Morgan M. Sparks

Curriculum Vitae
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Rocky Mountain Research Station,
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Employment

2024–	**Research Fish Biologist**, Rocky Mountain Research Station, USDA Forest Service
2023–2024	**Postdoctoral Fellow**, National Science Foundation (Colorado State University)
2017–2023	**Research Assistant**, Department of Biology, Purdue University
2014–2016	**Research Assistant**, USGS Alasko Cooperative Fish and Widlife Research Unit, University of Alaska Fairbanks

Education

2023	Ph.D.	Biology	Purude University
2016	M.Sc.	Fisheries	University of Alaska Fairbanks
2013	B.S.	Wildlife Biology (Aquatic) *High Honors*	University of Montana
2013	B.A.	Journalism (Print) *High Honors*	University of Montana

Research

- **Research Interests**: Fisheries ecology and conservation; freshwater ecosystem responses to climate change and land use change; aquatic habitat connectivity; stable isotope ecology; ecological statistics and programming.
- Since 2014 I have authored 8 papers in peer-reviewed journals on fisheries and conservation (pages 1–1).
- On Google Scholar my h-index is 6 with 135 total citations (as of 28 October 2025).
- I have authored 100 R package as a result of my research with a total of 0 downloads (page 1).
- I have contributed 42 papers and posters at AFS, SFS, ASLO, AGU, IAGLR, and regional chapter meetings (pages 5–6).

Publications

* indicates shared first authorship. Underlined names indicate undergraduate research mentees.

8. **Sparks, M.M.**, Maitland, B.M., Felts, E.A., Swartz, A.G., & Frater, P.N. (2025). hatchR: A toolset to predict when fish hatch and emerge. *Fisheries*, vuaf078. https://doi.org/10.1093/fshmag/vuaf078
7. Yin, X., Schraidt, C.E., **Sparks, M.M.**, Euclide, P.T., Hoyt, T.J., Ruetz III, C.R., Höök, T.O., & Christie, M.R. (2025). Parallel genetic adaptation amid a background of changing effective population sizes in divergent yellow perch (Perca flavescens) populations. *Proceedings of the Royal Society B: Biological Sciences*, *292*(2038), 20242339. https://doi.org/10.1098/rspb.2024.2339
6. **Sparks, M.M.**, Schraidt, C.E., Yin, X., Seeb, L.W., & Christie, M.R. (2024). Rapid genetic adaptation to a novel ecosystem despite a large founder event. *Molecular Ecology*, *n/a*(n/a). https://doi.org/10.1111/mec.17121
5. **Sparks, M.M.**, Kraft, J.C., Blackstone, K.M.S., McNickle, G.G., & Christie, M.R. (2022). Large genetic divergence underpins cryptic local adaptation across ecological and evolutionary gradients. *Proceedings of the Royal Society B: Biological Sciences*, *289*(1984), 20221472. https://doi.org/10.1098/rspb.2022.1472
4. Yin, X., Martinez, A.S., Perkins, A., **Sparks, M.M.**, Harder, A.M., Willoughby, J.R., Sepúlveda, M.S., & Christie, M.R. (2021). Incipient resistance to an effective pesticide results from genetic adaptation and the canalization of gene expression. *Evolutionary Applications*, *14*(3), 847–859. https://doi.org/10.1111/eva.13166
3. **Sparks, M.M.**, Falke, J.A., Quinn, T.P., Adkison, M.D., Schindler, D.E., Bartz, K., Young, D., & Westley, P.A.H. (2019). Influences of spawning timing, water temperature, and climatic warming on early life history phenology in western Alaska sockeye salmon. *Canadian Journal of Fisheries and Aquatic Sciences*, *76*(1), 123–135. https://doi.org/10.1139/cjfas-2017-0468
2. **Sparks, M.M.**, Westley, P.A.H., Falke, J.A., & Quinn, T.P. (2017). Thermal adaptation and phenotypic plasticity in a warming world: Insights from common garden experiments on Alaskan sockeye salmon. *Global Change Biology*, *23*(12), 5203–5217. https://doi.org/10.1111/gcb.13782
1. Eby, L.A., Pierce, R., **Sparks, M.M.**, Carim, K., & Podner, C. (2015). Multiscale Prediction of Whirling Disease Risk in the Blackfoot River Basin, Montana: A Useful Consideration for Restoration Prioritization? *Transactions of the American Fisheries Society*, *144*(4), 753–766. https://doi.org/10.1080/00028487.2015.1031914

