Zachary M. Subin

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September 21, 2015

EDUCATION

Ph.D. **Energy & Resources,** University of California, Berkeley, May 2012.

M.S. **Energy & Resources,** University of California, Berkeley, 2008.

M.P.P. **Public Policy,** University of California, Goldman School of Public Policy, Berkeley, 2007.

A.B. **Physics & Math,** Harvard University, Cambridge, 2003.

PEER-REVIEWED PUBLICATIONS

1. Frolking, S., J. Talbot, and **Z. M. Subin**, 2014. Exploring the relationship between peatland net carbon balance and apparent carbon accumulation rate at century to millennial time scales. *The Holocene*, 4: 1167-1173. doi:10.1177/0959683614538078

2. W. Thiery, V. M. Stepanenko, X. Fang, K. D. Jöhnk, Z. Li, A. Martynov, M. Perroud, **Z. M. Subin**, F. Darchambeau, D. Mironov, and N. P. M. van Lipzig, 2013. LakeMIP Kivu: Evaluating the representation of a large, deep tropical lake by a set of one-dimensional lake models. *Tellus A* 66, 21390. http://dx.doi.org/10.3402/tellusa.v66.21390

3. Gu, H., J. Jin, Y. Wu, M. B. Ek, and **Z. M. Subin**, 2013. Calibration and Validation of Lake Surface Temperature Simulations with the Coupled WRF-Lake Model. *Climatic Change*, 1-13. 10.1007/s10584-013-0978-y

4. Koven, C. D., W. J. Riley, **Z. M. Subin**, J. Y. Tang, M. S. Torn, W. D. Collins, G. B. Bonan, D. M. Lawrence, and S. C. Swenson, 2013. The effect of vertically-resolved soil biogeochemistry and alternate soil C and N models on C dynamics of CLM4. *Biogeosciences* 10, 7109-7131. doi:10.5194/bg-10-7109-2013

5. Stepanenko, V. M., A. Martynov, K. D. Jöhnk, **Z. M. Subin**, M. Perroud, X. Fang, F. Beyrich, D. Mironov, and S. Goyette, 2013. A one-dimensional model intercomparison study of thermal regime of a shallow, turbid midlatitude lake. *Geosci. Model Dev.*, 6, 1337-1352. doi:10.5194/gmd-6-1337-2013

6. Shi, M., Z.-L. Yang, D. M. Lawrence, R. E. Dickinson, and **Z. M. Subin**. Spin-up processes in the Community Land Model version 4 with explicit carbon and nitrogen components. *Ecological Modelling*, 263, 308–325. http://dx.doi.org/10.1016/j.ecolmodel.2013.04.008

7. **Z. M. Subin**, C. D. Koven, W. J. Riley, M. S. Torn, D. M. Lawrence, and S. C. Swenson, 2013. Effects of Soil Moisture on the Responses of Soil Temperatures to Climate Change in Cold Regions. *Journal of Climate* 26, 3139-3158. http://dx.doi.org/10.1175/JCLI-D-12-00305.1

8. Wania, R., J. R. Melton, E. L. Hodson, B. Poulter, B. Ringeval, R. Spahni, T. Bohn, C. A. Avis, G. Chen, A. V. Eliseev, P. O. Hopcroft, W. J. Riley, **Z. M. Subin**, H. Tian, V. Brovkin, P. M. van Bodegom, T. Kleinen, Z. C. Yu, J. S. Singarayer, S. Zürcher, D. P. Lettenmaier, D. J. Beerling, S. N. Denisov, C. Prigent, F. Papa, and J. O. Kaplan, 2013. Present state of global wetland extent and wetland methane modelling: methodology of a model inter-comparison project (WETCHIMP). *Geosci. Model Dev.* 6, 617-641. doi:10.5194/gmd-6-617-2013

