**Research Interests**

Liming Zhou, Associate Professor; PhD, Boston University, 2002. Land surface remote sensing/modeling, land-atmosphere/climate interactions

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**My research**

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Education

B.S. Meteorology, 1991, Nanjing Institute of Meteorology, China

M.S. Meteorology, 1994, Nanjing Institute of Meteorology, China  
Ph. D. Geography, 2002, Boston University

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Broadly trained as a physical geographer and a meteorologist, I have a strong interest in interdisciplinary research related to land surface remote sensing, weather and climate. For example, I would like to investigate how changes in land surface modify local, regional and global climate and hydrology at diurnal, seasonal, and longer time scales, and how climate changes affect ecosystems, land surface processes, our human systems and environment.

I find it very exciting in using satellite remote sensing data to identify weather and climate model deficiencies in land surface processes and to improve model’s forecast and simulation capabilities. I am also fascinated with climate change associated with changes in land surface. I examine extensively changes in spatiotemporal patterns and magnitude in key hydro-climate variables from observations and model outputs. I combine some unique methods and techniques such as quantitative analyses (e.g., time series analysis, statistical and geospatial methods) of observational and remote sensing/GIS data with physical modeling of land-climate processes (e.g., via regional and global models). I am extending my research into the human dimension of land-climate interactions, focusing on quantifying and projecting social-economic consequences of climatic change and impacts of human activities on our ecosystems, weather and climate systems.

My studies have produced some important and interesting results, among which are the findings of climate-induced greening and biomass increases in northern mid- to high-latitudes, significant effects of urbanization on climate in China, the asymmetric warming of drought and desertification on maximum/minimum temperatures over the Sahel, an inverse linear relationship between albedo and emissivity over barren soils, and the fingerprint of

anthropogenic signals in observed and multi-model simulated extreme temperatures.

The overarching objective of my research is to advance our understanding of land-human-climate interactions from the perspective of a changing land surface through a synthetic analysis of surface observations and remotely sensed and GIS data with Earth system modeling. To be specific, I will use satellite and GIS data, in situ observations and economic/societal information, and Earth system models to understand physical processes/mechanisms and interactions of land-human-climate systems, and to improve our model capability to predict climate and to assess climatic impacts and consequences on our environment, currently, and in the future. Land surface processes related to deforestation, irrigation, fires, urbanization, desertification, and renewable energy will be my emphases.

