

Carolyn Barrett Dash

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Education

University of Illinois at Urbana-Champaign

Ph.D. in Biology with a concentration in Ecology and Evolutionary Biology, May 2013

Dissertation title: "Responses of boreal forest fire regimes to climatic and land-cover changes: Perspectives from multiple spatiotemporal scales"

Dissertation adviser: Dr. Feng Sheng Hu

Kenyon College, Gambier, OH

B.A. in Biology

Graduated magna cum laude with honors in Biology, May 2006

Honors Thesis title: "Ohio Wetland and Surrounding Land-use Assessment: A Three Level Methodological Approach"

Thesis adviser: Dr. M. Siobhan Fennessy

Center for Marine Resource Studies, Turks and Caicos Islands

Study Abroad in Marine Resource Management Studies, School for Field Studies, Spring 2005

Research adviser: Dr. A. Charlotte DeFontaubert

Teaching Experience

Visiting Assistant Professor of Environmental Studies

Hamilton College 2014-2017

- I co-developed and taught the following 300-level courses at the Hamilton Adirondack Program during Fall 2016 in Keene, NY:
 - *Common Experience Seminar on Stewardship and Sustainability*: a synthesis course centered on ideas of stewardship and sustainability which contextualizes their off-campus semester's coursework, internships, communal duties, significant issues in and of the Adirondack Park, and potential career paths.
 - *Independent Capstone Project*: a writing intensive course that challenges students to conduct independent research in the Adirondack Park
- I developed and taught the following courses at Hamilton College in Clinton, NY:
 - *Seminar on Global Climate Change*: an advanced seminar that uses the IPCC and primary literature to help students develop advanced scientific literacy skills
 - *Environmental Science and Society*: an introductory course aimed as an overview of the environmental studies field
 - *Global Warming*: an intermediate-level course focused on teaching students about the natural and social science components of this complex issue
 - *Forever Wild: The Cultural and Natural Histories of the Adirondack Park*: a truly interdisciplinary course that explores the history, biology, politics, etc. of the Adirondacks through a writing intensive curriculum and discussions in the classroom and in the mountains
 - *Senior Project*: I act as the coordinator for all senior Environmental Studies majors as they complete theses with faculty mentors and help the students develop skills necessary for undertaking thesis research

Adjunct Professor of Biology

Syracuse University, 2014

- Created and taught an advanced seminar on “Disturbance Ecology” to undergraduates and graduate students that used primary literature to explore the interactions between natural and anthropogenic disturbance regimes while helping students improve their critical thinking and science literacy skills.

Adjunct Professor of Biology

SUNY Onondaga Community College, 2012

- Developed all course materials and led lectures and labs for “Exploring Biology”, a non-majors introductory course, organized into units on physiology, inheritance, and ecology.

Graduate Teaching Assistant

University of Illinois, 2006-2011

- Facilitated discussion sections and labs for the School of Integrative Biology for the following courses:
 - *Organismal and Evolutionary Biology*: introductory course for majors, taught seven discussion sections over 3 semesters, including a James Scholars Honors section
 - *Biological Sciences*: non-majors course geared toward education majors
 - *Ecology*: upper-level majors course that also qualifies as the department’s advanced composition course
 - *Environmental Biology*: blended learning non-majors course (half online, half face-to-face)
 - *National Merit Program for Emerging Scholars*: a NFS program for students with high ACT scores, but with a high attrition risk (examples include: inner-city, rural, first generation college, and transfer students). Students meet an extra 2-3 hours a week to go over course material. For my work with this course, I received the Award for Outstanding Teaching in Plant Biology and Heilgenstein TA Award for Excellent Teaching.
- Created all content and coordinated 12 teaching interns for “Introduction to World Citizenship”, a required course through the College of Liberal Arts and Sciences for all 400 incoming James Scholar first-year students.

Educational Outreach

- Co-organizer and co-creator of the Workshop in Ecosystem Ecology: Grasslands, Climate Change, and Society, a high school teacher professional development course. University of Illinois, Urbana, IL. June 18-21, 2012.

