Amanda M Liesch

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EDUCATION

NORTH CAROLINA STATE UNIVERSITY , RALEIGH, NC — SPRING 2021
Masters in GIS Technology, working on 3D Subterranean Soil Mapping and Implications on Precision Agriculture

KANSAS STATE UNIVERSITY , MANHATTAN, KS — JANUARY 2011
Masters of Science in Agronomy (Soil Fertility) GPA 3.76/4.0,
Thesis Title "Managing Iron Chlorosis in Western Kansas"

UNIVERSITY OF WISCONSIN - RIVER FALLS (UWRF) , RIVER FALLS, WI — MAY 2009
Bachelors of Science in International Studies, Agricultural Emphasis in Major GPA 3.97/4.0
Minor in Soil Science and Spanish
Summa Cum Laude, Cumulative GPA 3.91/4.0

SCHOLARSHIPS AND AWARDS

- Soil Science Society of America Graduate Leadership Conference Award
- North Carolina State University's 2013 Outstanding Teaching Assistant
- One of 50 participants selected (out of 700 applicants) to Harvard/MIT Communication In Science Workshop
- Awarded 3RD out of 33 in the Soil Fertility Graduate Student Oral Presentation at the 2011 Soil Science Meeting
- Received 2ND prize in the 2010 Great Plains Soil Fertility Conference Poster Contest
- Awarded the 2010 Great Plains Soil Fertility Conference $750 Travel Award
- Winner of the 2009 Phi Kappa Phi National $5000 Graduate Fellowship
- Recipient of the 2009 UWRF Chancellor's Award, Highest recognition for excellent service to the community
- First Prize in the 2009 National Undergraduate Research Symposium Contest for the American Society of Agronomy
- Winner of the 2009 Darrel S. Metcalfe Student Research Manuscript Writing Contest
- Recipient for the 2008 Conference for Undergraduate Research's "Posters on the Hill" in Washington DC

GEOSPATIAL SKILLS AND SOFTWARE

ARC GIS, GRASS GIS, Tangible GIS, HYDRUS 1D, SAS, R, PostgreSQL, Python, GitHub/GIT

PUBLICATIONS

Szulczewski, M., **Liesch, A.M**.,and Havlin, J.L. Soils and Society. 2013. In Lindbo, D., Koslowski, D., and C. Robinson. Know Soil Know Life. ACS Press. Madison,WI.

Liesch, A.M., Ruiz Diaz, D.A., Mengel, D., and Roozeboom, K. 2012. Interpreting relationships between soil variables and soybean iron deficiency using factor analysis. Soil Sci. Soc. Am. J. Vol. 76 No. 4, p. 1311-1318.

Liesch, A.M., Ruiz Diaz, D.A., Mengel, D., Roozeboom, K., and Martin, K. 2011. Management strategies for increasing soybean yield on soils susceptible to iron deficiency. Agron. J. 103:1870-1877.

Liesch, A.M., Ochsner, T.E., and Krueger, E. Effects of a rye double cropping system on soil structure and physical properties in a corn silage production system. Soil Sci. Soc. Am. J. Vol. 75 No. 4, p. 1307-1314.

Liesch A.M., Weyers, S.L., Gaskin, J.W., and Das, K.C. 2010. Impact of two different biochars on earthworm growth and survival. Annals of Environmental Science. 4: 1-9.

Liesch A.M., Weyers, S.L., Gaskin, J.W., and Das, K.C. 2010. The effects of two different biochars on earthworm survival and microbial carbon levels. *In*: Gilkes, R.J and N. Prakongkep (eds.) Proceeding of 19th World Congress of Soil Science: Soil solutions for a changing world. August 1-6, 2010, Brisbane, Australia.

Liesch, A.M. 2010. Wastewater Phosphorus Removal by Two Different Types of Andesitic Volcanic Tephra. J. Nat. Resour. Life Sci.Educ. 38.

GRANTS AND FUNDING

Liesch, A. *A Global Agronomy Education Kit for After School Programs.* American Society of Agronomy, 2017-2018. $13,000.