9. Melton, J. R., R. Wania, E. L. Hodson, B. Poulter, B. Ringeval, R. Spahni, T. Bohn, C. A. Avis, D. J. Beerling, G. Chen, A. V. Eliseev, S. N. Denisov, P. O. Hopcroft, D. P. Lettenmaier, W. J. Riley, J. S. Singarayer, **Z. M. Subin**, H. Tian, S. Zürcher, V. Brovkin, P. M. van Bodegom, T. Kleinen, Z. C. Yu, and J. O. Kaplan, 2013. Present state of global wetland extent and wetland methane modelling: conclusions from a model intercomparison project (WETCHIMP). *Biogeosciences* 10, 753-788. doi:10.5194/bg-10-753-2013

10. Tang, J., W. J. Riley, C. D. Koven, and **Z. M. Subin**, 2013. CLM4-BeTR, a generic biogeochemical transport and reaction module for CLM4: model development, evaluation, and application. *Geosci. Model Dev.* 6, 127-140. doi:10.5194/gmd-6-127-2013

11. **Z. M. Subin**, W. J. Riley, and D. Mironov, 2012. An Improved Lake Model for Climate Simulations: Model Structure, Evaluation, and Sensitivity Analyses in CESM1. *J. Adv. Mod. Earth Sys.* 4, M02001. doi:10.1029/2011MS000072

12. Meng, L., P. G. M. Hess, N. M. Mahowald, J. B. Yavitt, W. J. Riley, **Z. M. Subin**, D. M. Lawrence, S. C. Swenson, J. Jauhiainen, and D. R. Fuka, 2012. Sensitivity of wetland methane emissions to model assumptions: application and model testing against site observations. *Biogeosciences* 9, 2793-2819. doi:10.5194/bg-9-2793-2012

13. C. Bonfils, T. J. Phillips, D. M. Lawrence, P. Cameron-Smith, W. J. Riley, **Z. M. Subin**, 2012. On the influence of shrub height and expansion on boreal climate. *Environmental Research Letters* 7, 015503. doi:10.1088/1748-9326/7/1/015503

14. **Z. M. Subin**, L. N. Murphy, F. Li, C. Bonfils, and W. J. Riley, 2012. Boreal Lakes Moderate Seasonal and Diurnal Temperature Variation and Perturb Atmospheric Circulation: Analyses in the Community Earth System Model 1 (CESM1). *Tellus A* 64, 15639. doi:10.3402/tellusa.v64i0.15639

15. W. J. Riley, **Z. M. Subin**, D. M. Lawrence, S. C. Swenson, M. S. Torn, L. Meng, N. Mahowald, and P. Hess, 2011. Barriers to predicting changes in global terrestrial methane fluxes: analyses using CLM4Me, a methane biogeochemistry model integrated in CESM. *Biogeosciences* 8, 1925-1953. doi:10.5194/bg-8-1925-2011

16. **Z. M. Subin**, W. J. Riley, J. Jin, D. S. Christianson, M. S. Torn, and L. M. Kueppers, 2011. Ecosystem Feedbacks to Climate Change in California: Development, Testing, and Analysis Using a Coupled Regional Atmosphere and Land-Surface Model (WRF3-CLM3.5). *Earth Interactions*, 15, 1–38. doi:10.1175/2010EI331.1

Under Review:

17. Bohn, T. J., Melton, J. R., Ito, A., Kleinen, T., Spahni, R., Stocker, B. D., Zhang, B., Zhu, X., Schroeder, R., Glagolev, M. V., Maksyutov, S., Brovkin, V., Chen, G., Denisov, S. N., Eliseev, A. V., Gallego-Sala, A., McDonald, K. C., Rawlins, M. A., Riley, W. J., **Subin, Z. M.**, Tian, H., Zhuang, Q., and Kaplan, J. O., 2015. WETCHIMP-WSL: intercomparison of wetland methane emissions models over West Siberia. *Biogeosciences Discussions*. http://www.biogeosciences-discuss.net/12/1907/2015/bgd-12-1907-2015.html