- Organizer and facilitator of Ecology Day with Girl Scouts of America for Brownies to earn their “Plants”, “Illinois”, and “Water Everywhere” badges. St, Charles, IL. June 11, 2011.
- Organizer and co-creator of the Workshop in Ecosystem Ecology: Insights into Climate Change: Past, Present and Future, a high school teacher professional development course. University of Illinois, Urbana, IL. July 14-16, 2010.

Teaching and Service Awards

- Teacher Scholar Certificate, Center for Teaching Excellence, University of Illinois, 2012
- Award for Outstanding Teaching in Plant Biology, Plant Biology Department, University of Illinois, 2011
- Ranked as Excellent or higher by students for 4 courses, University of Illinois, 2010-2011
- Heilgenstein TA Award for Excellent Teaching, University of Illinois, 2008
- Graduate Teacher Certificate, Center for Teaching Excellence, University of Illinois, 2008
- Ranked as Outstanding by students, University of Illinois, 2007
- Biology Award for Outstanding Service, Kenyon College, 2006

Mentoring

Undergraduate and Graduate Teaching Mentoring

University of Illinois, 2008-2010

- NSF Merit Program for Emerging Scholars graduate teaching assistant mentor, Fall 2010, 2008
- Teaching mentor to 12 Interns facilitating discussion sections of “Introduction to World Citizenship”, Fall 2009
 - Two interns won the Excellence in Teaching Global Studies Intern Award

Undergraduate Research Mentoring

Hamilton College, 2014-2017

- Anne McGarvey, Senior Thesis Spring 2017, “The Influence of Acid Rain on *Acer Saccharum* Syrup Quality, Stand Health, and Tree Productivity”
- Peter Kane, Senior Thesis Spring 2016, “The Response of Aquatic Invaders to Globalization and Climate Trends: A Review and Meta-analysis” (co-adviser).
- Ianthe Lekometros, Senior Thesis Spring 2016, “Sustainable Agriculture as an Educational Tool in the Adirondack High Peaks”.
- Nicole LaBarge, Casstevens Research Scholar, Independent Study Fall 2014 and Senior Thesis Spring 2015, “Predicting the Spatiotemporal Patterns of Flooding and Drought on New York Agricultural Land”.
- Walker Lourie, Independent Study Fall 2014 and Senior Thesis Spring 2015, “Exploring the Impacts of Climate Change on Atlantic Oyster Reefs in the Chesapeake Bay”.
- Jessica Pederson, Independent Study Fall 2014 and Senior Thesis Spring 2015, “The Impact of Urban Growth on Regional Precipitation Patterns”.
- Nicole LaBarge, Arthur Levitt Public Affairs Center Summer 2014 Research Fellowship, “Climate Change in New York: Impacts on Local Farms and Food Production” (co-adviser).

University of Illinois, 2006-2013

- Hu Paleoecology Lab undergraduate adviser, assisted nine students with career counseling, recommendations, and general academic and research concerns, 2006-2013
- Christina Walsh, Advanced GIS for Natural Resource Planning Spring 2010, "Alaskan land-cover flammability"
- Haruka Tsubaki, 2008-2009, Introductory Research in Integrative Biology, University of Tokyo study abroad student
- Cory Triner, 2007-2009, Special Undergraduate Research on the Environment funded project and award winning poster "Forest Fires during the past millennia in Alaska"
- Patrick Mitsdarfer, Summer 2007, Fieldwork in Alaska with the Hu Paleoecology Laboratory

Research Experience

Planting for the future today: Using NYS climate change maps to optimize species and varietal selections

with Cornell University and SUNY College of Environmental Science and Forestry, 2013-present

- Working with Drs. Colin Beier and Art DeGaetano and Hamilton College undergraduates to understand the spatiotemporal shifts in climate over the past several decades. Our goal is to determine the potential influences of such climate shifts on New England agriculture.

The role of tundra burning in carbon cycling: Radiocarbon analysis of recent burns in the Noatak National Preserve, Alaska

with University of Illinois and National Parks Service, 2011-present

- Working with Dr. Feng Sheng Hu and Jennifer Barnes to ascertain how much carbon is released in Alaskan tundra wildfires, which has the potential to alter global concentrations of atmospheric carbon.

