

SHANNAN KATHLYN SWEET

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Lamont-Doherty Earth Observatory
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EDUCATION

Columbia University, Graduate School of Arts and Sciences, New York, NY

Ph.D. in Earth and Environmental Science 2015

Concentrations: Plant Physiology, Remote Sensing, and Ecology

Dissertation: The impact of deciduous shrub dominance on phenology, carbon flux, and arthropod biomass in the Alaskan arctic tundra

M.Phil. in Earth and Environmental Science 2013

3.9 GPA (of possible 4.0); 14 credit hours

Thesis: Greater deciduous shrub dominance extends the annual period of maximum tundra greenness and increases modeled net CO₂ uptake

M.A. in Earth and Environmental Science 2012

3.9 GPA (of possible 4.0); 41 credit hours

Thesis: Tall deciduous shrubs offset delayed start of growing season through rapid leaf development in the Alaskan arctic tundra

State University of New York at Plattsburgh, Plattsburgh, NY

B.A. in Earth and Environmental Science 2005

Major: Environmental Science (minor in Cultural Anthropology)

3.9 GPA (of possible 4.0); 113 credit hours

Graduated Suma Cum Laude; Dean's list every semester

RESEARCH EXPERIENCE

Lamont-Doherty Earth Observatory, Columbia University, New York, NY 2015 (current)

Postdoctoral Research Scientist with Dr. Natalie Boelman

Conducting analysis of large quantities of data from a five-year, collaborative, multi-university study in the Alaskan arctic tundra pertaining to vegetation, climate, arthropods, and songbirds. Responsible for bringing together and analyzing data from above listed factions. Responsible for providing technical support, maintaining open lines of communication between collaborators, and helping in the preparation of manuscripts

Dept. of Earth & Environmental Science, Columbia University, New York, NY 2010-2014

Graduate Research Scientist with Dr. Natalie Boelman

Conducted research in northern Alaska using field surveys, remote sensing and various environmental monitoring techniques. Research focused on the impacts of climate warming and changing seasonality on the interactions among vegetation, insects and songbird communities.

WH Miner Research Institute, Chazy, NY

2004

Undergraduate Research Experience with SUNY Plattsburgh

Participated in the Applied Environmental Science Program through SUNY Plattsburgh. Lived on campus and attended full-day courses that integrated theory developed in lectures with hands-on experience in indoor and outdoor labs dealing with soil, forestry, and the agricultural environment interface.

RESEARCH INTERESTS

My research in northern Alaska focused on: (1) understanding the ways in which Arctic warming is altering tundra vegetation phenology and productivity, and; (2) developing near surface remote sensing techniques to quantify changes in vegetation form and function, and in primary consumer (arthropod) communities. I have learned a large suite of field and lab techniques that include environmental monitoring, near surface remote sensing, measures of vegetation form and function, arthropod sampling, as well as measures of songbird reproductive success. I am interested in applying my knowledge of plant ecophysiology, ecology, earth science and remote sensing, as well as my field and laboratory skills to the fields of agriculture and viticulture. I am specifically interested in investigating the use of modern technology to improve agronomy and viticulture (i.e. precision viticulture, precision agriculture, and 'climate-smart' agriculture).

TEACHING EXPERIENCE**Teaching Assistant**

2012-2013

Earth and Environmental Science, Columbia University, New York, NY

Organized and taught weekly labs and field trips; attended course lectures; held office hours; and graded exams and lab reports in Spring 2012 and 2013 for Life Systems (EESC V2300).

Mentor

2012-2014

Toolik Field Station, University of Alaska, Fairbanks, AK

Mentored undergraduate research assistants during summer field work (and beyond) conducted at a remote arctic tundra field station in Alaskan.

Lab Assistant

2003

Ecology, State University of New York at Plattsburgh, Plattsburgh, NY

Provided support for students and professor in the laboratory and the field in Fall 2003 for Ecology (ENV 304).

WORK EXPERIENCE**Canvasser**

2008 –2009

Greenpeace, 205 SE Grand Ave, Portland, OR 97214

Mike Schultz (971) 212-3708

Frontline fundraiser (October to March) for the world's largest non-profit environmental organization. Worked on the streets as a canvasser, educated public about current environmental issues. Helped organize and participated in local awareness campaigns.

Ecological Restoration Intern

2006 – 2007

National Park Service, Channel Islands NP, 1901 Spinnaker Dr., Ventura, CA 93001

Sarah Chaney (805) 794-3756

Eradicated invasive/non-native plants (October to April); restored riparian ecosystem with native species; collected and organized native seeds from Santa Cruz Island for NPS seed bank; managed nurseries on mainland CA and on Santa Cruz Island; collaborated with multiple agencies in various restoration projects (e.g. The Nature Conservancy, Growing Solutions); and also worked on Santa Barbara and Santa Rosa Islands.

Trail Crew Intern

2006

Florida Trail Association, 5415 SW 13th St, Gainesville, FL 32608

Bob Woods (850) 582-5267

Volunteered for a non-profit agency (January to April) through the Student Conservation Society building and maintaining hiking trails while gaining knowledge and experience on basic construction techniques and “Leave No Trace” outdoor ethics.