R-packages

1. Maitland, B.M., **Sparks, M.M.**, Felts, E., Swartz, A., & Frater, P.N. (2025). *hatchR: Predict Fish Hatch and Emergence Timing*. https://github.com/bmait101/hatchR

Theses

2. **Sparks, M.M.**, (2023). *The Biological Consequences of Cryptic Local Adaptation and Contemporary Evolution* [Dissertation]. Purdue University.
1. **Sparks, M.M.**, (2016). *Climate, embryonic development, and potential for adaptation to warming water temperatures by Bristol Bay sockeye salmon* [Thesis]. University of Alaska Fairbanks.

Pre-prints and in-review

2. Hemstrom, W., Gruenthal, K., Shedd, K., Euclide, P., **Sparks, M.M.**, Habicht, C., Wilson, L., & Christie, M. (2025). *Variation in run-timing is strongly influenced by a large-effect locus in highly divergent lineages of pink salmon*. bioRxiv. https://doi.org/10.1101/2025.05.27.656387
1. **Sparks, M.M.**, Leavell, B.C., & Maitland, B.M. (2025). A generalizable tool for predicting developmental phenology for wild poikilotherms. In *Ecological Applications*.

Unpublished working papers

1. Thurow, R., Maitland, B.M., **Sparks, M.M.**, Isaak, D., & Buffington, J. (2025). *Habitat heterogeneity and phenotypic diversity: The influence of stream attributes on timing of Chinook Salmon spawning*. https://github.com/morgan-sparks/mfsr_phenology

Grants

➤ I have acquired (in most cases jointly) $167,073 in research grants since 2015. Grants > $5,000 below:

Pending	Co-PI. “Bull Trout movement using PIT tag arrays in the Boise Basin”. *Funding from U.S. Fish and Wildlife Serivce*. Collaborators: Morgan Sparks (Lead-PI).	$56,620
Pending	Co-PI. “Scaling satellite monitoring of fish spawning across space”. *Funding from National Geographic Society*. Collaborators: Dan Dauwwalter (Lead-PI), Morgan Sparks, Kellie Carim, Russell Thurow.	$20,000
2025–2027	Lead-PI. “Monitoring Chinook Salmon spawning from space”. *Funding from Trout Unlimited*. Collaborators: Dan Daulwater, Morgan Sparks.	$38,000
2024–2027	Lead-PI. “Chinook Salmon life history and otolith microchemistry”. *Funding from USDA Forest Service RMRS*. Collaborators: Carson Jeffries.	$48,000
2020–2021	Lead-PI. “Accessible underwater landscapes for non-STEM audiences”. *Funding from UWyo Biodiversity Institute*. Collaborators: Rank Rahel.	$19,866
2019–2020	Lead-PI. “Diet specialization along stream gradients”. *Funding from UWyo Zoology*. Collaborators: Rank Rahel.	$22,000
2018–2019	Lead-PI. “Assimilation and discrimination of C and N in prairie stream fishes”. *Funding from UWyo Biodiversity Institute*. Collaborators: Rank Rahel.	$6,000
2017–2018	Lead-PI. “Isotopic niches and fish biodiversity in Rocky Mountain streams”. *Funding from UWyo Biodiversity Institute*. Collaborators: Rank Rahel.	$5,000
2015–2018	Lead-PI. “Factors that influence the diversity of fish assemblages in Wyoming”. *Funding from UWyo Biodiversity Institute*. Collaborators: Rank Rahel.	$25,207

➤ Below are invited full proposals that were not awarded:

2025–2027	NA. “A palaeoecological toolset to address shifting baseline syndrome”. *Funding from DoD SERDP*. Collaborators: Morgan Sparks (Lead-PI), Kellie Carim, Russell Thurow.	$1,500,000
2023–2026	Lead-PI. “Cross-lake comparison of habitat coupling in Lakes Michigan and Superior”. *Funding from WI Sea Grant*. Collaborators: Olaf Jensen.	$258,571
2021–2024	Lead-PI. “Climate change and groundwater pumping impacts on Wisconsin trout fisheries”. *Funding from USGS MW CASC*. Collaborators: Alex Latzka, Olaf Jensen, Steven Loheide.	$399,853