Liesch, A. *Citizen Science Series: Agronomy.* American Society of Agronomy 2013-2015. $10,000

Amoozegar, A., Heitman, J.L., Lindbo, D.L., Austin, R.E., and **Liesch, A.M.** *Development of an Infiltration Index for Land Use Decision Support in Urbanizing Regions.* National Resource Conservation Service. 2012-2014. $40,000

Liesch, A., Weyers, S., and Dolliver, H. *The Impact of Biochar on Earthworms*. UWRF Foundation Grant. 2008. $2,500

CAREER EXPERIENCE

ORISE FELLOW, US ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON DC 2021-Present
Supervisor: Dr. Lauren Rafelski
- Prepared estimated soil carbon stocks for inclusion in an integrated assessment model
- Mapped and visualized cropland changes and cropping type in the United States

ENVIRONMENTAL DEFENSE FUND, RALEIGH, NORTH CAROLINA 2021
Supervisors: Kelly Suttles, Dr. Eileen McClellan
- Applied machine learning algorithms and data science to determine prime areas for wetland infrastructure
- Modeled socio-economic disaster risk and analysis to find high risk communities in the Mississippi River Basin
- Identified areas of rapid agricultural intensification and correlated those areas with socio-economic indicators

NORTH CAROLINA STATE UNIVERSITY, RALEIGH, NORTH CAROLINA 2017-2021
Faculty Supervisors: Dr. Helena Mitasova and Dr. Stacy Nelson
- Created a protocol for taking a grid of soil samples, and turning it into a map of soil horizons
- Modeled soil physical properties in 3D, and soil moisture in 4D (space and time)
- Utilized ArcGIS Collector and ArcGIS Survey123 for collection of stakeholder-based information

GIRL SCOUTS OF SOUTH CAROLINA-MOUNTAINS TO MIDLANDS, GREENVILLE, SC 2016-2017
Manager, Girl Leadership Experience Midlands Camp & STEAM Initiatives
- Responsible for designing and administering STEM programming functions for 10,000 girls
- Collaborate with museums, universities, botanical gardens and STEM consortiums to improve informal STEM education in South Carolina
- Utilized geospatial analytics to optimize programming placement within the 22 county area
- Increased STEM program participation from 816 girls in the 2016-2017 to 556 in September/October 2017
- Increased summer camp participation to 150 girls (3 x the previous year)

NORTH CAROLINA STATE UNIVERSITY, RALEIGH, NORTH CAROLINA 2011-2016
Faculty Supervisors: Dr. Josh Heitman and Dr. Aziz Amoozegar
- Developed an infiltration index of southern piedmont soils in relation to soil physical properties
- Extrapolated an infiltration index decision support tool using the existing Wake County Soil Survey and GIS
- Created a case study of the impacts of development on land use change and infiltration

KANSAS STATE UNIVERSITY: DEPARTMENT OF AGRONOMY, MANHATTAN, KS 2009-2011
Faculty Supervisor: Dr. Dorivar Ruiz Diaz
- Assessed the extent of soybean chlorosis in four different sites around the state of Kansas
- Determined if two different foliar iron applications and two different seed treatments effected soybean cholorosis
- Varied seed treatment to find the best economic application rate

MASSEY UNIVERSITY: SOIL AND EARTH SCIENCE GROUP, PALMERSTON NORTH, NEW ZEALAND 2008-2009
Faculty Supervisors: Dr. Mike Hedley and James Hanley

- Set up a column experiment to measure the infiltration rate and phosphorus removal in volcanic ejecta
- Used the Oleson P test to determine the levels of phosphorus in simulated wastewater

UNITED STATES DEPARTMENT OF AGRICULTURE, RESEARCH SERVICES, MORRIS, MN 2008-2011
Faculty Supervisor: Dr. Sharon Lachnicht Weyers

- Ran a toxicity study comparing two different types of five different levels of biochar on earthworms in an artificial soil and measured soil pH and moisture content
- Tested two different field soils and two types of char on survival rate, changes in microbial biomass, total carbon and nitrogen levels over a month long incubation period

UNITED STATES DEPARTMENT OF AGRICULTURE, RESEARCH SERVICES, ST. PAUL, MN 2007-2009
Faculty Supervisor: Dr. Tyson Ochsner