Horticultural Technician

1995 – present

Moon Valley Plant Co., 5664 RT 14, Dundee, NY 14837

Mary Ruth Sweet-Rood (607) 243-5120

Seasonal (April to November) position where responsibilities include managing 10,000 square feet of greenhouses, managing staff at garden sales center, and managing nursery; landscaping and grounds maintenance.

FELLOWSHIPS AND AWARDS

Columbia University:

Faculty Teaching Fellowship (~ \$65,000 per academic year) 2010-2015

James D. Hayes Graduate Student Research Grant (\$4,000) 2012

Bruce C. Heezen Memorial Prize (\$1,000) 2015

State University of New York, Plattsburgh:

Presidential Scholarship (~ \$40,000 per academic year) 2001-2005

James Fitzpatrick Scholarship in Environmental Science (~ \$30,000) 2004

Academic Excellence-NYHESC Scholarship (\$5,000) 2001

Outstanding Graduating Senior in Environmental Science (award) 2005

PUBLICATIONS

Sweet SK, Gough L, Griffin KL, Boelman NT (2014) Tall deciduous shrubs offset delayed start of growing season through rapid leaf development in the Alaskan arctic tundra. *Arctic, Antarctic, and Alpine Research*, **46**, 694-709

Boelman NT, Gough L, Wingfield J, Goetz S, Asmus A, Chmura HE, Krause J, Perez J, **Sweet S**, Guay KC (2014) Greater shrub dominance alters breeding habitat and food resources for migratory songbirds in Alaskan arctic tundra. *Global Change Biology*, doi: 10.1111/gcb.12761

Sweet SK, Asmus A, Rich ME, Gough L, Wingfield J, Boelman NT (2015) NDVI as a predictor of canopy arthropod biomass in the Alaskan arctic tundra. *Ecological Applications*, **25**, 779-790

Sweet SK, Griffin KL, Steltzer H, Gough L, Boelman NT (2015) Greater deciduous shrub abundance extends tundra peak season and increases modeled net CO₂ uptake. *Global Change Biology*, **21**, 2394-2409

MANUSCRIPTS IN PREPARATION

Krause JS, Chmura HE, Perez JH, Quach LN, Asmus A, Word KR, Nemeth Z, McGuigan M, **Sweet SK**, Meddle SL, Gough L, Boelman N, Wingfield JC. Breeding on the leading edge of a northward range expansion: differences in morphology and stress responses in the Arctic Gambel's White-crowned Sparrow. Accepted at *Oecologia* Aug 2015.

Perez JP, Bowman S, Chmura HE, Krause JS, Asmus A, **Sweet SK**, McGuigan MA, Meddle SL, Hunt KE, Gough L, Boelman N, Wingfield JC. Lapland longspur (*Calcarius lapponicus*) and White-crowned sparrow (*Zonotrichia leucophrys gambelii*) nestling growth rates in relation to food abundance and snow melt in the low arctic. In review at *The Auk* Sep 2015.

Boelman NT, Wingfield JC, Gough L, Krause JS, **Sweet SK**, Chmura HE, Perez JH (submitted). Long-distance migratory songbirds adjust timing of clutch initiation in response to unpredictable and dynamic spring conditions in the Arctic. Submitted to *Global Change Biology* Sep 2015

CONFERENCE PRESENTATIONS AND POSTERS

Gough L, Boelman NT, Wingfield JC, Krause JS, **Sweet S**, Rich ME, Asmus A (Poster) Effects of increasing shrub cover in arctic tundra on associated arthropods and migratory birds. Presented at Long Term Ecological Research All Scientists Meeting (LTER ASM) 2012: Estes Park, CO.

Sweet SK, Boelman NT, Gough L, Team Bird (Poster) Greater thaw depth facilitates the growth of woody shrubs through accelerated leaf development. Presented at Arctic Long Term Ecological Research (ARC LTER) Meeting 2013: Woods Hole, MA.

Krause JS, Perez JH, **Sweet S**, Asmus A, Rish ME, Schas J, Word KR, Gough L, Wingfield JC, Boelman NT (Poster) Impacts of changing seasonality and the potential for trophic mismatches in the Arctic. Presented at Society of Integrative and Comparative Biology (SICB) 2013 San Francisco, CA; and Woods Hole Biological Marine Lab Arctic LTER Meeting 2013: Woods Hole, MA.

Krause JS, Perez JH, Word KR, Chmura HE, Asmus A, **Sweet S**, Gough L, Boelman NT, Schas J, Wingfield JC (Poster) Timing of reproduction in two long distance migrants: trophic match? Presented at UC Davis Regional Annual Animal Behavior Student Conference 2013: Davis, CA.

Sweet SK, Boelman NT, Griffin KL, Steltzer H, Gough L (Poster) Greater deciduous shrub abundance extends tundra peak season and increases modeled net CO₂ uptake (Poster). Presented at Arctic Long Term Ecological Research (ARC LTER) Meeting 2014: Woods Hole, MA; and at the American Geophysical Union (AGU) Meeting 2014: San Francisco, CA.