Honors and Awards

Professional awards

2024 Outstanding Service Award, U.S. Forest Service, Rocky Mountain Research Station
2021 Best Professional Presentation Award, Wisconsin Chapter American Fisheries Society

Fellowships

2024 Wisconsin Water Resources Postdoctoral Fellow, University of Wisconsin-Madison

Student Awards

2019 Dean's Graduate Scholar Award, College of Arts and Sciences University of Wyoming
2018 Eugene Maughan Graduate Award, Western Division American Fisheries Society
2018 Hank Gardner Graduate Award, Department of Zoology and Physiology University of Wyoming
2017 Clemens-Rigler Award, Canadian Aquatic Resources Section American Fisheries Society
2017 Board of Visitors Award, College of Arts and Sciences University of Wyoming
2017 Dennis Anderson Fisheries Award, Department Zoology and Physiology University of Wyoming
2017 William Trachtenberg Scholarship, Sustainable Fisheries Foundation
2017 Vern Bressler Fisheries Award, Department of Zoology and Physiology University of Wyoming
2015 Excellence in Fisheries Award, Canadian Aquatic Resources Section American Fisheries Society
2015 Clemens-Rigler Award, Canadian Aquatic Resources Section American Fisheries Society

Invited Academic Talks

2025–Feb "Freshwater science for tomorrow: advancing fish ecology, conservation, and management". Wildlife Biology Program, University of Montana.

2023–Dec "Freshwater science in a changing world: fisheries research for conservation and management". School of Freshwater Science, UW-Milwaukee.

2023–Apr "Fish and freshwater in a changing World: Science for management and conservation". Rocky Mountain Research Station, US Forest Service.

2022–Mar "Coldwater fish in a changing world: Actionable ecology for management and policy". Department of Ecology, Montana State University.

2020–May "Exploring isotopic niches in Rocky Mountain Great Plains stream fish". Department of Zoology and Physiology, University of Wyoming.

Teaching

University of Wyoming

- ZOO 4330: Ichthyology, Instructor of Record
  - Spring 2020: 3 credits, 22 students
- Zoo 4330: Ichthyology, Teaching Assistant, Lab Instructor
  - Spring 2019: 3 credits, 20 students
  - Spring 2018: 3 credits, 25 students
  - Spring 2017: 3 credits, 19 students
  - Spring 2016: 3 credits, 18 students
- ZOO 4310: Fisheries Management, Teaching Assistant, Lab Instructor
  - Fall 2019: 3 credits, 21 students
  - Fall 2018: 3 credits, 26 students
  - Fall 2017: 3 credits, 23 students
  - Fall 2016: 3 credits, 19 students
  - Fall 2015: 3 credits, 23 students

University of Alberta

- RENR 376: Fisheries and Wildlife Management, Teaching Assistant, Lab Instructor
  - Spring 2015: 3 credits, 27 students
  - Spring 2014: 3 credits, 29 students

Guest Lectures

2023–Feb "Stable isotope mixing models in R". RENR 5500, University of Wyoming.

2020–Dec "Aquatic ecology in Western ecosystems". LIFE 3400, University of Wyoming.

2019–Apr "Applications of stable isotopes in fisheries management". ZOO 4310, University of Wyoming.

Mentoring

- I have mentored 12 undergraduate research assistants in lab and field settings
  - University of Wyoming, UW-Madison, University of Tennessee-Chattanooga
  - Several of these students have entered graduate programs or natural resource agencies

Professional Service and Leadership

Service

2022–2024 Field Operation Facilitation and Boat Committee, Center for Limnology, UW-Madison
2021–2022 Member, Fisheries Working Group, Wisconsin Initiative on Climate Change Impacts
2020–2022 Member, Trout Species Team, Wisconsin Department of Natural Resources
2019–2020 Faculty Search Committee, Department of Zoology and Physiology, University of Wyoming
2016–2020 Social Media Coordinator, Program in Ecology, University of Wyoming
2016–2018 Excom Member, CO-WY State Chapter, American Fisheries Society
2016–2017 Graduate Council, student representative, University of Wyoming
2016–2017 President, Program in Ecology, University of Wyoming
2016–2017 President, UWyo Student Chapter, American Fisheries Society
2015– Member, Freshwater Working Group, Society for Conservation Biology

