

MING-LIANG LIU

Assistant Research Professor

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RESEARCH INTERESTS

Dr. Liu's research interests focus on characterizing effects of climate change and human activities on water resources and terrestrial ecosystems with the goal of improving our understanding of regional earth system and our ability to forecast its variability. His current research interest focus on green house gas emission from terrestrial ecosystems, historical land-use/land-cover change detection by using remotely sensed data, interactions between hydrological and biogeochemical cycles, regional earth system modeling, and land-ocean interactions. The common theme of his research is the development and application of process-based computer model for integrating in situ and remote sensing data to solve scientific and policy-related questions on large-scale regional and global environmental issues.

EDUCATION

Auburn University Auburn, Alabama	Forestry	Non-Degree Graduate (GPA hours: 29), 2011
Institute of Remote Sensing Applications, Chinese Academy of Sciences (CAS), Beijing, China	GIS & Remote Sensing	Ph.D. 2001
Institute of Geographic Sciences and Natural Resources Research, CAS, Beijing, China	Physical Geography	M.S. 1998
Zhejiang University, Hangzhou, China	Geosciences	B.Sc. 1995

POSITION HELD

<i>Assistant Research Professor</i>	04/2012 – present
<i>Postdoctoral Fellow</i> Department of Civil and Environmental Engineering Washington State University, Pullman, Washington	09/2011 – 03/2012
<i>Research Fellow II</i>	08/2008 – 08/2011
<i>Post-doc Fellow</i> School of Forestry and Wildlife Sciences Auburn University, Auburn, Alabama	12/2004 – 07/2008
<i>Associate Professor</i>	10/2003 – 11/2004
<i>Post-doc Fellow</i> Institute of Geographical Sciences and Natural Resources Research Chinese Academy of Sciences, Beijing, China.	08/2001 – 09/2003
<i>Research Assistant</i> Institute of Remote Sensing Applications Chinese Academy of Sciences, Beijing, China.	1998 - 2001

PROFESSIONAL MEMBERSHIP AND SERVICE

- *American Geophysical Union*
- *The Ecological Society of America*
- *Journal reviewer: Remote Sensing of Environment, Journal of the American Water Resources Association, Ecological Modelling, Int.J. Appl. Earth Observation & Geoinformation, Journal of Asian Earth Sciences, Geo-Information Science, Atmosphere, etc.*

FUNDING HISTORY

- *Ground Penetration Radar System: GSSI SIR-4000 for agricultural and hydrologic studies on key subsurface processes, WSU VCEA Equipment Grant Program (2014), PI.*
- *Impacts of Changing Climate and Land Use on Carbon Cycling and Budgets of the Coastal Ocean Margin: Observations, Analysis, and Modeling, NASA-IDS program (2010-2013), Co-I.*
- *Assessing Impacts of Climate and Land Use Change on Terrestrial-Ocean Fluxes of Carbon and Nutrients and Their Cycling in Coastal Ecosystems, NASA-IDS program (2010-2013), Co-I.*
- *Land use-Ecosystem-Climate Interactions in Monsoon Asia: Evaluating the impacts of current and projected LCLUC on climate, water and carbon cycling in the first half of 21st century, US NASA LULCC program (2008-2011), Senior Personnel.*
- *Impacts of human activities and climate change on water resources and ecosystem health in Wolf Bay Basin: A Coastal Diagnostic and Forecast System (CDFS) for integrated assessment, AU Water Resource Center Grant Program (2008-2011), Senior Personnel.*
- *Linking Multi-scale Remotely Sensed Data, Field Observations and Biogeochemistry Models to Evaluate Changes in the Terrestrial Ecosystems of China, US NASA Interdisciplinary Science Program (2004-2007), Senior Personnel.*
- *Effects of Multiple Changes in Climate and Atmospheric Composition on Terrestrial Ecosystem Structure and Functioning in the Southeastern United States: A Regional Synthesis with Data-Model Assimilation, US Department of Energy, NICCR Program (2006-2009), Senior Personnel.*

PUBLICATIONS

Under Review/Revision:

