

Konstantinos M. Andreadis

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Pasadena, CA, USA

RESEARCH INTERESTS My research has primarily focused on the intersection between applied hydrologic modeling and remote sensing (visible and microwave), data assimilation, as well as the study of large-scale hydrology as it relates to climate change and environmental monitoring.

EDUCATION **University of Washington**, Seattle, WA USA
Ph.D., Civil and Environmental Engineering, June 2009

- Dissertation Title: A remote sensing data assimilation system for cold land processes hydrologic estimation

M.S.E., Civil and Environmental Engineering, June 2004

- Thesis Title: Assimilating remotely sensed snow observations into a macroscale hydrology model

Technical University of Crete Chania, Greece
Engineering Diploma, Environmental Engineering, July 2002

- Thesis Title: Statistical methods and software development for oil spill source identification

RESEARCH AND TEACHING EXPERIENCE **Jet Propulsion Laboratory**, Pasadena, CA
Research Scientist **June, 2011 – present**
Primarily working on developing the discharge algorithm for the upcoming SWOT satellite mission science team.

- Data assimilation of remotely sensed river measurements over the continental U.S.
- Impact of deforestation on drought characteristics.

Byrd Polar Research Center, Ohio State University, Columbus, OH
Post-doctoral Researcher **September, 2009 – June, 2011**
Worked on a number of different projects, revolving around the SWOT proposed satellite mission science team, including:

- Data assimilation of remotely sensed river measurements over the Ohio River basin
- Congo River basin hydrological processes from gravimetric remote sensing

Adjunct Professor **January – March, 2011**
Taught the “Water Resources Engineering” undergraduate class (CIVILEN562) at the Department of Civil and Environmental Engineering and Geodetic Science.

University of Washington, Seattle, WA

Research Assistant

August, 2002 – September, 2009

Worked on a number of different projects along with the pursuit of the M.S.E. and Ph.D.:

- MODIS and AMSR-E snow data assimilation
- Coupled microwave emission-snow hydrology model development
- Surface water swath altimetry virtual mission
- JCSDA radiative transfer model inter-comparison
- Twentieth century US and global drought
- Real-time drought monitoring
- Short and long-term hydrologic predictability
- Streamflow sensitivity to climatic change over the Colorado River basin

Guest Lecturer

April 2007-2009

Taught classes on Remote sensing of snow (CEE599 Snow Hydrology, Prof. Jessica Lundquist), and Applied optimal estimation (CEE599 Hydrologic Data Analysis, Prof. Dennis Lettenmaier).

NASA Goddard Space Flight Center, Greenbelt, MD

Visiting Scientist

September, 2006 – November, 2006

Examined the sensitivity of passive microwave emission model predictions to snow microphysical parameters in coupled modeling experiments.

PUBLICATIONS

Andreadis, K. M., D. P. Lettenmaier, 2011: Implications of representing snowpack stratigraphy for the assimilation of passive microwave satellite observations, *J. Hydrometeorology*, in review.

Lee, H., R. E. Beighley, D. Alsdorf, H. Jung, C.K. Shum, J. Duan, J. Guo, D. Yamazaki, K. Andreadis, 2011: Characterization of terrestrial water dynamics in the Congo Basin using GRACE and satellite radar altimetry, *Remote Sens. Environ.*, in review.

Beighley, R.E, R.L. Ray, Y. He, H. Lee, L. Schaller, M. Durand, K.M. Andreadis, D.E. Alsdorf, C.K. Shum, 2011: Comparing satellite derived precipitation datasets using the Hillslope River Routing (HRR) model in the Congo River Basin, *Hydrol. Process.*, doi:10.1002/hyp.8045.

Biancamaria, S., M. Durand, K. Andreadis, P.D. Bates, A. Boone, N.M. Mognard, E. Rodriguez, D.E. Alsdorf, D. Lettenmaier, and E. Clark, 2011: Assimilation of virtual wide swath altimetry to improve Arctic river modeling, *Remote Sens. Environ.*, **115**, 373-381.

Xu, X., D. Liang, K. M. Andreadis, L. Tsang, E. G. Josberger, and D. P. Lettenmaier, 2010: Active remote sensing of snow using NMM3D/DMRT and comparison with CLPX II airborne data, *IEEE J. Sel. Topics Earth Obs. and Remote Sens.*, **3**, 689-697.

Biancamaria, S., K. M. Andreadis, M. Durand, E. Clark, E. Rodriguez, N. Mognard, D. Alsdorf, D. Lettenmaier, and Y. Oudin, 2010: Preliminary characterization of SWOT hydrology error budget and global capabilities, *IEEE J. Sel. Topics Earth Obs. and Remote Sens.*, **3**, 6-19.