Society memberships

2010– American Fisheries Society
2010– Society for Conservation Biology
2010–2016 International Association of Great Lakes Research
2015– Ecological Society of America
2016– Society for Freshwater Science
2016–2019 Association for the Science of Limnology and Oceanography
2019– Galápagos Conservancy

Society service

2024 Program co-chair, Science to Restore and Manage Wildland Aquatic Habitats and Watersheds, AGU Fall Meeting
2016 Program co-chair, Western Division American Fisheries Society Student Colloquium

Reviewer

- Proposal reviewer
  - Lake Champlain Fisheries Research Program
  - NSF, Division of Environmental Biology (DEB)
- Manuscript reviewer:
  - Since 2016, I have reviewed 55 manuscripts from 18 journals ($\sim$ 6.1 per year).
  - Journals include: Fisheries Research, Oecologia, Global Change Biology, Ecological Applications, Ecosphere, Freshwater Biology, Freshwater Science, North American Journal of Fisheries Management, Frontiers in Ecology and Evolution, Aquatic Invasions, Hydrobiologia, Journal of Ecology, Environmental Biology of Fishes, Restoration Ecology, PeerJ, River Research and Applications, Journal of Great Lakes Research Diversity and Distributions, Transportation Research: Part D.

Leadership development

2021 Equity and Inclusion Workshop EQT By Design via WI Sea Grant
2008 Leave No Trace Master Educator Center for Outdoor Ethics, NOLS

Outreach and Broader Impacts

Hosted workshops

2023–Feb "Programming with R". Wisconsin Chapter AFS Annual Meeting, Stevens Point, WI.
2022–Feb "Data vizualization in R". Wisconsin Chapter AFS Annual Meeting, Virtual.

Media and public talks

2023–Feb	Milwaukee Journal Sentinel	Topic: Climate change and stream trout
2023–Jan	Live Interview: WPR Morning Show	Topic: Climate change and stream trout
2022–Dec	Water Blogged	Topic: Climate change and stream trout
2022–Mar	Trout Unlimited, Madison Chapter	Topic: Climate change and stream trout
2017–Nov	Magazine Article: The Tributary	Topic: Cutthroat trout
2017–Aug	U Wyoming Science Safe	Topic: Aquatic connectivity
2016–Jun	U Wyoming Science Safe	Topic: Aquatic connectivity

Public service and outreach

2022–2023	Food service volunteer	Ronald McDonald House, Madison, WI
2016–2020	Science outreach and stream ecology field trips	Laramie High School, Laramie, WY
2016–2019	Group leader, Wyoming Bio-Blitz	Biodiversity Institute, University of Wyoming
2016–2018	Big Brother	Big Brothers Big Sisters of Wyoming
2017–2018	Habitat restoration projects	Girl Scouts of America
2016–2017	Science judge	Wyoming State Science Fair

Conference Presentations

Underlined names indicate undergraduate research mentees.

