

## Lori Thompson Sentman

### EDUCATION:

Ph.D. candidate, Atmospheric Science  
Rutgers University, The Graduate School of New Brunswick  
New Brunswick, NJ  
2012-present  
*NOAA/OAR Graduate Studies Program, 2012-2014*

M.S., Environmental Science, Atmospheric Science option  
Rutgers University, The Graduate School of New Brunswick  
New Brunswick, NJ  
January 2002

B.S., Earth and Atmospheric Science  
Rutgers University, Cook College  
New Brunswick, NJ  
May 1997

### EXPERIENCE:

09/08 to Present

**National Oceanic and Atmospheric Administration (NOAA)  
Geophysical Fluid Dynamics Laboratory, Research Physical Scientist**

Biogeochemistry, Ecosystems and Climate team member responsible for the development of improved earth system models and research on the interactions and feedbacks of the biosphere with climate on varying temporal and spatial scales. Research initiatives include climate-carbon cycle interactions and feedbacks in past warm climates, sensitivity of CO<sub>2</sub> fertilization, impact of climate on the terrestrial carbon cycle, the effect of land use on the terrestrial carbon stores and stocks from decadal to centennial time scales, and the biophysical effects of land use on climate. Execution, analysis, quality control and data publishing of ESM2M CMIP5/IPCC AR5 experiments. Effective communication of research via oral presentations and written manuscripts.

03/08 to 09/08

**High Performance Technologies, Inc., Associate II-Software Engineer:  
NOAA/Geophysical Fluid Dynamics Laboratory, Princeton, NJ.**

Contracted at the National Oceanic and Atmospheric Administration's (NOAA) Geophysical Fluid Dynamics Laboratory (GFDL) as part of the Climate and Ecosystems group. Tasks include model execution and management of the earth system model components and the mixed layer ocean model, development of improved earth system models and research on the interactions and feedbacks of the biosphere with climate on varying time scales. Research initiatives include sensitivity of CO<sub>2</sub> fertilization, impact of climate on the terrestrial carbon cycle and the effect of land use on the terrestrial carbon stores and stocks from decadal to centennial time scales. Effective communication of research via oral presentations and written manuscripts.

01/02 to 03/08

**RS Information Systems, Inc./Wyle Laboratories, Software Engineer:  
NOAA/Geophysical Fluid Dynamics Laboratory, Princeton, NJ.**

Contracted at the National Oceanic and Atmospheric Administration's (NOAA) Geophysical Fluid Dynamics Laboratory (GFDL) as part of the Climate and Ecosystems group. Tasks include model execution and management of the earth system model components and the mixed layer ocean model, development of improved earth system models and research on the interactions and feedbacks of the biosphere with climate on varying time scales. Designed and created an automated vegetation analysis post processing suite for model and observation comparison. Investigation into the terrestrial biosphere and

climate responses to increased radiative and photosynthetic carbon dioxide levels. As a member of the Modeling Services group for over four years, provided public and internal release support for the Flexible Modeling System (FMS). Designed and created an automated database of FMS model development integrations used by the model development teams to catalogue and track the model development effort. Provided detailed source code module web-based documentation for the land model, LaD, and the nonhydrostatic atmospheric model ZETAC. Liaison to the Land Model Development Team (LMDT) and the Single Column Model (SCM), providing technical and programming support for two land models and the single column atmospheric model; performance profiling, ensuring bitwise reproducibility across restarts and processor counts, diagnostic support, code management and model development. Wrote user guides for the public and internal releases of the model infrastructure and the component models. I/O and data conversion from GRIB, binary, ASCII and HDF4 to netCDF, following the CF metadata conventions and using the netCDF decoders package. Conducted four hands-on tutorials and one refresher demonstration of PowerPoint 2000, as well as numerous other presentations and a Flexible Runtime Environment workshop.

**02/05 to 08/05**

**Princeton University, Scientific Programming Consultant**

Installed the National Aeronautics and Space Administration (NASA)/Goddard Space Flight Center (GSFC) Land Information System (LIS) on various platforms for the Department of Civil and Environmental Engineering, including Linux workstations, a Linux cluster and a Beowulf cluster at Princeton University. Used GrADS scripts for the development of a web-based diagnostic interface for testing and validation.