1. Liu, M., J.C. Adama, Z. Zhu, R.B. Myneni (2014), Effects of climate and vegetation changes on evapotranspiration, runoff, and soil moisture over the conterminous U.S. during 1983 - 2009, *Geophysical Research Letters* (under review)
2. Lu, C., H. Tian, S. Lohrenz, W. Ren, J. Yang, W. Cai, B. Tao, M. Liu, B. Zhang, Q. Yang, K. Banger, S. Pan, R. He, C. Hopkinson (2014), Climate extremes decouple water and nitrogen fluxes from land to oceans, *Environmental Science & Technology* (under review)
3. Tian, H., W. Ren, J. Yang, B. Tao., W. Cai, S. Lohrenz, M. Liu, Q. Yang, C. Lu, B. Zhang, K. Banger, S. Pan, C. Hopkinson, R. He (2014), Short-term climate extreme events control recent terrestrial carbon export from the Mississippi River basin, *Geophysical Research Letters* (under review)

Journal Papers

1. Chen, J., X. Ni, M. Liu, J. Chen, Z. Mao, H. Jin, D. Pan (2014), Monitoring the occurrence of seasonal low-oxygen events off the Changjiang Estuary through integration of remote sensing, buoy observations and modeling, *Journal of Geophysical Research - Oceans*, DOI: 10.1002/2014JC010333
2. Adam, J.C., J.C. Stephens, S.H. Chung, M.P. Brady, R.D. Evans, C.E. Kruger, B.K. Lamb, M. Liu,

- C.O. Stöckle, J.K. Vaughan, K. Rajagopalan, J.A. Harrison, C.L. Tague, A. Kalyanaraman, Y. Chen, A. Guenther, F.Y. Leung, L.R. Leung, A.B. Perleberg, J. Yoder, E. Allen, S. Anderson, B. Chandrasekharan, K. Malek, T. Mullis, C. Miller, T. Nergui, J. Poinsatte, J. Reyes, J. Zhu, J.S. Choate, X. Jiang, R. Nelson, J.H. Yoon, G.G. Yorgey, K. Johnson, K.J. Chinnayakanahalli, A.F. Hamlet, B. Nijssen, V. Walden (2014). BioEarth: Envisioning and Developing a New Regional Earth System Model to Inform Natural and Agricultural Resource Management, *Climatic Change* 10.1007/s10584-014-1115-2
3. Chen, J., D. Pan, Z. Mao, N. Chen, J. Zhao, M. Liu (2014) Land-cover reconstruction and change analysis using multisource remotely sensed imageries in Zhoushan Islands since 1970, *Journal of Coastal Research*, doi: <http://dx.doi.org/10.2112/JCOASTRES-D-13-00027.1>
 4. Liu, M., Rajagopalan, K., Chung, S. H., Jiang, X., Harrison, J., Nergui, T., Guenther, A., Miller, C., Reyes, J., Tague, C., Choate, J., Salathé, E. P., Stöckle, C. O., and Adam, J. C. (2014) What is the importance of climate model bias when projecting the impacts of climate change on land surface processes?, *Biogeosciences* 11, 2601-2622.
 5. Song, W., M. Liu (2014), Decoupling Expansion of Rural Residential Land from Rural Population Growth in China, *Land Use Policy* 39, 331-341. DOI: 10.1016/j.landusepol.2014.02.002
 6. Yang, Q., H. Tian, M.A. Friedrichs, M. Liu, X. Li, J. Yang (2014), Hydrological responses to climate and land-use changes along the U.S. east coast, *Journal of American Water Resources Association* DOI: 10.1111/jawr.12232.
 7. Song, X., H. Tian, X. Xu, D. Hui, G. Chen, G. Somers, L. Marzen, M. Liu (2013) Projecting terrestrial carbon sequestration of the southeastern United States in the 21st century, *Ecosphere* 4(7). <http://dx.doi.org/10.1890/ES12-00398.1>
 8. Liu, M., H. Tian, Q. Yang, J. Yang, X. Song, S. Lohrenz, W. Cai (2013), Long-term Trends in Evapotranspiration and Runoff over the Drainage Basins of the Gulf of Mexico during 1901-2008, *Water Resources Research*. 49, 1988-2012, doi: 10.1002/wrcr.20180.
 9. Tian, H., G. Chen, C. Lu, X. Xu, W. Ren, K. Banger, B. Zhang, B. Tao, S. Pan, M. Liu, C. Zhang (2013), Global land-atmosphere exchange of methane and nitrous oxide: Magnitude and spatial-temporal patterns, *Biogeosciences Discuss.*, 10, 19811-19865, 2013/doi:10.5194/bgd-10-19811-2013
 10. Liu, M., Adam J. C. and Hamlet A. F. (2013) Spatial-temporal variations of evapotranspiration and runoff/precipitation ratios responding to the changing climate in the Pacific Northwest during 1921-2006, *J. Geophys. Res., Atmospheres*. doi:10.1029/2012JD018400.
 11. Tao, B., H. Tian, G. Chen, W. Ren, C. Lu, K. Alley, X. Xu, M. Liu, S. Pan, H. Virji (2013), Terrestrial carbon balance in tropical Asia: Contribution from cropland expansion and land management, *Global and Planetary Change* 100, 85-98.
 12. Chen, G., H. Tian, C. Zhang, M. Liu, W. Ren, W. Zhu, A.H. Chappelka, S.A. Prior, G.B. Lockaby (2012), Drought in the southern United States over the 20th Century: variability and its impacts on terrestrial ecosystem productivity and carbon storage, *Climatic Change* 114 (2):379-397.
 13. Tian, H., G. Chen, C. Zhang, M. Liu, G. Sun, A. Chappelka, W. Ren, X. Xu, C. Lu, S. Pan, H. Chen, D. Hui, S. McNulty, G. Lockaby, E. Vance (2012), Century-scale responses of ecosystem carbon storage and flux to multiple environmental changes in the southern United States, *Ecosystems* 15(4):674-694.
 14. Liu, M., H. Tian, C. Lu, X. Xu, G. Chen, W. Ren (2012), Effects of Multiple Environment Stresses on Evapotranspiration and Runoff over Eastern China, *Journal of Hydrology*, 426-427, 39-54.
 15. Lu, C., H. Tian, M. Liu, W. Ren, X. Xu, G. Chen, C. Zhang (2012), Effect of nitrogen deposition on China's terrestrial carbon uptake in the context of multifactor environmental changes, *Ecological*

