JD021662.
  18. Berkelhammer, M., A. Sinha, M. Mudelsee, H. Cheng, K. Yoshimura, and J. Biswas, 2014: On the low-frequency component of the ENSO–Indian monsoon relationship: a paired proxy perspective, *Clim. Past*, **10**, 733-744, doi:10.5194/cp-10-733-2014.
  19. Minamide, M. and K. Yoshimura, 2014: Orographic Effect on the Precipitation with Typhoon Washi in the Mindanao Island of the Philippines, *SOLA*, **10**, 67-71.
  20. Liu, Z., K. Yoshimura, G. J. Bowen, N. H. Buenning, C. Risi, J. M. Welker, F. Yuan, 2014: Paired oxygen isotope records reveal modern North American atmospheric dynamics during the Holocene, *Nature Communications*, doi:10.1038/ncomms4701.
  21. Liu, G., K. Kojima, K. Yoshimura(cor.), T. Okai, A. Suzuki, T. Oki, F. Siringan, M. Yoneda, H. Kawahata, 2013: A model-based test of accuracy of seawater oxygen isotope ratio record derived from a coral dual proxy method at southeastern Luzon Island, the Philippines, *J. Geophys. Res. Biogeo.*, **118**,

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- 2012JG002266.
22. Farlin, J., C.-T. Lai, K. Yoshimura, 2013: Influence of synoptic weather events on the isotopic composition of atmospheric moisture in a coastal city of the western United States, *Water Resour. Res.*, **49**, 3685–3696, doi:10.1002/wrcr.20305.
  23. Yoshimura, K. and M. Kanamitsu, 2013: Incremental correction for the dynamical downscaling of ensemble mean atmospheric fields, *Mon. Wea. Rev.*, **141**, 3087-3101.
  24. Li, H., M. Kanamitsu, S.-Y. Hong, K. Yoshimura, D.R. Cayan, and V. Misra, 2013: A High-Resolution Ocean-Atmosphere coupled downscaling of a present climate over California, *Clim. Dyn.*, DOI 10.1007/s00382-013-1670-7.
  25. Gimeno, L., A. Stohl, R. M. Trigo, F. Dominguez, K. Yoshimura, L. Yu, A. R. de M. Drumond, A. M. Duran-Quesada, and R. Nieto, 2012: Oceanic and Terrestrial Sources of Continental Precipitation, *Rev. Geophys.*, doi:10.1029/2012RG000389.
  26. Okazaki, A. P.J.-F. Yeh, K. Yoshimura, M. Watanabe, M. Kimoto, T. Oki, 2012: Changes in flood risk under global warming estimated using MIROC5 and the discharge probability index, *J. Meteorol. Soc. Japan*, **90**, 509-524, doi:10.2151/jmsj.2012-405.
  27. Zhu, M., L.D. Stott, B. Buckley, K. Yoshimura, K. Ra, 2012: Indo-Pacific Warm Pool convection and ENSO since 1867 AD derived from Cambodian pine tree cellulose oxygen isotopes, *J. Geophys. Res.*, **117**, D11307, doi:10.1029/2011JD017198.
  28. Pierce, D., T. Das, D. Cayan, E. Maurer, N. Miller, Y. Bao, M. Kanamitsu, K. Yoshimura, M. Snyder, L. Sloan, G. Franco, and M. Tyree, 2012: Probabilistic estimates of future changes in California temperature and precipitation using statistical and dynamical downscaling, *Climate Dynamics*, 10.1007/s00382-012-1337-9.
  29. Welp, L., R.F. Keeling, H.A.J. Meijer, A.F. Bollenbacher, S.C. Piper, K. Yoshimura, R.J. Francey, C.E. Allison, and M. Wahlen, 2011: El Nino effects on the isotopic composition of oxygen in atmospheric CO<sub>2</sub>, *Nature*, **477**, 579–582, doi:10.1038/nature10421.
  30. Yoshimura, K., C. Frankenberg, 2011: J. Lee, M. Kanamitsu, J. Worden, T. Röckmann, Comparison of an isotopic AGCM with new quasi global satellite measurements of water vapor isotopologues, *J. Geophys. Res.*, **116**, D19118, doi:10.1029/2011JD016035.
  31. Yoshimura, K., M. Kanamitsu, and M. Dettinger, 2010: Regional downscaling for stable water isotopes: A case study of an Atmospheric River event, *J. Geophys. Res.*, **115**, doi:10.1029/2010JD014032.
  32. Frankenberg, C., K. Yoshimura, I. Aben, A. Butz, N. Deutscher, D. Griffith, F. Hase, J. Notholt, M. Schneider, H. Schrijver, T. Warneke, T. Röckmann, 2009: Dynamic processes governing lower-tropospheric HDO/H<sub>2</sub>O ratios as observed from space and ground, *Science*, **325**, 1374-1377.
  33. Yoshimura, K. and M. Kanamitsu, 2009: Specification of external forcing for regional model integrations, *Mon. Wea. Rev.*, **137**, 1409–1421.
  34. Yoshimura, K., M. Kanamitsu, D. Noone, and T. Oki, 2008: Historical isotope simulation using reanalysis atmospheric data, *J. Geophys. Res.*, **113**, doi:1029.10/2008JD010074.
  35. Yoshimura, K., T. Sakimura, T. Oki, S. Kanae, and S. Seto, 2008: Toward flood risk prediction: a statistical approach using a 29-year river discharge simulation over Japan, *Hydrol. Res. Lett.*, **2**, 22-26.
  36. Yoshimura, K. and M. Kanamitsu, 2008: Dynamical global downscaling of global reanalysis, *Mon. Wea. Rev.*, **136**, 8, 2983-2998.
  37. Yoshimura, K., S. Miyazaki, S. Kanae, and T. Oki, 2006: Iso-MATSIRO, a land surface model that incorporates stable water isotopes, *Glob. Planet. Change*, **51**, 90-107.
  38. Yoshimura, K., T. Oki, and K. Ichiyangi, 2004: Evaluation of two-dimensional atmospheric water circulation fields in reanalyses by using precipitation isotopes databases. *J. Geophys. Res.*, **109**(D20), D20109, doi:10.1029/2004JD004764.
  39. Yoshimura, K., T. Oki, N. Ohte, and S. Kanae, 2003: A quantitative analysis of short-term 18O variability with a Rayleigh-type isotope circulation model. *J. Geophys. Res.*, **108**(D20), 4647, doi:10.1029/2003JD003477.
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