

Christopher J. Crawford

Ph.D. Student

Minnesota Dendroecology Laboratory (MDL)
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EDUCATION

Ph.D. Geography: University of Minnesota-Twin Cities, Minneapolis, MN

Dissertation Topic: Dendroclimatology and Snowpack-Hydrology in the Northern Rocky Mountains of Western North America

Advisor: Dr. Kurt F. Kipfmueller

Committee Members: Dr. Kathy Klink, Dr. Steve Manson, Dr. Marvin Bauer

Areas of Specialization: Dendroclimatology, Snowpack Climatology, and Remote Sensing/GIS

M.S. Geography: Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, VA

Thesis Title: A Dendrochronological Analysis of Vegetation Change and Climate History in Two Southern Appalachian Balds, Craggy Gardens and Big Bald, NC

Advisor: Dr. Lisa M. Kennedy

Committee Members: Dr. Carolyn Copenheaver, Dr. Jim Campbell

Areas of Specialization: Dendroecology, Biogeography, and GIS

Graduated: May 2007

B.S. Forestry: University of Tennessee-Knoxville, Knoxville, TN

Graduated: May 2004

Advisor: Dr. Dave Buckley

RESEARCH INTERESTS

Mountain Climatology, Synoptic Dendroclimatology, Snowpack-Climatology, Spatial Analysis, Cryosphere
Remote Sensing

ACADEMIC APPOINTMENTS

Graduate Research Assistant, Department of Geography, University of Minnesota, Minneapolis, MN

June 2009 – present (Research Advisor: Dr. Steve Manson)

Graduate Research Assistant, Department of Geography, University of Minnesota, Minneapolis, MN

September 2008 – May 2009 (Research Advisor: Dr. Kathy Klink)

Remote Sensing/GIS Research Assistant and Lab Coordinator, Center of Applied Geographic Information Science (CAGIS)-Department of Geography and Earth Sciences, University of North Carolina-Charlotte, Charlotte, NC

July 2007 – May 2008 (Research Advisor: Dr. Ross Meentemeyer)

Part-Time Faculty, Department of Geography and Earth Sciences, University of North Carolina-Charlotte, Charlotte, NC

January 2008 – May 2008

Adjunct Instructor, Department of Education, Kings College, Charlotte, NC
June 2007 – December 2007

Graduate Teaching Assistant, Department of Geography, Virginia Tech, Blacksburg, VA
January 2006 – May 2007

Undergraduate Research Assistant, Tennessee Tree Improvement-Department of Forestry, University of Tennessee-Knoxville, Knoxville, TN
October 2001 – August 2002

RESEARCH EXPERIENCE

- 2009-present **North American Land Change: Decision Making in Coupled Human-Environment Systems**
P.I. Steve Manson, University of Minnesota
- 2008–2009 **Impacts of historical climate variability on crop yields in Minnesota**
P.I. Kathy Klink, University of Minnesota
Analyzed and modeled instrumental climate and experimental crop data to examine impacts of climate change on cool season small grain yields in Minnesota.
- 2007–2008 **Forecasting Patterns of Urbanization and the Loss of Natural and Rural Landscapes in the Carolinas Piedmont**
P.I. Dr. Ross Menteemeyer, Director-Center of Applied Geographic Information Science, University of North Carolina-Charlotte
Prepared, processed, and analyzed historical aerial photography, satellite imagery, and ancillary GIS data to map historical land-use/landcover for characterization of landscape scale change in the central piedmont of North Carolina.
- 2007–2008 **Lab Coordinator for the Center of Applied Geographic Information Science (CAGIS)**
Director and Advisor - Dr. Ross Menteemeyer, Director-Center of Applied Geographic Information Science, University of North Carolina-Charlotte
Research duties involved supporting ongoing funded projects at the CAGIS. Daily workload included GIS (ArcGIS 9.2) and remote sensing (ERDAS 8.2 and ENVI 4.1) data development and image processing. Additional responsibilities: project coordination and leadership, organization of weekly research meetings, travel planning-logistics, and reimbursement, management of equipment and supplies, research marketing-project displays, obtaining and updating peer-reviewed scientific databases, research scheduling, data file organization and management, lab aesthetics and overall functioning.
- 2001-2002 **Undergraduate Research Assistant for Tennessee Tree Improvement**
Director and Advisor – Dr. Scott Schlarbun Director-Tennessee Tree Improvement, University of Tennessee-Knoxville
Worked on Tennessee Tree Improvement projects including reforestation, forest inventory, forest disease surveys. Laboratory duties included collecting, measuring, grading tree seedlings for genetic research experiments.

