

# Alexandra Georges Konings

Assistant Professor

Dept. of Earth System Science and, by courtesy, of Geophysics  
Center Fellow, by courtesy, Woods Institute for the Environment  
Stanford University

473 Via Ortega, Y2E2 Room 345, Stanford, CA 94305  
[konings@stanford.edu](mailto:konings@stanford.edu); 650-736-2083

## EDUCATION

<b>Massachusetts Institute of Technology</b>	2015
Ph.D. in Civil and Environmental Engineering (Hydrology)	
<b>Duke University</b>	2011
M.S. in Environmental Science	
<b>Massachusetts Institute of Technology</b>	2009
S.B. in Environmental Engineering Science	

## PROFESSIONAL APPOINTMENTS

<b>Stanford University</b>	
Assistant Professor	09/2016-Present
Faculty Affiliate, Woods Institute for the Environment	09/2016-Present
<b>Stanford University</b>	
Postdoctoral Fellow	
- located at Columbia University	09/2015-02/2016
- located at NASA Jet Propulsion Laboratory	03/2016-08/2016
<b>Massachusetts Institute of Technology</b>	
Graduate Research Assistant	2011 - 2015
<b>Duke University</b>	
Graduate Research Assistant	2009-2011

## PEER-REVIEWED PUBLICATIONS

Students and post-docs underlined

38. Dadap, N.C., A.R. Cobb, A.M. Hoyt, C.F. Harvey, and **A.G. Konings** (2019): Satellite soil moisture observations predict fire vulnerability in Southeast Asian peatlands, *Environmental Research Letters*, 14, 094014.
37. **Konings, A.G.**, A.A. Bloom, J. Liu, N.C. Parazoo, D.S. Schimel, and K.W. Bowman (2019): Global, satellite-driven estimates of heterotrophic respiration, *Biogeosciences*, 16 (11), 2269-2284.
36. Rao, K, W.R.L. Anderegg, A. Sala, J. Martinez-Vilalta, and **A.G. Konings**: Remotely sensed vegetation optical depth as an indicator of drought-driven tree mortality (2019), *Remote Sensing of Environment*, 227:125-136.

35. **Konings, A.G.**, K. Rao, and S.C. Steele-Dunne (2019): Macro to micro: microwave remote sensing of plant water content for physiology and ecology, *New Phytologist*, 223:1166-1172
34. Novick, K.N., **A.G. Konings**, and P. Gentine (2019): Beyond soil water potential: an expanded view on isohydricity including land-atmosphere interactions and phenology, *Plant, Cell, and Environment*, 1-14.
33. Jagdhuber, T., **A.G. Konings**, K.A. McColl, S.H. Alemohammad, N. N. Das, C. Montzka, M. Link, R. Akbar, and D. Entekhabi (2019): Physics-Based Modeling of Active and Passive Microwave Covariations Over Vegetated Surfaces. *IEEE Transactions in Geoscience and Remote Sensing*, 57(2):788-801.
32. A. Feldman, D. Short Gianotti, **A.G. Konings**, K.A. McColl, R. Akbar, D. Entekhabi (2018): Moisture pulse-reserve in the soil-plant continuum observed across biomes, *Nature Plants*, 4: 1026-1033.
31. Anderegg W.R.L, **A.G Konings**, A.T. Trugman, K. Yu, D.R. Bowling, R. Gabbitas, D. Karp, S. Pacala, J.S. Sperry, B. Sulman, and N. Zenes (2018): Hydraulic diversity of forests regulates ecosystem resilience during drought. *Nature*, 561:538-541.
30. Giardina, F., **A.G. Konings**, S.H. Alemohammad, D. Kennedy, R.S. Oliviera, M. Uriarte, and P. Gentine (2018): Tall Amazonian forests are less sensitive to precipitation variability, *Nature Geoscience*, 11: 405-409.  
*NB: Featured with Nature Geoscience News and Views article*
29. Chaparro, D., M. Piles, M. Vall-Ilossera, A. Camps, **A.G. Konings**, and D. Entekhabi (2018): L-band vegetation optical depth seasonal metrics for crop yield assessment, *Remote Sensing of Environment*, 212:249-259.
28. Alemohammad, S.H., **A.G. Konings**, T. Jagdhuber, M. Moghaddam, and D. Entekhabi (2018). Characterization of vegetation and soil scattering mechanisms across different biomes using P-band SAR polarimetry. *Remote Sensing of Environment*, 208:107-117.
27. Kim, H., R. Parinussa, **A.G. Konings**, W. Wagner, M.H. Cosh, V. Laskshmi, M. Zohaib (2018). Global-scale assessment and combination of SMAP with ASCAT (active) and AMSR2 (passive) soil moisture products. *Remote Sensing of Environment*, 204: 260-275.
26. Momen, M., J. D. Wood, K. A. Novick, R. Pangle, W. T. Pockman, N. G. McDowell, and **A. G. Konings** (2017), Interacting Effects of Leaf Water Potential and Biomass on Vegetation Optical Depth, *Journal of Geophysical Research – Biogeosciences*, 122:3031-3046.  
*NB: Featured as journal and AGU EOS spotlight*
25. Li, Y., K. Guan, P. Gentine, **A.G. Konings**, F.C. Meinzer, J.S. Kimball, X. Xu, W.R.L. Anderegg, N.G. McDowell, J. Martinez-Vilalta, D.G. Long, and S.P. Good (2017). Estimating global ecosystem iso/anisohydry using active and passive microwave satellite data. *Journal of Geophysical Research – Biogeosciences*: 122:3306-3321.
24. S.H. Alemohammad, B. Fang, **A.G. Konings**, J.A. Green, J. Kolassa, C. Prigent, F. Aires, and P. Gentine (2017). Water, Energy, and Carbon with Artificial Neural Networks (WECANN): A statistically-based estimate of global surface turbulent fluxes using solar-induced fluorescence. *Biogeosciences*, 14:4101-4124.