Impacts of climatic change on the boreal-forest fire regimes of Alaska: Lessons from the past and prospects for the future

with University of Illinois, 2006-present

Graduate Research Assistant

- Organized and participated in three Alaskan field seasons, summers 2006-2008
- Mentored undergraduate assistants and supervised laboratory technicians in processing lake-sediment cores and soil monoliths for isotope analysis, terrestrial macrofossil identification, and macro-charcoal analysis
- Prepared >200 terrestrial macrofossils for radiocarbon dating and created calibrated age-depth models based on ^{14}C and ^{210}Pb ages
- Mastered paleo-charcoal statistics and spatial analysis, using Mathwork's MatLab and ESRI's ArcMap

Assessment of wetlands in the Cuyahoga River watershed of northeast Ohio

Kenyon College, 2003-2006

Undergraduate Research Assistant

- Worked in conjunction with the EPA to field test the Ohio Rapid Assessment Method for wetland ecological condition in the Cuyahoga River watershed

- Elucidated the influence of land-use on wetland health measured through floristic quality as my senior honors thesis
- Worked as the greenhouse manager for the Kenyon College plant collection

Development of a new methodology to assess *Acropora palmata* health and fragmentation near South Caicos, Turks and Caicos Islands

School for Field Studies, Turks and Caicos Islands, Spring 2005

Undergraduate Research Assistant

- Created a baseline assessment of *Acropora palmata*, Staghorn coral, health in undisturbed reefs near South Caicos as several resorts were being built nearby
- Developed a radial transect assessment method, equipment, and a computer database to determine the influence of anthropogenic disturbance on the local reefs

Publications

Carolyn Barrett Dash, Jennifer M. Fraterrigo and Feng Sheng Hu. 2016. Land cover influences boreal-forest fire responses to climate change: geospatial analysis of historical records from Alaska. *Landscape Ecology*. DOI 10.1007/s10980-016-0361-2

C. B. Dash and B. Hug. 2014. Demystifying Data. *The Science Teacher* 81: 51-56.

Hu, F.S., Barnes, J.L. and **Dash, C.** 2014. The role of tundra burning in carbon cycling: Radiocarbon analysis of recent burns in the Noatak National Preserve, Alaska. CESU Final Report.

C. M. Barrett, R. F. Kelly, P.E. Higuera, and F.S. Hu. 2013. Climatic and land-cover influences on the spatiotemporal dynamics of Holocene boreal fire regimes. *Ecology* 94(2):389-402.

Kelly, Ryan F., Philip E. Higuera, **Carolyn M. Barrett** and Feng Sheng Hu. 2011. A signal-to-noise index to quantify the potential for peak detection in sediment-charcoal records, *Quaternary Research* 75:11-17.

Manuscripts in prep

C. B. Dash and F.S. Hu. How many lake-sediment cores do we need to characterize regional fire-regime changes using macro-charcoal records?, *in prep for Quaternary Research* .

Victoria A. Hudspith, Claire M. Belcher, Ryan Kelly, **Carolyn B. Dash**, Jennifer Barnes, Margaret E. Collinson, Feng Sheng Hu. Charcoal reflectance suggests duration of heating and fuel moisture influenced burn severity in four Alaskan tussock tundra wildfires. *in prep for Ecological Applications*.

Feng Sheng Hu, Jennifer Barnes, **Carolyn Dash**, and Thomas Brown, Radiocarbon Ages of Organic Matter Burned in Recent Tundra Fires: Implications for Carbon Cycling and Fire Management, *in prep for Frontiers in Ecology and the Environment*.

Presentations

Carolyn Barrett Dash and Nicole LaBarge. Emerging Spatiotemporal Trends in Extreme Weather Events Threaten Agriculture in New York State. Contributed Poster. *Ecological Society of America 101th annual meeting*. August, 2016. Fort Lauderdale, FL.

C. B. Dash, J.M. Fratterigo, and F.S. Hu. The Role of Land Cover in Boreal Fire Responses to Climate Change Based on Historical Data from Alaska. *The Ecological Society of America 100th annual meeting*. August, 2015. Baltimore, Maryland.

