

NICOLE-JEANNE SCHLEGEL

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Education

March 2011, Ph.D., Specialty: Climate Science, Department of Earth and Planetary Science, School of Letters and Sciences, University of California, Berkeley, California

May 2000, B.A., Major: Computer Science / Science of Earth Systems (concentration in Atmospheric Sciences)
Minor: Concentration in French Area Studies, School of Arts and Sciences, Cornell University, Ithaca, NY

Research Experience

7/2017 – present, Scientist II, NASA Jet Propulsion Laboratory, Pasadena, CA

- *Expert in the JPL-UCI Ice Sheet System Model (ISSM) software, specifically for use in scientific research of ice sheet response to changes in climate and other boundary conditions/forcing, with a strong focus on utilization of uncertainty quantification tools to understand ice sheet sensitivity and error propagation in ice flow models.*
- *Main research goals include the use of NASA observations (i.e., GRACE/ICESat) to better constrain uncertainty in model simulations and ultimately, to determine the mechanisms, physical processes, and timescales most responsible for current changes in ice sheet dynamics and total/regional mass balance.*

7/2016 – 7/2017, Assistant Researcher III, University of California Los Angeles, Los Angeles, CA

7/2014 – 7/2016, Assistant Researcher II, University of California Los Angeles, Los Angeles, CA

- *Uncertainty quantification of ice sheet model simulation / model sensitivity to climate and boundary conditions*
- 5/2011 – 7/2014, Caltech Postdoctoral Scholar, NASA Jet Propulsion Laboratory, Pasadena, CA, advisor: Eric Larour (NASA JPL)

- *Ice Sheet System Model (ISSM) developer, enhancement and testing of ISSM (C/C++, Matlab platform)*
- *Research focus on sensitivities of ice sheets to external forcings/boundary conditions (atmosphere/ocean)*

9/2003 – 5/2011, Graduate Student Researcher/Instructor, Department of Earth and Planetary Science, School of Letters and Sciences, University of California, Berkeley, CA

- *Enhancement of the University of British Columbia three-dimensional thermo-mechanical ice sheet model to investigate the sensitivity of the Greenland Ice Sheet to modern day climate variability and projected future climatic trends (FORTRAN90/95, Matlab)*
- *Force Polar version of the NCAR/Penn State Mesoscale Model (PMM5) with various ice sheet topographies calculated from the ice sheet model (FORTRAN90/95, C/C++)*

5/2004 – 5/2011, Visiting Graduate Student Researcher, Climate Science Department, Earth Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA

- *Climate model simulation and analysis: Running of various climate models (NCAR/Penn State Mesoscale Model [MM5], Weather Research and Forecasting Model [WRF]) and analysis of output from multiple high-resolution Mesoscale simulations (C++, FORTRAN90/95, NetCDF, GRIB, Matlab)*
- *Statistical Climatic downscaling of AOGCM model output (i.e. PCM, GFDL, HadCM3, CCSM) with observational and reanalysis data (ECMWF, NCEP, PRISM)*
- *Development of algorithms to capture the historical and projected frequencies of synoptic scale patterns currently believed to drive California mesoscale weather events (eg. Santa Ana Winds, coastal fog)*

5/2002 – 8/2003, Team Lead for Training Simulation Program, National Air and Space Model (NASM) for the Joint Simulation (JSIMS) Project, Raytheon Company, Sudbury, MA

9/2000 – 8/2003, Software Engineer, National Air and Space Model (NASM) for the Joint Simulation (JSIMS) Project, Raytheon Company, Sudbury, MA

- *Software design, development, and testing for Air force portion of a US armed forces joint simulation for officer training (UML, OOC/C++)*

8/1999 – 9/2000, Member of Robotic Soccer (Robocup) Research and Development Team, Artificial Intelligence, Department of Mechanical Engineering, Cornell University, Ithaca, NY

- *Software design for robotic soccer team artificial intelligence development (C/C++, Java)*
- *Software code development for simulation games and robot artificial intelligence (C++, Matlab)*