18. **Z. M. Subin**, P. C. Milly, B. N. Sulman, S. Malyshev, and E. Shevliakova. Resolving Terrestrial Ecosystem Processes along a Subgrid Topographic Gradient for an Earth-System Model. *Hydrology and Earth System Sciences Discussions*. http://www.hydrol-earth-syst-sci-discuss.net/11/8443/2014/hessd-11-8443-2014.html

RESEARCH INTERESTS

Climate change science: interactions between changes in land surface and subsurface physical and biochemical properties and changes in regional and global climate: regional and global climate modeling; feedbacks to climate change; reduced-order modeling.

Climate policy: climate mitigation (i.e. economics of emission reduction options in electricity and transportation) and regional impacts.

PROFESSIONAL EXPERIENCE

Postdoctoral Fellow with George Pau and William Riley, Earth Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA, 2014 through present.
Postdoctoral Fellow with Stephen Pacala, Elena Shevliakova, Chris Milly, and Steve Frolking, Princeton Environmental Institute and Geophysical Fluid Dynamics Laboratory, Princeton, NJ. 2012 through 2014.
Ph.D. Dissertation Research with William Riley, Margaret Torn, and William Collins, University of California, Berkeley and Lawrence Berkeley National Laboratory, Berkeley, CA. 2008 through 2012.
Graduate Student Instructor, University of California, Berkeley. 2006 through 2008.
Intern, Energy and Environmental Economics, San Francisco, CA. Summer 2007.

Graduate Student Research Assistant, Lawrence Berkeley National Laboratory, Berkeley, CA. Summer 2006.
Intern, Redefining Progress, Oakland, CA. Summer 2006.
Teaching Assistant, Harvard University, Cambridge, MA. 2003 through 2004.
Undergraduate Research Assistant, Los Alamos Summer School for Physics, Los Alamos National Lab, Los Alamos, NM. Summer 2001.
Undergraduate Research Assistant, Harvard University, Cambridge, MA. 2000.

RESEARCH EXPERIENCE

1. **Lawrence Berkeley National Laboratory, Earth Sciences Division, Berkeley, CA**. 2014-present. Developing Machine-Learning / Reduced-Order Modeling techniques for terrestrial climate model applications.
2. **Princeton Environmental Institute, Princeton University, Princeton.** 2012-2014. Modeling hillslope hydrology in a global climate model.
3. **Lawrence Berkeley National Laboratory, Earth Sciences Division, Berkeley, CA.** 2008-2012. Modeling land cover change, lake and permafrost temperatures and surface fluxes, and wetland and methane biogeochemistry in regional and global climate models.
4. **Energy and Environmental Economics, San Francisco, CA.** 2007-2008. California transportation and greenhouse gas emission reduction options.
5. **Lawrence Berkeley Laboratory, Energy and Environmental Technology Division, Berkeley, CA.** 2006. Wind energy economics.
6. **Redefining Progress, Oakland, CA.** 2005. California renewable energy policy economics.
7. **Los Alamos National Laboratory, Los Alamos, NM.** 2001. Reaction kinetics of mechanically shocked materials.
8. **Harvard University, Department of Physics, Cambridge, MA.** 2000. Statistical methods for particle physics.

GRADUATE STUDENT INSTRUCTOR AND TEACHING ASSISTANT POSITIONS

1. **University of California, Berkeley.** Fall, 2008. *Graduate Student Instructor* for *Energy and Society (Energy & Resources).*
2. **University of California, Berkeley.** Spring 2006 through Spring, 2007. *Graduate Student Instructor* for *Descriptive Introduction to Physics (Physics).*
3. **Harvard University, Cambridge.** Spring, 2004. *Teaching Assistant* for *Physics of Music (Physics Core Curriculum).*
4. **Harvard University, Cambridge.** Spring, 2004. *Teaching Assistant* for *Time (Physics Core Curriculum).*
5. **Harvard University, Cambridge.** Fall, 2003. *Teaching Assistant* for *Physics 11a: Mechanics*

SCIENTIFIC COMMUNITY SUPPORT

Served as reviewer for the following journals: Journal of Advances in Modeling Earth Systems, Agricultural and Forest Meteorology, Journal of Geophysical Research-Atmospheres, and Environmental Research Letters. Served as a reviewer for the U.S. Department of Energy for scientific proposal merit review.