**02/00 to 01/02**

**Rutgers University, Department of Environmental Science, Graduate Assistant**

Studied land surface parameterizations using a regional nonhydrostatic atmospheric model, the Regional Atmospheric Modeling System (RAMS). Studied and analyzed the effects of land surface heterogeneity on precipitation rates during the Amazonian wet season. Used a one dimensional radiative convective model to study the effects of land surface on Amazonia's radiative and hydrological balances. Additional modeling research projects include the sensitivity of RAMS eddy diffusivity parameterizations, parameterizing the uptake of soil water through plant roots, the environmental cycle of polychlorinated biphenyls, and a critical review of atmospheric dispersion modeling. FORTRAN 90 programming and Perl scripting in a Unix environment.

**05/96 to 09/97**

**National Oceanic and Atmospheric Administration (NOAA)  
National Weather Forecast Office/Mount Holly, Student Career  
Experience Program (SCEP) intern**

Wrote and transmitted daily and extended local forecasts, nowcasts, fire weather forecasts and Transcribed Weather Enroute Broadcasts (TWEBs) aviation forecasts and Terminal Aerodrome Forecasts (TAFs). Experience in aviation routine weather reports (METAR) via the Automated Surface Observing System (ASOS). Broadcast watches, warnings and hourly observations on the National Oceanic and Atmospheric Administration (NOAA) weather radio. Experience on the radar and hydrology shifts. Conducted research into the propagation of sea breezes across New Jersey using the Next Generation Weather Radar system (NEXRAD). Created an internal web-based station duty manual using Hypertext Markup Language (HTML).

**PUBLICATIONS:**

Ding, Yanni, Gennady Chepurin, Georgiy Stenichikov, Alan Robock, Lori T. Sentman, and John P. Krasting, in press: Ocean Response to Volcanic Eruptions in Coupled Model Intercomparison Project 5 (CMIP5) Simulations. *Journal of Geophysical*

*Research – Oceans*. DOI:10.1002/2013JC009780.

Dunne, John P., et al., 2013: GFDL's ESM2 global coupled climate-carbon Earth System Models Part II: Carbon system formulation and baseline simulation characteristics. *Journal of Climate*. DOI:10.1175/JCLI-D-12-00150.1.

Dunne, John P., et al., 2012: GFDL's ESM2 global coupled climate-carbon Earth System Models Part I: Physical formulation and baseline simulation characteristics. *Journal of Climate*, 25(19). DOI:10.1175/JCLI-D-11-00560.1.

Sentman, Lori T., Elena Shevliakova, Ronald J. Stouffer, Sergey Malyshev, 2011: Time Scales of Terrestrial Carbon Response Related to Land-Use Application: Implications for Initializing an Earth System Model. *Earth Interactions*, 15, 1-16. doi:10.1175/ei401.1.

Shevliakova, E., S. W. Pacala, S. Malyshev, G. C. Hurtt, P.C.D. Milly, J. P. Caspersen, L. T. Sentman, J. P. Fisk, C. Wirth, and C. Crevoisier, 2009: Carbon Cycling under 300 Years of Land-use Change: the Importance of the Secondary Vegetation Sink, *Global Biogeochem. Cycles*, 23, GB2022, doi:10.1029/2007GB003176.  
(also appears as a research highlight in *Nature Reports Climate Change*, 5, doi:10.1038/climate.2009.35, April 2009.)

Anderson, Jeffrey L., et al. 2004: The new GFDL global atmosphere and land model AM2/LM2: Evaluation with prescribed SST simulations. *J. Climate*, 17(24), 46414673.

## **PRESENTATIONS:**

“Paleoclimate: Understanding the Past to Improve Predictions of the Future”, *The Ronald J. Stouffer Symposium*, GFDL, Princeton, NJ, June 2016.

“Earth System Implications of a Central American Seaway”, *Connecting Paleo and Modern Oceanographic Data to Understand AMOC Over Decades to Centuries*, NCAR, Boulder, CO, May 2016.

“The Role of the Central American Seaway on the Earth System: Sensitivity Study using an Earth System Model”, Princeton University, May 2015.

“The Role of the Central American Seaway on the Earth System: Sensitivity Study using an Earth System Model”, Rutgers University, October 2014.

