

Jennifer Marie Corcoran

Minnesota Department of Natural Resources ♦ Division of Forestry
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Current Position

Research Analyst Specialist

Minnesota Department of Natural Resources, Saint Paul, MN **Aug 2014 – Present**
Division of Forestry

- Areas of Specialization: land cover change detection using remotely sensed data (satellite optical imagery and lidar); spatial analyses of forest disturbance; implementation and effectiveness of forestry best management practices; water quality implications of forest practices at the watershed scale; risk assessment.
- Funded by the Clean Water, Land and Legacy Amendment

Adjunct Professor

University of Minnesota Twin Cities, St. Paul, MN **Jan 2016 – Present**
Department of Forest Resources

Education

Doctor of Philosophy, Natural Resource Science and Management

Minor, Water Resources Science
University of Minnesota Twin Cities, Minneapolis, MN **May 2013**
Department of Forest Resources

- Certification, Preparing Future Faculty, December 2010
- Areas of Specialization: Assessment, Monitoring, and Geospatial Analysis
- Dissertation Title: *"Integrating Data from Several Remotely Sensed Platforms to Map Wetlands and Developing New Methodologies for Novel Dissemination of Results"*
- Faculty Advisor: Dr. Joseph Knight

Master of Science, Soil Science

Minor, Geographic Information Science
University of Minnesota Twin Cities, Minneapolis, MN **July 2009**
Department of Soil, Water & Climate

- Areas of Specialization: Climatology
- Thesis title: *"Assessing the Spatial Variability of Net Ecosystem Carbon Dioxide Production in the Upper Midwest"*
- Faculty Advisors: Dr. Timothy Griffis (advisor), Dr. Marvin Bauer (co-advisor)

Bachelor of Arts & Science, Mathematics and Physics

The Evergreen State College (TESC), Olympia, WA **June 2006**

- Emphases: Environmental Studies, Mathematics, Modeling, and Physics
- Faculty Advisor: Dr. David McAvery

Research Experiences

NASA Postdoctoral Program Fellow

May 6, 2013 – July 2014

Jet Propulsion Laboratory, Pasadena, CA

Fellowship Mentor: Fellowship Mentor: Dr. Marc Simard

- Shuttle Radar Topography Mission (SRTM) topographic data analysis, derivation of ground-based Digital Elevation Models (DEM), and watershed map creation
- Assessment of biophysical field data and generation of simple biomass models
- Land cover classification methods explored for multiple ecogeomorphological regions throughout the Americas, focusing on the mangrove land cover class
- Investigate various sources of data to create more accurate land cover maps, strengthen the confidence of a ground DEM, and generate hydrological models

Research Assistant & Doctoral Dissertation Fellow **July 13, 2009 – April 23, 2013**

University of Minnesota Twin Cities, Minneapolis, MN

Advisor: Dr. Joseph Knight

- Investigate modern mapping methods and unique data sources to produce recommendations for a statewide update to the National Wetlands Inventory (NWI)
- Participate in the design and implementation of a field reference data campaign
- Examine radar polarimetry and image processing techniques for detecting flooded vegetation and explore data fusion between optical and microwave imagery

Visiting Scientist

May 17 – July 9, 2010

Canada Centre of Remote Sensing, Ottawa, ON

Supervisor: Dr. Brian Brisco

- Utilize RADARSAT-2 synthetic aperture radar (SAR) imagery from sensitive hydrologic periods to generate surface water polygons for incorporation into GIS
- Explore polarimetric decompositions, including Cloude-Pottier, Van Zyl, and Freeman-Durden, to evaluate the best method for flooded vegetation discrimination

Field Scientist

July 26 – August 20, 2009

Makerere University and Mulago Hospital, Kampala, Uganda

Supervisors: Drs. Kirsten Neilsen and Joseph Knight

- Assess the ecological niche of fungus *Cryptococcus neoformans* in a small region surrounding Kampala, Uganda by navigating to random points and collecting environmental samples representative of the site.
- Perform lab analysis on the environmental samples and prepare the samples for cryogenic storage to be sent back to the US for further analysis.