Sweet SK, Krause JS, Asmus A (Talk) Effects of warming-induced increases in shrub abundance and changing seasonality on migratory songbirds in the Alaskan arctic tundra. Presented at Arctic Long Term Ecological Research (ARC LTER) Meeting 2014: Woods Hole, MA.

Chmura HE, Krause JS, Perez JH, **Sweet S**, Asmus A, Boelman NT, Gough L, Wingfield JC (Poster) Interannual variability in arctic phenology and reproductive success in the White-crowned sparrow

(*Zonotrichia leucophrys gambelii*) and Lapland longspur (*Calcarius lapponicus*). Presented at Society of Integrative and Comparative Biology (SICB) 2014: Austin, TX.

Chmura, HE, Krause, JS, Perez, JH, **Sweet SK**, Asmus A, Hunt KE, McGuigan, MA, Boelman, NT, Gough L, Wingfield JC (Poster) Reproductive success in the White-crowned sparrow (*Zonotrichia leucophrys gambelii*) and Lapland longspur (*Calcarius lapponicus*): Reproductive Timing and Implications for Global Change. Presented at Society for Comparative and Integrative Biology (SICB) 2015: West Palm Beach, FL.

Sweet SK, Asmus A, Rich M, Wingfield JC, Gough L, Boelman NT (Poster) NDVI as a predictor of canopy arthropod biomass in the Alaskan arctic tundra. Presented at Arctic Long Term Ecological Research (ARC LTER) Meeting 2015: Woods Hole, MA.

PROFESSIONAL AFFILIATIONS

The New York Academy of Sciences (member since 2010)

American Geophysical Union (member since 2014)

American Society for Enology and Viticulture (member since 2014)

MEDIA AND PRESS FEATURES

Field blog (by N Boelman) featured in the *NY Times: Scientist at Work*,

URL: http://scientistatwork.blogs.nytimes.com/author/natalie-boelman/?_r=0

CNN Opinion Piece (by N Boelman) '*Next Global Warming Worry: Thawing Tundra*',

URL: <http://www.cnn.com/2012/09/25/opinion/boelman-arctic-tundra/>

Article published by Audubon (by A Mascarelli) entitled '*Out of Sync*',

URL: <http://www.audubon.org/magazine/september-october-2013/arctic-researchers-race-uncover>

Research Highlight in Nature Plants (by A Armstorng) entitled '*Arctic ecosystems: Tundra carbon gain*'

URL: <http://www.nature.com/articles/nplants201542>

RELEVANT COURSEWORK

Graduate – Columbia University (Fall 2010 – Spring 2013):

Earth Science Colloquium (EESC G6001)

Ornithology (EEEE G4140)

Forest Ecology (EEEE W4100)

Plant Physiology & Ecology Seminar (EESC G9500)

Dynamics of Climate Variability & Climate Change (EESC W4400)

Understanding Nature Through Observation & Experiment (EEEE G4250)

Fundamentals of GIS – Ecology & Conservation Biology (EEEE G6020)

Introduction to Probability and Statistics (SIEO W4150)

Chemical Oceanography (EESC W4926)

Introduction to Statistics – Ecology & Evolutionary Biology (EEEE G5005)

Global Assessment – Remote Sensing (EESC W4050)

Remote Sensing & Environmental Change (EAEE E 4010)

Introduction to Atmospheric Science (EESC W4008)

Undergraduate – WH Miner Research Institute (Fall 2004):

Field Ecology (ENV 337)
Forest Ecology & Management (ENV 338)
Introduction to Soil Science (ENV 370)
Agriculture & the Environment (ENV 440)

Undergraduate – SUNY Plattsburgh (Fall 2001 – Spring 2005):

Environmental Science (ENV 101)
Physical Geology (GEL 101)
General Biology II (BIO 102)
Earth & Atmospheric Processes (ENV 306)
General Biology I (BIO 101)
Seminar in Urban Ecology (HON 171)
Ecology (ENV 304)
Environmental Planning (ENV 310)
Ecology, Systems & Culture (ANT 359)
General Chemistry (CHE 101)
Environment & Society (ENV 302)
Principles of Remote Sensing (ENV 355)
Environmental Technology (ENV 305)
Introduction to GIS & Mapping (ENV 350)
Environmental Management (ENV 329)
Environmental Science Seminar (ENV 340)
Trigonometry (MAT 104)

RELEVANT SKILLS

PC and Mac based word processing, spreadsheet and graphic software; goespatial image processing and analysis software (i.e. ENVI, ImageJ, ERDASImagine); Statistical software (i.e. R, Excel); Managing and organizing individuals and small groups; Working independently or with small group; Conducting research in remote locations; Mentoring and teaching; Grant writing

REFERENCES

Dr. Natalie Boelman (graduate advisor/lead-PI)
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Dr. Kevin Griffin (graduate co-advisor)
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Dr. Laura Gough (co-PI)
Department of Biological Sciences
Towson University
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Dr. Lee Vierling (colleague)
College of Natural Resources
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