23. **Konings, A.G.**, M. Piles, N. Das, and D. Entekhabi (2017). L-band vegetation optical depth and effective scattering albedo estimation from SMAP. *Remote Sensing of Environment*, 198:460-470.
  22. Rotzer, K, C. Montzka, D. Entekhabi, **A.G. Konings**, K.A. McColl, M. Piles, H. Vereecken (2017). Relationship between vegetation microwave optical depth and cross-polarized backscatter from multi-year Aquarius observations. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 10(10): 4493-4503.
  21. Green, J., **A.G. Konings**, S.H. Alemohammad, J. Berry, D. Entekhabi, J. Kolassa, J.-E. Lee, and P. Gentine (2017). Regionally strong feedbacks between the atmosphere and terrestrial biosphere. *Nature Geoscience*, 10:410-414.
  20. **Konings, A.G.**, A.P. Williams, and P. Gentine (2017). Sensitivity of grassland productivity to aridity controlled by stomatal and xylem regulation. *Nature Geoscience*, 10: 2290-2299.
  19. **Konings, A.G.**, Y. Yu, L. Xu, Y. Yang, D.S. Schimel, and S.S. Saatchi (2017). Active microwave observations of diurnal and seasonal variations of canopy water content across the humid African tropical forests. *Geophysical Research Letters*, 44: 2290-2299.
  18. McColl, K.A., S.H. Alemohammad, R. Akbar, **A.G. Konings**, S.Yueh, and D. Entekhabi (2017). The global distribution and dynamics of surface soil moisture. *Nature Geoscience*, 10: 100-104.
  17. **Konings, A.G** and, P. Gentine (2017). Global Variations in Ecosystem-Scale Isohydricity. *Global Change Biology*, 23(2): 891-905.
  16. McColl K.A., A. Roy, C. Derksen, **A.G. Konings**, S.H. Alemohammad, and D. Entekhabi (2016). Triple collocation for categorical target variables: application to validating soil freeze/thaw products. *Remote Sensing of Environment*, 176, 31-42.
  15. **Konings, A.G.\***, M. Piles\*, K. Rötzer, K.A. McColl, S. Chan, and D. Entekhabi (2016). Vegetation optical depth and scattering albedo retrieval using time-series of dual-polarized L-band radiometer observations. *Remote Sensing of Environment*. 172, 178-189.
- N.B.: First two authors contributed equally to this paper*
14. Bruscantini, C.A., **A.G. Konings**, P. Narvekar, K.A. McColl, D. Entekhabi, F. M. Grings, and H. Karszenbaum (2015). L-band radar soil moisture retrieval without ancillary parameters. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 8(12), 5526-5540.
  13. Alemohammad S.H., K.A. McColl, **A.G. Konings**, and D. Entekhabi (2015). Characterizing precipitation product errors across the United States using triple collocation. *Hydrology and Earth System Science*, 19, 3489-3503.
  12. **Konings, A.G.**, K.A. McColl, M. Piles and D. Entekhabi (2015): How many parameters can be maximally estimated from a set of measurements? *IEEE Geoscience and Remote Sensing Letters*, 12(5), 1081-1085.
  11. McColl K.A., J. Vogelzang, **A.G. Konings**, D. Entekhabi, M. Piles and A. Stoffelen (2014): Extended triple collocation: estimating errors and correlation coefficients with respect to an unknown target. *Geophysical Research Letters*, 41, 6229–6236,