Applications, 22(1), 53-75.

16. Xu, X., H. Tian, G. Chen, M. Liu, W. Ren, C. Lu, and C. Zhang (2012), Multifactor controls on terrestrial N₂O flux over North America from 1979 through 2010, *Biogeosciences*, 9, 1351-1366, doi:10.5194/bg-9-1351-2012.
17. Zhang, C., H. Tian, G. Chen, A. Chappelka, X. Xu, W. Ren, D. Hui, M. Liu, C. Lu, S. Pan, G. Lockaby (2012), Impacts of urbanization on carbon balance in terrestrial ecosystems of the Southern United States, *Environmental Pollution*, 164, 89-101.
18. Tao, B., H. Tian, G. Chen, W. Ren, C. Lu, K. Alley, X. Xu, M. Liu, S. Pan, and H. Virji (2011), Changes in carbon fluxes and pools induced by cropland expansion in South and Southeast Asia in the 20th century, *Biogeosciences Discuss.*, 8, 1–34.
19. Tian, H, C. Lu, G. Chen, X. Xu, M. Liu, W. Ren, B. Tao, G. Sun, and S. Pan (2011), Climate and land use controls over terrestrial water use efficiency in monsoon Asia, *Ecohydrology* 4, 332-340.
20. Ren, W., H. Tian, X. Xu, M. Liu, C. Lu, C. Chen, J.M. Melillo, J. Reilly, J. Liu (2011), Spatial and temporal patterns of CO₂ and CH₄ fluxes in China's croplands in response to multifactor environmental changes, *Tellus*, 63B, 222-240.
21. Ren, W., H. Tian, B. Tao, A. Chappelka, G. Sun, C. Lu, M. Liu, G. Chen, and X. Xu (2011), Impacts of tropospheric ozone and climate change on net primary productivity and net carbon exchange of China's forest ecosystems, *Global Ecology and Biogeography* DOI: 10.1111/j.1466-8238.2010.00606.x
22. Tian, H., X. Xu, C. Lu, M. Liu, W. Ren, G. Chen, J.M. Melillo, J. Liu (2011), Net exchanges of CO₂, CH₄, and N₂O between China's terrestrial ecosystems and the atmosphere and their contributions to global climate warming, *Journal of Geophysical Research - Biogeosciences*
23. Tian, H., J.M. Melillo, C. Lu, D.W. Kicklighter, M. Liu, W. Ren, X. Xu, G. Chen, C. Zhang, S. Pan, J. Liu, S.W. Running (2011), China's terrestrial carbon balance: Contributions from multiple global change factors, *Global Biogeochem. Cycles*, 25, GB1007, doi:10.1029/2010GB003838.
24. Liu, M., and H. Tian (2010), China's land cover and land use change from 1700 to 2005: Estimations from high-resolution satellite data and historical archives, *Global Biogeochem. Cycles*, 24, GB3003, doi:10.1029/2009GB003687.
25. Tian, H., G. Chen, M. Liu, C. Zhang, G. Sun, C. Lu, X. Xu, W. Ren, S. Pan, and A. Chappelka (2010), Model estimates of net primary productivity, evapotranspiration, and water use efficiency in the terrestrial ecosystems of the southern United States during 1895-2007, *Forest Ecology and Management* 259, 1311-1327
26. Tian, H., M. Liu, C. Zhang, W. Ren, X. Xu, G. Chen, C. Lu, and B. Tao (2010), The Dynamic Land Ecosystem Model (DLEM) for simulating terrestrial processes and interactions in the context of multifactor global change, *ACTA GEOGRAPHICA SINICA*, 65 (9), 1027-1047. (in Chinese)
27. Tian, H., X. Xu, M. Liu, W. Ren, C. Zhang, G. Chen, and C. Lu (2010), Spatial and temporal patterns of CH₄ and N₂O fluxes in terrestrial ecosystems of North America during 1979-2008: application of a global biogeochemistry model, *Biogeosciences*, 7, 2673-2694, 2010.
28. Xu, X., H. Tian, C. Zhang, M. Liu, W. Ren, G. Chen, C. Lu, and L. Bruhwiler (2010), Attribution of spatial and temporal variations in terrestrial methane flux over North America, *Biogeosciences* 7, 3637–3655, 2010.
29. Liu, M., H. Tian, G. Chen, W. Ren, C. Zhang, and J. Liu (2008), Effects of land use and land cover change on evapotranspiration and water yield in China during the 20th century, *Journal of the American Water Resources Association*, 44(5):1193-1207.
30. Mu, Q., M. Zhao, S. W. Running, M. Liu, and H. Tian (2008). Contribution of increasing CO₂ and