HONORS AND AWARDS

Harold T. White Prize for Excellence in the Teaching of Physics, Department of Physics, Harvard University, 2004.
Graduated Magna Cum Laude from Harvard University, 2003.

OTHER PUBLICATIONS

1. Oleson, K.W., D.M. Lawrence, G.B. Bonan, B. Drewniak, M. Huang, C.D. Koven, S. Levis, F. Li, W.J. Riley, **Z.M. Subin**, S.C. Swenson, P.E. Thornton, A. Bozbiyik, R. Fisher, E. Kluzek, J.-F. Lamarque, P.J. Lawrence, L.R. Leung, W. Lipscomb, S. Muszala, D.M. Ricciuto, W. Sacks, Y. Sun, J. Tang, Z.-L. Yang, 2013: Technical Description of version 4.5 of the Community Land Model (CLM). Ncar Technical Note [Number Not Yet Assigned], National Center for Atmospheric Research, Boulder, CO, 422 pp.
2. L. M. Kueppers., W. Riley, J. Jin, **Z. Subin**, D. Christianson, M. Torn, 2009. Ecosystem Feedbacks to Climate Change in California: Integrated Climate Forcing From Vegetation Redistribution. *California Energy Commission*, Public Interest Energy Research Program. CEC-500-2009-075.
3. Schuur, E. A. G., B. Abbott, and the Permafrost Carbon Network, 2011. Climate change: High risk of permafrost thaw. *Nature* 480, 32-33 (Comment) doi:10.1038/480032a

CONFERENCES & OTHER PRESENTATIONS

1. **Z.M. Subin**, G.H.S. Pau, Y. Liu, W.J. Riley, G. Bisht, C.D. Koven, C. Shen, 2015. *CESM Land Model Working Group Meeting*, Mar 2-4, Boulder, CO.
2. **T. Bohn** and Co-Authors, 2014. Intercomparison of the Wetchimp-Wsl Wetland Methane Models over West Siberia: How Well Can We Simulate High-Latitude Wetland Methane Emissions? Abstract B44A-08 presented at the *American Geophysical Union Fall Meeting*, December 15-19, San Francisco, CA. (invited)
3. **Z.M. Subin**, 2014. Representing the Interactions of Soil Moisture, Groundwater, and Biogeochemistry in Earth-System Models. Abstract H53J-01 presented at the *American Geophysical Union Fall Meeting*, December 15-19, San Francisco, CA. (invited)
4. **Z.M. Subin**, P.C. Milly, B.N. Sulman, S. Malyshev, and E. Shevliakova, 2014. Incorporating a Topographic Gradient into an ESM-Coupled Land Model. Complex Soil Systems Conference, September 3-5, Berkeley, CA. (poster)

5. **Z.M. Subin**, P.C. Milly, B.N. Sulman, S. Malyshev, and E. Shevliakova, 2014. Incorporating a Topographic Gradient into an ESM-Coupled Land Model. CESM Workshop 2014, June 16-19, Breckenridge, CO. (poster)

6. **Z.M. Subin**, P.C. Milly, B.N. Sulman, S. Malyshev, and E. Shevliakova, 2014. Incorporating Subgrid Hillslope Hydrology into an Earth System Model to Simulate Global Wetland Dynamics. *Peatlands Workshop*, McGill University, March 3-4, Montreal, Canada.