- Designed a soil quality research project: "Assessment of the effects of a rye cover crop on soil structural stability, physical quality, and water infiltration" and tested these analyses in different locations of Minnesota
- Correlated soil physical compaction readings with a Cone Penetrometer and water infiltration with the Infiltrometer with Visual Soil Structural Analysis learned in Scotland, and dry aggregate distribution to study the effects of a rye cover crop and corn crop on soil structure, drainage, and compaction over a one year period

SCOTTISH AGRICULTURAL COLLEGE: CROP AND SOIL SYSTEMS GROUP, EDINBURGH, SCOTLAND
2006-2007
Faculty Supervisor: Dr. Bruce Ball

- Compared Visual Soil Structural Analysis to Vane Shear Strength Analysis to quantify strength of correlation between physical and visual measurements
- Measured dry aggregate distribution and moisture content for correlation to visual analysis.
- Gathered and processed data comparing the soil visual quality and compaction of tillage and organic matter treatments

TEACHING EXPERIENCE

UNIVERSITY EXPERIENCE

TEACHING ASSISTANT, RALEIGH, NC Fall 2012, 2013
"**Graduate Soils Physics"**

- Renovated the first six labs into one paper for the 2013 school year.
- Wrote case studies and scenarios for critique and evaluation.
- Created a handout for the use of HYDRUS 1D in lab

TEACHING ASSISTANT, RALEIGH, NC Fall 2012, Spring 2013
"**Introduction to Soil Science"**

- Generated several YouTube videos for outside class learning

TEACHING ASSISTANT, MANHATTAN, KS Spring 2010
"**Soil Genesis and Classification"**

FRESHMAN HONORS SEMINAR, RIVER FALLS, WI Spring 2009

"**Soundtrack of Your Life"**

- Created a seminar analyzing the effects of music on the lives of the twenty students, creating and autobiographical CD for a final project, and discussing their stories in class

FRESHMAN HONORS SEMINAR, RIVER FALLS, WI Spring 2008
"**See The World Without Leaving Home"**

- Facilitated discussions on global issues, such as religion, food agriculture, global warming, health care, education, urbanization, and environmental degradation

COMMUNITY OUTREACH

STEM THINKTANK WORKSHOP, NASHVILLE, TN July 2013
- Soil Science and Creative Expression: It Isn't Just About STEM
- 10 participants, 4 hour workshop

GIRL SCOUT COUNCIL OF THE NORTH CAROLINA COASTAL PINES 2012-2014
- Mentored four high school students through soil morphology, fertility, and physics data collection
- Constructed a Citizen Science program on sustainable agriculture program on fertility, agronomy, and spatial variability for high school girls
- Created a Citizen Science Series in soil science and conservation for high school girls, designing a rain garden at Camp Mary Atkinson
- Ran an Adventures in Soil Science Research Program for elementary and middle school students
- Travelled to various state parks teaching about soils, native plant life, geomorphology, and wildlife

GIRL SCOUT LEADERSHIP DEVELOPMENT SEMINAR, ST. PAUL, MN Spring 2009
- Trained 13 teenagers on successful design and management of environmental science programs

GIRL SCOUT COUNCIL OF THE MINNESOTA AND WISCONSIN RIVER VALLEYS, ST,PAUL, MN 2008-2009
Council Trainer
- Teach adults how to facilitate the Girl Scout Leadership Experience, including age level training, learn by doing, girl planning, and cooperative learning.
- Train adults to lead their troops through the process of planning outings and camping trips, including indoor and outdoor cooking, indoor and outdoor sleeping, including budgeting, brainstorming, and girl safety.

GIRL SCOUT COUNCIL OF THE CANON VALLEY COUNCIL: CAMP SINGING HILLS, NORTHFIELD, MN 2006-2009
Nature Director
- Designed and facilitated environmental, agricultural and conservation education programs for girls aged 6-17, troop leaders, and parents
- Implemented and funded an educational vegetable garden for teaching about physiology, and nutrition of plants
- Conceptualized a recycled functioning greenhouse made out of two liter pop bottles

GIRL SCOUT COUNCIL OF THE ST. CROIX VALLEY: CAMP LAKAMAGA, ST. PAUL, MN 2005-2009
Adventure Program Director
- Developed programming and community service projects involving the existing gardens for girls over the age of 13 to earn badges and participate in service projects
- Instructed cross country skiing, snowshoeing, ice skating, archery, horseback riding, arts and crafts, and group games to adults and girls in group sizes from 4-75 people