- climate change to the carbon cycle in China's ecosystems. *Journal of Geophysical Research*, 113, G01018, doi:10.1029/2006JG000316.
31. Sun, G., C. Zuo, S. Liu, M. Liu, S.G. McNulty, and J.M. Vose, 2008, Evapotranspiration Increased due to Progressive Deforestation in a Small Humid Subtropical Watershed, *Journal of the American Water Resources Association*, 44(5):1164-1175.
 32. Zhang, C., H. Tian, S. Pan, M. Liu, G. Lockaby, E.B. Schilling and J. Stanturf (2008), Effects of Forest Regrowth and Urbanization on Ecosystem Carbon Storage in a Rural-Urban Gradient in the Southeast US. *Ecosystems* 11: 1211–1222
 33. He, J., J. Liu, D. Zhuang, W. Zhang, and M. Liu (2007), Assessing the effect of land use/land cover change on the change of urban heat island intensity, *Theor. Appl. Climatol.* 90, 217-226, DOI 10.1007/s00704-006-0273-1.
 34. Ren, W., H. Tian, G. Chen, M. Liu, C. Zhang, A. Chappelka, and S. Pan (2007), Influence of ozone pollution and climate variability on grassland ecosystem productivity across China. *Environment Pollution* 149:327-335.
 35. Ren, W., H. Tian, M. Liu, C. Zhang, G. Chen, S. Pan, B. Felzer, and X. Xu (2007), Effects of tropospheric ozone pollution on net primary productivity and carbon storage in terrestrial ecosystems of China, *Journal of Geophysical Research*, 112, D22S09, doi:10.1029/2007JD008521.
 36. Zhang, C., H. Tian, A.H. Chappelka, W. Ren, H. Chen, S. Pan, M. Liu, D. Styers, G. Chen, and Y. Wang (2007), Impacts of climatic and atmospheric changes on carbon dynamics in the Great Smoky Mountains National Park, *Environmental Pollution* 149:336-347.
 37. Chen, H., H. Tian, M. Liu, J.M. Melillo, S. Pan, and C. Zhang (2006), Effect of land-cover change on terrestrial carbon dynamics in the southern USA. *Journal of Environmental Quality*, 35, 1533-1547.
 38. Lü, A., H. Tian, M. Liu, J. Liu, and J. M. Melillo (2006), Spatial and temporal patterns of carbon emissions from forest fires in China from 1950 to 2000, *Journal of Geophysical Research - Atmosphere*, 111, D05313, doi:10.1029/2005JD006198.
 39. Mu, Q., M. Zhao, F.A. Heinsch, M. Liu, H. Tian, and S.W. Running (2006), Evaluating water stress controls on primary production in biogeochemical and remote sensing based models, *Journal of Geophysical Research - Biogeosciences* 112, G01012, doi:10.1029/2006JG000179.
 40. Liu, J., H. Tian, M. Liu, D. Zhuang, J. M. Melillo, Z. Zhang (2005), China's changing landscape during the 1990s: Large-scale land transformations estimated with satellite data, *Geophys. Res. Lett.*, 32, L02405, doi:10.1029/2004GL021649.
 41. Liu, J., M. Liu, H.Q. Tian, D. Zhuang, Z. Zhang, W. Zhang, X. Tang, and X. Deng (2005), Spatial and temporal patterns of China's cropland during 1990-2000: An analysis based on Landsat TM data. *Remote Sensing of Environment* 98: 442-456.
 42. Liu, X., J. Wang, M. Liu, and B. Meng (2005), Spatial heterogeneity of the driving forces of cropland change in China, *Science in China (Series D)*, 48(12):2231-2240.
 43. Yan, H., M. Cao, J. Liu, D. Zhuang, J. Guo, and M. Liu (2005), Characterizing spatial patterns of multiple cropping system in China from multi-temporal remote sensing images, *Transactions of the Chinese Society of Agricultural Engineering*, 21(4): 85-90.