7. **Z.M. Subin**, P.C. Milly, B.N. Sulman, S. Malyshev, and E. Shevliakova, 2014. Representing the Effects of Hillslope-Scale Hydrology on Soil Carbon Distributions within an Earth System Model. *EaSM Principal Investigators Meeting*, United States Department of Agriculture, January 27-29, Washington DC. (poster)

8. **Z. M. Subin**, P. C. Milly, B. N. Sulman, S. Malyshev, and E. Shevliakova, 2013. Applying Hillslope Hydrology to Bridge between Ecosystem and Grid-Scale Processes in an Earth System Model. Abstract H24A-01 presented at the *American Geophysical Union Fall Meeting*, December 9-13, San Francisco, CA.

9. **Z. M. Subin** and B. N. Sulman, 2013. Representing the Effects of Hillslope-Scale Hydrology on Soil Carbon Distributions within an Earth System Model. Abstract M-24 presented at the *American Geophysical Union* Chapman Conference on Soil-mediated Drivers of Coupled Biogeochemical and Hydrological Processes Across Scales, October 21-24, Tucson, AZ.

10. **Z. M. Subin**, C. D. Koven, W. J. Riley, M. S. Torn, D. M. Lawrence, and S. C. Swenson, 2012. Effects of Soil Moisture on the Responses of Soil Temperatures to Climate Change in Cold Regions. Abstract B31B-0418 presented at the *American Geophysical Union Fall Meeting*, December 3-7, San Francisco, CA. (poster)

11. Koven, C. D., W. J. Riley, M. S. Torn, **Z. M. Subin**, J. Tang, D. M. Lawrence, S. C. Swenson, and G. B. Bonan, 2012. Abstract B13B-0488 presented at the *American Geophysical Union Fall Meeting*, December 3-7, San Francisco, CA. (poster)

12. Meng, L., N. M. Mahowald, P. G. Hess, J. B. Yavitt, W. J. Riley, **Z. M. Subin**, D. M. Lawrence, S. C. Swenson, J. Jauhiainen, D. R. Fuka, 2012. Estimation of wetland methane emissions in a biogeochemical model integrated in CESM: sensitivity analysis and comparison against surface and atmospheric measurements. Abstract B24C-01 presented at the *American Geophysical Union Fall Meeting*, December 3-7, San Francisco, CA.

13. **Z.M. Subin**, C.D. Koven, W.J. Riley. M.S. Torn, D.M. Lawrence, S.C. Swenson, 2012. Effects of soil moisture on soil temperature in freezing soils. *Land Model Working Group, CESM Workshop 2012*, June 19, Breckenridge, CO.

14. **Z.M. Subin**, W.J. Riley, M.S. Torn, L.N. Murphy, F. Li, C. Bonfils, C.D. Koven, D.M. Lawrence, S.C. Swenson, D. Mironov, 2012. Modeling High-Latitude Terrestrial Feedbacks to Climate Change. *Energy and Resources Group Colloquium, University of California*, March 21, Berkeley, CA.

15. **Z.M. Subin**, W.J. Riley, M.S. Torn, L.N. Murphy, F. Li, C. Bonfils, C.D. Koven, D.M. Lawrence, S.C. Swenson, D. Mironov, 2012. Interactions of Water and Energy Mediate Permafrost Climate Feedbacks. *Geophysical Fluid Dynamics Laboratory, Princeton University*, March 14, Princeton, NJ.

