

JESSICA ANNE NELSON CURRICULUM VITAE

Watershed Outreach & GIS Analyst

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EDUCATION

Minnesota State University, Mankato, MN May 2014

Environmental Science, Bachelor of Science
Biology with Ecology emphasis, Bachelor of Science
Geographical Information Systems Certificate
GPA 3.53

North Hennepin Community College, Brooklyn Park, MN May 2011

Associates in Liberal Arts
GPA 3.32

PROFESSIONAL EXPERIENCE

Watershed Outreach & GIS Analyst August 2015 – Present

Water Resources Center, Minnesota State University, Mankato

- Managed crop residue management survey datasets between 2012-2016 in Le Sueur River Watershed using ArcPad, ArcCollector, and ArcGIS, then compared to historical County records from 1990's and 2007. Results were uploaded to ArcGIS Online platform to share with a larger audience.
- Integrated different aspects of GIS technology to prepare hydro terrain analysis products across three HUC8 watersheds (Yellow River Watershed District, Lac Qui Parle-Yellow Bank River Watershed District, and Watonwan River Watershed), one HUC10 watershed (Wood Lake Creek).
- Applied Agricultural Conservation Planning Framework (ACPF) and GIS toolset, in unison with local conservation planners to prioritize agricultural best management practices (BMPs) suited for each work area's distinct topography and water features.
- Developed land management scenario mapbooks and databases using hydromodified DEM datasets, soil data, land use and other GIS datasets.
- Coordinated and led four hydro terrain analysis and field-scale GIS targeting workshops with local and regional natural resource professionals.
- Trained students how to interpret GIS datasets and best practices while performing raster analysis for natural resource management.
- Established South Central Minnesota GIS User Group meetings with local partners serving on Steering Committee.
- Met with city officials to identify needs for changes in drainage management to protect infrastructure from increased frequency of high-intensity rain events.
- Worked with producers and ditch inspectors to investigate the history of drainage to identify leverage points for increased water storage on the landscape.
- Formed South Central Minnesota GIS User Group Steering Committee to coordinate quarterly meetings for improved information flow among regional private and public organizations.

- Coordinated and led eight community watershed meetings in Le Sueur River Watershed. Meetings facilitated dissemination of information from public agencies, citizens crop consultants, engineering firms, and researchers about local water resources concerns and a good land stewardship ethic. Discussions fostered cross-sector communication with those that live, work, and play in the watershed.
- Organized bi-monthly Le Sueur River Watershed Network meetings to help shape annual objectives and measure progress towards their vision for the Le Sueur River Watershed outlined in the *7 Recommendations for Cleaner Water and River Health*.
- Created outreach materials with Le Sueur River Watershed Network citizen-volunteer steering committee to educate elected officials, state agencies, local staff, and citizens about the Network's *7 Recommendations for Cleaner Water and River Health*.
- Provided GIS technical support to various private and public entities (i.e. County, SWCD, DNR, Watershed Districts, BWSR, etc.) through map development, database requests, and product demonstrations.
- Presented at national and state conferences on GIS applications, agricultural watershed management concerns and other project-related findings.
- Developed, designed and maintained websites for Le Sueur River Watershed Network, Minnesota Nutrient Planning Portal, Conservation Marketplace Midwest, and Minnesota River Valley 2014 Ravine Stabilization Workshop.
- Performed equipment needs assessment and developed a strategy to acquire software and hardware to improve work flow efficiency at the Water Resources Center.
- Maintained and troubleshot problems with equipment for Water Resources Center and Southern Minnesota Regional Science and Engineering Fair.
- Assisted Watershed Load Monitoring Network (WPLMN) specialist prepare sampling equipment and collect water quality samples from streams in the Greater Blue Earth River Basin. Followed SOP for YSI Sonde™, Van-Dorn bottle, and grab samples with Nasco swing sampler.

GIS Analyst

November 2014 – August 2015

Water Resources Center, Minnesota State University, Mankato

- Digitized breachlines using LiDAR-derived, 3-meter DEM to model surface water flow paths appropriately within the jurisdiction of Yellow Medicine River Watershed District.

Stormwater Member

September 2014 – August 2015

Minnesota GreenCorps at Water Resources Center, Minnesota State University, Mankato

- Integrated different aspects of GIS technology to prepare hydro terrain analysis products for five HUC12 subwatersheds of Le Sueur River Watershed.
- Coordinated paddle with DNR and Mankato Paddling and Outings Club to provide an opportunity for Le Sueur River Watershed Network participants to paddle the river to listen to researchers describe changes in hydrology.
- Worked with MDA to host a field day and brainstorm opportunities with participants to experiment and demonstrate benefits of increasing water storage across the landscape.
- Prepared and presented subwatershed mapbooks to Le Sueur River Watershed Network Steering Committee to gather feedback on how to best display results for public consumption.

