

Curriculum Vitae

Name Yoshihide Wada
Date of Birth August 25th 1980
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Center for Climate Systems Research
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Research Experiences Hydrology and Climate, Global Hydrological Modeling, Global Water Use Modeling, Global Water Scarcity, Human Impacts on Global Water Resources, Groundwater Resources Sustainability, Hydrological Drought, Irrigation, Crop Growth Modeling, Land Use Modeling

Research Descriptions Dr. Yoshihide Wada is a research scientist at the NASA Goddard Institute for Space Studies and the Center for Climate Systems Research, Columbia University. His completed PhD projects include estimating global water use and water availability by using the global hydrological and water resources model PCR-GLOBWB. His work also includes estimating and projecting global water scarcity, and assessing the sustainability of global groundwater resources. His current research projects include a global assessment of the sustainability of future food production under socio-economic and climate change, and water scarcity.

Education/Profession

- 2017 – present **Deputy Water Program Director** The International Institute for Applied Systems Analysis (IIASA) in Laxenburg, Austria
- 2016 – present **Senior Research Scientist** The International Institute for Applied Systems Analysis (IIASA) in Laxenburg, Austria
- 2015 – present **Research Scientist** National Aeronautics and Space Administration (NASA) Goddard Institute for Space Studies/ Center for Climate Systems Research/The Earth Institute, Columbia University
Research Thema: Global water-food-energy nexus under changing environments
- 2015 – 2018 **Japan Society for the Promotion of Science (JSPS) Oversea Research Fellow***
*Top 10%
Research Thema (PI): Global assessment of the sustainability of future food production under socio-economic, land use, and climate change, and water scarcity
- 2015 **Invited Research Scientist** The International Institute for Applied Systems Analysis (IIASA) in Laxenburg, Austria
- 2013 – present **Research Scientist** Department of Physical Geography, Utrecht University, The Netherlands
Research Thema: 1) Dynamic coupling of the global hydrological model PCR-GLOBWB with the global crop model PEGASUS, 2) Future water and food security under increasing socio-economic pressure and changing climate
- 2013 **Visiting Scientist** Department of Civil Engineering, McGill University, Canada
[Hosts: Dr. Tom Gleeson, Dr. Navin Ramankutty]
- 2009 – 2013 **PhD (Cum Laude*) in Hydrology** *Top 2-3%

Department of Physical Geography, Utrecht University, The Netherlands (Research Focus Earth and Sustainability; Project FM0906: *Global Assessment of Water Resources*)
Research Thema: Modeling past and projecting future global water stress – including population growth, economic development and climate change
[Supervisors: Prof. dr. ir. Marc F. P. Bierkens, Dr. Ludovicus P. H. van Beek]

- 2008 **Visiting Scientist** Hydrology Group, University of Bern, Switzerland
[Supervisors: Prof. dr. Rolf Weingartner, Dr. Daniel Viviroli]
- 2006 – 2008 **MSc in Hydrology and System Earth Modeling (Prestige Master) (GPA 3.9/4.0)**
Department of Earth Sciences, Utrecht University, The Netherlands
[Supervisors: Prof. dr. ir. Marc F. P. Bierkens, Dr. Ludovicus P. H. van Beek, Dr. Hans H. Dürr]
[Co-supervisors: Prof. dr. Rolf Weingartner, Dr. Daniel Viviroli]
- 2005 **Certificate of Global Sustainability Programme** Alliance for Global Sustainability (AGS), Braunwald, Switzerland (AGS is an organization of ETH Zurich, The University of Tokyo, Massachusetts Institute of Technology, and Chalmers University of Technology)
- 2004 – 2006 **Master of International and Environmental Studies (GPA 4.0/4.0)**
Institute of Environmental Studies, Graduate School of Frontier Sciences, The University of Tokyo, Japan [Supervisor: Dr. Jin Sato]
- 2002 **Visiting Student (Political Science and Asian Studies)** Department of Political Sciences, Faculty of Arts, Humanities and Social Sciences, The University of Western Australia, Australia
[Supervisors: Prof. dr. Dennis Rumley, Dr. Samina Yasmeen]
- 2000 **Visiting Student (Asian Studies)** Murdoch University, Australia
- 1999 – 2004 **BA in Linguistics, Cultural Studies, and International Relations (with distinction)**
Faculty of English, Department of Foreign Language, Himeji Dokkyo University, Japan
[Supervisors: Prof. dr. Kiyotaka Doi, Prof. dr. Kiyoshi Hatsuoka]