16. **Z.M. Subin**, W.J. Riley, M.S. Torn, L.N. Murphy, F. Li, C. Bonfils, C.D. Koven, D.M. Lawrence, S.C. Swenson, D. Mironov, 2012. Interactions of Water and Energy Mediate Permafrost Climate Feedbacks. *Institute for the Study of Earth, Oceans, and Space, University of New Hampshire*, March 8, Durham, NH.
17. W.J. Riley, C.D. Koven, **Z.M. Subin**, J. Tang. Progress Toward a Mechanistic Belowground N Cycle in CLM. *CESM Land Model and Biogeochemistry Working Group Meeting*, February 2, Boulder, CO.
18. J. Tang, W.J. Riley, C.D. Koven, and **Z.M. Subin**. Progress in Developing CLM4-BeTr: a tool for incorporating and evaluating different formulations of below ground biogeochemistry. *CESM Land Model and Biogeochemistry Working Group Meeting*, February 2, Boulder, CO.
19. C.D. Koven, W.J. Riley, M.S. Torn, **Z.M. Subin**, J. Tang, D.M. Lawrence, G. Bonan, S.C. Swenson. Soil BGC Developments in CLM4. *CESM Land Model and Biogeochemistry Working Group Meeting*, February 2, Boulder, CO.
20. **Z.M. Subin**, W.J. Riley, M.S. Torn, C.D. Koven, D.M. Lawrence, S.C. Swenson, 2012. Permafrost Soil Warming Induced by Elevated CO_2-Physiological Forcing and Increased Summer Rainfall. *CESM Land Model and Biogeochemistry Working Group Meeting*, February 1, Boulder, CO.
21. **Z.M. Subin**, W.J. Riley, C.D. Koven, M.S. Torn, D.M. Lawrence, S.C. Swenson, 2012. Permafrost Soil Warming Induced by Elevated CO_2-Physiological Forcing and Increased Summer Rainfall. *Berkeley Atmospheric Sciences Center Symposium*, February 10, Berkeley, CA. (poster)
22. **Z. M. Subin**, W.J. Riley, M.S. Torn, L.N. Murphy, F. Li, C. Bonfils, C.D. Koven, D.M. Lawrence, S.C. Swenson, D. Mironov, 2012. Interactions of Water and Energy Mediate Permafrost Climate Feedbacks. *Department of Earth System Science, University of California*, February 6, Irvine, CA.
23. **Z. M. Subin**, F. Li, L.N. Murphy, C. Bonfils, W.J. Riley, S.-Y. Lee, S. Kang, W.D. Collins, 2011. Atmospheric Responses to Changes in Boreal Lake Distribution and to Idealized Extratropical Terrestrial Surface Forcing Propagate to the Tropics and the Southern Hemisphere. *American Geophysical Union Fall Meeting*, December 5–9, San Francisco, CA.
24. C. D. Koven, W. J. Riley, **Z. M. Subin**, J. Tang, M. S. Torn, D. M. Lawrence, G. B. Bonan, S. C. Swenson, 2011. Permafrost carbon and nitrogen dynamics in CLM4. *American Geophysical Union Fall Meeting*, December 5–9, San Francisco, CA.
25. H. Liu, J. S. Famiglietti, **Z. M. Subin**, 2011. Using land surface model and satellite observations to simulate lake water level and thermal variations. *American Geophysical Union Fall Meeting*, December 5–9, San Francisco, CA. (poster)
26. **Z. M. Subin**, W. J. Riley, D. M. Lawrence, S. C. Swenson, M. S. Torn, L. Meng, N. Mahowald, P. Hess, 2011. Modeling Terrestrial Methane Biogeochemistry in CLM4Me. *Department of Energy Climate and Earth System Modeling Principal Investigators Meeting*, September 19, Washington, DC.

27. Charles D. Koven, William J. Riley, **Zachary M. Subin**, Jinyun Tang, Margaret Torn, Jennifer Harden, David Lawrence, Gordon Bonan, Sean Swenson, 2011. Permafrost C and N Dynamics in CLM4. *Department of Energy Climate and Earth System Modeling Principal Investigators Meeting*, September 20, Washington, DC.

28. **Z. M. Subin**, W. J. Riley, L. N. Murphy, F. Li, C. Bonfils, and D. Mironov, 2011. Developing an Improved Lake Model for Climate Simulations in CESM1: Model Structure, Evaluation, Sensitivity, and Atmospheric Responses to Changes in Lake Distribution. *Department of Energy Climate and Earth System Modeling Principal Investigators Meeting*, September 19, Washington, DC. (poster)

29. **Zack Subin**, Jinyun Tang, Bill Riley, Charlie Koven, and Margaret Torn, 2011. Modeling Carbon Cycling in High-Latitude Ecosystems to Understand Interactions with Climate Change. *International Arctic Research Center*, August 24, Fairbanks, AK.

