

KEI YOSHIMURA

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EDUCATION

University of Tokyo, Tokyo, Japan

February 2006 Ph.D. Civil Engineering
Thesis: *A Study on Systems of the Global Hydrologic Cycles with Stable Water Isotopic Information.*
Committee: Professors Taikan Oki (chair), Naohiro Yoshida, Toshio Koike, Takeshi Ishihara, Kung Yang, Toshiharu Kishi, and Masaki Sato

September 2002 M.S. Civil Engineering

March 2000 B.S. Civil Engineering

University of Durham Business School, Durham, UK

September 2001 to March 2002 Attended all M.A. Management classes as an exchange student

PROFESSIONAL EXPERIENCE

Scripps Institution of Oceanography, UCSD, La Jolla, CA

August 2008 to present *Assistant Project Scientist*: research on stable water isotope circulation, global and regional atmospheric modeling, data assimilation, carbon cycle modeling, dynamical downscaling, past and future changes in meso-scale climate and extremes.
(*Visiting Scholar* during June 2006 to May 2008)

Institution of Industrial Science, University of Tokyo, Tokyo, Japan

October 2002 to July 2008 *Assistant Professor*: research on stable water isotope circulation, modeling and impact assessment of terrestrial and hydrological processes, flood risk analysis and early warning.
(*Research Associate* during May 2004 to March 2007)
(*Technical Research Fellow* during October 2002 to April 2004)

Japan Agency for Marine-Earth Science and Technology, Yokohama, Japan

October 2006 to present *Invited Researcher*: research on relationship between water isotopes and Asian Monsoon, typhoon mechanism, tropical convective precipitation.

TEACHING EXPERIENCE

Institution of Industrial Science, University of Tokyo, Tokyo, Japan

May 2004 to July 2008 *Assistant Professor*: Taught *Advanced Hydrology* and *Environmental Restoration, Rehabilitation and Mitigation* for graduate students with other professors; developed a seminar and provided lectures for undergraduate students; research mentor for 6 undergraduate and 17 graduate students of diverse international backgrounds.
(*Research Associate* during May 2004 to March 2007)

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SERVICE

- 2008 to present *Associate Editor* for Hydrological Research Letters.
- 2005 *Session Convener* on Isotope Hydrology, 2005 Asia Oceania Geosciences Society annual meeting, Singapore.
- 2003-2006 *Open House Coordinator* for Hydrology and Water Resources Lab. in IIS.
- Reviewer for *Journal of Geophysical Research, Journal of Meteorological Society of Japan, Hydrological Processes, Global and Climate Change, Water Resources Research, Advances in Atmospheric Sciences, Advances in Geosciences, Terrestrial, Atmospheric and Oceanic Sciences.*

INTERNATIONAL COLLABORATIVE RESEARCH ACTIVITIES

- 2008 to present *Co-chair*: The second phase of the Stable Water Isotope Intercomparison Group (SWING2)
- 2007 to present *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)

HONORS AND AWARDS

- 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.
- September 2002 *Furuichi Award* (upper 10% of master course graduates) from Civil Engineering Department, University of Tokyo Graduate School.
- August 2001 *Excellent Poster Presentation Award* from Japan Society of Hydrology and Water Resources.

GRANTS

- Pending *Principal Investigator*: "Isotope Reanalysis: Data assimilation of vapor isotope (HDO) with isotopic AGCM and ensemble Kalman filter," National Science Foundation, \$464,416, May 2009 to April 2012.
- 2006 *Principal Investigator*: "Study on processes of Earth hydrological cycle with stable water isotopes," Japan Society for the Promotion of Science, \$88,000, June 2006 to May 2008.
- 2005 *Principal Investigator*: "Development of a stable water isotope circulation model with land surface process," Japan Society for the Promotion of Science, \$30,000, April 2005 to May 2006.