Professional Experiences

- 2014 MSc thesis examination committee for Rutger Hofste (Delft University of Technology, The Netherlands), and for Hafsa Ahmed Munia (Aalto University, Finland)
- 2013 MSc thesis examination committee for Laurent Esnault (McGill University, Canada)
- 2009 – present Supervisor of ten MSc students and two PhD candidates at Utrecht University, at McGill University, and at Aalto University
- 2009 – present Lecturer and teaching assistant, Utrecht University
MSc courses: Land Surface Hydrology (GEO4-4404), Land degradation and Catchment Modeling (GEO4-4406), Unsaturated Zone Hydrology (GEO4-4417)
- 2008 – 2009 Internship, Environment Planning and Water Preservation Agency, Ehime, Japan
- 2004 – 2006 Research assistant, Institute of Environmental Studies, The University of Tokyo

Honors and Personal Grants

- 2015 2015 Editors' Citations for Excellence in Refereeing, Cited by Alberto Montanari (Editor in Chief) for Water Resources Research
- 2015-2018 Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellowships for Research Abroad (3-year full funding)
- 2013 PhD degree with Cum Laude, Utrecht University, The Netherlands
- 2012 American Geophysical Union Horton (Hydrology) Research Grant (US\$ 10,000)
- 2006 – 2008 National Research Scholarship Programme by the Ministry of Education of Japan (JPY 10,000,000~US\$ 100,000)
- 2005 – 2006 Nakamura Sekizen Foundation Scholarship (JPY 2,000,000~US\$ 20,000)
- 2005 Travel grant for the Global Sustainability Programme, Switzerland (US\$ 2000)
- 2004 – 2005 National First-Grade Scholarship, Japan (JPY 1,500,000~US\$ 15,000)
- 2001 – 2002 HUMAP Honorary Scholarship, Japan-Australia (JPY 1,200,000~US\$ 12,000)
- 2000 – 2001 Highest Grade Award 2001, Himeji Dokkyo University, Japan

International Projects (Participated)

2015 – 2018	LandMIP Land Modelling Intercomparison Project, a community-driven modeling effort with the goal of providing global impact assessments over the land surface
2015 – 2016	World Resources Institute (WRI) Aqueduct Water Risk Atlas Aqueduct's global water risk mapping tool helps companies, investors, governments, and other users understand where and how water risks and opportunities are emerging worldwide. The Atlas uses a robust, peer reviewed methodology and the best-available data to create high-resolution, customizable global maps of water risk.
2014 – 2018	Earth2Observe Global Earth Observation for Integrated Water Resource Assessment, a collaborative project funded under the DG Research European Union FP7 programme and brings together the findings from European FP projects DEWFORA, GLOWASIS, WATCH, GEOWOW and others. The project aims to contribute to the assessment of global water resources through the use of new Earth Observation datasets and techniques. For this purpose, the project integrates available earth observations, in-situ datasets and models, to construct a consistent global water resources reanalysis dataset of sufficient length (>30 years). The resulting datasets are available through an open Water Cycle Integrator data portal: the European contribution to the GEOSS/WCI approach. The datasets are downscaled for application in case-studies at regional and local levels, and optimized based on identified European and local needs supporting water management and decision making.
2013 – 2016	WFaS Water Futures and Solutions: World Water Scenarios Initiative (coordinated by the IIASA), Multi-layered, cross-sector, stakeholder informed, scenario-based assessment of the state of water resources and water demand using state-of-the-art socio-economic and hydrological models, based on the Shared Socioeconomic Pathways (SSPs) and Representative Concentration Pathways (RCPs) in the context of the Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report (AR5).
2013 – 2016	ISI-MIP2 Inter-Sectoral Impact Model Intercomparison Project (coordinated by PIK), a community-driven modeling effort with the goal of providing cross-sectoral global impact assessments
2010 – 2015	The Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC) Contributing Author Working Group I, Chapter 13: Sea Level Change
2012 – 2014	Water2Invest.com Global facility for calculating investments needed to bridge the climate-induced water gap. Water2Invest.com develops a web-based tool that can be used to perform analyses of investments needed to bridge the water gap for selected regions and countries.
2012 – 2013	ISI-MIP Inter-Sectoral Impact Model Intercomparison Project (coordinated by PIK), a community-driven modeling effort with the goal of providing cross-sectoral global impact assessments
2011 – 2013	European GLOWASIS (Global Water Scarcity Information Service) project (coordinated by Deltares), GLOWASIS is part of the European Earth Observation Programme (GMES) which provides and combines Earth observation data from space, air, water and land through a sustainable information infrastructure.