**Recent Publications**

* **Zhou, L**., Tian, Y., Baidya Roy, S., Dai, Y. and Chen, H., Diurnal and seasonal variations of wind farm impacts on land surface temperature over Western Texas, *Climate Dynamics*, DOI 10.1007/s00382-012-1485-y, 2012.
* **Zhou, L**., Tian, Y., Baidya Roy, S., Thorncroft, C., Bosart, L.F., and Hu, Y., *Impacts of wind farms on land surface temperature*, *Nature Climate Change*, *2*,539–543, 2012.
  + **Zhou, L.,** R. E. Dickinson, A. Dai, and P. Dirmeyer, [Detection and attribution of anthropogenic forcing to diurnal temperature range changes from 1950 to 1999: Comparing multi-model simulations with observations](file:///C:\Users\lzhou\Documents\lzhou\homepage\2009CD_00081.pdf), *Climate Dynamics*, DOI: 10.1007/s00382-009-0644-2, 2010.
  + **Zhou, L.,** R. E. Dickinson, P. Dirmeyer, A. Dai, and S.-K. Min, [Spatiotemporal patterns of changes in maximum and minimum temperatures in multi-model simulations](file:///C:\Users\lzhou\Documents\lzhou\homepage\2008GL036141.pdf), *Geophy. Res. Lett.*,36, L02702, doi:10.1029/2008GL036141, 2009.
  + **Zhou, L.,** Dai, A., Dai, Y., Vose, R.S, Zou, C-Z., Tian, Y., and Chen, H., [Spatial patterns of diurnal temperature range trends on precipitation from 1950 to 2004](file:///C:\Users\lzhou\Documents\lzhou\homepage\2007CD-00165.pdf), *Climate Dynamics*, DOI 10.1007/s00382-008-0387-5, 2009.
  + **Zhou, L.,** Dickinson, R.E., Tian, Y., Chen, H., and Dai, Y., [Asymmetric response of maximum and minimum temperatures to soil emissivity change over the Northern African Sahel in a GCM](file:///C:\Users\lzhou\Documents\lzhou\homepage\2007GL032953.pdf), *Geophy. Res. Lett*., 35, L05402, doi:10.1029/2007GL032953, 2008.
  + A contributing author, *Chapter 7: Couplings Between Changes in the Climate System and Biogeochemistry in The IPCC Fourth Assessment Report: Climate Change 2007: The Physical Science Basis*, 2007 (SBN 978-0-521-88009-1).
  + **Zhou, L.,** Dickinson, R.E., Tian, Y., and Vose, R.S., [Impact of vegetation removal and soil aridation on diurnal temperature range in a semiarid region – Application to the Sahel](file:///C:\Users\lzhou\Documents\lzhou\homepage\Zhou_et_al_pnas_2007.pdf), *Proc. Natl. Acad. Sci. USA*, 104 (46), 17937-17942, 2007.
  + **Zhou, L.,** Kaufmann, R.K., Tucker, C.J., Myneni, R.B., *The Green Wave in Our Changing Planet: The View from Space*, edited by King, M., Parkinson, C., Partington, K.C., and Williams, R.G., Cambridge University Press, 2007 (ISBN-13: 9780521828703).
  + **Zhou, L.,** R.E. Dickinson, and Y. Tian, [Derivation of a soil albedo dataset from MODIS using principal component analysis - Norther Africa and the Arabian Peninsula](file:///C:\Users\lzhou\Documents\lzhou\homepage\2005GL024448.pdf). *Geophy. Res. Lett.,* 32, L21407, doi:10.1029/2005GL024448, 2005.
  + **Zhou, L.,** R.E. Dickinson, Y. Tian, J. Fang, Q. Li, R.K. Kaufmann, C.J. Tucker, and R.B. Myneni, [Evidence for a significant urbanization effect on climate in China](file:///C:\Users\lzhou\Documents\lzhou\homepage\urbanization_pnas.pdf), *Proc. Natl. Acad. Sci. USA.*, 101(26), 9540-9544, 2004 ([Press released by Georgia Tech: “Heating Up: Study Shows Rapid Urbanization in China Warming the Regional Climate Faster than Other Urban Area](http://climate.eas.gatech.edu/lzhou/urbanization_newsrelease.html)”).
  + **Zhou, L.,** Dickinson, R.E., Tian, Y., Jin, M., Ogawa, K., Yu, H., and Schmugge, T., [A sensitivity study of climate and energy balance simulations with use of satellite derived emissivity data over the northern Africa and the Arabian peninsula](file:///C:\Users\lzhou\Documents\lzhou\homepage\2003JD004083.pdf). *J. Geophys. Res.*, 108(D24), 4795, doi:10.1029/2003JD004083, 2003.
  + **Zhou, L.,** Dickinson, R.E., Ogawa, K., Tian, Y., Jin, M., Schmugge, T., and Tsvetsinskaya, E., [Relations Between Albedos and Emissivities from MODIS and ASTER Data Over North African Desert](file:///C:\Users\lzhou\Documents\lzhou\homepage\2003GL018069.pdf). *Geophy. Res. Lett*., 30 (20), 2026, doi:10.1029/2003GL018069, 2003.
  + **Zhou, L.,** Dickinson, R.E., Tian, Y., Zeng, X., Dai, Y., Yang, Z., Schaaf, C.B., Gao, F., Jin, Y., Strahler, A., Myneni, R.B., Yu, H., Wu, W., and Shaikh, M., [Comparison of seasonal and spatial variations of albedos from Moderate-Resolution Imaging Spectroradiometer (MODIS) and Common Land Model](file:///C:\Users\lzhou\Documents\lzhou\homepage\2002JD003326.pdf). *J. Geophys. Res*., 108(D15), 4488, doi:10.1029/2002JD003326, 2003.
  + **Zhou, L.,** Kaufmann, R.K., Tian, Y., Myneni, R.B, and Tucker, C.J., [Relation between interannual variations in satellite measures of vegetation greenness and climate between 1982 and 1999](file:///C:\Users\lzhou\Documents\lzhou\homepage\2002jd002510.pdf). *J. Geophys. Res*.,108 (D1), 10.1029/2002JD002510, 2003.
  + **Zhou, L.,** Tucker, C.J., Kaufmann, R.K., Slayback, D., Shabanov, N.V, and Myneni, R.B., [Variations in northern vegetation activity inferred from satellite data of vegetation index during 1981 to 1999](file:///C:\Users\lzhou\Documents\lzhou\homepage\2000jd000115.pdf). *J. Geophys. Res*., 106, 20069-20083, 2001 ([Press released by NASA-HQ, NASA-GSFC, AGU and BU: “Earth is Becoming a Greener Greenhouse](http://cliveg.bu.edu/greenergh/ggh.html)”).
  + Myneni, R.B, Dong, J., Tucker, C.J., Kaufmann, R.K., Kauppi, P.E., Liski, J. **Zhou, L.,** Alexeyev, V., and Huges, M.K., A large carbon sink in the woody biomass of northern forests. *Proc. Natl. Acad. Sci*. 98(26), 14784-14789, 2001 (Press released by NASA-HQ, EFI and BU: “A large carbon sink in the woody biomass of northern forests”).