Melinda R. Nicewonger
PhD Candidate, NSF GRFP Fellow

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Education

PhD **University of California, Irvine,** Earth System Science, *2013-present*
Advisor: Dr. Eric S. Saltzman (co-advisor: Dr. Murat Aydin)
Dissertation topic: Measuring ethane and acetylene in polar ice cores to reconstruct preindustrial biomass burning emissions

MS **University of California Irvine**, Earth System Science, *2015*

BS **Texas A&M University**, Meteorology, *2013*
Graduated Cum Laude, Minors: Mathematics, Geology

Honors and Awards

Associated Graduate Student Symposium Judges' Award, *2018*
Ice Core Young Scientists (ICYS) Travel Grant, *2016*
National Science Foundation Graduate Research Fellowship, *2014-present*
National Science Foundation REU Fellow, UC Irvine, *Summer 2012*
Jesse Jones and Mary Gibbs Scholarship, *2009-2013*

Research Experience

University of California, Irvine
Graduate Student Researcher, Saltzman/Aydin Lab, *2013-Present*
- Reconstruct trace gas atmospheric histories from ice cores
- Utilize gas chromatography and mass spectrometry

NSF REU Fellow, Saltzman/Aydin Lab, *June-August 2012*
- Investigated methods to correct for in situ hydrolysis loss of carbonyl sulfide in ice cores (led to publication)

Teaching Experience

University of California, Irvine
Teaching Associate (Instructor)
- Earth System Science 5, *The Atmosphere*, Summer 2017, Class size: 45

Teaching Assistant
- Earth System Science 5, *The Atmosphere*, Spring 2017, Class size: 450
- Earth System Science 7, *Physical Geology*, Winter 2017, Class size: 190
- Earth System Science 21, *On Thin Ice*, Spring 2014, Class size: 280

Pedagogical Development

Course Design Certificate, Center for Engaged Instruction, UC Irvine, *Feb 2017*
- Developed a curriculum and syllabus for a course using backwards, student-centered course design

Earth System Science Teaching Topics, UC Irvine, *Winter 2017*
- Introduction to pedagogy with emphasis on backwards teaching techniques, creating and using learning outcomes, evidence-based teaching practice, active learning, and strategies to address diversity and inclusion in the classroom

Field Experience

South Pole Ice Core (SPICEcore) Drilling Project, *South Pole, Antarctica*
Science team member, Nov 2015 – Dec 2015 (5 weeks)
Science team member, Nov 2014 – Feb 2016 (14 weeks)
- Assisted with drilling, logging, and handling of the South Pole Ice Core

National Ice Core Laboratory (NICL), *Denver, CO*

- Assisted with multiple core processing lines of the South Pole Ice Core Project and sample allocation for various labs (~12 weeks total)

Desert Research Institute, *Reno, NV*
Graduate Student Researcher, Aug 2013 (1 week)

- Assisted with analysis of organic acids in a Greenland ice core using ES/MS/MS technique

Publications

Nicewonger, M.R., M. Aydin, M. J. Prather, and E. S. Saltzman (2018), Large changes in biomass burning over the last millennium inferred from paleoatmospheric ethane in polar ice cores, *in press*

Nicewonger, M. R., K. R. Verhulst, M. Aydin, and E. S. Saltzman (2016), Preindustrial atmospheric ethane levels inferred from polar ice cores: A constraint on the geologic sources of atmospheric ethane and methane, *Geophys. Res. Lett.*, 43, 214–221, doi:10.1002/2015GL066854.

Aydin, M., J. E. Campbell, T. J. Fudge, K. M. Cuffey, **M. R. Nicewonger**, K. R. Verhulst, and E. S. Saltzman (2016), Changes in atmospheric carbonyl sulfide over the last 54000 years inferred from measurements in Antarctic ice cores. *J. Geophys. Res. Atmos.*, 120, doi: 10.1002/2015JD024235.

Aydin, M., T. J. Fudge, K. R. Verhulst, **M. R. Nicewonger**, E. D. Waddington, and E. S. Saltzman (2014), Carbonyl sulfide hydrolysis in Antarctic ice cores and an atmospheric history for the last 8000, *J. Geophys. Res. Atmos*., 119, doi:10.1002/2014JD021618.

Oral Presentations

Associated Graduate Students Research Symposium, Irvine, CA, "*Fire and Ice: Quantifying preindustrial fire emissions using ice core gas measurements*", April 2018

South Pole Ice Core Meeting, Seattle, WA, "*SPICEcore and WAIS Divide measurements of ethane and acetylene over the last 2,000 years*", September 2017

South Pole Ice Core Science Meeting, La Jolla, CA, "*Measuring ethane and acetylene in polar ice cores to quantify long-term biomass burning and geologic hydrocarbon emissions*", September 2016

WAIS Divide/SPICE Core Science Meeting, La Jolla, CA, "*Ethane measurements in polar ice cores and preindustrial ethane emissions from biomass burning and geologic sources*", September 2015

Poster Presentations

AGU Fall Meeting, New Orleans, LA, "*Measuring ethane and acetylene in Antarctica ice cores to reconstruct biomass burning emissions over the last 1,000 years*", **presenter,** December 2017

University of California, Irvine NSF GRFP "Training for Tomorrow" Symposium, May 2017

AGU Fall Meeting, San Francisco, CA, "Measurements of acetylene in air extracted from polar ice cores", **presenter**, December 2016

AGU Fall Meeting, San Francisco, CA, "*Pre-industrial ethane levels inferred from polar ice cores*", co-author, December 2014.

AGU Fall Meeting, San Francisco, CA "*Carbonyl sulfide hydrolysis in polar ice cores and the feasibility of recovering a paleoatmospheric history*", **presenter**, December 2012

Professional Affiliations

American Geophysical Union, 2012-Present
American Meteorological Society 2016-Present

Outreach

CLEAN Education, University of California, Irvine
Board Member/Treasurer, University of California Irvine, *2015-Present*

- Graduate student led climate literacy and education outreach program
- Present active learning seminars at schools, businesses and other events

Physical Science Undergraduate Mentor (PSUM) Program
Mentor, *Fall 2016-Present*

- Mentored three undergraduate students in Physical Sciences

Ice Core Laboratory Tours
University of California Irvine, *July 2014 – Present*

- Lead tours of the ice core research lab at UC Irvine for visitors and undergraduate students. Visitors range from 3th grade to business professionals.

A full list of all outreach activities is available upon request.

Extracurricular

zotCAMS, Student Chapter of the American Meteorological Society at UCI
Treasurer, University of California, Irvine, June *2017-Present*

- Helped to establish the student chapter, lead fundraisers, and participate as an active member of the organization

Half-Baked Seminar Series
Co-organizer, *2016-present*

- Help organize and manage an informal, bi-monthly department seminar series

Computer Skills

Advanced: Matlab, Microsoft Office (Excel, PowerPoint, Word)
Beginner: R