30. **Zack Subin**, Fuyu Li, Lisa Murphy, Celine Bonfils, Shihyu Lee, and Bill Riley, 2011. Effect of High-Latitude Surface Forcing on the Tropics and Southern Hemisphere. *Land Model Working Group, CESM Workshop 2011*, June 21, Breckenridge, CO.

31. Charlie Koven, Bill Riley, Margaret Torn, **Zack Subin**, Gordon Bonan, David Lawrence, Sean Swenson, 2011. Development of a vertically-resolved soil C and N model in CLM4. *Biogeochemistry Working Group, CESM Workshop 2011*, June 22, Breckenridge, CO.

32. **Z. M. Subin**, W. J. Riley, L. N. Murphy, F. Li, C. Bonfils, and D. Mironov, 2011. Update on New Lake Model for CLM. *CESM Land Model Working Group Meeting, National Center for Atmospheric Research*, March 15, Boulder, CO.

33. W. J. Riley, **Z. M. Subin**, D. M. Lawrence, S. C. Swenson, M. S. Torn, L. Meng, N. Mahowald, and P. Hess, 2011. CLM4Me, a Methane Biogeochemistry Model Integrated in CESM. *CESM Joint Land Model, Biogeochemistry, and Chemistry-Climate Working Group Meetings*, *National Center for Atmospheric Research*, March 16, Boulder, CO.

34. C. D. Koven, W. J. Riley, M. S. Torn, **Z. M. Subin**, G. Bonan, D. M. Lawrence, and S. C. Swenson, 2011. Addition of Long-lived Soil Carbon to CLMCN. *CESM Biogeochemistry Working Group Meeting, National Center for Atmospheric Research*, March 17, Boulder, CO.

35. L. Meng, P. G. Hess, N. M. Mahowald, J. B. Yavitt, W. J. Riley, **Z. M. Subin**, D. M. Lawrence, S. C. Swenson, J. Jauhiainen, and D. Fuka, 2011. Constrained Estimate of Methane Emissions. *CESM Joint Land Model, Biogeochemistry, and Chemistry-Climate Working Group Meetings*, *National Center for Atmospheric Research*, March 16, Boulder, CO.

36. V. Stepanenko, A. Martynov, K. D. Joehnk, M. Perroud, X. Fang, **Z. M. Subin**, F. Beyrich, A. Nordbo, D. Mironov, and J. Huotari, 2011. Thermal regime and water-atmosphere interactions of shallow mid-latitude lakes: a case study within the framework of the Lake Model Intercomparison Project. *European Geosciences Union General Assembly 2011*, April 3 – 8, Vienna, Austria.

37. **Z. M. Subin**, W. J. Riley, L. N. Murphy, and C. Bonfils, 2011. An Improved Lake Model in CESM1, with Climate Sensitivity to Lake Distribution. *Berkeley Atmospheric Sciences Center Symposium*, February 11, Berkeley, CA. (poster)

38. **Z. M. Subin**, W. J. Riley, and C. Bonfils, 2011. Climate sensitivity to lake properties and distribution using an improved lake model in CCSM. *91st Annual American Meteorological Society Annual Meeting*, January 23 – 28, Seattle, WA. (poster)

39. W. J. Riley, **Z. M. Subin**, D. M. Lawrence, S. C. Swenson, M. S. Torn, L. Meng, N. Mahowald, P. Hess, 2010. Sensitivity and Uncertainty of High-Latitude Terrestrial Methane Emissions in a Changing Climate: Application of a Methane Biogeochemical Model in CLM4. *American Geophysical Union Fall Meeting*, December 13–17, San Francisco, CA.