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PUBLICATIONS

Published work:

- Yoshimura, K. and M. Kanamitsu, 2009: Specification of external forcing for regional model integrations, *Mon. Wea. Rev.*, in print.
- Yoshimura, K. and M. Kanamitsu, 2008: Dynamical global downscaling of global reanalysis, *Mon. Wea. Rev.*, **136**, 8, 2983-2998.
- Yoshimura, K., M. Kanamitsu, D. Noone, and T. Oki, 2008: Historical isotope simulation using reanalysis atmospheric data, *J. Geophys. Res.*, **113**, doi:10.2916/2008JD010074.
- Uemura, R., Y. Matsui, K. Yoshimura, H. Motoyama, N. Yoshida, 2008: Evidence of deuterium excess in water vapour as an indicator of ocean surface conditions, *J. Geophys. Res.*, **113**, doi:10.2916/2008JD010209.
- Fudeyasu, H., K. Ichianagi, A. Sugimoto, K. Yoshimura, A. Ueta, M.D. Yamanaka, K. Ozawa, 2008: Isotope ratios of precipitation and water vapor observed in Typhoon Shanshan, *J. Geophys. Res.*, **113**, D12113, doi:10.2916/2007JD009313.
- 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. Let.*, **2**, 22-26.
- Islam, M.S., T. Oki, S. Kanae, N. Hanasaki, Y. Agata, K. Yoshimura, 2007: A grid-based assessment of global water scarcity including virtual water trading, *Water Resour. Manag.*, **21**(1), 19-33.
- 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.
- Henderson-Sellers, A., M. Fischer, I. Aleinov, K. McGuffie, W.J. Riley, G. Schmidt, K. Sturm, and K. Yoshimura, 2006: Stable water isotope simulation by current land surface schemes: Results of iPILPS phase 1, *Glob. Planet. Change*, **51**, 34-54.
- Ichianagi, K., K. Yoshimura, and M.D. Yamanaka, 2005: Validation of changing water origins over Indochina during the withdrawal of the Asian monsoon using stable isotopes, *Sci. Onl. Let. Atmos.*, **1**, 113-116.
- Shinoda, T., H. Uyeda, and K. Yoshimura, 2005: Structure of moist layer and sources of water over the southern region far from the Meiyu/Baiyu front, *J. Meteor. Soc. Japan*, **83**, 137-152.
- Yoshimura, K., T. Oki, and K. Ichianagi, 2004: Evaluation of two-dimensional atmospheric water circulation fields in reanalyses by using precipitation isotopes databases. *J. Geophys. Res.*, **109**(D20), D20109, doi:10.2916/2004JD004764.
- Yoshimura, K., T. Oki, N. Ohte, and S. Kanae, 2004: Colored moisture analysis estimates of variations in 1998 Asian monsoon water sources, *J. Meteor. Soc. Japan*, **82**, 1315-1329.
- Yoshimura, K., T. Oki, N. Ohte, and M. Koike, 2003: Development and verification of a vertical integrated two dimensional water isotope circulation model, *J. Hydrosoci. and Hydraul. Eng.*, **21**, 25-35.
- 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:10.2916/2003JD003477.

Work in progress:

- Frankenberg, C., K. Yoshimura, I. Aben, A. Butz, N. Deutscher, D. Griffith, F. Hase, J. Notholt, M. Schneider, H. Schrijver, T. Warneke, T. Röckmann: Tracing near-surface deuterated water vapour and its seasonal variations from space and ground, submitted to *Nature*.
- Miller, N.L., P. Duffy, D. Cayan, H. Hidalgo, J. Jin, H. Kanamaru, M. Kanamitsu, T. O'Brien, N. Schlegel, L. Sloan, M. Snyder, K. Yoshimura, An evaluation of simulated California climate using multiple dynamical and statistical downscaling techniques, submitted to *California Energy Committee*.
- Yeh P.J.-F., T. Oki, T. Ngo-Duc, K. Yoshimura, H. Kim, Y. Shen, S. Seto, and S. Kanae, Seasonal variations in terrestrial water storage and its components in large river basins from GSWP2, combined land-atmosphere water balance computation and GRACE, submitted to *J. Hydrometeor.*

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RECENT CONFERENCE PRESENTATIONS