 44. Yue, T., Y. Wang, J. Liu, S. Chen, D. Qiu, X. Deng, M. Liu, Y. Tian, and B. Su (2005), Surface modelling of human population distribution in China, *Ecological Modelling*, 461-478.
 45. Zhang, C., H.Q. Tian, J. Liu, S. Wang, M. Liu, S. Pan, and X. Shi (2005). Pools and distributions of soil phosphorus in China. *Global Biogeochemical Cycles*, 19, GB1020, doi:10.1029/2004GB002296.
 46. Liu, J., S. Wang, J. Chen, M. Liu, and D. Zhuang (2004), Storages of soil organic carbon and nitrogen and land use changes in China: 1990-2000, *Acta Geographica Sinica*, 484-496. (in Chinese)

47. Liu, J., M. Liu, D. Zhuang, Z. Zhang, and X. Deng (2003), Study on spatial pattern of land-use change in China during 1995-2000, *Science in China (Series D)*, 46(4):373-384.
48. Liu, M., X. Tang, D. Zhuang, and J. Liu (2003), A new technique on spatial temporal data fusion and the construction of structural grid data platform, *Geo-Information Science*, 5(4), 63-68. (in Chinese)
49. Xiao, X., J. Liu, D. Zhuang, S. Froking, S. Boles, B. Xu, M. Liu, W. Salasb, B. Moore III, and C. Li (2003), Uncertainties in estimates of cropland area in China:a comparison between an AVHRR-derived dataset and a Landsat TM-derived dataset, *Global and Planetary Change*, 37, 297-306.
50. Yue, T., Y. Wang, S. Chen, J. Liu, D. Qiu, X. Deng, M. Liu, and Y. Tian (2003), Numerical Simulation of Population Distribution in China, *Population and Environment*, 25(2):141-263;
51. Liu, J., M. Liu, X. Deng, D. Zhuang, Z. Zhang, and D. Luo (2002), The land use and land cover change database and its relative studies in China, *Journal of Geographical Sciences*, 12, 275-282.
52. Liu, J., X. Deng, M. Liu, and S. Zhang (2002), Study on the spatial patterns of land-use change and analyses of driving forces in northeastern China during 1990-2000, *Chinese Geographical Science*, 12, 299-308.
53. Xiao, X., S. Boles, J. Liu, D. Zhuang, and M. Liu (2002), Characterization of forest types in Northeastern China, using multi-temporal SPOT-4 VEGETATION sensor data, *Remote Sensing of Environment*, 2002,82(2-3): 335-348.
54. Zhuang, D., M. Liu, X. Deng (2002), Spatialization model of population based on dataset of land use and land cover change in China, *Chinese Geographical Sciences*, 12(2) 114-119.
55. Liu, M., D. Zhuang, and J. Liu (2001), Farmland and urban area dynamics monitoring in china using remote sensing and spatial statistics methodology. *Chinese Geographical Sciences*, (111) 1: 42-49.
56. Liu, M., D. Zhuang, and W. Hu (2001), An analysis on current cropland change basing on geomorphology and spatial difference character, *Resources Sciences*, 23(5):11-16 (in Chinese)
57. Liu, M., X. Tang, J. Liu, and D. Zhuang (2001), Research on scaling effect based on 1 km grid cell data, *Journal of Remote Sensing*, 5(3):183-189 (in Chinese).
58. Liu, M., and B. Chen (2000), The fluctuations of crop yield and its relating analysis with natural disaster of agriculture in China during recent years, *Journal of Catastrophology*, 2000, Vol.15 No.4 pp78~85 (in Chinese)
59. Zhuang, D., J. Liu, and M. Liu (1999), Research activities on land-use/cover change in the past ten years in china using space technology, *Chinese Geographical Science*, 9, 330-334.