6/1999 – 8/1999, Summer Institute Student Scholar, Land Data Assimilation Scheme (LDAS) Student Intern, NASA Goddard Space Flight Center, Greenbelt, MD

- *Scripting for automatic download and visualization of satellite data (UNIX shell)*
- *Developed real-time website visualization for validation of LDAS model's earth temperature prediction output (FORTRAN,GrADS)*
- *Web page modification and creation (HTML,Java)*

Teaching-Mentoring Experience

2014 – Present, Co-advisor of Dr. Josh Cuzzone, a JPL/UCI postdoctoral scholar focusing on Greenland Ice Sheet Paleo-climate simulations

2012 – Present, Mentor of JPL/ISSM student interns from local high schools and U.S/foreign Universities

2011 – 2016, Instructor/co-organizer of Ice Sheet System Model workshops (12/2011: 2 day workshop in Pasadena, CA; 12/2012: 3 day workshop in Irvine, CA; 6/2014: 3 day workshop in Bergen, Norway; 6/2016: 3 day workshop in La Jolla, CA)

9/2004 – 5/2011, Graduate Student Instructor, Department of Earth and Planetary Science, School of Letters and Sciences, University of California, Berkeley, California

- *Run labs/discussion sections, hold office hours, run review sessions, maintain class web site, in collaboration with professors and other graduate student instructors: develop and grade assignments, exams, and class field trips, serve as substitute lecturer*

Courses taught:

- The Planet Earth (EPS 50): *Introduction to earth science, Spring 2011 (head graduate student instructor for Chi-Yuen Wang) and Fall 2004*
- Introduction to Oceans (EPS 82): *Fall 2005 and Fall 2007*
- The Planets (EPS 12): *Introduction to the Solar System, Spring 2006*
- Freshman/Sophomore Seminar (EPS 39): *Introductory field trip to the Northern California Sierras, Fall 2004 (Lead by Chi-Yuen Wang)*

1/1999 – 12/1999, Student Consultant for Introduction to Computer Science (CS 100), Department of Computer Science, School of Engineering, Cornell University, Ithaca, NY

- *Oversee computer laboratory and provide support for students working on coding assignment, grade assignments and exams*

8/1997 – 5/2000, Student Private Tutor, Athletic Department, Cornell University, Ithaca, NY

8/1997 – 5/2000, Student Grader, Department of Mathematics, School of Arts and Sciences, Cornell University, Ithaca, NY

- *Grade weekly assignments for and work with graduate student instructors for upper level undergraduate mathematics courses*

Awards

NASA 2013 Cryosphere Science, “Modeling the dynamic evolution of the Greenland Ice Sheet under different scenarios of Atmospheric Forcings, using ISSM.” Co-I., 1/2014-12/2016

NASA Graduate Student Fellowships in Earth System Sciences, “Determining Greenland Ice Sheet sensitivity to regional climate change: Coupling of a 3-D thermo-mechanical ice model with a mesoscale climate model”, 9/2005-9/2007

Scholastic Grant for Santa Ana Wind Research, Earth Sciences Division, Lawrence Berkeley National Laboratory, 7/2005

World Championship Robotic Soccer Competition, Robocup 2000, First Place, Melbourne, Australia, 9/2000

Scholastic Grant received from Cornell University Mechanical Engineering Department for Robocup Artificial Intelligence Research and Travel to Robocup Competition, Melbourne, Australia, 5/2000-9/2000

Award of Degree with Distinction in all Subjects, Cornell University, 5/2000

Publications

N.-J. Schlegel, D.N. Wiese, E. Larour, M.M. Watkins, J.E. Box, X. Fettweis, X., and M. R. van den Broeke, 2016, Application of GRACE to the evaluation of an ice flow model of the Greenland Ice Sheet, *The Cryosphere*, 10, 1965-1989, doi:10.5194/tc-10-1965-2016.

E. Larour and **N. Schlegel**, 2016, ISSM in the Cloud: how to improve uncertainty quantification of ice-sheet mass balance projections, *Comput. Geosci.*, 96, doi:10.1016/j.cageo.2016.08.007.