- Yoshimura, K. and M. Kanamitsu, 2008: Study on data assimilation of vapor isotope with the ensemble Kalman filter, *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract A23C-0318, Dec. 16-20, 2008.
- Yoshimura, K., 2008: Isotope-incorporated global and regional spectral models, the SWING2 GNIP-Dynscape meeting, the IAEA headquarters, Vienna, Nov. 16-19, 2008.
- Yoshimura, K., 2008: Ensemble Kalman filter and Isotope Reanalysis, the SWING2 GNIP-Dynscape meeting, the IAEA headquarters, Vienna, Nov. 16-19, 2008.
- Yoshimura, K. and D. Noone, 2008: Activity report and planning of Isotope Cross Cut Studies (ICCS), International Implementation Planning Meeting for CEOP, Geneva, Sep. 15-17, 2008.
- Yoshimura, K., 2008: Toward Isotope Reanalysis, TMU Climatology Lab. Seminar, Tokyo, Jul. 3, 2008.
- Yoshimura, K., 2008: Incremental interpolation of vertically coarse global forcing data for regional model integrations, S-5-3 FYH20 1st Seminar, Tsukuba, Jun. 19, 2008.
- Yoshimura, K., 2008: Scripps' global and regional circulation models for water isotopes: The multi-decadal global simulation and double-nudged regional experiments, S-5-3 FYH20 1st Seminar, Tsukuba, Jun. 19, 2008.
- Yoshimura, K., D. Noone, and M. Kanamitsu, 2008: Introduction of Isotope Reanalysis, Isoscapes 2008, Santa Barbara, California, April 7-10, 2008.
- Yoshimura, K. and M. Kanamitsu, 2008: Global dynamical downscaling of reanalysis with bias correction, 3rd WCRP International Conference on Reanalysis, Tokyo, Jan 28 - Feb 1, 2008.
- Yoshimura, K., M. Kanamitsu, T. Oki, and J. Roads, 2008: Global simulation of stable water isotope circulation using Iso-GSM and spectrum nudging, 3rd WCRP International Conference on Reanalysis, Tokyo, Jan 28 - Feb 1, 2008.
- Yoshimura, K. and M. Kanamitsu, 2007: Dynamical downscaling technique for global climate model, 2007 AGU Fall Meeting, GC17, San Francisco, Dec 12-16, 2007.
- Yoshimura, K., M. Kanamitsu, T. Oki, and J. Roads, 2007: Accurate reproduction of daily to interannual variations of stable water isotopes using Iso-GSM and spectral nudging technique, 2007 AGU Fall Meeting, H62, San Francisco, Dec 12-16, 2007.
- Yoshimura, K., 2007: Introduction of Iso-GSM, International Symposium on Water Isotopes and Climates, Nagoya University, Nagoya, Japan, 1-4 December, 2007.
- Yoshimura, K. and M. Kanamitsu, 2007: Development of a spectral nudging technique for global dynamical downscaling, the 32nd Climate Diagnostics and Prediction Workshop in Tallahassee, FL, Oct 22-26, 2007.
- Yoshimura, K., 2007: Incorporation of stable water Isotopes in GSM and spectrum-nudged 28-year simulation, the 32nd Climate Diagnostics and Prediction Workshop in Tallahassee, FL, Oct 22-26, 2007.

RESEARCH INTERESTS (SUMMARY)

Development of Isotope Reanalysis and dynamical downscaling for regional climate projections with a regional atmosphere-ocean coupled model are my short-term (up to 5 years) main research targets. A long-term (up to 10 years) research target is to assimilate any kind of in-situ isotopic analogues (ice core, tree ring, coral, ocean and lake sediments, etc.) to reconstruct the Earth's state. This research can be very important for more understanding of the Earth climate system because the isotopic analogues are usually unique information obtainable from the past. Furthermore, carbon cycle modeling also interests me. In addition to CO₂, ¹³CO₂ and CO¹⁸O will be included. The ¹⁸O labeling of CO₂, which offers the possibility to separate the different terrestrial biospheric gross fluxes, namely assimilation and respiration, depends on ¹⁸O concentration in H₂O, so that the previously developed water isotope models will be closely connected.