10. **Konings A.G.**, D. Entekhabi, M. Moghaddam and S.S. Saatchi (2014): The effect of variable soil moisture profiles on P-band backscatter. *IEEE Transactions on Geoscience and Remote Sensing*, 52(10), 6315-6325.
9. **Konings A.G.**, X. Feng, A. Molini, S. Manzoni, G. Vico and A. Porporato (2012): Thermodynamics of an idealized hydrologic cycle. *Water Resources Research*, 48, W05527.
8. **Konings A.G.**, G.G. Katul and S.E. Thompson (2012): A phenomenological model for the flow resistance over submerged vegetation. *Water Resources Research*, 48, W02522.
7. Katul G.G., **A.G. Konings**, and A. Porporato (2011): The mean velocity profile in a sheared and thermally stratified atmospheric boundary layer. *Physical Review Letters*, 107, 268502.
6. **Konings, A.G**, S.C. Dekker, M. Rietkerk and G.G. Katul (2011): Drought sensitivity of patterned vegetation determined by rainfall-land surface feedbacks, *Journal of Geophysical Research-Biogeosciences*, 116, G04008.
5. Thompson, S., G. Katul, **A. Konings** and L. Ridolfi (2011): Unsteady overland flow on flat surfaces induced by spatial permeability contrasts. *Advances in Water Resources*, 34, 1049-1058.
4. Thompson, S.E., C.J. Harman, **A.G. Konings**, M. Sivapalan, A. Neal and P. A. Troch (2011): Comparative hydrology across AmeriFlux sites: the variable roles of climate, vegetation, and groundwater. *Water Resources Research*, 47, W00J07.
3. **Konings A.G.**, D. Entekhabi, E.G. Njoku, and S.K. Chan (2011): Effect of radiative transfer uncertainty on L-band radiometric soil moisture retrieval. *IEEE Transactions on Geoscience and Remote Sensing*, 49(7), 2686-2698.
2. **Konings, A.G.**, G.G. Katul, and A. Porporato (2010): The rainfall-no rainfall transition in a coupled land-convective atmosphere system, *Geophysical Research Letters*, 37, L14401.
1. Wójcik R., D. McLaughlin, **A.G. Konings**, and D. Entekhabi (2009): Conditioning stochastic rainfall replicates on remote sensing data. *IEEE Transactions on Geoscience and Remote Sensing*, 47(8), 2436-49.

<b>PUBLICATIONS IN REVIEW OR REVISION</b>
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4. Anderegg, W.R.L., A.T. Trugman, G. Badgley, **A.G. Konings**, and J. Shaw. Divergent ecosystem sensitivity to divergent climate extremes, *in review*.
3. Quetin G., A.A Bloom, K.W. Bowman, and **A.G. Konings**. Data-Informed Ecosystem Model Predictions of NBE Variability Consistent with Terrestrial Biosphere Model Estimates, *in review*.
2. Karthikeyan, L., M. Pan, **A.G. Konings**, M. Piles, R. Fernandez-Moran, D. Nagesh Kumar, and E.F. Wood: Simultaneous retrieval of global-scale vegetation optical depth, surface roughness, and soil moisture using X-band AMSR-E observations, *in review*.
1. Liu, Y, **A.G. Konings**, and P. Gentine: Global coordination in plant physiological and rooting strategies to water stress, *in review*.