42. Ferone, G.S., Maitland, B.M., Isaak, D.J., & Caudill, C.C. (2025, November). *Applying spatial stream networks and species distribution models to two decades of Idaho DEQ BURP stream benthic macroinvertebrate samples* [Paper]. SFS Pacific Northwest Chapter Annual Meeting, Boise, ID.
41. **Sparks, M.M.**, Leavell, B.C., & Maitland, B.M. (2025, November). *A generalizable tool for predicting developmental phenology for freshwater poikilotherms* [Paper]. SFS Pacific Northwest Chapter Annual Meeting, Boise, ID.
40. Kirk, M.A., & Maitland, B.M. (2025, August). *Trophic overlap between invasive round gobies and native benthic darters in a stream biodiversity hotspot* [Paper]. AFS annual meeting, san antonio, TX.
39. Maitland, B.M., **Sparks, M.M.**, Felts, E., Swartz, A., & Frater, P. (2025a, August). *hatchR: A toolset for predicting when fish hatch and emerge* [Poster]. AFS annual meeting, san antonio, TX.
38. Maitland, B.M., **Sparks, M.M.**, Felts, E., Swartz, A., & Frater, P. (2025b, May). *hatchR: A toolset for predicting when fish hatch and emerge* [Poster]. Western division AFS annual meeting, westminster, CO.
37. Maitland, B.M., **Sparks, M.M.**, Felts, E., Swartz, A., & Frater, P. (2025c, April). *hatchR: A toolset for predicting when fish hatch and emerge* [Paper]. Idaho chapter AFS annual meeting, boise, ID.
36. Davis, T., Wright, L., Keisser, D., Maitland, B.M., & Walker, R.H. (2024, November). *That's a mouthful: Periodical cicadas, fish body size, and feeding ecology* [Poster]. Southeastern fisheries council annual meeting, little rock, AR.
35. Keisser, D., Maitland, B.M., & Walker, R.H. (2024, November). *Quantifying rare allochthonous insect pulses: How many periodical cicadas enter streams?* [Paper]. Southeastern fisheries council annual meeting, little rock, AR.
34. Walker, R.H., Keisser, D., Maitland, B.M., & Hunt, D. (2024, November). *Quantifying the availability, use, and consequences of periodical cicadas in stream food webs* [Paper]. Southeastern fisheries council annual meeting, little rock, AR.
33. Hauxwell, J.A., Voter, C.B., Guerrero-Bolaño, F.J., Latzka, A.W., & Maitland, B.M. (2024, June). *Adaptable university-agency early-career fellowship program creates win-win-win for Wisconsin's Waters* [Paper]. IAGLR annual conference, milwaukee, WI.
32. Maitland, B.M. (2024, June). *Testing food web theory in a large lake: The role of body size in habitat coupling in Lake Michigan* [Paper]. ASLO annual meeting, madison, WI.
31. Maitland, B.M., & Latzka, A.W. (2024, May). *Shifting climate conditions affect recruitment in Midwestern trout, but depend on seasonal and spatial context* [Paper]. Washington, british colombia, and idaho chapters AFS joint meeting, spokane, WA.
30. Walker, R.H., & Maitland, B.M. (2024, May). *The cicadian rhythm: Preparation for evaluating the availability, use, and consequences of periodical cicadas to stream fishes* [Paper]. Iowa chapter AFS annual meeting, iowa city, IA.
29. Maitland, B.M., Jensen, O.P., Hoffman, J.C., & Keppeler, F.W. (2023a, August). *Testing food web theory in large lakes: The role of body size in habitat coupling in Lake Michigan* [Paper]. AFS annual meeting, grand rapids, MI.
28. Clancy, N., Isaak, D., Maitland, B.M., Budy, P., & Walters, A. (2023, March). *Thermal refuges for climate vulnerable fishes in Wyoming* [Paper]. Colorado/Wyoming chapter of the American Fisheries Society, Laramie, WY.
27. Maitland, B.M., Jensen, O.P., Hoffman, J.C., Keppeler, F.W., Bunnell, D.B., McNaught, A.S., & Gerig, B.S. (2023b, February). *Body size, trophic position, and energy coupling in Lake Michigan* [Paper]. Wisconsin chapter AFS annual meeting, stevens point, WI.
26. Sass, G.G., Beard, D., Broda, S., Carpenter, S.R., Chipps, S.R., Cichosz, T.A., Dassow, C.J., Elwer, B., Embke, H.S., Feiner, Z.S., Gaeta, J.W., Hansen, G.J.A., Hansen, J., Hennessy, J., Homola, J.J., Isermann, D.A., Jones, S., Latzka, A.W., Lynch, A.J., Maitland, B.M., Mitro, M.G., … Zebro, L. (2023, January). *Depensatory recruitment in Wisconsin walleye: Mechanisms and management* [Paper]. Wisconsin DNR office of applied science webinar series, virtual.
25. Ward, N.K., Lynch, A.J., Beever, E.A., Bouska, K.L., Embke, H.S., Kocik, J.F., Limpinsel, D., Magee, M.R., Maitland, B.M., Morton, J.M., Mueller, J.M., Oliver, D.C., Rantala, H.M., Sass, G.G., Schultz, A., Thompson, L.M., & Wilkening, J.L. (2022, August). *Using the Resist-Accept-Direct (RAD) Framework to Reimagine Large River Management* [Paper]. AFS annual meeting, spokane, WA.
24. Maitland, B.M., & Latzka, A.W. (2022, May). *Shifting climate conditions affect recruitment in Midwestern stream trout but depend on seasonal and spatial context* [Paper]. Joint aquatic sciences meeting, grand rapids, MI.
23. Maitland, B.M., & Latzka, A.W. (2021, November). *Long-term trends of Midwestern stream trout populations in a changing climate, and the effects of seasonal weather* [Paper]. AFS annual meeting, baltimore, MD.