Research Assistant

August 1, 2006 – July 9, 2009

University of Minnesota Twin Cities, Minneapolis, MN

Advisor: Dr. Timothy Griffis

- Develop field-to-regional scale models of surface fluxes using micrometeorological data and Matlab (ver. 7.4) software.
- Create land-use classification and ecosystem production maps using Landsat imagery in ERDAS Imagine (ver. 9.0) and ArcGIS (ver. 9.2) software.

- Measure biophysical variables, radiometric response, and perform basic maintenance of meteorological instrumentation at the University of Minnesota Outreach, Research and Education (UMore) Park in Rosemount, MN.

Assistant Field Technician

January 2 – March 17, 2006

The Wind River Canopy Crane Research Facility (WRCCRF), Carson, WA

Advisor: Dr. Nalini Nadkarni

- Performed routine maintenance, calibrated equipment, and established a new micrometeorological research tower in a remote location.
- Completed a poster and research paper about the eddy covariance measurement technique, on display at the WRCCRF headquarters.

Teaching Experiences

Adjunct Professor

May 2016

Field Remote Sensing,

Department of Forest Resources, University of Minnesota, Cloquet, MN

- Delivered review lecture on remote sensing and forestry field applications.
- Reviewed and graded class projects.

Adjunct Professor

Spring 2016

Advanced Remote Sensing,

Department of Forest Resources, University of Minnesota, St. Paul, MN

- Developed advanced remote sensing curriculum and delivered lectures as well as arranged several guest lectures for specific topics.
- Reviewed and edited class papers at several stages and graded presentations.

Co-Instructor

Fall 2012

Remote Sensing of Natural Resources & Environment,

Department of Forest Resources, University of Minnesota, Minneapolis, MN

- Prepared several lectures in various subjects, including:
 - "Introduction to Remote Sensing Data"
 - "Image Processing and Enhancement"
 - "Image Classification"
 - "Introduction to Hyperspectral Data"
 - "Introduction to Radar Data"

Laboratory Instructor

Fall 2010

Remote Sensing of Natural Resources & Environment,

Department of Forest Resources, University of Minnesota, Minneapolis, MN

- Created weekly computer lab assignments for 15-20 undergraduate and graduate students and conducted brief lectures to introduce the lab assignment.
- Administered weekly lab quizzes testing important concepts learned from the assignment finished in the previous week.
- Corrected lab quizzes and participated in grading panel for final course project.

Teaching Assistant **2006 – 2008**

The Atmosphere,

Department of Soil, Water, and Climate, University of Minnesota, St. Paul, MN

- Conducted laboratory sessions for 20-40 undergraduate students and taught introductory meteorological concepts through interactive workshop tutorials.
- Lead students on a field trip to the on-campus DNR Weather Station with State Climatologist Pete Boulay and described instrumentation in use on the site.

Teaching Assistant **Spring 2005**

Algebra to Algorithms,

The Evergreen State College, Olympia, WA

- Conducted homework sessions for 35 undergraduate students and created review worksheets on algebraic concepts for struggling students.
- Corrected assignments/exams and provided feedback for effective learning.

Invited Lectures

"Wetland Mapping with Lidar Data" **Nov. 7, 2012**

Remote Sensing and GIS,

Environmental Studies Department, St. Olaf College, Northfield, MN

"Data Integration" **Nov. 15, 2011**

Remote Sensing of Natural Resources & Environment,

Department of Forest Resources, University of Minnesota, Minneapolis, MN

"An Introduction to Radar" **Nov. 8, 2011**

Remote Sensing of Natural Resources & Environment,

Department of Forest Resources, University of Minnesota, Minneapolis, MN

"Online Resources" **Nov. 23, 2010**

Remote Sensing

Department of Geography, University of St. Thomas, St. Paul, MN

"Data Integration" **Nov. 11, 2010**

Remote Sensing of Natural Resources & Environment,

Department of Forest Resources, University of Minnesota, Minneapolis, MN

"An Introduction to Radar" **Nov. 4, 2010**

Remote Sensing of Natural Resources & Environment,

Department of Forest Resources, University of Minnesota, Minneapolis, MN

"Feature Selection – Extract Features by Finding Like Areas" **Oct. 28, 2010**

Remote Sensing

Department of Geography, University of St. Thomas, St. Paul, MN

"An Introduction to Radar & LiDAR" **Oct. 19, 2010**
Remote Sensing
Department of Geography, University of St. Thomas, St. Paul, MN