K.H. Briggs et al., 2016, Charting ice sheet contributions to global sea level rise, *Eos*, 97, doi:10.1029/2016EO055719. Published on 18 July 2016.

- P.M. Alexander, M. Tedesco, **N.-J. Schlegel**, S.B. Luthcke, X. Fettweis, and E. Larour, 2016, Greenland Ice Sheet seasonal and spatial mass variability from model simulations and GRACE (2003–2012), *The Cryosphere*, 10, 1259-1277, doi:10.5194/tc-10-1259-2016.
- N.-J. Schlegel**, E Larour, H Seroussi, M. Morlighem, and J. E. Box, 2015, Ice discharge uncertainties in Northeast Greenland from boundary conditions and climate forcing of an ice flow model, *J. Geophys. Res. - Earth Surf.*, 120, 29–54, doi:10.1002/2014JF003359.
- E. Larour, J. Utke, B. Csatho, A. Schenk, H. Seroussi, M. Morlighem, E. Rignot, **N. Schlegel**, and A. Khazendar, 2014, Inferred basal friction and surface mass balance of the Northeast Greenland Ice Stream using data assimilation of ICESat (Ice Cloud and land Elevation Satellite) surface altimetry and ISSM (Ice Sheet System Model), *The Cryosphere*, 8, 2335-2351, doi:10.5194/tc-8-2335-2014.
- E. Larour, **N. Schlegel** and M. Morlighem, 2014, Modeling the Evolution of Polar Ice Sheets, *Eos Trans. AGU*, 95(45), 411, doi:10.1002/2014EO450005.
- N.-J. Schlegel**, E Larour, H Seroussi, M. Morlighem, and J. E. Box, 2013, Decadal-scale sensitivity of northeast Greenland ice flow to errors in surface mass balance using ISSM, *J. Geophys. Res. - Earth Surf.*, 118, doi: 10.1002/jgrf.20062.
- Xu, P., Y. Huang, N. Miller, **N. Schlegel**, and P. Shen, 2012, Impacts of climate change on building heating and cooling energy patterns in California, *Energy*, v. 44, pp 792-804.
- Jin, J., Miller, N.L., **N.J. Schlegel**, 2010, Sensitivity Study of Four Land Surface Schemes in the WRF Model, *Advances in Meteorology*, vol. 2010, Article ID 167436, doi:10.1155/2010/167436.
- Hayhoe, K., VanDorn, J., Croley, T., **Schlegel, N.**, Wuebbles, D., 2010, *Regional climate change projections for Chicago and the US Great Lakes*, Journal of Great Lakes Research, v. 36, i. 2, pp. 7 - 21
- Xu, P., Y. Huang, N.L. Miller, **N.J. Schlegel**. 2009. *Effects of global climate change on building energy consumption and its implications on building energy codes and policy in California*, CEC-500-2009-006. Available from <http://www.energy.ca.gov/publications/>.
- Miller, N.L., J. Jin, **N.J. Schlegel**, M.A. Snyder, T.O'Brien, L.C. Sloan, P.B. Duffy, H. Hidalgo, M. Kanamatsu, K. Yoshimura, and D.R. Cayan. 2009. *An analysis of simulated California climate using multiple dynamical and statistical techniques*. A Report to the CA Energy Commission as part of the CA Assessment Report. CEC-500-2009-017-D, 47 pp. Available from <http://water.usgs.gov/nrp/>.
- Harmsen, E.W., N.L. Miller, **N.J. Schlegel**, and J.E. Gonzalez, 2009, Seasonal climate change impacts on evapotranspiration, precipitation deficit and crop yield in Puerto Rico, *Agricultural Water Management*, v. 96, i. 7
- Hayhoe, K. et al., 2007, *Climate Change and Chicago: Projections and Potential Impact*, Chicago Climate Action Plan, Chapter 2: Climate. Available from <http://www.chicagoclimateaction.org> (Contributing Author)
- Miller, N.L. and **N.J. Schlegel**, 2006. *Climate change projected fire weather sensitivity: California Santa Ana wind occurrence*. Geophysical Research Letters. 33, L15711, doi:10.1029/2006GL25808.
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