Research Funding (allocated to my research part)

2015 – 2016	WRI Aqueduct Water Risk Atlas (US\$ 20,000)
2014 – 2018	Earth2Observe (US\$ 10,000)
2013 – 2016	ISI-MIP2 (US\$ 5,000)
2013 – 2016	WFaS (US\$ 45,000)
2012 – 2013	ISI-MIP (US\$ 30,000)
2011 – 2013	European GLOWASIS (US\$ 10,000)
2009 – 2013	Research Focus Earth and Sustainability of Utrecht University: Modelling past and future global water stress – including population growth, economic development and climate change (US\$ 300,000)

Professional Societies

American Geophysical Union (AGU)
European Geosciences Union (EGU)
International Association of Hydrological Sciences (IAHS)
Japanese Association of Groundwater Hydrology (JAGH)

Professional Activities

- 2016 **Co-convener** for the session “The Water-Energy-Food Nexus Approach in Support of Water Security” at the Asia Oceania Geosciences Society (AOGS) 13th Annual Meeting in Beijing, China, July 31-August 5 2016.
- 2015 **Primary convener** for the session “Global and regional water-food-energy security under changing environments” at the American Geophysical Union (AGU) Fall Meeting in San Francisco, US, December 14-18 2015.
- 2015 **Co-convener** for the session “Recent advancement in terrestrial water storage change estimation and its contribution to global sea level variation” at the American Geophysical Union (AGU) Fall Meeting in San Francisco, US, December 14-18 2015.
- 2015 **Co-convener** for the session “Drought in the Anthropocene” at the American Geophysical Union (AGU) Fall Meeting in San Francisco, US, December 14-18 2015.
- 2014 **Primary convener** for the session “Global and regional water-energy-food security under changing environments” at the American Geophysical Union (AGU) Fall Meeting in San Francisco, US, December 15-19 2014.
- 2014 **Co-convener** for the session “The Effects of Anthropogenic Land Use and Land Cover Change on Local to Global Climate: Forcings and Feedbacks From the Past to the Future” at the American Geophysical Union (AGU) Fall Meeting in San Francisco, US, December 15-19 2014.

Review (peer-reviewed journals) two per month (average)

Advances in Water Resources
Agricultural Water Management
AGU Books
American Society of Agricultural and Biological Engineers
British Journal of Environment and Climate Change
CATENA
CLEAN - Soil, Air, Water
Climate
Climatic Change
Earth System Dynamics
Elementa: Science of the Anthropocene
Environmental Research Letters
Geophysical Research Letters
Geoscientific Model Development
Global and Planetary Change
Global Environmental Change
Hydrology and Earth System Sciences
Hydrology Research
Hydrological Sciences Journal
Hydrogeology Journal
International Journal of Climatology
International Journal of River Basin Management
International Journal of Sustainable Development and Planning
International Journal of Water Resources and Environmental Engineering
Journal of Advances in Modeling Earth Systems
Journal of Arid Land
Journal of Cleaner Production
Journal of Environmental Management
Journal of Hydrology
Journal of Hydrology: Regional Studies
Journal of Hydro-environment Research
Journal of Hydrometeorology
Journal of Irrigation and Drainage Engineering
Journal of Geophysical Research
Nature
Nature Geoscience
Nature Scientific Reports
Proceedings of the National Academy of Sciences of the United States of America (PNAS)