Book Chapters and Conference Proceedings

1. Mullis, T., M. Liu, A. Kalyanaraman, J. Vaughan, C. Tague, and J. Adam (2014), Design and Implementation of Kepler Workflows for BioEarth, *ICCS 2014*.
2. Tian, H., X. Xu, C. Zhang, W. Ren, G. Chen, M. Liu, D. Lu and S. Pan (2008), Understanding Large-Scale Patterns and Processes of Terrestrial Ecosystems in Changing Global Environment: the Integrated Regional Study Approach and its Applications to China and the United States. In Miao S.L., S. Carstenn and M. Nungesser (Eds) *Real World Ecology: Large-scale and Long-term Case Studies and Methods*. Springer-Verlag, New York Nerlin Heidelberg.
3. Tian, H., J. Liu, J. M. Melillo, M. Liu, D. Kicklighter, X. Yan and S. Pan. 2008. The Terrestrial Carbon Budget in East Asia: Human and Natural Impacts. In: C. Fu, J. Freney and J. Steward (eds). *Changes in the Human-Monsoon System of East Asia in the Context of Global Change. SCOPE Series*, Island Press, Whashington DC.
4. Liu, M., H. Tian, C. Zhang, G. Chen, W. Ren, X. Xu, S. Pan, X. Wang, and C. Nagy (2007), Effects of urbanization and land use on water yield – a case study of Haihe Basin in China, in *Proceedings of the*

Emerging Issues Along Urban/Rural Interfaces II: Linking Land-use Science and Society, pp. 90-96.

5. Chen, G., H. Tian, M. Liu, W. Ren, C. Zhang, and S.F. Pan (2006), Climate impacts on China's terrestrial carbon cycle: An assessment with the Dynamic Land Ecosystem Model. In: Tian, H.Q. (eds) *Environmental Modeling and Simulation*. ACTA Press, Anheim/Calgary/Zurich. pp. 65-71.
6. Liu, M. as chapter author in Yu, G. (editor) 2003, *Global Change, Carbon Cycle and Storage in Terrestrial Ecosystem*, China Meteorological Press, Beijing. (in Chinese)
7. Liu, M. as chapter author in Liu, J., Z. Zhang, D. Zhuang, S. Zhang, X. Li etc., 2005, *Study on the Spatial-Temporal Patterns of China's Land Use Change During 1990s from Remotely Sensed Data*, Science Press, Beijing.
8. Liu, M. as chapter author in Chen, B., 2001, *Chinese Agricultural Recourse Integrated Productivity and Population Carrying Capacity*, China Meteorological Press, Beijing.