“The Role of the Central American Seaway (CAS) Closure on Ocean Circulation”, Rutgers University, December 2013.

“Evaluation of Historical Carbon Cycle Changes in the GFDL ESM CMIP5 Simulations”, Rutgers University, December 2013.

“Uncertainty in the Global Carbon Cycle from Land-Use Application of Earth System Model Initialization”, Key Uncertainties in the Global Carbon-Cycle: Perspectives across terrestrial and ocean ecosystems, ASP Researcher Workshop, NCAR, Boulder, CO, August 2013.

“GFDL Atmospheric Chemistry-Climate and Earth System Models”, Rutgers University, April 2013.

"Land Ecosystems and Biogeochemical Cycling", GFDL External Review, July 2009.

"The Importance of Land Use for the Evaluation of Terrestrial Carbon: Preindustrial Equilibrium or Transient?", QUEST/GLASS land benchmarking workshop, Exeter, UK, June 2009.

"The New Mixed-Layer Model: SM2.1-LM3V", GFDL, February 2008.

**AWARDS:**

U.S. Dept. of Commerce Silver Medal, Scientific/Engineering Achievement, 2014.  
NOAA/OAR Graduate Studies Program, 2012-2014.  
RSIS Employee of the Month, Science and Engineering Division. October 2002.  
RSIS Delighting the Customer Award (FMS team). January 2002, June 2002.

**COMMITTEES**

Paleoclimate Model Intercomparison Project (PMIP), Pre-Pliocene Working Group, GFDL representative, 2013-present  
GFDL Early Career Scientist Committee, 2016-present  
GFDL Equal Employment Opportunity and Advisory Committee, 2009-present

**PROFESSIONAL SERVICES:**

Expert Reviewer of the Second Order Draft WGI contribution to the *IPCC Fifth Assessment Report*  
Reviewer, *Journal of Climate*  
Reviewer, *Journal of Geophysical Research Atmospheres*  
Reviewer, *Climate of the Past*

**COMMUNITY OUTREACH:**

"Weather for Preschoolers: Clouds", Sand Hills Preschool, Kendall Park, NJ. May 2017.  
"Weather for 1<sup>st</sup> Graders: The Water Cycle, Clouds, and Storms", Monmouth Junction Elementary School, Monmouth Junction, NJ, May 2017.  
"Monmouth Junction Elementary School 11<sup>th</sup> Annual Science Fair", Visiting Scientist, Brooks Crossing Elementary School, Monmouth Junction, NJ, March 2017.  
"Weather for Kindergarteners: Clouds, Thunder and Lightning Science", Monmouth Junction Elementary School, Monmouth Junction, NJ, April 2016.  
"Monmouth Junction Elementary School 10<sup>th</sup> Annual Science Fair", Visiting Scientist, Brooks Crossing Elementary School, Monmouth Junction, NJ, February 2016.  
"Weather for Preschoolers.", Sand Hills Preschool, Kendall Park, NJ. May 2015.  
"Thunderstorms for Kindergarteners", Deans Crossing School, Monmouth Junction, NJ. December 2013.  
"Weather for Kindergarteners, Part II: Thunder and Lightning", Deans Crossing School, Monmouth Junction, NJ. March 2012.  
"Weather for Kindergarteners, Part I: Clouds", Deans Crossing School, Monmouth Junction, NJ. December 2011.  
"The Water Cycle II", Plainsboro Library, Plainsboro, NJ. July 22, 2009.  
"The Water Cycle I", Plainsboro Library, Plainsboro, NJ. July 8, 2009.  
Rapporteur, Climate Working Group (CWG) CRM Program Review. March 25, 2008.  
"Science and Engineering Expo", Princeton University, Princeton, NJ. March 19, 2008.  
"2008 Young Women's Conference", Plasma Physics Laboratory, Princeton, NJ. March 14, 2008.  
"Weather, Oceans and Climate", Plainsboro Library, Plainsboro, NJ. October 18, October 25, November 8, November 15, November 29 and December 6, 2007.

**PROFESSIONAL  
ORGANIZATIONS:**

American Meteorological Society  
American Geophysical Union  
Earth Science Women's Network

**CONTACT  
INFORMATION:**

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<http://www.gfdl.noaa.gov/lori-thompson-sentman-homepage>