PUBLICATIONS

Peer-Reviewed Publications

Crawford, C.J., L.M. Kennedy. (In Press). Spatial and temporal patterns of tree encroachment into a southern Appalachian grass/heath bald. *Natural Areas Journal*.

Copenheaver, C.A., **C.J. Crawford**, and T.M. Ferrer. (In Press) Age dependent climate responses indentified in white oak (*Quercus alba*). *Forest Science*.

TEACHING EXPERIENCE

Part-time Faculty, Department of Geography and Earth Sciences, University of North Carolina-Charlotte, Charlotte, NC

- ESCI 1101: Introduction to Physical Geography (2 Sections Spring 2008)

Adjunct Instructor, Department of Education, Kings College, Charlotte, NC

- GS 202: Physical Geography (2 Sections Summer 2007/ 3 Sections Fall 2007)

Laboratory Instructor, Department of Geography, Virginia Tech, Blacksburg, VA

- GEOG 4084/5084: Introduction to Geographic Information Systems (2 Sections Fall 2006)

Graduate Teaching Assistant, Department of Geography, Virginia Tech, Blacksburg, VA

- GEOG 3954: Study Abroad in the Dominican Republic (Introduction to Physical and Human Geography of the Caribbean) (Spring 2007)
- GEOG 1004: Human Geography (Spring 2007)
- GEOG 4084/5084: Introduction to Geographic Information Systems-Lecture Section (Fall 2006)
- GEOG 2314: Maps and Mapping (Spring 2006)

COURSE DESCRIPTIONS (courses taught)

Introduction to Physical Geography: This introductory course covered all of the elements of the physical environment. The course emphasizes specific examinations of and interrelationships between the Earth's four spheres: atmosphere, lithosphere, hydrosphere, and biosphere.

Laboratory - Introduction to Geographic Information Systems: This laboratory course covered basic and advanced aspects of GIS data collection, projection, display, manipulation, storage, and retrieval. Weekly labs focused on the development of specific skills in discrete (vector) and continuous (raster) data analysis with a strong emphasis on spatial analysis.

INVITED LECTURES

September 2009 – **The Global Climate System:** Ecosystem Ecology taught by Dr. Sarah Hobbie
Introduces, explains, and illustrates the concepts of global radiation balance, oceanic and atmospheric circulation, and climate-biome classifications.

PROFESSIONAL EXPERIENCE

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| 2005 | Forestry Technician (Fuels) , US Forest Service, Salmon-Challis National Forest, Salmon, ID
Primary duties included wildland firefighting (handcrew) and helicopter crew member (initial attack). Conducted fuels inventory and prepared and implemented fuels reduction projects/prescribed fire management. |
| 2004 | Forestry Technician (Timber/TSD) , US Forest Service, Salmon-Challis National Forest, Salmon, ID
Primary duties included silvicultural thinning for forest management plans. Performed pre-commercial thinning layouts, and conducted timber cruising/ marking operations. Provided support for hazard tree removal, wildland firefighting (handcrew/initial attack), and prescribed fire management. |
| 2003 | Forestry Technician (Timber) , US Forest Service, White River National Forest, Carbondale, CO
Primary duties included reforestation, forest health inventory, and spruce beetle surveys. Performed timber sale layouts and conducted timber cruising/marking operations. |

OTHER RELEVANT RESEARCH EXPERIENCE

- Summer 2008 **Multi-scale Analysis of Tree-line in Response to Climate Change in the Rocky Mountains**
P.I. Grant Elliot, University of Minnesota
Assisted in the collection of tree-ring data at multiple tree-line sites in the Rocky Mountains.
- Winter 2007 **Paleoenvironmental Research in the Dominican Republic**
P.I. Dr. Lisa Kennedy, Virginia Tech
Assisted in the collection of costal lake sediments to indentify historic hurricane deposition.
- Summer 2006 **Attendance to the 2006 Dendroecology Summer School/Workshop**
Laboratory of Tree Ring Research (LTRR), University of Arizona
Summer School Directors: Dr. Don Falk and Dr. Tom Swetnam
Participation included learning standard dendrochronological techniques and interacting with LTRR research scientists who facilitated lectures, discussions, and field trips with applications in climatology and ecology.

