

Curriculum Vitae - Gust M. Annis

The Nature Conservancy, 101 E. Cesar E. Chavez Ave., Lansing, MI 48906

Phone: (517) 316-2272; Email: gannis@tnc.org

PROFESSIONAL EXPERIENCE

- Conservation Scientist, The Nature Conservancy, Michigan Chapter (2012-present)
- Aquatic Resources Coordinator, Missouri Resource Assessment Partnership, University of Missouri (2005-2012)
- Research Associate, Missouri Resource Assessment Partnership, University of Missouri (1998-2005)

EDUCATION

M.A. 1998, Geography, Western Illinois University

Thesis: *Michigan and Wisconsin Stream Restoration: An Investigation of the Factors Affecting Project Monitoring and Evaluation*

Post Baccalaureate Course Work, 1993 – 1994, Geography, Northern Michigan University

B.S. 1992, Elementary Education, Northern Michigan University

PUBLICATIONS

Chadderton WL, AJ Tucker, **G Annis**, A Dahlstrom-Davidson, J Bossenbroek, S Hensler, J Hoffman, M Hoff, E Jensen, D Kashian, S LeSage, T Strakosh, A Trebitz (2022) Aquatic Invasive Species Interstate Surveillance Framework for the U.S. Waters of the Great Lakes. Technical Document, 67 pp.

Tucker AJ, **Annis G**, Elgin E, Chadderton WL, Hoffman J (2022) Towards a framework for invasive aquatic plant survey design in Great Lakes coastal areas. *Management of Biological Invasions* 13(1): 45–67, <https://doi.org/10.3391/mbi.2022.13.1.03>.

Tucker AJ, Chadderton WL, **Annis G**, Davidson AD, Hoffman J, Bossenbroek J, Hensler S, Hoff M, Jensen E, Kashian D, LeSage S, Strakosh T (2020) A framework for aquatic invasive species surveillance site selection and prioritization in the US waters of the Laurentian Great Lakes. *Management of Biological Invasions* 11(3): 607–632, <https://doi.org/10.3391/mbi.2020.11.3.17>.

Egly, Rachel M., **Gust M. Annis**, W. Lindsay Chadderton, Jody A. Peters, and Eric R. Larson. "Predicting the potential distribution of the non-native Red Swamp Crayfish *Procambarus clarkii* in the Laurentian Great Lakes." *Journal of Great Lakes Research* 45, no. 1 (2019): 150-159.

Annis, Gust M., Douglas R. Pearsall, Katherine J. Kahl, Erika L. Washburn, Christopher A. May, Rachael Franks Taylor, James B. Cole, David N. Ewert, Edward T. Game, and Patrick J. Doran. "Designing coastal conservation to deliver ecosystem and human well-being benefits." *PloS one* 12, no. 2 (2017): e0172458.

Beletsky, Dmitry, Raisa Beletsky, Edward S. Rutherford, Jennifer L. Sieracki, Jonathan M. Bossenbroek, W. Lindsay Chadderton, Marion E. Wittmann, **Gust M. Annis**, and David M. Lodge. "Predicting spread of aquatic invasive species by lake currents." *Journal of Great Lakes Research* 43, no. 3 (2017): 14-32.

