



## Alexandra Konings

Assistant Professor of Earth System Science and, by courtesy, of Geophysics & Center Fellow, by courtesy, at the Woods Institute for the Environment

 Curriculum Vitae available Online

### Bio

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#### BIO

Alexandra Konings is an ecohydrologist - she is interested in how ecosystems and the carbon cycle respond to variations in water availability at large scales (and vice versa). Research questions in the Konings lab span a range of ecosystem properties, but many of them surround the role of vegetation water content in predicting plant health and its associated fluxes and growth. She holds SB and PhD degrees from MIT (working with Dara Entekhabi), and a M.S. from Duke University (working with Gaby Katul). She joined the Department of Earth System Science as an assistant professor in 2016 after two short postdoctoral stints at Columbia University (working with Pierre Gentine) and the NASA Jet Propulsion Laboratory (working with Dave Schimel, Sassan Saatchi, and others). She received the NASA New (Early Career) Investigator Award in 2018 and the NSF CAREER in 2020.

#### ACADEMIC APPOINTMENTS

- Assistant Professor, Earth System Science
- Center Fellow (By courtesy), Stanford Woods Institute for the Environment
- Assistant Professor (By courtesy), Geophysics

#### ADMINISTRATIVE APPOINTMENTS

- Faculty Affiliate, Stanford Woods Institute for the Environment, (2016- present)
- Assistant Professor, Stanford Department of Earth System Science, (2016- present)
- Visiting Postdoc, NASA Jet Propulsion Laboratory, (2016-2016)
- Visiting Postdoc, Columbia University, (2015-2016)
- NASA Earth and Space Science Fellow, Massachusetts Institute of Technology, (2012-2015)
- NSF Graduate Research Fellow, Massachusetts Institute of Technology, (2011-2011)
- NSF Graduate Research Fellow, Duke University, (2009-2011)

#### HONORS AND AWARDS

- CAREER, NSF (2020-2025)
- New (Early Career) Investigator Award, NASA (2018-2021)
- Group Achievement Award: AirMOSS Implementation Team, NASA (2016)
- Best Doctoral Thesis Award, MIT Department of Civil and Environmental Engineering (2015-2016)
- Earth and Space Science Fellowship, NASA (2012-2015)
- Graduate Research Fellowship, National Science Foundation (2009-2012)
- James B. Duke Fellowship, Duke University (2009-2011)

## BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Member, Jasper Ridge Biological Preserve Faculty Advisory Committee (2017 - present)
- Member, AGU Hydrology Technical Committee on Remote Sensing (2016 - present)
- Member, IEEE Geoscience and Remote Sensing Society (2010 - present)
- Member, American Geophysical Union (2008 - present)

## PROFESSIONAL EDUCATION

- Ph.D., Massachusetts Institute of Technology , Hydrology (2015)
- M.S., Duke University , Environmental Science (2011)
- S.B., Massachusetts Institute of Technology , Environmental Engineering Science (2009)

## LINKS

- Remote Sensing Ecohydrology Group: <http://earth.stanford.edu/koningslab>

## Teaching

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### COURSES

#### 2020-21

- Biosphere-Atmosphere Interactions: EARTHSYS 123A, EARTHSYS 223, ESS 123, ESS 223 (Win)
- Remote Sensing of Hydrology: CEE 260D, ESS 224 (Spr)

#### 2019-20

- Biosphere-Atmosphere Interactions: EARTHSYS 123A, EARTHSYS 223, ESS 123, ESS 223 (Win)
- Remote Sensing of Hydrology: CEE 260D, ESS 224 (Spr)

#### 2018-19

- Ecophysiology and Land Surface Processes: ESS 223 (Win)
- Remote Sensing of Hydrology: CEE 260D, ESS 224 (Spr)

#### 2017-18

- Ecophysiology and Land Surface Processes: BIO 125, ESS 123, ESS 223 (Aut)
- Remote Sensing of Hydrology: ESS 124, ESS 224 (Spr)