- Evaluated existing rural stormwater management within Le Sueur River Watershed.
- Work with local conservation districts to identify available conservation programs to provide financial assistance to producers.
- Prepared a list of conservation practices and funding mechanisms to support experimentation of stormwater practices within rural communities and farming operations.

Community Outreach & GIS Intern

January 2013 – September 2014

Water Resources Center, Minnesota State University, Mankato

- Organized and facilitated meetings and conferences for civic engagement and community outreach projects.
- Developed, designed and updated the following websites: *Le Sueur River Watershed Network* (www.lesueurriver.org), *Minnesota Nutrient Planning Portal* (www.mrbdc.mnsu.edu/mnnutrients), and *Minnesota River Valley Ravine Stabilization Charette* (mnravines.org).
- Developed efficient generation and distribution of *Minnesota River Weekly Update* newsletter using Microsoft Office product, InfoPath Designer.
- Prepared water management policy analysis for Minnesota by compiling approved water plans and synthesized reports from case studies and research.
- Provided GIS support to WRC staff and cooperators.
- Performed terrain analysis on elevation models to identify potential water storage areas.
- Conducted crop residue management surveys identifying crop practices and tillage rotations.

Undergraduate Field Work Assistant

May 2012 – April 2013

Biology Department, Minnesota State University, Mankato

- Placed and retrieved overnight trap nets in Minnesota River and adjacent backwater lakes to sample fish populations (diversity, age, and size).
- Sampled fish populations along lake shoreline using seine nets.
- Collected 160 aquatic macroinvertebrate samples in Minnesota River and adjacent backwater lakes using overnight light traps.
- Collected 160 zooplankton samples with sled net.
- Sorted and identified samples of aquatic macroinvertebrates from three backwater lakes
- Developed quantitative and qualitative database of aquatic macroinvertebrates sampled.
- Performed statistical analysis to evaluate the transfer of energy during flood pulses, along with diversity and distribution of aquatic macroinvertebrate populations.

PROFESSIONAL ASSOCIATIONS

- Hydrologic Landforms & Hydrography Workgroup, *3d Geomatics Committee* (2018-Present)
- Watershed Leaders Network Workshop, *Fishers & Farmers Partnership* (2017-Present)
- Steering Committee Member, *South Central Minnesota GIS User Group* (2016-Present)
- Board Member, Minnesota River Basin Representative, *Soil and Water Conservation Society, Minnesota Chapter* (2016-Present)
- Board Member, *Conservation Marketplace Midwest* (2015-2018)

ADDITIONAL TRAINING

- Getting Started with ArcGIS Pro, MN GIS/LIS Consortium Spring Workshops, 2017
- ArcGIS for Server: Administration and Advanced Topics, MN GIS/LIS Consortium Spring Workshops, 2017

- Growing Future Skills: Building Dynamic Maps with CartoDB, Upper Midwest Geocon, 2016
- Civic Governance, Minnesota Active Citizenship Initiative, 2015-2017
- Agricultural Conservation Planning Framework, University of Minnesota, 2015
- Southwest Civic Engagement Cohort, University of Minnesota, 2013-2014

PUBLICATIONS

- Yuan, F., P. Larson, R. Mulvihill, D. Libby, J. Nelson, T. Grupa, and R. Moore. 2018. Mapping and analyzing stream network changes in Watonwan River Watershed, Minnesota, USA. *ISPRS International Journal of Geographic Information*.

PRESENTATIONS

- Nelson, J.A. and K. Musser. (2018, October) Linking Citizens and Watershed Science. Presentation at Water Resources Conference, St. Paul, MN.
- Nelson, J.A. (2017, August) ACPF in the Minnesota River Basin: Integrating citizen involvement with targeting efforts in Mark Tomer (Chair), *Update on the Agricultural Conservation Planning Framework: New tools, training resources, and watershed engagement efforts*. Symposium conducted at the 72nd Annual International Soil and Water Conservation Society Conference, Madison, WI.
- Nelson, J.A. and J. Klang. (2016, July) Evaluation of economic barriers to incentivizing ecosystem services in Minnesota. Presentation at the 71st Annual International Soil and Water Conservation Society Conference, Louisville, KY.
- Nelson, J.A. and S. Porter. (2015, October) The Agricultural Conservation Planning Framework (ACPF) and its application in the Le Sueur River Watersheds in southern Minnesota. Presentation at Minnesota GIS/LIS Consortium 25th Annual Conference & Workshops, Duluth, MN.
- Nelson, J.A. and J. Klang. (2015, October) Linking water storage BMPs to watershed goals. Presentation at the Minnesota Water Resources Conference, St. Paul, MN.
- Musser, K. and J.A. Nelson. (2015, October) Citizen led subwatershed targeting in the Le Sueur River Watershed. Presentation at the Minnesota Water Resources Conference, St. Paul, MN.
- Nelson, J.A. (2015, August) Downstream impacts on impaired waters. Presentation at Agricultural Drainage and the Future of Water Quality Workshop, Mankato, MN.
- Nelson, J.A. and R. Moore. (2015, July) Use of ACPF in subwatersheds of the Le Sueur River, Minnesota in Mark Tomer (Chair), *Engaging farmers in watershed planning through precision conservation: Midwestern case studies utilizing the Agricultural Conservation Planning Framework*. Symposium conducted at the 70th Annual International Soil and Water Conservation Society Conference, Greensboro, NC.
- Nelson, J.A. (2015, March) Past, present and future of water quality in the Le Sueur River Watershed. Watershed Division meeting at Minnesota Pollution Control Agency, St. Paul, MN.
- Nelson, J.A., A. Nickel and S.J. Fisher. (2013, April) Impacts of flood pulses on limnetic macroinvertebrates in Minnesota River backwater lakes. Presentation at the Undergraduate Research Symposium held at Minnesota State University, Mankato, MN.
- Nelson, J.A., A. Nickel and S.J. Fisher. (2013, March) Impacts of flood pulses on limnetic macroinvertebrates in Minnesota River backwater lakes. Poster presented at Minnesota Chapter of the American Fisheries Society 46th Annual Meeting, St. Cloud, MN.
- Nelson, J.A., A. Nickel and S.J. Fisher. (2012, December) River backwater connectivity relationships to limnetic macroinvertebrates. Poster presented at 73rd Midwest Fish and Wildlife Conference, Wichita, KS.