- Kramer, Andrew M., **Gust Annis**, Marion E. Wittmann, William L. Chadderton, Edward S. Rutherford, David M. Lodge, Lacey Mason, Dmitry Beletsky, Catherine Riseng, and John M. Drake. "Suitability of Laurentian Great Lakes for invasive species based on global species distribution models and local habitat." *Ecosphere* 8, no. 7 (2017): e01883.
- Wittmann, Marion E., **Gust Annis**, Andrew M. Kramer, Lacey Mason, Catherine Riseng, Edward S. Rutherford, William L. Chadderton, Dmitry Beletsky, John M. Drake, and David M. Lodge. "Refining species distribution model outputs using landscape-scale habitat data: forecasting grass carp and Hydrilla establishment in the Great Lakes region." *Journal of Great Lakes Research* 43, no. 2 (2017): 298-307..
- Keitzer, S.C., S.A. Ludsin, S.P. Sowa, A.M. Sasson, **G. Annis**, J.G. Arnold, A. Brennan, P. Daggupati, A.M. Froehlich, M.E. Herbert, M.V. Johnson, C. Vollmer-Sanders, M.J. White, C. J. Winslow, and H. Yen. 2016. Quantifying the Potential Water Quality Benefits of Agricultural Conservation Practices for Stream Conservation in the Western Lake Erie Basin. Final Report submitted to NRCS Conservation Effects Assessment Project. 63 pp.
- Keitzer, S. Conor, Stuart A. Ludsin, Scott P. Sowa, **Gust Annis**, Jeff G. Arnold, Prasad Daggupati, August M. Froehlich et al. "Thinking outside of the lake: Can controls on nutrient inputs into Lake Erie benefit stream conservation in its watershed?." *Journal of Great Lakes Research* (2016).
- Forsyth, Danielle K., Catherine M. Riseng, Kevin E. Wehrly, Lacey A. Mason, John Gaiot, Tom Hollenhorst, Craig M. Johnston, Conrad Wyrzykowski, **Gust Annis**, Chris Castiglione, Kent Todd, Mike Robertson, Dana M. Infante, Lizhu Wang, James E. McKenna, and Gary Whelan, 2016. The Great Lakes Hydrography Dataset: Consistent, Binational Watersheds for the Laurentian Great Lakes Basin. *Journal of the American Water Resources Association (JAWRA)* 1–21. DOI: 10.1111/1752-1688.12435.
- Sowa, Scott P., Matthew Herbert, Sagar Mysorekar, **Gust M. Annis**, Kimberly Hall, A. Pouyan Nejadhashemi, Sean A. Woznicki, Lizhu Wang, and Patrick J. Doran. "How much conservation is enough? Defining implementation goals for healthy fish communities in agricultural rivers." *Journal of Great Lakes Research* 42, no. 6 (2016): 1302-1321.
- Fore, J.D., Sowa, S.P., Galat, D.L., **Annis, G.M.**, Diamond, D.D. and Rewa, C., 2014. Riverine threat indices to assess watershed condition and identify primary management capacity of agriculture natural resource management agencies. *Environmental management*, 53(3), pp.567-582.
- Annis G.**, M. DeBacker, D. Diamond, L. Elliott, A. Garringer, P. Hanberry, K. James, R. Lee, S. Leis, M. Morey, D. Pursell, and C. Young. 2011. George Washington Carver National Monument Natural Resource Condition Assessment. Natural Resource Report NPS/HTLN/NRR—2011/425. National Park Service, Fort Collins, Colorado.