22. Maitland, B.M., Latzka, A.W., Frater, P., & Mitro, M.G. (2021a, May). *Untangling the effects of hydrologic change on trout in Wisconsin streams* [Paper]. Wisconsin water week, virtual.
21. Lapides, D.A., Maitland, B.M., & Pruitt, A.H. (2021, March). *Assessing approaches to quantify hydrological alteration on Wisconsin's streams* [Paper]. Wisconsin section AWRA annual meeting, virtual.
20. Maitland, B.M., Voter, C.B., Guerrero-Bolaño, F.J., Latzka, A.W., & Hauxwell, J.A. (2021b, March). *Tackling Wisconsin's water challenges through UW Water Science-Policy Fellowships and agency partnerships* [Paper]. Wisconsin water week, virtual.
19. Maitland, B.M., Latzka, A.W., Frater, P., & Mitro, M.G. (2021c, February). *Long-term trout trends in Wisconsin and the role of hydrologic change* [Paper]. Wisconsin chapter AFS annual meeting, virtual.
18. Maitland, B.M., Fetzer, W.W., Collins, S.M., & Rahel, F.J. (2020, March). *Non-lethal approaches for obtaining stable isotope data for diet studies of North American fishes* [Paper]. Colorado/wyoming chapter AFS annual meeting, laramie, WY.
17. Barrus, N.T., Maitland, B.M., & Rahel, F.J. (2019, October). *Identification of an ideal baseline organism for stream food web studies* [Paper]. Joint meeting of the wildlife and american fisheries society, reno, NV.
16. Maitland, B.M., & Rahel, F.J. (2019, October). *Stream food web expansion in response to changing environmental conditions* [Paper]. Joint meeting of the wildlife and american fisheries society, reno, NV.
15. Maitland, B.M., & Rahel, F.J. (2018, January). *Niche partitioning in fish assemblages along longitudinal stream gradient* [Poster]. Canadian conference for freshwater fisheries research, edmonton, AB.
14. Maitland, B.M., & Rahel, F.J. (2017, June). *Isotopic niches and the longitudinal gradient in Rocky Mountain-Great Plains streams* [Paper]. SFS annual meeting, raleigh, NC.
13. Maitland, B.M., Walker, R.H., LaSharr, T.N., Rosin, M., & Ben-David, M. (2017a, April). *Juvenile salmonids stranded in flood ponds of Alaska* [Paper]. Program in ecology symposium, laramie, WY.
12. Maitland, B.M., Walker, R.H., LaSharr, T.N., Rosin, M., & Ben-David, M. (2017b, February). *The fate of juvenile salmonids stranded in flood ponds: Implications for nutrient transfers* [Paper]. Utah and colorado/wyoming chapter AFS joint meeting, grand junction, CO.
11. Maitland, B.M., Poesch, M.S., & Anderson, A.E. (2016a, May). *Culverts in forested watersheds: Impacts and restoration methods for native freshwater fishes* [Paper]. SFS annual meeting, sacramento, CA.
10. Annear, A.A., Maitland, B.M., & Rahel, F.J. (2016, March). *Stable isotope quantification of resource use by crayfish in the Laramie River to inform lotic food web analyses* [Poster]. Colorado/wyoming chapter AFS annual meeting, laramie, WY.
9. Maitland, B.M., Poesch, M.S., & Anderson, A.E. (2016b, March). *Culverts in forested watersheds: Impacts and restoration methods for native freshwater fishes* [Paper]. Colorado/wyoming chapter AFS annual meeting, laramie, WY.
8. Daniels, S.E., Fitzpatrick, T.A., & Maitland, B.M. (2015, January). *Idiosyncratic resource use by Laramie raccoons: Are trash pandas, trash pandas?* [Poster]. Stable isotope ecology symposium, laramie, WY.
7. Hirschfield, F., Anderson, A.E., Maitland, B.M., Wagner, M., Zaichkowsky, M., & Mottishaw, C. (2014, October). *Integrating science and management to improve sustainability of forested watersheds in Northwestern Canada* [Poster]. SAF national convention, salt lake city, UT.
6. Maitland, B.M., Poesch, M.S., & Anderson, A.E. (2014a, August). *Stream crossing impacts on freshwater fishes: Implications for management* [Poster]. Forest industry lecture series, edmonton, AB.
5. Maitland, B.M., O'Malley, B.P., O'Brien, T.P., Armenio, P.M., Watson, N.M., & Roseman, E.F. (2014b, May). *Zooplankton community dynamics in a northern Lake Huron embayment: The influence of water temperature and larval fish abundance* [Paper]. IAGLR annual meeting, hamilton, ON.
4. Maitland, B.M., Poesch, M.S., & Anderson, A.E. (2014c, May). *Stream crossing assessment procedures as a tool for mitigating impacts on freshwater fish* [Poster]. Columbia mountain institute of applied ecology's resource roads conference, nelson, BC.
3. Maitland, B.M., Poesch, M.S., & Anderson, A.E. (2014d, January). *Stream crossing impacts on freshwater fish and in-stream habitat in Alberta* [Paper]. Canadian conference for freshwater fisheries research, yellowknife, NWT.
2. Maitland, B.M., Farha, S.A., Darnton, R.W., Smith, K.R., & Riley, S.C. (2012, September). *2012 Avian botulism environmental sampling in Sleeping Bear Dunes National Lakeshore* [Paper]. Workshop on GLRI project no. 73 and 91 USGS/NPS meeting, empire, MI.
1. Discenza, J.D., O'Malley, B.P., Maitland, B.M., & Fernando, D. (2011, April). *Analyzing the genetic variation in American Hart's tongue fern* [Poster]. SUNY: ESF spotlight on student's research, syracuse, NY.