## STANFORD ADVISEES

### Doctoral Dissertation Advisor (AC)

Nathan Dadap

### Master's Program Advisor

Lilla Petruska

### Doctoral (Program)

Natan Holtzman, Krishna Rao, Matthew Worden

## Publications

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### PUBLICATIONS

- **Plant hydraulics accentuates the effect of atmospheric moisture stress on transpiration** *NATURE CLIMATE CHANGE*

Liu, Y., Kumar, M., Katul, G. G., Feng, X., Konings, A. G.  
2020

- **Carbon Flux Variability from a Relatively Simple Ecosystem Model with Assimilated Data is Consistent with Terrestrial Biosphere Model Estimates** *Journal of Advances in Modeling Earth Systems*  
Quetin, G. R., Bloom, A. A., Bowman, K. W., Konings, A. G.  
2020; 12: e2019MS001889
- **Validation practices for satellite soil moisture retrievals: What are (the) errors?** *Remote Sensing of Environment*  
Gruber, A., De Lannoy, G., Albergel, C., Al-Yaari, A., Brocca, L., Calvet, J., Colliander, A., Cosh, M., Crow, W., Dorigo, W., Draper, C., Hirshi, M., Kerr, et al  
2020; 224: 111806
- **Satellite-based vegetation optical depth as an indicator of drought-driven tree mortality** *REMOTE SENSING OF ENVIRONMENT*  
Rao, K., Anderegg, W. L., Sala, A., Martinez-Vilalta, J., Konings, A. G.  
2019; 227: 125–36
- **Global satellite-driven estimates of heterotrophic respiration** *BIOGEOSCIENCES*  
Konings, A. G., Bloom, A., Liu, J., Parazoo, N. C., Schimel, D. S., Bowman, K. W.  
2019; 16 (11): 2269–84
- **Physics-Based Modeling of Active and Passive Microwave Covariations Over Vegetated Surfaces** *IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING*  
Jagdhuber, T., Konings, A. G., McColl, K. A., Alemohammad, S., Das, N., Montzka, C., Link, M., Akbar, R., Entekhabi, D.  
2019; 57 (2): 788–802
- **Satellite soil moisture observations predict burned area in Southeast Asian peatlands** *ENVIRONMENTAL RESEARCH LETTERS*  
Dadap, N. C., Cobb, A. R., Hoyt, A. M., Harvey, C. F., Konings, A. G.  
2019; 14
- **Simultaneous retrieval of global-scale vegetation optical depth, surface roughness, and soil moisture using X-band AMSR-E observations** *Remote Sensing of Environment*  
Karthikeyan, L., Pan, M., Konings, A. G., Piles, M., Fernandez-Moran, R., Kumar, D. N., Wood, E. F.  
2019; 234: 111473
- **Macro to micro: microwave remote sensing of plant water content for physiology and ecology** *NEW PHYTOLOGIST*  
Konings, A. G., Rao, K., Steele-Dunne, S. C.  
2019; 223: 1166-1172
- **Beyond soil water potential: An expanded view on isohydrlicity including land–atmosphere interactions and phenology** *PLANT, CELL, AND ENVIRONMENT*  
Novick, K. A., Konings, A. G., Gentine, P.  
2019; 42: 1802-1815
- **Moisture pulse-reserve in the soil-plant continuum observed across biomes** *NATURE PLANTS*  
Feldman, A. F., Gianotti, D., Konings, A. G., McColl, K. A., Akbar, R., Salvucci, G. D., Entekhabi, D.  
2018; 4 (12): 1026–33
- **Global-scale assessment and combination of SMAP with ASCAT (active) and AMSR2 (passive) soil moisture products** *REMOTE SENSING OF ENVIRONMENT*  
Kim, H., Parinussa, R., Konings, A. G., Wagner, W., Cosh, M. H., Lakshmi, V., Zohaib, M.  
2018; 204: 260-275
- **Hydraulic diversity of forests regulates ecosystem resilience during drought** *NATURE*  
Anderegg, W. R., Konings, A. G., Trugman, A. T., Yu, K., Bowling, D. R., Gabbitas, R., Karp, D. S., Pacala, S., Sperry, J. S., Sulman, B. N., Zenes, N.  
2018; 561: 538-541
- **Tall Amazonian forests are less sensitive to precipitation variability** *NATURE GEOSCIENCE*  
Giardina, F., Konings, A. G., Kennedy, D., Alemohammad, S., Oliveira, R. S., Uriarte, M., Gentine, P.  
2018: 405-409
- **L-band vegetation optical depth seasonal metrics for crop yield assessment** *REMOTE SENSING OF ENVIRONMENT*