PLOS ONE

Regional Environmental Change

Remote Sensing Applications: Society and Environment

Remote Sensing of Environment

Science

Science of the Total Environment

Stochastic Environmental Research and Risk Assessment

Surveys in Geophysics

Water

Water Economics and Policy

Water Resources Research

Water Resources Management

Review (research proposals)

University of Leuven (KU Leuven), Belgium

National Center for Science and Technology Evaluation, Ministry of Education and Science, Republic of Kazakhstan

Technical Skills

Fortran 77, Fortran 90, PCRaster, Python, Borland Delphi/Object Pascal, ArcGIS, SPSS, PC-Ord, HYDRUS 1D/2D/3D, MODFLOW, Latex, Photoshop, Microsoft Office

Language Skills

Japanese (Native), English (Excellent), Dutch (Poor), Germany (Poor), Chinese (learning)

Dissertations

Wada, Y. (2013), Human and climate impacts on global water resources, *Utrecht Studies in Earth Sciences*, vol. 50, *Doctoral Thesis*, Utrecht University, Utrecht, The Netherlands, ISBN 978-90-6266-346-0, p. 470, Available online at <http://igitur-archive.library.uu.nl/dissertations/2013-1105-200603/UUindex.html>

Wada, Y. (2008), Water Stress over the Year: Quantitative Analysis of Seasonality and Severity on a Global Scale, *Master's Thesis*, Utrecht University, Utrecht, The Netherlands, p. 160, Available online at <http://igitur-archive.library.uu.nl/student-theses/2010-0308-200229/UUindex.html>.

Wada, Y. (2006), Social Analysis on Groundwater Management, *Master's Thesis*, The University of Tokyo, Tokyo, Japan, p. 180, Available online at <http://repository.dl.itc.u-tokyo.ac.jp/>.

Wada, Y. (2003), The Democracy Movement in the People's Republic of China, *Bachelor's Thesis*, Himeji Dokkyo University, Himeji, Japan, p. 80.

References

Prof. dr. ir. Marc F. P. Bierkens

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Chair of Earth Surface Hydrology Group
Head of Department of Physical Geography
Senior Scientist at Deltares, The Netherlands

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Professor of Earth System Science and of Civil and Environmental Engineering, The University of California, Irvine
Senior Water Scientist at the NASA Jet Propulsion Laboratory at the California Institute of Technology
The Founding Director of the UC Center for Hydrologic Modeling (UCCHM) at UC Irvine

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Publication Summary 60 articles in peer-reviewed journals (including papers under review)
2 conference proceedings (peer-reviewed)
1 book chapter (peer-reviewed)
100 conference abstracts and 50 invited talks (AGU, EGU, IAHS)
2000 citations (Google Scholar), 1200 citations (Scopus, Web of Science)
h-index 20 (Google Scholar), 18 (Scopus, Web of Science)