"Air Masses and Fronts" **April 29, 2008**
The Atmosphere
Department of Soil, Water, & Climate, University of Minnesota, St. Paul, MN

"Extratropical Cyclones and Fronts" **May 1, 2008**
The Atmosphere
Department of Soil, Water, & Climate, University of Minnesota, St. Paul, MN

Mentorship

Mentor, Natural Resource Science and Management **Sept 2013 – Present**
Students: Louis Mielke, Environmental Science, Policy, & Management (class of 2016), University of Minnesota; and Qi Wang, Environmental Science, Policy, & Management (class of 2017), University of Minnesota

Mentor, Women Mentoring Women Program **Sept 2013 – Aug 2014**
Student: Laura Harrison, PhD Candidate (class of 2014), Computation & Neural Systems, California Institute of Technology

Co-Mentor and Collaborator, NASA Internship Program **June - Aug. 2013**
Students in the Master of Professional Studies in GIS program, University of Maryland:
- Melanie Rosenberg, project title: *"Assessing Land Cover Change at a Watershed Scale in Central America"*
- Kristofer Lasko, project title: *"Temporal Analysis of Forest Cover Disturbance in the Laurentides Forest Reserve"*

Mentor, Natural Resource Science and Management **Jan 2010 – Sept 2010**
Student: John Patapenko, Computer Science, University of Minnesota
- Project title: *"Ecoepidemiology: Ecology and geospatial analysis of Cryptococcus neoformans in Sub-Saharan Africa"*

Publications

In Review

Rampi, L., Corcoran, J., Knight, J., Kloiber, S., Evaluation of hydrologic conditioning requirements for modeling wetland occurrence with lidar-derived digital elevation models.

Published

Corcoran, J., Knight, J., Pelletier, K., Rampi, L., Wang, Y. 2015. The Effects of Point or Polygon Based Training Data on RandomForest Classification Accuracy of Wetlands. *Remote Sensing*, Special Issue: Towards Remote Long-Term Monitoring of Wetland Landscapes. *Remote Sensing*. 2015(7), DOI: 10.3390/rs70404002.

Knight, J., Corcoran, J. Rampi, L., Pelletier, K. 2015. Theory and Applications of Object-Based Image Analysis and Emerging Methods in Wetland Mapping. In Tiner, R., Lang, M., Klemas, V. *Remote Sensing of Wetlands: Applications and Advances*. CRC Press, 2015.

Jiang, Z., Shekhar, S., Zhou, X., Knight, J., Corcoran, J. 2013. Focal-Test-Based Spatial Decision Tree Learning: A Summary of Results. 2013 IEEE 13th International Conference on Data Mining (ICDM). Dec 7-10, 2013. p320-329. doi: 10.1109/ICDM.2013.96.

Corcoran, J., 2013. Integrating data from several remotely sensed platforms to accurately map wetlands; Dissertation by Corcoran, Jennifer, Ph.D., University of Minnesota, 195 pages; AAT 3567413.

Corcoran, J., J. Knight, A. Gallant, 2013. Influence of Multi-Source and Multi-Temporal Remotely Sensed and Ancillary Data on the Accuracy of Random Forest Classification of Wetlands in Northern Minnesota, *Remote Sensing*, 5(7), 3212-3238; doi:10.3390/rs5073212.

Knight, J.F., Tolcser, B.T., Corcoran, J.M., Rampi, L.P. 2013. The effects of data selection and thematic detail on the accuracy of high spatial resolution wetland classifications. *Photogrammetric Engineering and Remote Sensing*, 79(7), July 2013, pp. 613–623.