THESIS AND DISSERTATION RESEARCH

- 2008-present **Dendroclimatology and Snowpack-Climatology of the Northern Rocky Mountains**
PI, dissertation research involves developing high and low elevation tree-ring networks in concordance with time series development and analysis of seasonal snow cover from repeat satellite imagery. This research will explore alternative calibration methods for millennial length snowpack-tree ring reconstructions.
- 2005-2007 **Dendroecology of Southern Appalachian Grass/Heath Balds**
PI, thesis research employed dendroecological methods to reconstruct disturbance regimes and successional dynamics of multiple grass/heath balds.

OTHER RESEARCH PROJECTS

- 2005-present **400 Hundred Years of Mountain Climate in the Southern Appalachians.**
P.I. this research involves the development of a regional high elevation network of *Quercus rubra* tree-ring chronologies from the Southern Appalachian Mountains. Main objectives are to update historical tree ring records from this region and explore potential climate reconstructions.

PROFESSIONAL PRESENTATIONS (Presenter in Bold)

- Crawford, C.J.** 2009. Past and present climate variation in the Southern Appalachian Mountains. Association of American Geographers 105th Annual Meeting, March 22–26, Las Vegas, NV.
- Crawford, C.J.** 2008. The use of rule-based spatial modeling in tree ring site selection: applications in dendroclimatology. Association of American Geographers 104th Annual Meeting, April 10-14, Boston, MA.
- Crawford, C.J.**, and L.M. Kennedy. 2007. Recent successional patterns in a high elevation forest-grass ecotone from tree ring records of Frasier fir (*Abies fraseri*) and mountain ash (*Sorbus Americana*). Southeastern Division of Association of American Geographers Annual Meeting, November 16-18, Charleston, SC.
- Shoemaker, D.A., R.K. Meentemeyer, and **C.J. Crawford**. 2007. Forecasting patterns of urbanization and the loss of natural and rural landscapes in the Carolinas piedmont. GIS Day: Greater Charlotte Region, Charlotte, NC.

Crawford, C.J., and L.M. Kennedy. 2007. A tree ring record of climate, disturbance, and tree encroachment in a southern Appalachian grass/heath bald. Association of American Geographers 103rd Annual Meeting, April 12-17, San Francisco, CA.

Crawford, C.J., and L.M. Kennedy. 2006. A 250 year tree ring record of northern red oak (*Quercus rubra*) establishment and recruitment in a southern Appalachian grass/heath bald. Southeastern Division of the Association of American Geographers 103rd Annual Meeting, November 13-15, Morgantown, WV.

Crawford, C.J. 2006. Climatic variability and red spruce growth (*Picea rubens* Sarg.) in the southern Appalachians. Laboratory of Tree Ring Research, University of Arizona, June 3, Tuscan, AZ.

GRANTS, FELLOWSHIPS, AND AWARDS

- 2009 Summer Scholarship, Department of Geography, University of Minnesota
Amount: \$2,500
- 2007 Sidman Poole Scholarship, Department of Geography, Virginia Tech
Amount: \$500
- 2006 Graduate Research Develop Grant, Virginia Tech Graduate School
Amount: \$200
- Runner-Up, Best Master's Paper, Southeastern Division of Association of American Geographers,
Annual Meeting,
- Alumni Grant, Department of Geography, Virginia Tech
Amount: \$200
- Sidman Poole Scholarship, Department of Geography, Virginia Tech
Amount: \$500

SERVICE ACTIVITIES

- 2009 **Graduate Student Representative:** Department of Geography, University of Minnesota
- 2008 **Graduate Student Mentor:** Using Trees to Study Climate. Taught and demonstrated to third and fourth graders how dendrochronologists use trees to study climate change. University of Minnesota, Minneapolis, MN, November 13, 2008.
- 2007 **Participant:** Teaching Workshop, "Improving Student Attitudes: The Key to Success", Kings College, Charlotte, NC
- 2003 **Chairman of Student Liaison Committee:** Forestry Spring Camp
- Vice President-Society of American Foresters:** University of Tennessee-Student Chapter

PROFESSIONAL MEMBERSHIPS

American Society for Photogrammetry and Remote Sensing (2009 – present)

Association of American Geographers (2005 – present)

- Climate Specialty Group
- Paleoenvironmental Change Group

- Mountain Geography Specialty Group
- Cryosphere Specialty Group

Southeastern Division of Association of American Geographers (2005 – present)

Tree Ring Society (2006-present)