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- Chapparo, D., Piles, M., Vall-Ilossera, M., Camps, A., Konings, A. G., Entekhabi, D.  
2018
- **Characterization of vegetation and soil scattering mechanisms across different biomes using P-band SAR polarimetry** *REMOTE SENSING OF ENVIRONMENT*  
Alemohammad, S., Konings, A. G., Jagdhuber, T., Moghaddam, M., Entekhabi, D.  
2018: 107-117
  - **Active microwave observations of diurnal and seasonal variations of canopy water content across the humid African tropical forests** *GEOPHYSICAL RESEARCH LETTERS*  
Konings, A. G., Yu, Y., Xu, L., Yang, Y., Schimel, D., Saatchi, S.  
2017; 44: 2290-2299
  - **Water, Energy, and Carbon with Artificial Neural Networks (WECANN): a statistically based estimate of global surface turbulent fluxes and gross primary productivity using solar-induced fluorescence** *BIOGEOSCIENCES*  
Alemohammad, S., Fang, B., Konings, A. G., Aires, F., Green, J. K., Kolassa, J., Miralles, D., Prigent, C., Gentine, P.  
2017; 14: 4101-4124
  - **Relationship between vegetation microwave optical depth and cross-polarized backscatter from multi-year Aquarius observations.** *IEEE JOURNAL OF SELECTED TOPICS IN EARTH OBSERVATIONS AND REMOTE SENSING*  
Rotzer, K., Montzka, C., Entekhabi, D., Konings, A. G., McColl, K. A., Piles, M., Vereecken, H.  
2017
  - **Estimating global ecosystem iso/anisohdry using active and passive microwave satellite data** *JOURNAL OF GEOPHYSICAL RESEARCH - BIOGEOSCIENCES*  
Li, Y., Guan, K., Gentine, P., Konings, A. G., Meinzer, F. C., Kimball, J. S., Xu, X., Anderegg, W. R., McDowell, N. G., Martinez-Vilalta, J., Long, D. G., Good, S. P.  
2017; 122
  - **Interacting effects of leaf water potential and biomass on vegetation optical depth** *JOURNAL OF GEOPHYSICAL RESEARCH - BIOGEOSCIENCES*  
Momen, M., Wood, J. D., Novick, K. A., Pangle, R., Pockman, W. T., McDowell, N. G., Konings, A. G.  
2017; 122
  - **Regionally strong feedbacks between the atmosphere and terrestrial biosphere** *NATURE GEOSCIENCE*  
Green, J., Konings, A. G., Alemohammad, S., Berry, J., Entekhabi, D., Kolassa, J., Lee, J., Gentine, P.  
2017; 10: 410-414
  - **L-band vegetation optical depth and scattering albedo estimation from SMAP** *REMOTE SENSING OF ENVIRONMENT*  
Konings, A. G., Piles, M., Das, N., Entekhabi, D.  
2017; 198: 460-470
  - **The global distribution and dynamics of surface soil moisture** *NATURE GEOSCIENCE*  
McColl, K. A., Alemohammad, S., Akbar, R., Konings, A., Yueh, S., Entekhabi, D.  
2017; 10: 100-104
  - **Global variations in ecosystem scale isohyricity** *GLOBAL CHANGE BIOLOGY*  
Konings, A. G., Gentine, P.  
2017; 23 (2): 891-905
  - **Sensitivity of grassland productivity to aridity controlled by stomatal and xylem regulation** *NATURE GEOSCIENCE*  
Konings, A. G., Williams, A., Gentine, P.  
2017; 10: 284-288
  - **Triple collocation for binary and categorical variables: Application to validating landscape freeze/thaw retrievals** *REMOTE SENSING OF ENVIRONMENT*  
McColl, K. A., Roy, A., Derksen, C., Konings, A. G., Alemohammed, S. H., Entekhabi, D.  
2016; 176: 31-42
  - **Vegetation optical depth and scattering albedo retrieval using time series of dual-polarized L-band radiometer observations** *REMOTE SENSING OF ENVIRONMENT*  
Konings, A. G., Piles, M., Roetzer, K., McColl, K. A., Chan, S. K., Entekhabi, D.  
2016; 172: 178-189