Moskalenko, O., D. Wiesner, J. Corcoran, D. Meya, H. Kajumbula, J. Knight, D. Boulware, and K. Nielsen. 2012. Cryptococcal Genotype Influences Immunologic Response and Human Clinical Outcome after Meningitis, *mBio*, 3(5), doi:10.1128/mBio.00196-12.

Corcoran, J., J. Knight, B. Brisco, S. Kaya, A. Cull, and K. Murnaghan. 2011. The Integration of Optical, Topographic, and Radar Data for Wetland Mapping in Northern Minnesota, *Canadian Journal of Remote Sensing*, 37(5), doi:10.5589/m11-067.

Griffis, T., J. Baker, S. Sargent, M. Erickson, J. Corcoran, M. Chen, and K. Billmark. 2010. Influence of C4 vegetation on ¹³CO₂ discrimination and isoforcing in the Upper Midwest, United States. *Global Biogeochem.Cycles*, 24, 4006, doi:10.1029/2009GB003768.

Corcoran, J. 2009. Assessing the Spatial Variability of Net Ecosystem Carbon Dioxide Production in the Upper Midwest Using Satellite Remote Sensing Technology, Master's Thesis, University of Minnesota, 147 p.

Presentations

Conference Presenter **Feb 24, 2015**

Forestry and Wildlife Research Review, Cloquet, MN

"Forest disturbance and implications for effects on water quality at the watershed scale"

Conference Paper (not in attendance) **July 13 – 18, 2014**

IEEE International Geoscience and Remote Sensing Symposium (IGARSS),
Quebec City, QC

"Watershed scale analyses of land cover change in the contributing upland area of mangrove ecosystems"

Invited Seminar Speaker **March 28, 2014**

NASA Goddard Space Flight Facility, Greenbelt, MD

"Improved Watershed boundaries, Vegetation Height, and Analyses of Land Cover Change Influencing Mangrove Ecosystem Vitality in the Americas"

Poster Presenter **Dec. 12, 2013**

American Geophysical Union, San Francisco, CA

"Watershed Scale Analyses of Mangrove Ecosystems in the Americas: Contributing Upland Area Land Cover Change Over Time"

Conference Presenter **April 9, 2013**

American Association of Geographers, Los Angeles, CA

"Mapping and Monitoring Wetland Ecosystems More Accurately by Integrating Data from Several Remotely Sensed Platforms"

Poster Presented (not in attendance) **Nov. 6 – 9, 2012**

ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (ACM SIGSPATIAL GIS 2012), Redondo Beach, CA

"Learning Spatial Decision Tree for Geographical Classification: A Summary of Results"
Zhe Jiang, Shashi Shekhar, Pradeep Mohan, Joseph Knight, Jennifer Corcoran

Conference Presenter **October 7, 2012**

Minnesota GIS/LIS Consortium, St. Cloud, MN

"The Influence of Multi-Platform, Multi-Frequency, and Multi-Temporal Remote Sensing and Field Reference Data Quality on the Accuracy of Decision Tree Classification of Wetlands"

Conference Presenter **June 6, 2012**
INTECOL International Wetlands Conference, Orlando, FL
"Incorporating Data from Several Remotely Sensed Platforms to Map Current and Potentially Restorable Wetlands"

Conference Presenter **March 22, 2012**
American Society for Photogrammetry and Remote Sensing, Sacramento, CA
"Integration is Modernization: On Incorporating Data from Several Remotely Sensed Platforms to Accurately Map Current and Potential Wetlands"

Invited Seminar Speaker **May 12, 2011**
U.S. Geological Survey Earth Resource Observation Systems, Sioux Falls, SD
"The Integration of Optical, Topographic, & Radar Data for Wetland Mapping"

Conference Presenter **May 5, 2011**
American Society for Photogrammetry and Remote Sensing, Milwaukee, WI
"Data Integration of Fully Polarimetric Synthetic Aperture Radar (SAR), Optical Imagery & Topographic Data for Wetland Mapping"

