Min Xu

Climate Change Science Institute
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RESEARCH INTERESTS

- Earth system modeling and scientific computing
- Application of remote sensing data to improve weather and climate prediction
- Land-atmosphere interactions, crop-climate interactions, climate variability and extremes, ultraviolet radiation transfer and impacts on biosphere, and lake dynamics
- Boundary layer meteorology and air pollution over urban area
- Theoretical analysis of atmospheric turbulence

PROFESSIONAL SKILLS

- Experienced in numerical weather and climate models (CWRF, WRF, MM5, RAMS and ARPS), land surface models (CoLM/CLM/CSSP, BATS, SIB and NOAH), radiation transfer models (TUV and DISORT) and crop growth models (Cotton2k/GOSSYM and DSSAT)
- Skillful in assimilating various remote sensing products including TOMS, AVHRR, MODIS and MISR) and observational reanalysis data (NCEP/RII, NASA/MERRA, and ECMWF/ERI) into climate-ecosystem modeling system
- Good knowledge of applying data analysis techniques such as statistical and wavelet analysis

SCIENTIFIC COMPUTATIONAL SKILLS

- Proficient in major programming languages including FORTRAN90/95 and C, and script languages including Perl, Python, Bash/Tcsh under UNIX/LINUX, and MacOS
- Knowledgeable in parallel computing (MPI and OpenMP) in PC cluster and supercomputer
- Experienced in system administrative work including users supports, software maintenances, code repository (GIT/SVN/CVS) managements, and web designing with HTML
- Proficient in scientific software including Matlab, ArcGIS/GDAL, IDL, R, NCL/Grads/Gnuplot, LaTeX, and NCO/CDO and Microsoft/Open/Libre/ Office
- Familiar with the coupling software suites including the Earth System Modeling Framework (ESMF) and the Modeling Coupling Toolkit (MCT)
- Skillful in handling and processing massive data in various scientific formats including HDF4/5, NETCDF3/4, and GRIB1/2

EDUCATION

Doctor of Philosophy, Atmospheric Sciences
Nanjing University, China 1999–2002
Thesis - Numerical Simulation on the Turbulence Structures and Meteorological Environment in Atmospheric Boundary Layer: From Regional Scale to Micro Scale

Master of Science, Atmospheric Physics
Nanjing University, China 1996–1999
Thesis - Study on Characteristics of Turbulent Moisture of Atmospheric Boundary Layer

Bachelor of Science, Atmospheric Physics
Nanjing University, China 1992–1996
Thesis - Study on a Particle-Puff Dispersion Model

RESEARCH EXPERIENCE

Climate Change Science Institute, Oak Ridge National Laboratory, Oak Ridge, TN
R&D Associate — January 2015–present

Earth System Science Interdisciplinary Center, University of Maryland at College Park, College Park, Maryland
Research Associate — February 2011–December 2014

Illinois State Water Survey, University of Illinois at Urbana-Champaign, Champaign, Illinois
Assistant Professional Scientist/Climate Modeler — November 2003–January 2011

State Key Laboratory of Atmospheric Physics and Atmospheric Chemistry of Chinese Academy of Sciences (LAPC), Beijing, China
Guest Scientist — 1999–2002

Department of Atmospheric Sciences, Nanjing University, Nanjing, China
Graduate Research Assistant — 1996–2002

PUBLICATIONS AND PRESENTATIONS

Peer-reviewed journals since 2010

Tiejun Ling, Min Xu, Xin-zhong Liang, Julian Wang, and Yign Noh (2015), A multi-level ocean mixed layer model resolving the diurnal cycle: development and validation, Journal of Advances in Modeling Earth Systems, in revision.

Xu, M., X.-Z. Liang, Wei Gao, and Arthur Samel (2014), MODIS consistent vegetation parameter specifications and their impacts on regional climate simulations, Journal of Climate, 10.1175/JCLI-D-14-00082.1.

Zhang, X., Roberto C. Izaurralde, David H. Manowitz, Ritvik Sahajpal, Tristram O. West, Allison M. Thomson, Min Xu, Kaiguang Zhao, Stephen D. Leduc, Jimmy R. Williams (2014), Regional Scale Cropland Carbon Budgets: Evaluating a Geospatial Agricultural Modeling System Using Inventory Data, Environmental Modelling and Software (accepted).