- **L-Band Radar Soil Moisture Retrieval Without Ancillary Information** *IEEE JOURNAL OF SELECTED TOPICS IN APPLIED EARTH OBSERVATIONS AND REMOTE SENSING*  
Bruscantini, C. A., Konings, A. G., Narvekar, P. S., McColl, K. A., Entekhabi, D., Grings, F. M., Karszenbaum, H.  
2015; 8 (12): 5526-5540
- **How Many Parameters Can Be Maximally Estimated From a Set of Measurements?** *IEEE GEOSCIENCE AND REMOTE SENSING LETTERS*  
Konings, A. G., McColl, K. A., Piles, M., Entekhabi, D.  
2015; 12 (5): 1081-1085
- **Characterization of precipitation product errors across the United States using multiplicative triple collocation** *HYDROLOGY AND EARTH SYSTEM SCIENCES*  
Alemohammad, S. H., McColl, K. A., Konings, A. G., Entekhabi, D., Stoffelen, A.  
2015; 19 (8): 3489-3503
- **The Effect of Variable Soil Moisture Profiles on P-Band Backscatter** *IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING*  
Konings, A. G., Entekhabi, D., Moghaddam, M., Saatchi, S. S.  
2014; 52 (10): 6315-6325
- **Extended triple collocation: Estimating errors and correlation coefficients with respect to an unknown target** *GEOPHYSICAL RESEARCH LETTERS*  
McColl, K. A., Vogelzang, J., Konings, A. G., Entekhabi, D., Piles, M., Stoffelen, A.  
2014; 41 (17): 6229-6236
- **Thermodynamics of an idealized hydrologic cycle** *WATER RESOURCES RESEARCH*  
Konings, A. G., Feng, X., Molini, A., Manzoni, S., Vico, G., Porporato, A.  
2012; 48
- **A phenomenological model for the flow resistance over submerged vegetation** *WATER RESOURCES RESEARCH*  
Konings, A. G., Katul, G. G., Thompson, S. E.  
2012; 48
- **Mean Velocity Profile in a Sheared and Thermally Stratified Atmospheric Boundary Layer** *PHYSICAL REVIEW LETTERS*  
Katul, G. G., Konings, A. G., Porporato, A.  
2011; 107 (26)
- **Drought sensitivity of patterned vegetation determined by rainfall-land surface feedbacks** *JOURNAL OF GEOPHYSICAL RESEARCH-BIOGEOSCIENCES*  
Konings, A. G., Dekker, S. C., Rietkerk, M., Katul, G. G.  
2011; 116
- **Unsteady overland flow on flat surfaces induced by spatial permeability contrasts** *ADVANCES IN WATER RESOURCES*  
Thompson, S., Katul, G., Konings, A., Ridolfi, L.  
2011; 34 (8): 1049-1058
- **Comparative hydrology across AmeriFlux sites: The variable roles of climate, vegetation, and groundwater** *WATER RESOURCES RESEARCH*  
Thompson, S. E., Harman, C. J., Konings, A. G., Sivapalan, M., Neal, A., Troch, P. A.  
2011; 47
- **Effect of Radiative Transfer Uncertainty on L-Band Radiometric Soil Moisture Retrieval** *IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING*  
Konings, A. G., Entekhabi, D., Chan, S. K., Njoku, E. G.  
2011; 49 (7): 2686-2698
- **The rainfall-no rainfall transition in a coupled land-convective atmosphere system** *GEOPHYSICAL RESEARCH LETTERS*  
Konings, A. G., Katul, G. G., Porporato, A.  
2010; 37
- **Conditioning Stochastic Rainfall Replicates on Remote Sensing Data** *IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING*  
Wojcik, R., McLaughlin, D., Konings, A. G., Entekhabi, D.  
2009; 47 (8): 2436-2449