Seminar Presenter **Oct. 27, 2010**
University of Minnesota Department of Forest Resources, St. Paul, MN
"Synthetic Aperture Radar (SAR) for Wetland Mapping"

Poster Presenter **Oct. 19-20, 2010**
Minnesota Water Resources Conference, St. Paul, MN
"Synthetic Aperture Radar (SAR) for Wetland Mapping"

Conference Presenter **Oct. 16, 2010**
Minnesota GIS/LIS Consortium, Duluth, MN
"Synthetic Aperture Radar (SAR) for Wetland Mapping and Change Detection"

Invited Conference Speaker **Oct. 1, 2010**
RADARSAT-2 Annual Workshop, Montreal, QC
"Synthetic Aperture Radar (SAR) Polarimetry for Wetland Mapping and Change Detection"

Conference Presenter **Oct. 22, 2009**
Minnesota GIS/LIS Consortium Annual, Duluth, MN
"Land Cover Classification Comparison: An Assessment of the USDA/NASS Cropland Data Layer (CDL)"

Service

Reviewer

2013 – present

Water, MDPI Open Access Publishing
Remote Sensing, MDPI Open Access Publishing
GIScience and Remote Sensing, Taylor and Francis
WETLANDS, Journal of the Society of Wetland Scientists

President, Remote Sensing and Geospatial Analysis Chapter

2010 – 2013

American Society for Photogrammetry and Remote Sensing (ASPRS),
University of Minnesota, St. Paul, MN

- Lead discussions about remote sensing and geospatial analysis, research, and interests on campus for students and faculty.
- Communicate with Chapter members and the greater University community about current events related to remote sensing and geospatial analysis in the region.

Webmaster, Natural Resource Association of Graduate Students

Department of Forest Resources, University of Minnesota, St. Paul, MN **2012 – 2013**

- Develop and update a website, two social networking sites, and a group calendar to communicate with NRAGS members and the greater University community about current events related to Natural Resources in the region.

Communications Officer, GIS Student Organization (GISSO)

2010 – 2011

Department of Geography, University of Minnesota, Minneapolis, MN

- Communicate with GISSO members and the greater University community about current events related to GIS in the region.
- Participate in the planning and implementation of two events: GIS Day held in the fall and the GIS Career and Networking fair held in the spring.

Student Chair, Graduate Advising and Mentoring Workgroup

2009 – 2010

University of Minnesota, Minneapolis, MN

- Discuss ways to support the academic and professional development of graduate and professional students through improving the quality of advising and mentoring.
- Develop materials for best/worst practices, improving advising and mentoring, orientation guides, preparing for difficult conversations, and evaluation.

V.P. Communications, Council of Graduate Students

2007 – 2009

University of Minnesota, Minneapolis, MN

- Student chair on the University Biological Sciences Policy and Review Council.
- Maintain the organization's website using *Dreamweaver*.
- Responsible for taking minutes at General Assembly and Executive Board meetings.
- Executive chair on the Travel Award and Leadership Award committee.
- Involvement COGS sponsored social and academic events, such as Graduate School Orientation Q & A Panel, Graduate and Professional Student Conference, and Graduate Student Appreciation Week.

Other Student Chair Positions Held

Department of Soil, Water & Climate, University of Minnesota, St. Paul, MN

- **Awards Committee (Spring 2008)**, provide a graduate student perspective on potential faculty and student award nominations for the department.
- **Social Committee (2006 – 2007)**, assisted in the organization of weekly seminars, monthly social events, an annual holiday party, and annual International Dinner.
- **Search Committee (2006 – 2007)**, provided graduate student perspective on a hiring committee for a faculty position in Biosphere-Atmosphere Modeling.

Specialized Training and Development

Practicum for Future Faculty

Fall 2010

Preparing Future Faculty, University of Minnesota, Minneapolis, MN

- Partner with a mentor from University of St. Thomas in St. Paul, MN to improve teaching skills, observe typical faculty role activities, and gain classroom experience
- Critical reflection and assessment on institutional and position fit.
- Prepared a job search portfolio, including CV, cover letter, research statement, and teaching philosophy.