GIRL SCOUT COUNCIL OF THE ST. CROIX VALLEY: CAMP LAKAMAGA, ST. PAUL, MN 2005
Agricultural Education Intern and Program Counselor
- Designed and implemented an educational vegetable garden maintained by the girls
- Responsible for the health and wellbeing of 4-8 girls for the entire week

PROFESSIONAL DEVELOPMENT

NATIONAL SOCIETY INVOLVEMENT

AMERICAN SOCIETY OF AGRONOMY K-12 DIVISION LEADER 2016-2017
- Organized the 2017 Symposium "Agronomy and Technology: Collaborations for Solving Our Workplace Pipeline Problem"
- Published a Newsletter article on the importance of K-12 Education in Agronomy

ACS WOMEN IN AGRONOMY, CROPS, SOILS, & ENV'L SCIENCE COMMITTEE 2013-2016
- Participate in organizing the programming at the annual meetings

SOIL SCIENCE SOCIETY OF AMERICA GRADUATE STUDENT MEMBERSHIP COMMITTEE 2011-2016
- Organized the 2014 Graduate Leadership Workshop for the 2014 American Society of Agronomy Meetings, presiding over the teaching and conflict resolution sections.
- Developed and facilitated a "Getting a Job in a Nonprofit" panel for the 2013 American Society of Agronomy

- Wrote professional development pieces for Crops, Soils, and Agronomy Magazine on behalf of the group, including the Art of Finding a Mentor
- Facilitated the "So What's Next" career panel for the 2012 American Society of Agronomy Meeting
- Assisted in the development of a "So What's Next" career panel for the 2011 American Society of Agronomy Meeting in San Antonio, TX.
- Helped facilitate discussion in a graduate student meet and greet for the 2011 meetings.

SOIL SCIENCE SOCIETY OF AMERICA K-12 EDUCATION COMMITTEE 2010-PRESENT

- Used Girl Scout Citizen Science Data to package soil science data and activities for teachers
- Collaborated on a teachers going for the Know Soil, Know Life book
- Updated and wrote content for the K-12 committee website content to a new web page
- Helped generate PowerPoint's for an online teacher's guide for the Scoop! Soils book for fourth graders
- Generated a list of activities and test question to be used in association with the teacher's guide
- Primary Author on a "Soils and Society" book chapter for use in a middle and high school soils textbook
- Wrote curriculum on music, art, and creative writing in soil science

RESEARCH PRESENTATIONS

Liesch, A.M., Heitman, J., Amoozegar, A., Lindbo, D., and Austin, R. "Development of an Infiltration Index for Rapidly Developing Regions."

Poster Presentations

- Soil Science Society of America Meeting, St. Paul, MN November, 2015.
- National Resource Conservation Service Conference, Duluth, MN. June 2015.

Liesch, A.M., Heitman, J., Amoozegar, A., and Hesterberg, D. "Measuring Specific Surface Area"

Poster Presentations

- Soil Science Society of America Meeting, Cincinnati, OH., November, 2012.

Liesch, A.M., Lachnicht Weyers, S.L., Gaskin, J., and Das, K.C. "The effects of two different biochars on earthworm survival and microbial carbon levels."

Poster Presentations

- World Soils Congress. Brisbane, Australia. August 2, 2010.

Liesch, A.M., Ruiz Diaz, D.A., and Marten, K. "Iron Chlorosis in Western Kansas".

Poster Presentations

- Great Plains Soil Fertility Conference. Denver, CO. March 3, 2010.

Liesch, A.M., and Ochsner, T.E. "Does a rye cover crop effect soil physical structure?"

Poster Presentations

- Soil Science Society of America Annual Meetings, Pittsburgh PN. November, 2009
- UWRF Local Research, Scholarly and Creative Activities Day. River Falls, WI. April 22, 2009
- National Conference for Undergraduate Research, La Crosse, WI. April 2009

Liesch, A.M., and Lachnicht Weyers, S.L. "The relationship between biochar and earthworms: toxicity, carbon sequestration, and carbon dioxide emissions."