- Andreadis, K. M., P. Storck, and D. P. Lettenmaier, 2009: Modeling the effects of canopies on snow accumulation and ablation processes, *Water Res. Research*, **45**, W05429, doi:10.1029/2008WR007042.
- Sheffield, J., K. M. Andreadis, E. F. Wood, and D. P. Lettenmaier, 2009: Global and continental drought in the second half of the 20th century: severity-area-duration analysis and temporal variability of large-scale events, *J. Climate*, , **22**, 1962-1981.
- Rutter, N., R. Essery, J. Pomeroy, N. Altimir, K. M. Andreadis et al., 2009: Evaluation of forest snow processes models (SnowMIP2), *J. Geophys. Res.*, **114**, D06111, doi:10.1029/2008JD011063.
- Durand, M., K. M. Andreadis, D. Alsdorf, and D. P. Lettenmaier, 2008: Bayesian estimation of bathymetric depth and slope from swath altimetry and a hydrodynamic model, *Geophys. Res. Lett.*, **35**, L20401, doi:10.1029/2008GL034150.
- Wójcik, R., K. M. Andreadis, M. Tedesco, E. F. Wood, and D. P. Lettenmaier, 2008: Multi-model estimation of snow microwave emission during CLPX03 using operational parameterization of micro-physical snow characteristics, *J. Hydrometeorology*, **9**, doi:10.1175/2008JHM9091.
- Liang, D., X. Xu, L. Tsang, K. M. Andreadis, and E. G. Josberger, 2008: Modeling Multi-layer Effects in Passive Microwave Remote Sensing of Dry Snow Using Dense Media Radiative Transfer Theory Based on the Quasicrystalline Approximation, *IEEE Trans. Geosci. Remote Sens.*, **46**, 3663-3671.
- Andreadis, K. M., D. Liang, L. Tsang, D. P. Lettenmaier, and E. G. Josberger, 2008: Characterization of errors in a coupled snow hydrology-microwave emission model, *J. Hydrometeorology*, **9**, 149-164.
- Andreadis, K. M., E. A. Clark, D. P. Lettenmaier, and D. E. Alsdorf, 2007: Prospects for river discharge and depth estimation through assimilation of swath-altimetry into a raster-based hydrodynamics model, *Geophys. Res. Lett.*, **34**, L10403, doi:10.1029/2007GL029721
- Andreadis, K.M., and D.P. Lettenmaier, 2006: Trends in 20th century drought over the continental United States, *Geophys. Res. Lett.*, **33**, L10403, doi:10.1029/2006GL025711
- Andreadis, K.M., and D.P. Lettenmaier, 2006: Assimilating Remotely Sensed Snow Observations into a Macroscale Hydrology Model, *Adv. Water Res.*, **29**, 872-886.
- Andreadis, K.M., E.A. Clark, A.W. Wood, A.F. Hamlet, and D.P. Lettenmaier, 2005, 20th Century Drought in the Conterminous United States, *J. Hydrometeorology*, **6**, 985-1001.

GRANTS

NASA Physical Oceanography Program

Project title: "Assessing and retiring risk in SWOT discharge products: Two methods for characterizing river depth"

Award amount: \$270,352

Period: 2010-2013

[PENDING] NASA ROSES 2010 THP

Project title: "Evaluating SWOT observations of river discharge and their implications for large-scale hydrologic estimation and prediction"

Award amount: \$612,149

Period: 2011-2014

[PENDING] NASA Recompetition of the GRACE Science Team

Project title: "Enhancement of GRACE Temporal Gravity Field Solutions to Study Terrestrial Water Dynamics in the Congo Basin"

Award amount: \$663,353

Period: 2011-2014

[PENDING] NASA NEWS

Project title: "Quantifying the evaporation rates and energy balance of large water bodies: A NEWS-based approach for Lake Superior"

Award amount: \$447,774

Period: 2011-2013

AWARDS

AGU Fall Meeting Outstanding Student Paper Award (2008)

Andy Studebaker Fellowship, Center for Water and Watershed Studies, University of Washington (2006)

PROFESSIONAL MEMBERSHIPS

- American Geophysical Union
- European Geosciences Union
- Institute of Electrical and Electronic Engineers
- American Meteorological Society
- American Water Resources Association

TECHNICAL REVIEWS

Journals: Journal of Hydrometeorology, Journal of Geophysical Research, Advances in Water Resources, Hydrological Processes, Theoretical Applied Climatology, IEEE Transactions of Geosciences and Remote Sensing, Vadose Zone, Journal of Hydrology, Hydrology and Earth System Sciences

Agencies: NOAA, NWS

TECHNICAL SKILLS

Programming languages: C, C++, Python, Fortran 77/90, CUDA C, SQL, Scala, F#, Clojure, Perl, Unix shell scripting, HTML, PHP

Technical software: Matlab, R, GRASS GIS, PostGIS, IDL/ENVI, GMT, ArcGIS

Publishing: Latex, OpenOffice, Microsoft Office

Operating systems: Linux, MacOS, Windows

LANGUAGES

English, Greek (fluent), German (basic)

COLLABORATORS

- Doug Alsdorf, Ohio State University
- Dennis Lettenmaier, University of Washington
- Eric Wood, Princeton University
- Leung Tsang, University of Washington

- Ernesto Rodriguez, NASA JPL
- Delwyn Moller, Remote Sensing Solutions, Inc.
- Edward Beighley, San Diego State University
- Michael Durand, Ohio State University
- Marco Tedesco, City University of New York
- Mark Moritz, Ohio State University
- Nelly Mognard, CNES
- Paul Bates, Bristol University
- Rolf Reichle, NASA GSFC
- Jerad Bales, USGS
- CK Shum, Ohio State University
- Steve Margulis, UCLA