## HONORS AND AWARDS

NASA New (Early Career) Investigator Award	2018
NASA Group Achievement Award: AirMOSS Implementation Team	2016
MIT CEE Best Doctoral Thesis Award	2016
NASA Earth and Space Science Fellowship	2012-2015
NSF Graduate Research Fellowship	2009-2012
James B. Duke Fellowship	2009-2011
Chi Epsilon National Civil Engineering Honors Society	2008

## INVITED SEMINARS AND INVITED CONFERENCE PRESENTATIONS

05/2019	Princeton University, Department of Civil and Environmental Engineering
04/2019	Lawrence Berkeley National Laboratory
04/2019	Carnegie Institution for Science, Dept. of Global Ecology
01/2019	American Meteorological Society Annual Meeting, Inez Fung Symposium, panelist
11/2018	University of Saskatchewan, Global Institute for Water Security ( <i>Breakthroughs in Water Security Research</i> lecture series)
05/2018	Harvard University, Dept. of Earth and Planetary Sciences
04/2018	University of California, Berkeley, Dept. of Geography
03/2018	University of Utah, Dept. of Biology
02/2018	University of California, Los Angeles, Dept. of Ecology and Evolution
01/2018	American Meteorological Society Annual Meeting
12/2017	American Geophysical Union Fall Meeting
09/2017	NASA Goddard Space Flight Center, Global Modelling and Assimilation Office
05/2017	Carnegie Institution for Science, Dept. of Global Ecology
12/2016	American Geophysical Union Fall Meeting
12/2016	University of California, Berkeley, Dept. of Civil and Environmental Eng.
10/2016	Boston University, Dept. of Earth and Environment
10/2016	Stanford University, Dept. of Geophysics
07/2016	NASA Jet Propulsion Laboratory, Carbon Cycle & Ecosystems Group
06/2016	Gordon Research Conference on Multiscale Vascular Plant Biology
05/2015	Tsinghua University, Center for Earth System Science
04/2015	The Ohio State University, Dept. of Civil, Environmental, and Geodetic Eng.
03/2015	Columbia University, Dept. of Earth and Environmental Engineering
03/2015	Stanford University, Dept. of Earth System Science
06/2011	Utrecht University, Dept. of Environmental Sciences
07/2010	Istituto Veneto di Scienze, Lettere, ed Arti, Summer School on Biogeodynamics and Earth System Sciences

## TEACHING

### Main or co-instructor

ESS 223 Ecophysiology and Land Surface Processes (Fall 2017, Winter 2019)  
ESS 224 Remote Sensing of Hydrology (Spring 2018, Spring 2019)

**Guest lecture**

ENVRES 330 Research Approaches for Environmental Problem Solving (Spring 2017)  
ESS 305 Climate Change: An Earth Systems Perspective (Fall 2017, Fall 2018)  
EARTHSYS 10 Introduction to Earth Systems (Fall 2017, Fall 2018)  
Stanford Undergraduate Research in Geoscience and Engineering, SURGE (Summer 2018, 2019)

**Teaching Assistant**

MIT 1.070 Introduction to Hydrology (Fall 2013)  
Summer school on Biogeodynamics and Earth System Science (June 2010)  
MIT Chi Epsilon Matlab Tutorial (Spring 2009)

**Workshop Organization**

Software Carpentry Scientific Programming Workshop at MIT CEE (2013)

<b>RESEARCH MENTORSHIP</b>
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**Postdoctoral Scholars**

Yanlan Liu, 07/2019 - present  
Gregory Quetin, 02/2018 – present  
Mostafa Momen, 02/2017-01/2018

**PhD Students**

Caroline Famiglietti, 2018 – present (Stanford Graduate Fellow)  
Natan Holtzman, 2018 - present  
Krishna Rao, 2018 – present (NASA Earth and Space Science Fellow)  
Nathan Dadap, 2016 – present (NASA Earth and Space Science Fellow)