Synthetic Aperture Radar (SAR) Workshop

Aug. 10-12, 2010

US Geological Survey, Lafayette, LA

- Overview of SAR, case studies of flooded vegetation from hurricane damage, and polarimetric and interferometric image processing

Member, Toastmasters International

2007 – 2009

Dialoggers, University of Minnesota, St. Paul, MN

- Practice writing and giving speeches for wide audiences, explore effective evaluation and communication techniques.

Teaching in Higher Education

Spring 2008

Preparing Future Faculty, University of Minnesota, Minneapolis, MN

- Practice teaching with guided co-facilitation, discussion and experimentation with multiple learning and teaching strategies.
- Critical reflection and assessment on effective learning and teaching styles.
- Prepared a course syllabus and a teaching portfolio.

ERDAS Imagine Fundamentals I & II Certificate Program

Jan. 12 – 16, 2008

Leica Geosystems, Denver, CO

ArcGIS Training and Education

2004 – 2005

ESRI Virtual Campus

- Getting to Know ArcGIS (ver. 9.0), Learning ArcGIS Desktop (ver. 9.0), Creating, Editing, and Managing Geodatabases (ver. 9.0)

Fellowships, Grants, Awards, and Scholarships Received

NASA Postdoctoral Program Fellowship **May 2013 – July 2014**
Oak Ridge National Laboratories, Jet Propulsion Laboratory, Pasadena, CA

Student Leadership Award **April 2013**
College of Food, Agriculture, and Natural Resource Science Alumni Society Award,
University of Minnesota, Minneapolis, MN

Doctoral Dissertation Fellowship **2012 - 2013**
The University of Minnesota, Minneapolis, MN

Student Travel Award **March 19-23, 2011**
Western Great Lakes Region, American Society of Photogrammetry and Remote
Sensing, Annual Conference in Sacramento, CA

Student Assistantship Award **April 25-30, 2010**
American Society of Photogrammetry and Remote Sensing, Annual Conference in San
Diego, CA

GIS Day Best Poster Award **Nov 19, 2008**
GIS Student Organization, University of Minnesota, Minneapolis, MN

Travel Grant **Jan. 12-16, 2008**
Department of Soil, Water & Climate, University of Minnesota, ERDAS Fundamentals
Certificate Program, Denver, CO

Scholarship **2004 – 2006**
National Science Foundation, Computer Science, Engineering, & Math, The Evergreen
State College, Olympia, WA

Professional Membership and Associations

American Geophysical Union (AGU), since 2013

AmericaView, since 2011

Association of American Geographers (AAG), since 2010

American Society for Photogrammetry & Remote Sensing (ASPRS), since 2009

Professional and Personal References

Dr. Rob Slesak (Colleague)

Site-level Program Manager, MN Forest Resources Council
10B Green Hall
1530 Cleveland Ave N
St. Paul, MN 55108
(651) 603-6756; raslesak@umn.edu

Dr. Marc Simard (Postdoctoral Mentor)

Senior Engineer, NASA JPL
Radar Science and Engineering
4800 Oak Grove Drive
Pasadena, CA 91109
(818) 354-4321; marc.simard@jpl.nasagov

Dr. Joseph Knight (Doctoral Advisor)

Assistant Professor, University of Minnesota
Department of Forest Resources & Department of Soil, Water, & Climate
1530 Cleveland Ave. N., 115 Green Hall
St. Paul, MN 55108
(612) 624-5354; jknight@umn.edu

Dr. Marvin Bauer (Doctoral Co-Advisor and Masters Committee Member)

Professor, University of Minnesota
Department of Forest Resources
1530 Cleveland Ave. N., 115 Green Hall
St. Paul, MN 55108
(612) 624-3703; mbauer@umn.edu

Dr. Timothy Griffis (Masters Advisor)

Associate Professor, University of Minnesota
Department of Soil, Water, & Climate
1991 Upper Buford Circle, 439 Borlaug Hall
St. Paul, MN 55108
(612) 625-3117; tgriffis@umn.edu