40. **Z. M. Subin**, W. J. Riley, and C. Bonfils, 2010. Global Climate Sensitivity to Lake Distribution, and Predicted 21st Century Thermokarst Active Layer Thickening, Using an Improved Lake Model in CESM1. *American Geophysical Union Fall Meeting*, December 13–17, San Francisco, CA. (poster)

41. L. Meng, N. M. Mahowald, P. G. Hess, J. B. Yavitt, **Z. Subin**, W. J. Riley, D. M. Lawrence, 2010. Simulation of methane emissions from tropical wetlands and rice paddies in the Community Land Model (CLM4)-CN: Introduction and preliminary results. *American Geophysical Union Fall Meeting*, December 13–17, San Francisco, CA. (poster)

42. **Z. M. Subin**, W. J. Riley, and C. Bonfils, 2010. Developing a new lake model in CCSM: Model Development, Sensitivity, and Effects on Regional and Global Climate. *2nd Workshop on Parameterization of Lakes in Numerical Weather Prediction and Climate Modelling, SMHI (Sveriges Meteorologiska och Hydrologiska Institute)*, September 15 – September 17, Norrköping, Sweden.

43. **Z. M. Subin**, W. J. Riley, and C. Bonfils, 2010. Developing a new lake model in CCSM 4. *15th Annual CESM Workshop*, June 28 – July 2, Breckenridge, CO.

44. **Z. M. Subin**, W. J. Riley, and C. Bonfils, 2010. Developing a new lake model in the CCSM: Model Development, Sensitivity, & Effects on Regional and Global Climate. *Université du Québec à Montréal*, June 23, Montreal, Canada.

45. H. Gu, J. Jin, and **Z. M. Subin**, 2010. Coupling a Physical Lake Model into the Weather Research Forecasting Model. *11th Annual WRF Users Workshop, National Center for Atmospheric Research*, June 21 – 25, Boulder, CO. (poster)

46. W. J. Riley, **Z. M. Subin**, M. S. Torn, and D. M. Lawrence, 2010. Developing a Prognostic Methane Biogeochemistry Model in the CCSM: Model Evaluation and Regional Predictions, *Berkeley Atmospheric Sciences Center Symposium*, February 26, Berkeley, CA. (poster)

47. **Z. M. Subin**, W. J. Riley, and C. Bonfils, 2010. Developing a new lake model in CLM, *Land Model and Biogeochemistry Working Group Meeting, National Center for Atmospheric Research*, February 9, Boulder, CO.

48. W. J. Riley, **Z. M. Subin**, M. S. Torn, and D. M. Lawrence, 2010. Methane emissions from high-latitude systems: Model development, testing, and application, *Land Model and Biogeochemistry Working Group Meeting, National Center for Atmospheric Research*, February 9, Boulder, CO.

49. W. J. Riley and **Z. M. Subin**, 2010. Developing a prognostic methane biogeochemical model in the CESM. Invited, *Oak Ridge National Laboratory*, January 31, Oak Ridge, TN.

50. **Z. M. Subin** and W. J. Riley, 2009. Integrating a 1D Thermal Lake Model into a Global and Regional Climate Model: Model Evaluation and Regional Climate Simulation, *American Geophysical Union Fall Meeting*, December 10−14, San Francisco, CA. (poster)

51. W. J. Riley, **Z. M. Subin**, M. S. Torn, and D. M. Lawrence, 2009. Developing a Prognostic Methane Biogeochemistry Model in the CCSM: Model Evaluation and Regional Predictions, *American Geophysical Union Fall Meeting*, December 10 – 14, San Francisco, CA. (poster)

52. Y. Lu, L. M. Kueppers, **Z. Subin**, and J. Jin, 2009. Modeling the climate sensitivity to forest cover in North America. *American Geophysical Union Fall Meeting*, December 10 – 14, San Francisco, CA. (poster)

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