Zhang, X., R. Sahajpal, D. H. Manowitz, K. Zhao, S. D. LeDuc, M. Xu, W. Xiong, A. Zhang, R. C. Izaurralde, A. M. Thomson, T. O. West, and W. M. Post (2014), Multi-scale geospatial agroecosystem modeling: A case study on the influence of soil data resolution on carbon budget estimates, Science of The Total Environment. 479–480, 138–150, doi:10.1016/j.scitotenv.2014.01.099.

Chen, Q., X.-Z. Liang, M. Xu, T. Ling, and J. X. L. Wang (2013), Improvement of Cloud Radiative Forcing and Its Impact on Weather Forecasts. The Open Atmospheric Science Journal, 7, 1–13.

Liang, X.-Z., M. Xu, W. Gao, K.R. Reddy, K.E. Kunkel, D.L. Schmoldt, and A.N. Samel (2012a), Development of a distributed cotton growth model and its parameter determination over the United States. Agronomy Journal, 104: 661–674.

Liang, X.-Z., M. Xu, W. Gao, K.R. Reddy, K.E. Kunkel, D.L. Schmoldt, and A.N. Samel (2012b), Physical modeling of U.S. cotton yields and climate stresses during 1979-2005. Agronomy Journal, 104: 675–683.

Liang, X.-Z., M. Xu, X. Yuan, T. Ling, H.I. Choi, F. Zhang, L. Chen, S. Liu, S. Su, F. Qiao, Y.X. He, J.X.L. Wang, K.E. Kunkel, W. Gao, E. Joseph, V. Morris, T.-W. Yu, J. Dudhia, and J. Michalakes, (2012c), Climate-Weather Research and Forecasting Model (CWRF). Bull. Amer. Meteor. Soc. 93, 13631387, doi:10.1175/BAMS-D-11-00180.1.

Ling, T.-J., X.-Z. Liang, M. Xu, Z. Wang, and B. Wang, (2011), A multilevel ocean mixed-layer model for 2-dimension applications. Acta Oceanologica Sinica, 33(03):1–10.

Xu, M., X. Z. Liang, W. Gao, and N. Krotkov (2010), Comparison of TOMS retrievals and UVMRP measurements of surface spectral UV radiation in the United States. Atmospheric Chemistry and Physics 10. 8669–8683.

Selected presentations

Xu, M., X.Z. Liang, and W Gao (2013), Incorporation of crop growth models into Climate Weather Research and Forecasting model – bio-geophysical feedbacks of maize growth to regional climate, 14th Annual WRF users workshop 2013, Jun. 24-28 Bounder, CO.

Xu, M., Xin-Zhong Liang, and Brent Lofgren, (2012), The simulation of lake effects on regional climate

by CWRF, the NOAA-GLERL workshop on Methods of Projecting the Hydrologic Impacts of Climate Change, Muskegon, MI, Aug. 2012 (Invited).

Xu, M., Xin-Zhong Liang, and Brent Lofgren, (2012), Comparison of Two Lake Models Implemented in CWRF. In: 55th Annual Conference of International Association for Great Lakes Research, May 13-17, 2012, Cornwall, ON Canada .

Xu, M., X.-Z. Liang, W. Gao (2011), Regional Climatic Effects of Crop Growth modeled by coupled CWRF-CROP system, Abstract B1B-0480, presented at 2011 Fall Meeting, AGU, San Francisco, California, 5-9 December.

Liang, X.-Z., Min Xu, W. Gao (2011), Evaluation of the coupled CWRF-Crop modeling system, C29-W149B, 2011 World Climate Research Programme (WCRP) Conference, Denver, Colorado, 24-28 October.

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

- Memberships
  American Geophysical Union membership since 2005
  American Meteorological Society membership since 2005
- Reviewers for Journals
  Journal of Geophysical Research
  Remote Sensing
  Journal of Applied Meteorology and Climatology
  Journal of Hydrometeorology
  Agronomy Journal
  Computers and Electronics in Agriculture
  Journal of Applied Remote Sensing
  Journal of Meteorological Research / Acta Meteorologica Sinica
  Advances in Atmospheric Sciences