Publications

Articles in peer-reviewed journals

60. Mehran, A., A. AghaKouchak, J. A. Vrugt, N. Nakhjiri, S. Grant, M. J. Stewardson, M. C. Peel, T. J. Phillips, **Y. Wada**, and J. K. Ravalico (2016), Human-Induced Water Stress Exacerbates Climate Impacts on Water Availability, *Sci. Rep.*, in preparation.
59. van Vliet, M. T. H., L.P.H. van Beek, S. Eisner, M. Flörke, **Y. Wada**, and M.F.P. Bierkens (2016), Multi-model assessment of global hydropower and cooling water discharge potential under climate change, *Global Environ. Change*, under review.
58. **Wada, Y.**, I. E. M. de Graaf, and L. P. H. van Beek (2016), High-resolution modeling of human and climate impacts on global water resources, *J. Adv. Model Earth Sy.*, under review.
57. Hattermann, F. F., V. Krysanova, S. Gosling, R. Dankers, P. Daggupati, Ch. Donnelly, M. Flörke, Sh. Huang, Yu. Motovilov, Su Buda, T. Yang, C. Müller, G. Leng, Q. Tang, F.T. Portmann, S. Hagemann, D. Gerten, **Y. Wada**, Y. Masaki, T. Alemayehu, Y. Satoh, and L. Samaniego (2016), Cross-scale intercomparison of climate change impacts simulated by regional and global hydrological models in eleven large river basins, *Clim. Change*, under review.
56. Slangen, A. B. A., F. Adloff, S. Jevrejeva, P. W. Leclercq, B. Marzeion, **Y. Wada**, and R. Winkelmann (2016), Sea level projections at global and regional scales, *Surv. Geophys.*, under review, *Special Issue: ISSI Workshop on Global Sea Level Budget*.
55. Chambers, D. P., A. Cazenave, N. Champollion, H. Dieng, W. Llovel, R. Forsberg, K. von Schuckmann, and **Y. Wada** (2016), Evaluation of the Global Mean Sea Level Budget between 1993 and 2014, *Surv. Geophys.*, under review, *Special Issue: ISSI Workshop on Global Sea Level Budget*.
54. Hofste, R. W., W. G. M. Bastiaanssen, M. C. Anderson, W. P. Kustas, C. Hein, A. Seid, G. B. Senay, J. P. Verdin, A. I. J. M. van Dijk, J. P. Guerschman, D. G. Miralles, R. A. M. de Jeu, Z. Su, **Y. Wada**, M. Menenti, and A. M. J. Gerrits (2016), Comparative Analysis of Near-Operational Evapotranspiration Products for the Nile Basin Based on Earth Observations; First Steps Towards an Ensemble ET Product, *Remote Sens. Environ.*, under review.
53. **Wada, Y.**, and M. F. P. Bierkens (2016), Uncertainty of 21st century agricultural drought, *Nature Commun.*, under review.
52. Flörke, M., S. Eisner, N. Hanasaki, Y. Masaki, **Y. Wada**, M. F. P. Bierkens, and J. Alcamo (2016), Spatially robust estimates of severe water stress under changed climate and water use, *Nature Clim. Change*, resubmitted after revisions.
51. Wang, J., Y. Sheng, and **Y. Wada** (2016), What Drives Recent Lake Declines across China's Yangtze Plain?, *Nature Commun.*, resubmitted after revisions.
50. Nasta, P., J. B. Gates, and **Y. Wada** (2016), Impact of climate variability on spatio-temporal distribution of continental-scale potential groundwater recharge in Africa, *Hydrol. Process.*, resubmitted after revisions.
49. Bhanja, S. N., I. Velicogna, A. Mukherjee, M. Rodell, K. Pangaluru, **Y. Wada**, and J. S. Famiglietti (2016), Controls on changing decadal groundwater storage and availability trends over Indian Sub-Continent, *Nature Geosci.*, resubmitted after revisions.
48. **Wada, Y.**, M.-H. Lo, P. J.-F. Yeh, J. T. Reager, J. S. Famiglietti, R.-J. Wu, and Y.-H. Tseng (2016), Fate of water pumped from underground: overestimated contribution to sea level rise, *Nature Clim. Change*, resubmitted after revisions.
47. Pokhrel, Y., N. Hanasaki, **Y. Wada**, and H. Kim (2016), Human impacts on the terrestrial water cycle: incorporating irrigation, flow regulation, and groundwater pumping in Earth System Models, *WIREs Water*, in press.
46. Long, D., X. Chen, B. R. Scanlon, **Y. Wada**, Y. Hong, V. P. Singh, Y. Chen, C. Wang, Z. Han, and W. Yang (2016), Have GRACE satellites overestimated groundwater depletion in the Northwest India Aquifer?, *Sci. Rep.*, in press.
45. Veldkamp, T. I. E., **Y. Wada**, J. C. J. H. Aerts, and P. J. Ward (2016), Towards a global water scarcity risk assessment framework: incorporation of probability distributions and hydro-climate variability, *Environ. Res. Lett.*, 11, 024006, doi:10.1088/1748-9326/11/2/024006.
44. **Wada, Y.**, M. Flörke, N. Hanasaki, S. Eisner, G. Fischer, S. Tramberend, Y. Satoh, M. T. H. van Vliet, P. Yillia, C. Ringler, P. Burek, and D. Wiberg (2016), Modeling global water use for the 21st century: the Water Futures and Solutions (WFaS) initiative and its approaches, *Geosci. Model Dev.*, 9, 175-222, doi:10.5194/gmd-9-175-2016, 2016 (**Highlight articles**).
43. Munia, H., J. H. A. Guillaume, N. Mirumachi, M. Porkka, **Y. Wada**, and M. Kummu (2016), Water stress in global transboundary river basins: significance of upstream water use on downstream stress, *Environ. Res. Lett.*, 11, 014002, doi:10.1088/1748-9326/11/1/014002.

