

RYAN G KNOX

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EDUCATION

Massachusetts Institute of Technology
PhD in Hydrology

February 2013

University of Connecticut, Storrs
B.S.E. in Civil and Environmental & Engineering

June 2002

EXPERIENCE

Lawrence Berkeley National Laboratory - Earth Science Division - Climate and Carbon Sciences

May 2013 - Present

Postdoctoral Fellow

Research on the development and implementation of next-generation terrestrial biosphere dynamics and biophysics in land modeling systems.

Sustainability Science Program at Harvard Kennedy Schools Mossavar-Rahmani Center for Business and Government

January 2013 - May 2013

Postdoctoral Researcher

Research Project: “Sustainable Development of the Amazon and its Surrounding Regions: The Interplay of Changing Climate, Hydrology, and Land Use”. Development of environmental modeling software, pertaining to the physical consistencies of cloud radiation scattering and general handling of model memory.

Massachusetts Institute of Technology

September 2004 - October 2012

Research Assistant

Cambridge, MA

- Thesis research: Knox, R.G. *Land Conversion in Amazonia and Northern South America; Influences on Regional Hydrology and Ecosystem Response*. Dissertation, Massachusetts Institute of Technology. Cambridge, 2012.

TECHNICAL STRENGTHS

Co-lead Developer	Ecosystem Demography Model 2.1 and 2.2 (ED2)
Lead Manager	ED2 Community Code Repository and Version Control (github)
Terrestrial Ecosystem Biophysics	Parametrization of terrestrial heat and mass transfer, integration techniques, radiative transfer in plant canopies
High Performance Computing	Parallelization and numerical optimization techniques, vectorization, procedural optimization, input/output, memory handling
Computer Languages	C, Fortran 90, Matlab/Octave, OpenGL, Visual Basic
Protocols & APIs	Message Passing Interface (MPI), Hierarchical Data Format (HDF), Network Common Data Format (NetCDF), OpenMP
Sensor Technology	Campbell data loggers, sensor system design, eddy covariance, heat flux plates, radiation sensors, dielectric soil moisture probes
Visualization Techniques	Designer, Ecosystem Demography Display Interface (EDDI)
Server Administration	Distributed HPC Linux computer clusters
Information Systems Processing	Techniques in: Satellite Retrieval Spectral Correction Geospatial Mosaicing Classification Filtering MODIS,Landsat,SRTM,TRMM,etc

AWARDS AND AFFILIATIONS

Member, Chi Epsilon National Civil Engineering Honor Society

Recipient, American Geophysical Union Outstanding Student Paper Award, 2003 Joint Assembly

Recipient, Presidential Fellow, Massachusetts Institute of Technology, 2004-2005

SELECTED PUBLICATIONS

Knox, R. G., Longo, M., Swann, A. L. S., Zhang, K., Levine, N. M., Moorcroft, P. R., and Bras, R. L.: Hydrometeorological effects of land-conversion in a biosphere-atmosphere model of Northern South America, *Hydrol. Earth Syst. Sci.*, 19(1), 2015

Fisher, R.A., S. Muszala, M. Versteinstein, P. Lawrence, C Xu, NG McDowell, RG Knox, C Koven, J Holm, BM Rogers, D Lawrence and G Bonan. Taking off the training wheels: the properties of a dynamic vegetation model without climate envelopes. *Geosci. Model Dev. Disc.* 8(4), 2015

Koven, C.D., J.Q. Chambers, K. Georgiou, R. Knox, R. Negron-Juarez, W.J. Riley, V.K. Arora, V. Brovkin, P. Friedlingstein and C.D. Jones. Controls on terrestrial carbon feedbacks by productivity vs. turnover in the CMIP5 Earth System Models. *Biogeosciences Discussions.* 12, 2015

Zhang, K., A.D.A Castanho, D.R. Galbraith, S. Moghim, N.M. Levine, R.L. Bras, M.T. Coe, M.H. Costa, Y. Malhi, M. Longo, R.G. Knox, S. McKnight, J. Wang and P.R. Moorcroft. The fate of Amazonian ecosystems over the coming century arising from changes in climate, atmospheric CO₂ and land use. *Global Change Biology.* 2015

Kim Y., R.G. Knox, M. Longo, D. Medvigy, L.R. Hutyra, E.H. Pyle, S.C. Wofsy, R.L. Bras and P.R. Moorcroft. Seasonal carbon dynamics and water fluxes in an Amazon rainforest. *Global Change Biology*, 18(4), 2012.

Knox, R., G. Bisht, J. Wang, and R.L. Bras. Precipitation Variability Over the Forest to Non-Forest Transition in Southwestern Amazonia. *Journal of Climate*, 24(9), 2011.

Wang J., R. L. Bras, G. Sivandran and R. G. Knox. A simple method for the estimation of thermal inertia, *Geophysical Research Letters*, 37, L05404, 2010.

Knox, R. and E.N. Anagnostou. Scale Interactions in Radar Rainfall Estimation Uncertainty. *Journal of Hydrologic Engineering*. 14(9), 2009.

Wang, J., F.J.F Chagnon, E.R. Williams, A.K. Betts, N.O. Renno, L.A.T. Machado, G. Bisht, R. Knox, and R.L. Bras, Impact of deforestation in the Amazon basin on cloud climatology, *Proceedings of the National Academy of Sciences*, 106(10), 2009.

Knox, R., F.L. Ogden and T. Dinku. Chapter: Using TRMM to Explore Rainfall Variability in the Upper Rio Chagres Catchment, Panama. Book, *The Rio Chagres, Panama*. R. Harmon (Ed.), Water Science and Technology Library, Springer, 2005.