- Annis G.**, M. DeBacker, D. Diamond, L. Elliott, A. Garringer, P. Hanberry, K. James, R. Lee, S. Leis, M. Morey, and D. Pursell. 2011. Pea Ridge National Military Park Natural Resource Condition Assessment. Natural Resource Report NPS/HTLN/NRR—2011/426. National Park Service, Fort Collins, Colorado.
- Annis G.**, M. DeBacker, D. Diamond, L. Elliott, A. Garringer, P. Hanberry, K. James, R. Lee, M. Morey, D. Pursell, and C. Young. 2011. Wilsons Creek National Battlefield Natural Resource Condition Assessment. Natural Resource Report NPS/HTLN/NRR—2011/427. National Park Service, Fort Collins, Colorado.
- Annis, G. M.**, D. Millican, C. Gallipeau, E. Inlander, D. Diamond, S. Sowa, M. Morey, P. Hanberry, A. Garringer, K. Mabrey. Developing Stream Reach-Scale Predicted Distribution Models for Fish Species in Arkansas. 2011. Final Report, submitted to the USGS National Gap Analysis Program. 1,079 pp.
- Annis, G. M.**, S. P. Sowa, D. D. Diamond, A. Garringer, P. Hanberry, and M. E. Morey. 2010. A GAP Analysis for Riverine Ecosystems of the Missouri River Basin. Final Report, submitted to the USGS National Gap Analysis Program. 1,351 pp.
- Annis, G. M.**, S. P. Sowa, D. D. Diamond, M. D. Combes, K. E. Doisy, A. J. Garringer, and P. Hanberry. 2010. Developing Synoptic Human Threat Indices for Assessing the Ecological Integrity of Freshwater Ecosystems in EPA Region 7. Final Report, submitted to Environmental Protection Agency. 192 pp.
- Annis, G. M.**, S. P. Sowa, D. D. Diamond, A. Garringer, P. Hanberry, and M. E. Morey. 2009. Completing and Integrating Core Aquatic GAP Geospatial Data Layers for the Missouri River Basin. Final Report, submitted to the USGS National Gap Analysis Program. 1,259 pp.
- Sowa, S.P., **Annis, G.**, Morey, M.E. and Garringer, A., 2008. Improving Predicted Distribution Models for Riverine Species: An Example from Nebraska. Publications of the US Geological Survey. Paper 27. <http://digitalcommons.unl.edu/usgspubs/27>
- Sowa, S.P., D.D. Diamond, **G.M. Annis**, A.J. Garringer, P.A. Hanberry, R.D. Lea, and D.L. Pursell. 2008. Effigy Mounds National Monument Ecological Condition Assessment. Final Report, submitted to the National Park Service.
- Sowa, S.P., D.D. Diamond, **G.M. Annis**, A.J. Garringer, P.A. Hanberry, R.D. Lea, and D.L. Pursell. 2008. Ozark National Scenic Riverways Ecological Condition Assessment. Final Report, submitted to the National Park Service.
- Brewer, S.K., C.F. Rabeni, S.P. Sowa, and **G. Annis**. 2007. Natural Landscape and Stream Segment Attributes Influencing the Distribution and Relative Abundance of Riverine Smallmouth Bass in Missouri. North American Journal of Fisheries Management 27:326-341.
- Sowa, S.P., **G. Annis**, M. Morey, and D. Diamond. 2007. A Gap Analysis and Comprehensive Conservation Strategy for Riverine Ecosystems of Missouri. Ecological Monographs 77(3):301-334.

- Sowa, S.P., **G.M. Annis**, A.J. Garringer, and M.E. Morey. 2006. Developing Predicted Distribution Models for Fish Species in Nebraska. U.S. Geological Survey, National Gap Analysis Program, Moscow, Idaho.
- Whitledge, G.W., C. Rabeni, **G. Annis**, and S.P. Sowa. 2006. Riparian Shading and Groundwater Enhance Growth Potential for Smallmouth Bass in Ozark Streams. *Ecological Applications* 16(4):1461-1473.
- Sowa, S. P., **G. M. Annis**, D. D. Diamond, D. Figg, M. E. Morey, and T. Nigh. 2005. Missouri Department of Conservation Aquatic Biodiversity Assessment. Final Report, Missouri Department of Conservation.
- Sowa, S.P., D.D. Diamond, R. Abbitt, **G. Annis**, T. Gordon, M.E. Morey, G.R. Sorensen, and D. True. 2005. A Gap Analysis for Riverine Ecosystems of Missouri. U.S. Geological Survey, National Gap Analysis Program, Moscow, Idaho.
- Sowa, S. P., **G. M. Annis**, D. D. Diamond, D. Figg, M. E. Morey, and T. Nigh. 2004. An Overview of the Data Developed for the Missouri Aquatic GAP Project and an Example of how it is Being Used for Conservation Planning. *Gap Analysis Bulletin* 12:7-19.
- Sowa, S. P., D. D. Diamond, R. Abbitt, **G. M. Annis**, T. Gordon, M. E. Morey, G. R. Sorensen, and D. True. 2004. The Aquatic Component of Gap Analysis: A Missouri Prototype. Final Report, U.S. Department of Defense Legacy Program, Washington, D.C.