42. Zhuo, L., M. M. Mekonnen, A. Y. Hoekstra, and **Y. Wada** (2016), Inter- and intra-annual variation of water footprint of crops and blue water scarcity in the Yellow River Basin (1961-2009), *Adv. Water Resour.*, 87, 29–41, doi:10.1016/j.advwatres.2015.11.002.
41. Wanders, N., and **Y. Wada** (2015), Decadal predictability of river discharge with climate oscillations over the 20th and early 21st century, *Geophys. Res. Lett.*, 42, 10,689–10,695, doi:10.1002/2015GL066929.
40. Dieng, H. B., N. Champollion, A. Cazenave, **Y. Wada**, E. Schrama, and B. Meysignac (2015), Total land water storage change over 2003-2013 estimated from a global mass budget approach, *Environ. Res. Lett.*, 10, 124010, doi:10.1088/1748-9326/10/12/124010.
39. Puma, M. J., S. Chon, and **Y. Wada** (2015), Exploring the potential impacts of historic volcanic eruptions on the contemporary global food system, *PAGES*, 23, 66-67.
38. Otto, F. E. L., K. Haustein, P. Uhe, C. A. S. Coelho, J. A. Aravequia, W. Almeida, A. King, E. C. de Perez, **Y. Wada**, G. J. van Oldenborgh, R. Haarsma, M. van Aalst, and H. Cullen (2015), Factors other than climate change, main drivers of 2014/15 water shortage in Southeast Brazil, *Bull. Amer. Meteor. Soc.*, 96, S35–S40, doi:10.1175/BAMS-EEE_2014_ch8.1, *Special Issue: Explaining Extreme Events of 2014 from a Climate Perspective*.
37. **Wada, Y.** (2015), Modelling groundwater depletion at regional and global scales: Present state and future prospects, *Surv. Geophys.*, doi:10.1007/s10712-015-9347-x, *Special Issue: ISSI Workshop on Remote Sensing and Water Resources*.
36. Döll, P., H. Douville, A. Güntner, H. Müller Schmied, and **Y. Wada** (2015), Modelling freshwater resources at the global scale: Challenges and prospects, *Surv. Geophys.*, doi:10.1007/s10712-015-9343-1, *Special Issue: ISSI Workshop on Remote Sensing and Water Resources*.
35. Veldkamp, T. I. E., S. Eisner, **Y. Wada**, J. C. J. H. Aerts, and P. J. Ward (2015), Sensitivity of water scarcity events to ENSO-driven climate variability at the global scale, *Hydrol. Earth Syst. Sci.*, 19, 4081-4098, doi:10.5194/hess-19-4081-2015, *Special Issue: HYPER Droughts (Hydrological Precipitation – Evaporation – Runoff Droughts)*.
34. Long, D., Y. Yang, **Y. Wada**, Y. Hong, W. Liang, Y. Chen, B. Yong, A. Hou, J. Wei, and L. Chen (2015), Deriving scaling factors using a global hydrological model to restore GRACE total water storage changes for China's Yangtze River Basin, *Remote Sens. Environ.*, 168, 177–193, doi:10.1016/j.rse.2015.07.003.
33. Hartmann, A., T. Gleeson, R. Rosolem, F. Pianosi, **Y. Wada**, and T. Wagener (2015), A large-scale simulation model to assess karstic groundwater recharge over Europe and the Mediterranean, *Geosci. Model Dev.*, 8, 1729-1746, doi:10.5194/gmd-8-1729-2015 (*EGU Highlighted Paper*).
32. Wanders, N., and **Y. Wada** (2015), Human and climate impacts on the 21st century hydrological drought, *J. Hydrol.*, 526, 208-220, doi:10.1016/j.jhydrol.2014.10.047, *Special Issue: Drought processes, modeling, and mitigation*.
31. Veldkamp, T. I. E., **Y. Wada**, H. de Moel, M. Kummu, S. Eisner, J. C. J. H. Aerts, and P. J. Ward (2015), Changing mechanism of global water scarcity events: impacts of socioeconomic changes and inter-annual hydro-climatic variability, *Global Environ. Change*, 32, 18-29, doi:10.1016/j.gloenvcha.2015.02.011.