WORKSHOPS

- Nelson, J.A., M.T. Reineke, and C. Freeman. (2018, September) Visualizing ACPF and PTMApp datasets for watershed planning. Greater Blue Earth River Basin Alliance, Mankato, MN.
- Nelson, J.A., M.T. Reineke, and T. Grupa. (2018, August) Visualizing and editing hydro terrain analysis datasets. Greater Blue Earth River Basin Alliance, Mankato, MN.
- Nelson, J.A. and T. Grupa. (2017, June) ArcCollector to verify breachline inventory. Greater Blue Earth River Basin Alliance, St. James, MN.
- Nelson, J.A. (2016, May, June, and September) Yellow Medicine River Watershed Hydro Terrain Analysis Training: 3-Day Workshop Series. Yellow Medicine River Watershed District, Minneota, MN.
- Klang, J., J.A. Nelson, K. Breth, D. Anderson, and L. Meschke. (2016, August) Quantifying Water Storage Benefits Workshop. Mankato, MN.
- Nelson, J.A. and A. Meyer. (2015, September) Hydro Terrain Analysis Workshop. Lac Qui Parle-Yellow Bank River Watershed District, Madison, MN

HONORS AND AWARDS

- Education Minnesota Outstanding Leadership Award, *Minnesota Valley Uniserv*, April 2015
- May Volunteer of the Month at Adult Basic Education, *Mankato Area Public Schools*, May 2014
- John and Anne Frey Bioscience Scholarship, *John and Anne Frey Foundation*, August 2013- May 2014
- Undergraduate Research Center Grant, *Minnesota State University, Mankato*, March 2013
- McNair Achievement Program First Year Scholar of the Year, *McNair Program at Minnesota State University, Mankato*, September 2012-July 2013

GRANTS RECEIVED

July 2017 - January 2018	Wood Lake Creek Watershed Hydro Terrain Analysis <i>Southwest Prairie Technical Service Area</i> Principle Investigator	\$12,390.00
July 2016 - December 2018	Watowan River Watershed Hydro Terrain Analysis <i>Greater Blue Earth River Basin Alliance</i> Principle Investigator	\$52,280.00
June 2016 - June 2019	Integrating Targeted Watershed Tools with Citizen Involvement <i>Legislative Citizen Commission for Minnesota Resources</i> Co-Principle Investigator	\$169,000.00

INSTITUTIONAL SERVICE

- Biomonitoring Educator, *Explore STEM Camps*, 2018
- Search Committee member for MINRALS Director, 2016-2017
- Water Quality Sampling Educator, *Max Scholarship Program Retreat*, 2014
- Aquatic Macroinvertebrate Sampling Educator, *Fisheries Biology (BIOL 505) Lab*, 2013

COMMUNITY INVOLVEMENT

- Advisory Board Member and Management Committee Member, Minnesota River Congress, 2015-Present
- Capstone Mentor, Eastern Carver County Schools, May 2017

- Presentation on impacts of climate change to water resources, Mankato Paddling and Outings Club, 2016/2017
- Lead Crew Member, Sibley Park Clean-up, September 2016
- ESL Teacher Aide, Adult Basic Education, Mankato Area Public Schools, MN, February 2013-May 2015
- Science Fair Judge, Southern Minnesota Regional Science Fair, Mankato, MN, February 2012, April 2013, February 2014
- Osprey Migration Pattern Volunteer, West Coon Rapids Dam Regional Park, Brooklyn Park, MN, February-June 2011
- Pathology Lab Volunteer, North Memorial Hospital, Robbinsdale, MN, June-December 2010

REFERENCES

Kimberly Musser, Assistant Director of Water Resources Center
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