Technical skills and training

Field

Fish Sampling	Electrofishing, netting, seining, trawling, angling
Aquatic Ecology	Water quality sampling, invertebrate sampling, aquatic vegetation sampling, habitat assessment
Identification	Fish (freshwater and marine), amphibians, reptiles, aquatic invertebrates, aquatic plants
Operations	Piloting and trailering small vessels, rafting, helicopters experience, orienteering
Other	Light machinery operation, small power equipment repair, minor electrical repair, handiwork

Lab

Fisheries	Fish aging (scales, otoliths), fish dissection, fish tissue processing
Aquatic Ecology	Water quality analysis (nutrients, chlorophyll a, turbidity), invertebrate processing, aquatic vegetation
Stable Isotopes	Sample preparation, light (C, N, O, S) and heavy (Sr) stable isotope analysis
Molecular	DNA extraction, PCR, qPCR

Computer

Operating Systems	Linux, MacOS, Windows
Programming Languages	R, Python, BASH, JavaScript
Markup Languages	Markdown, RMarkdown, CSS, HTML, LaTeX
Data Interchange Formats	CSV, JSON, XML
Other Languages	YAML
Version Control	Git
Text Editors	RStudio, SQL Server Management Studio, Visual Studio, Visual Studio Code
Microsoft Office	Excel, Outlook, OneNote, PowerPoint, Word

Analytical

Statistical Analysis	Generalized linear models, mixed effects models, Bayesian statistics, multivariate statistics
Data Visualization	ggplot2, base R graphics, leaflet, plotly
Data Management	Data wrangling and cleaning, data management with SQL
Spatial Analysis	R, QGIS, ArcGIS, Google Earth Engine
Package Development	R package development, documentation, testing, and maintenance

Certifications

2025	Wilderness First Aid	Wilderness Medicine Institute
2025	Advanced CPR and First Aid	American Red Cross
2014	Defensive Driving	USDA Forest Service
2018	Avalanche Safety Level 1	National Ski Patrol
2013	Electrofishing Safety	University of Alberta
2013	MOCC Federal Motor Boat Operator	US Department of the Interior