30. Wanders, N., **Y. Wada**, and H. A. J. van Lanen (2015), Global hydrological droughts in the 21st century under a changing hydrological regime, *Earth Syst. Dynam.*, 6, 1-15, doi:10.5194/esd-6-1-2015, *Special Issue: Intersectoral Impact Model Intercomparison Project (ISI-MIP)*.
29. Jasechko, S., S. J. Birks, T. Gleeson, **Y. Wada**, P. J. Fawcett, Z. D. Sharp, J. J. McDonnell, and J. M. Welker (2014), The pronounced seasonality of global groundwater recharge, *Water Resour. Res.*, 50, 8845–8867, doi:10.1002/2014WR015809.
28. **Wada, Y.**, and M. F. P. Bierkens (2014), Sustainability of global water use: past reconstruction and future projections, *Environ. Res. Lett.*, 9, 104003, doi:10.1088/1748-9326/9/10/104003.
27. **Wada, Y.**, T. Gleeson, and L. Esnault (2014), Wedge approach to water stress, *Nature Geosci.*, 7, 615–617, doi:10.1038/ngeo2241.
26. Van Dijk, A. I. J. M., L. J. Renzullo, **Y. Wada**, and P. Tregoning (2014), A global water cycle reanalysis (2003–2012) merging satellite gravimetry and altimetry observations with a hydrological multi-model ensemble, *Hydrol. Earth Syst. Sci.*, 18, 2955-2973, doi:10.5194/hess-18-2955-2014.
25. Slangen, A. B. A., R. S. W. van de Wal, **Y. Wada**, and L. L. A. Vermeersen (2014), Comparing tide gauge observations to regional patterns of sea-level change (1961–2003), *Earth Syst. Dynam.*, 5, 243-255, doi:10.5194/esd-5-243-2014.
24. Esnault, L., T. Gleeson, **Y. Wada**, J. Heinke, D. Gerten, E. Flanary, M. F. P. Bierkens, and L. P. H. van Beek (2014), Linking groundwater use and stress to specific crops using the groundwater footprint in the Central Valley and High Plains aquifer systems, U.S., *Water Resour. Res.*, 50, 4953-4973, doi:10.1002/2013WR014792.
23. Gain, A. K. and **Y. Wada** (2014), Assessment of future water scarcity at different spatial and temporal scales of the Brahmaputra River Basin, *Water Resour. Manage.*, 28, 999-1012, doi:10.1007/s11269-014-0530-5.
22. **Wada, Y.**, D. Wisser, and M. F. P. Bierkens (2014), Global modeling of withdrawal, allocation and consumptive use of surface water and groundwater resources, *Earth Syst. Dynam.*, 5, 15-40, doi:10.5194/esd-5-15-2014.
21. De Graaf, I. E. M., L. P. H. van Beek, **Y. Wada**, and M. F. P. Bierkens (2014), Dynamic attribution of global water demand to surface water and groundwater resources: Effects of abstractions and return flows on river discharges, *Adv. Water Resour.*, 64, 21-33, doi:10.1016/j.advwatres.2013.12.002.
20. Prudhomme, C., I. Giuntoli, E.L. Robinson, D.B. Clark, N. W. Arnell, R. Dankers, B. Fekete, W. Franssen, D. Gerten, S. N. Gosling, S. Hagemann, D. M. Hannah, H. Kim, Y. Masaki, Y. Satoh, T. Stacke, **Y. Wada**, and D. Wisser (2014), Drought in the 21st century: a multi-model ensemble experiment to assess global change, quantify uncertainty and

- identify 'hotspots', change, *Proc. Natl. Acad. Sci. USA*, 111(9), 3262–3267, doi:10.1073/pnas.1222473110, *Global Climate Impacts: A Cross-Sector, Multi-Model Assessment Special Feature*.
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