V. A. Hudspith, C. M. Belcher, R. Kelly, **C. B. Dash**, J. Barnes, M. E. Collinson, F. S. Hu. A post-burn assessment of four tussock tundra wildfires in Alaska. *5th International Conference of Fire Effects on Soil Properties*. July, 2015. Dublin, Ireland.

Carolyn Dash. Catching Fire: Boreal Forests in a Changing Climate. Woodin Environmental Studies Colloquium. February, 2015. Middlebury College. Middlebury, VT.

Jennifer Barnes, **Carolyn Barrett**, Thomas Brown, and Feng Sheng Hu. Tundra fires in northwestern Alaska: potential impacts of burn severity vegetation and soil carbon storage. Oral Presentation. 5th International Fire Ecology and Management Congress. December, 2012. Portland, OR.

Carolyn Barrett and Feng Sheng Hu. How many lake-sediment cores do we need to characterize regional fire-regime changes using macro-charcoal records? Oral presentation. *Ecological Society of America 97th annual meeting*. August, 2012. Portland, OR.

Carolyn Barrett, Ryan Kelly, Philip Higuera, and Feng Sheng Hu. Climate and Landform Controls of Holocene Fire Regimes in the Boreal Forests of Alaska. Oral presentation. American Geophysical Union Annual Meeting, December, 2011. San Francisco, CA.

Carolyn Barrett, Hillary Lauren, Barbara Hug, James Planey, and Feng Sheng Hu. Education and Ecology: Assessing the Quality of a Graduate Student Driven Workshop for Teachers. Poster presentation. *Ecological Society of America 96th annual meeting*. August, 2011. Austin, TX.

Carolyn Barrett, Ryan Kelly, Melissa Chipman, Philip Higuera, and Feng Sheng Hu. Impacts of Climatic Change on Boreal-Forest Fire Regimes over the Past 2000 Years. Poster presentation. American Geophysical Union Annual Meeting, December, 2010. San Francisco, CA.

Barbara Hug, **Carolyn Barrett**, and James Planey. Teacher Workshop on Insights into Climate Change: Past, Present, and Future. Hands-on Workshop. National Association of Biology Teachers. November, 2010. Minneapolis, MN.

Carolyn M Barrett and Feng Sheng Hu. Impacts of Climatic Change on Boreal-Forest Fire Regimes over the Past 2000 Years. Oral presentation. *Ecological Society of America 95th annual meeting*, August, 2010. Pittsburgh, PA.

Carolyn M Barrett, Benjamin F Clegg, Philip E Higuera, and Feng Sheng Hu. University of Illinois, Urbana-Champaign. Impacts of Climate and Landform on Boreal Forest Fire Regimes over the last 6000 years. Poster presentation. *Ecological Society of America 94th annual meeting*, August, 2009. Albuquerque, NM.

Siobhan Fennessy and **Carolyn Barrett**. Kenyon College. The response of wetland vegetation to surrounding land use at a variety of scales: An information-theoretic approach. Oral presentation. *The 28th Society of Wetland Scientists Annual Meeting*, May, 2008. Washington, D.C.

Research Awards, Honors, Grants

- Elected Vice Chair of the Ecological Society of America's Paleocology Section, 2015
- Edward S. Deevey Student Award in Paleocology, honorable mention, Ecological Society of America, 2012
- Dissertation Completion Fellowship, Graduate College, University of Illinois, 2011-2012
- Spring Travel Grant, Program in Ecology, Evolution, and Conservation Biology, University of Illinois, 2009, 2010, 2011, 2012
- Fall Travel Grant, Program in Ecology, Evolution, and Conservation Biology, University of Illinois, 2011
- Francis M. and Harlie M. Clark Research Support Grant, School of Integrative Biology, University of Illinois, 2011
- Conference Travel Grant, Graduate College, University of Illinois, 2010, 2011
- Summer Research Support Grant, Program in Ecology, Evolution, and Conservation Biology, University of Illinois, 2007, 2008, 2009
- Summer Science Scholars Research Grant, Kenyon College, 2005
- Jegla Prize for introductory level research, Biology Department, Kenyon College, 2004