Poster Presentations

- Wisconsin Research Posters in the Rotunda. Madison, WI, April 23, 2009
- UWRF Local Research, Scholarly and Creative Activities Day. River Falls, WI. April 22, 2009
- UWRF November Research Gala. River Falls, WI, November 10, 2008
- UWRF 60th Anniversary Foundation Dinner. River Falls, WI. September 17, 2008

Liesch, A.M., and Ball, B.C. "Visual soil structure, vane shear strengths and dry aggregate distribution in three different organic matter treatments."

Poster Presentations

- Posters on the Hill- Council on Undergraduate Research Presentations. Washington DC. April 29, 2008
- Wisconsin Systems State Symposium. River Falls, WI. April 25, 2008
- UWRF Local Research, Scholarly and Creative Activities Day. River Falls, WI. April 22, 2008
- National Conference for Undergraduate Research, Salisbury Maryland. April 2008

- Wisconsin Research Posters in the Rotunda. Madison, WI, March 5, 2008
- UWRF November Research Gala. River Falls, WI, November 11, 2007

Oral Presentations

Liesch, A.M., "Shifting the Paradigm: Rethinking K-12 Education and Outreach with Nonprofit Partners" American Society of Agronomy Meeting, Tampa Bay, Florida. October 2017.

Liesch, A.M., Amoozegar, A., Heitman, J., Lindbo, D., and Austin, R. "Development of an Infiltration Index in a Rapidly Developing Region." Soil Science Society of America Meeting, St. Paul, MN. November 2015.

Liesch, A.M., "Sow What, an Agronomy Citizen Science Program." Agronomy Society of America Meeting, St. Paul, MN. November 2015.

Liesch, A.M., Amoozegar, A., Heitman, J., Lindbo, D., and Mitasova, H. "Development of an Infiltration Index and Its Application to Site Assessment in the Piedmont Region of the Southeastern USA." Soil Science Society of America Meeting, Long Beach, CA. November 2014.

Liesch, A,M. "Soils and Creative Expression: A Citizen Science Program in Soil Science: Advocacy and Leadership Development Through Targeted Research Mentorship and Service Learning". Soil Science Society of America Meeting, Tampa, FL. November 2013.

Liesch, A.M., Ruiz Diaz, Mengel, D, and Roozeboom, K. "Interpreting Soybean Iron Chlorosis In the Soil Using Factor Analysis and Multiple Regression." Soil Science of America Annual Meeting, San Antonio, TX. October 2011.

Liesch, A.M., Ruiz Diaz, D.A., Mengel, D, Roozeboom, K., and Marten, K. "Management Strategies for Soybeans in Western Kansas". Soil Science of America Annual Meeting, Long Beach, CA. November 2010.

Liesch, A.M., Ruiz Diaz, D.A. and Marten, K. "Management Strategies for Chlorotic Soybeans in Western KS" Kansas Southwest Research and Extension Center Field Day, Garden City, KS. August 2010.

Liesch, A.M., and Ochsner, T.E. "Does a Rye Cover Crop Remediate Soil Physical Degradation?" Plant Water Relations, Kansas State University, Manhattan, KS. February 2010

Liesch, A.M., and Ochsner, T. E. "Does a Rye Cover Crop Improve the Soil Physical Environment?" Massey University, Palmerston North, New Zealand. January 2009

Liesch, A.M. "Groundwater Drawdown on the North China Plain: Historical and Case Study Analysis" International Studies Senior Seminar, River Falls, Wisconsin. November 2007

STUDY ABROAD EXPERIENCE

BIOENERGY STUDENT EXCHANGE PROGRAM SEMESTER, GHENT, BELGIUM — SPRING 2011

INTERNATIONAL INTERNSHIP, PALMERSTON NORTH, NEW ZEALAND — FALL 2008
Project Advisor: Dr. William Anderson

PACIFIC DISCOVERY: SOUTH EAST ASIA, THAILAND, LAOS, VIETNAM, AND CAMBODIA — FALL 2008

WISCONSIN IN SCOTLAND, EDINBURGH, SCOTLAND — SPRING 2007

SEMESTER ABROAD EUROPE PROGRAM, EDINBURGH, SCOTLAND — FALL 2006
Project Advisor: Dr. William Anderson