SELECTED RECENT PRESENTATIONS

- Annis, Gust, David Karpovich, Tami Sivy, Doug Pearsall, *Building the Saginaw Bay Report Card and Data Collection Project: An Online Water Quality Dashboard*. State of the Bay Conference. Bay City, MI, September 2022
- Annis, Gust, Matt Herbert, Stephanie Kyriakakis, Alex Verdeja, Philippa Kohn, Jared Ross, Ed Rutherford, David (Bo) Bunnell, Nick Boucher, Yu-Chun Kao, Ed Roseman. *Mapping Priority Spawning and Nursery Habitat for Cisco and Lake Whitefish*. Joint Aquatic Sessions Meeting. Grand Rapids, Michigan, May 2022
- Annis, Gust, Matt Herbert, Stephanie Hickel, Alex Verdeja, Philippa Kohn, Jared Ross, Ed Rutherford, David (Bo) Bunnell, Nick Boucher, Andrew Honsey, Yu-Chun Kao, Danielle Forsyth Kilijanczyk. *Mapping priority spawning and nursery habitat for cisco and lake whitefish*. International Association of Great Lakes Research (*Virtual*), May 2021
- Annis, Gust, Matt Herbert, Jared Ross, Stephanie Hickel. *Using historical survey data to inform contemporary science and conservation: A Great Lakes example*. TNC Global Science Meeting (*Virtual*), March 2021
- Annis, Gust, Matt Herbert, Jared Ross, Stephanie Hickel. *A New High-resolution Historic Substrate Layer for the Laurentian Great Lakes*. American Fisheries Society Annual Meeting (*Virtual*). Columbus, Ohio, September 2020.
- Annis, Gust, Doug Pearsall, Chris May. *Designing Coastal Conservation to Achieve both Ecological and Human Well-being Goals*. American Fisheries Society - Southern Division Meeting. Little Rock, Arkansas, February 2020

Annis, Gust, Matt Herbert, Jared Ross, Stephanie Hickel. *A new high-resolution historic substrate layer for the Laurentian Great Lakes*. International Association of Great Lakes Research. Brockport, New York, June 2019

Annis, Gust, Doug Pearsall, Chris May, Dave Ewert, American Bird Conservancy. *Symposium: Birds with benefits: evidence and trade-offs of multiple-benefit conservation focused on birds; Presentation Title: Designing coastal conservation to achieve both ecological and human well-being goals*. American Ornithological Society Annual Meeting. Anchorage, Alaska, June 2019

Annis, Gust, Chris May, Doug Pearsall, Katie Kahl, Morgan Chow, Zach Ferdana. *Informing Coastal Resilience in Western Lake Erie: A New Visualization Tool*. International Association of Great Lakes Research Annual Meeting. Detroit, Michigan, May 2017

GRANTS AWARDED

- 2012 Aquatic Threat Analysis in the Middle Rockies Ecoregion (\$20,000)
- 2011 Aquatic Species Distribution Modeling and Threat Analysis in the Northwestern Plains Ecoregion (\$18,487)
- 2011 The Imperiled Coldwater Crayfish (*Orconectes eupunctus*) in the Black River Drainage of Missouri and Arkansas: Factors Affecting Distribution and Decline, Data Development (\$15,000)
- 2010 Midwest Glacial Lakes Partnership (MGLP) Data Suite Integration (\$8,000)
- 2010 Midwest Glacial Lakes Partnership (MGLP) Lakeshed Delineations for North Dakota and South Dakota (\$60,000)
- 2010 Modeling Fish Distributions throughout the Arkansas/White/Red River Basins and Gathering Fish Community Collection Data (\$223,300)
- 2009 Upper Mississippi River Basin Data Development and Aquatic Gap Analysis and Missouri River Basin Aquatic Gap Analysis (\$146,650)

COMMITTEE PARTICIPATION

- Midwest Fish Habitat Partnership's Science Advisory Network (2009-2012)
- Great Plains Fish Habitat Partnership's Science Assessment Team (2010-2012)
- Fishers and Farmers Fish Habitat Partnership's Science Team (2009-2012)

MEMBERSHIP IN SOCIETIES

- Association of American Geographers
- American Fisheries Society
- Society for Conservation Biology
- American Ornithological Society