**MS Students**

Krishna Rao (CEE), 2017  
Christopher Jansen (CEE), 2017  
Jacqueline Fortin (CEE), 2018

**Undergraduate Students**

Michael Burnett (Earth Systems), 2018-2019  
Yesenia Ulloa (undeclared, Stanford SESUR summer student), 2018-2019  
Guadalupe Alvarez (UT-EI Paso, Stanford SURGE summer student), 2018

**Geophysics Second-Project Students**

Aakash Ahamed, 2018 - present

**Visiting Students**

Yanlan Liu (Duke University PhD student), summer 2018

**PhD Committee Member**

Andrew Feldman, MIT Civil and Environmental Engineering, current

Aakash Ahamed, Stanford geophysics, current  
Shersingh Tumbler-Davila, Stanford Earth System Science, current  
Roger Michaelides, Stanford Geophysics, current  
Emily Francis, Stanford Earth System Science, PhD 2019  
Jordana Deane, Stanford Civil and Environmental Engineering, PhD 2018  
Ryan Smith, Stanford Geophysics, PhD 2018  
Yoichi Shiga, Stanford Civil and Environmental Engineering, PhD 2018

## **STANFORD UNIVERSITY SERVICE**

- Woods Institute Environmental Ventures Projects Selection Committee (2019-2021)
- 'Postdoc Academic Chats' Panelist (2018)
- Long-Range Planning Committee on Faculty Affordability (2018-present)
- Price Chair in Hydrology and Water Resources Faculty Search Committee (2018-2019)
- Jasper Ridge Biological Preserve Faculty Advisory Committee (2017-present)
  
- Earth System Science Departmental Seminar Organizer (Spring Quarter 2017)
- Earth System Science Graduate Admissions Committee (Fall 2016-Spring 2018)
- Earth System Science Diversity Committee (2018 – present)

## **PROFESSIONAL SERVICE**

### **Leadership**

- Co-Chair, Keck Institute for Space Studies Workshop on “Sensing Forest Water Dynamics from Space: Towards Predicting the Earth System Response to Droughts” (October 2019)
- Program committee member, AGU Chapman Conference on “Understanding Carbon-Climate Feedbacks” (August 2019)
- Co-convener, AGU Fall Meeting 2018 session “Emergent Behavior in the Terrestrial Carbon Cycle”
- Primary convener, AGU Fall Meeting 2018 session “Understanding the Role of Plant Hydraulics Across Scales”
- Primary convener, AGU Fall Meeting 2017 session on “Emerging technologies in hydrologic remote sensing: drones, proximal sensing using neutron probes, and more”
- Member, Remote Sensing Technical Committee, American Geophysical Union Hydrology Section, 2016-present
- Co-organizer, JPL workshop on Applications of GNSS-R to Cold Land Processes and Surface Hydrology, August 2016
- Outstanding Student Paper Award judge, American Geophysical Union 2016-present

### **Reviewer and Editor**

- Associate Editor, *Frontiers in Big Data*, Data-Driven Climate Sciences section (2019 - present)
- Ad Hoc Journal Reviews: *Advances in Water Resources*, *Earth Surface Processes and Landforms*, *Earth System Science Data*, *Ecological Applications*, *Geophysical Research Letters*, *Global Change Biology*, *IEEE Geoscience and Remote Sensing Letters*, *Journal of Hydrometeorology*, *Hydrological Processes*, *Hydrology and Earth System Sciences*, *Nature*, *Nature Ecology and Evolution*, *Nature Geoscience*, *New Phytologist*, *Proceedings of the National Academy of Sciences*, *Remote Sensing*, *Remote Sensing of Environment*, *Science Advances*, and *Water Resources Research*.
- Conferences: *IEEE Geoscience and Remote Sensing Symposium*
- Proposals: NASA Terrestrial Ecology (panel), NASA Terrestrial Hydrology (panel), NSF Geography and Spatial Sciences (ad hoc)

## **PROFESSIONAL AFFILIATIONS**

American Association for the Advancement of Science, American Geophysical Union, Ecological Society of America, American Meteorological Society, IEEE Geoscience and Remote Sensing Society, Chi Epsilon Civil Engineering Honors Society