PRESENTATIONS AND PUBLISHED ABSTRACT (Fist author only)

1. Liu, M. (2014), Impacts of land use and climate change on the biogeochemical and water cycles. State Key Laboratory of Satellite Ocean Environment Dynamics, Second Institute of Oceanography, SOA, July 11, 2014, Hangzhou (Invited presentation)
2. Liu, M., J.C. Adam, C. Tague (2013), Scaling in Global Change Studies, Ignite Session 17, 98th ESA Annual Meeting, Minneapolis, Minnesota (Oral presentation)
3. Liu, M., K. Rajagopalan, S. H. Chung, X. Jiang, J. Harrison, T. Nergui, A. Guenther, C. Miller, J. Reyes, C. Tague, J. Choate, E.P. Salathé, C.O. Stöckle, J. C. Adam (2013), What is the importance of climate model bias when projecting the impacts of climate change on land surface processes? 4-9 August, 2013, 98th ESA Annual Meeting, Minneapolis, Minnesota (Poster)
4. Liu, M., J.C. Adam, R.D. Evans, Z. Zhu, R.B. Myneni, Responses of Terrestrial Water Cycles to Changes in Climate and Land Cover over Conterminous U.S. During 1983-2011, 3-7 Dec. 2012, *AGU Fall Meeting*, San Francisco (Poster).
5. Liu, M., J. Adam, Z. Zhu, and R. Myneni, Responses of Terrestrial Water Cycles to Changes in Phenology in North America during 1981-2010, *Fourth International Conference on Climate change*, July 12-13, 2012, Seattle, USA.
6. Liu, M., J.C. Adam, A.F. Hamlet, Spatial-temporal variations of evapotranspiration and runoff/precipitation ratios responding to the changing climate in the Pacific Northwest during 1921-2006, March 30, WSU Showcase 2012 (Poster).
7. Liu, M. et al., Water and Nutrient Fluxes from Land to East Coast and Gulf of Mexico During 1901-2008: Results from the Dynamic Land Ecosystem Model (DLEM), *AmeriFlux Science Meeting & 3rd NACP All-Investigators Meeting*, January 31 – February 4, 2011, New Orleans, LA (Poster)
8. Liu, M., H. Tian, Q. Yang, G. Chen, X. Song, X. Xu, J. Yang, W. Ren, C. Lu, Water and Nutrient Fluxes from Land to East Coast and Gulf of Mexico During 1901-2008: Results from Dynamic Land Ecosystem Model, *AGU Fall Meeting*, Dec.14, 2010, San Francisco (Oral Presentation)
9. Liu, M., H. Tian, G. Chen, J. Yang, and X. Xu, Variations of runoff and soil moisture in North America caused by climate and land use change during 1978-2008, *The 95th ESA Annual Meeting*, August 1-6, Pittsburgh, PA. (Oral Presentation)
10. Liu, M., H. Tian, C. Zhang, G. Chen, B. Villarreal, X. Xu, C. Lu, W. Ren, and H. Mao, Quantifying variations of sources and delivery of organic carbon from continental US induced by multiple environmental stresses by using integrated system of the Dynamic Land Ecosystem Model and

Nutrient Export (DLEM-NE), *2nd NACP All-Investigators Meeting*, February 17-20, 2009, San Diego, CA. (Poster)

11. Liu, M. et al., Impacts of climate and land-use changes on water yield in Southeastern United States during the 20th century, *Ocean Carbon and Biogeochemistry Scoping Workshop on Terrestrial and Coastal Carbon Fluxes in the Gulf of Mexico*, St. Petersburg, Florida, May 6-8, 2008. (Poster)
12. Liu, M., H. Tian, C. Zhang, G. Chen, W. Ren, X. Xu, S. Pan, X. Wang, and C. Nagy, 2007, Effects of urbanization and land use on water yield – a case study of Haihe Basin in China, *Proceedings of the Emerging Issues Along Urban/Rural Interfaces II: Linking Land-use Science and Society*, (Oral Presentation).
13. Liu, M et al., Impacts of Climate and Land-Use Changes on Water Yield in Southeastern United States during the 20th Century, *Water Resources Conference - Bridging the Gap Between Science, People, and Policies*, Auburn, Alabama, June 14-15, 2007. (Poster)
14. Liu, M et al., Dynamics of water yield from China's terrestrial ecosystems in the 20th century: impact of climate change, atmospheric carbon dioxide, tropospheric ozone, and land-use, *2006 AGU Joint Assembly*: Baltimore, Maryland - 23-26 May 2006. (Oral Presentation)