

Curriculum Vitae

Ian M. McCullough

Email: immccull@gmail.com

Phone: (703) 626-9090

Website: <http://ianmccullough.weebly.com/>

Interests and Expertise

Landscape ecology, conservation biology, lakes, forests, wildfire, climate, geographic information systems and environmental data science

Education

2017 PhD University of California, Santa Barbara
Environmental Science and Management
Advisor: Frank Davis

2012 MS University of Maine
Ecology and Environmental Science
Advisors: Cynthia Loftin and Steven Sader

2010 BA Colby College
Environmental Studies (major), Anthropology (minor)

Professional Appointments

Landscape Conservation Scientist Osa Conservation, Climate Corridor Initiative

2023 - present

Adjunct Faculty Sustainability Studies/Ecosystem Science and Stewardship, Colorado Mountain College (Summit)

2022 - present

Academic Specialist – Research (Faculty) Department of Fisheries and Wildlife, Michigan State University

2021 - 2023

Postdoctoral Researcher Department of Fisheries and Wildlife, Michigan State University
2017 – 2021

Contracting

Spatial Informatics Group (2023-present)

- I provide subject-matter expertise in landscape ecology, biodiversity, forests, water, wildfire and climate, co-write publications and co-develop project work plans and funding proposals for clients at research institutions, the private sector and nonprofits

Lake County Water Resources Department (2023-present)

- I analyze and visualize and long-term water quality data for managers of Clear Lake in Lake County, California in relation to climate change and watershed wildfire

Academic Honors and Funding

Awards:

2020 Outstanding Paper in Landscape Ecology, International Association for Landscape Ecology, North America. **McCullough** et al. (2019). Do lakes feel the burn? Ecological consequences of increasing exposure of lakes to fire in the continental United States. *Global Change Biology* 25(9), 2841-2854.

Fellowships:

2015-2016 GLEON Graduate Student Fellowship (<http://fellowship.gleon.org/>)

Research grants:

2022 Collaborative Research: RAPID: Lake ecosystem responses to fire along gradients of burn characteristics and hydrologic connectivity (NSF Ecosystem Sciences Cluster; \$177183) (lead Principal Investigator)

2020 Research Experience for Undergraduates Supplemental Support, National Science Foundation (\$14700) (drafted proposal)

2016 Summer Research Fellowship, Bren School of Environmental Science and Management, University of California, Santa Barbara (\$5500)

2015 Institute for the Study of the Ecological Effects of Climate Impacts (ISEECI), University of California Natural Reserve System (\$6000)

2014 Summer Research Fellowship, Earth Research Institute, University of California, Santa Barbara (\$1000)

2012 Horace Bond Scholarship, Penobscot County Conservation Association (\$500)

Manuscripts in Review/Revision

** undergraduate student mentored, * graduate student mentored

McCullough, I. M., Sun, X., Hanly, P. J. and P. A. Soranno (In review). Knowing your limits: patterns and drivers of nutrient limitation and nutrient-chlorophyll relationships in US lakes. *Limnology and Oceanography Letters*.

McCullough, I. M., Beirne, C., Soto-Navarro, C. and A. Whitworth. (In review). Mapping climate adaptation corridors for biodiversity - A regional-scale case study in Central America. *Conservation Science and Practice*.

Farrugia, M. J., Brahney, J., Tanentzap, A., J., Brentrup, J. A., Brighenti, L. S., Chandra, S., Cortes, A., Fernandez, R. L., Fischer, J. M., Forrest, A. L., Jin, Y., Larrieu, K., **McCullough, I. M.**, Oleksey, I. A., Pilla, R. M., Rusak, J. A., Scordo, F., Smits, A. P., Symons., C. C., Tang, M., Woodman, S. G. and S. Sadro. (In review). Wildfire smoke impacts lake ecosystems. *Global Change Biology*.

Díaz Vázquez, J.**, **McCullough, I. M.**, Haite, M., Soranno, P. A. and K. S. Cheruvilil. (In review). US lakes are monitored disproportionately less in communities of color. *Frontiers in Ecology and the Environment*.

Peer-Reviewed Publications

** undergraduate student mentored, * graduate student mentored

Lapierre, J., Webster, K. E., Hanks, E. H., Soranno, P. A., Wagner, T. W., **McCullough, I. M.**, Reinl, K., Domka, M. and N. R. Lottig. (2023). A continuous classification of the 480,000 lakes of the conterminous US based on geographic archetypes. *Limnology and Oceanography*. <https://doi.org/10.1002/lno.12457>

McCullough, I. M., Brentrup, J. A., Wagner, T., Lapierre J., Henneck, J, Paul, A. M.**, Belair, M., Moritz, M. A. and C. T. Filstrup. (2023). Fire characteristics and hydrologic connectivity influence short-term responses of north temperate lakes to wildfire. *Geophysical Research Letters*. <https://doi.org/10.1029/2023GL103953>

McCullough, I. M., Hanly, P. J., King, K. B. S. and T. Wagner. (2022). Freshwater corridors in the conterminous United States: a coarse-filter approach based on lake-stream networks. *Ecosphere*. <https://doi.org/10.1002/ecs2.4326>

DePalma-Dow, A., **McCullough, I. M.** and J. A. Brentrup. (2022). Turning up the heat: long-term water quality responses to wildfires and climate change in a hypereutrophic lake. *Ecosphere*. <https://doi.org/10.1002/ecs2.4271>

Lofton, M., Brentrup, J., Beck, W., Zwart, J., Bhattacharya, R., Brighenti, L., Burnet, S., **McCullough, I.**, Steele, B., Carey, C., Cottingham, K., Dietze, M., Ewing, H., Weathers, K. and S. LaDeau. (2022). Using near-term forecasts and uncertainty partitioning to improve predictions of oligotrophic cyanobacterial density. *Ecological Applications*. <https://doi.org/10.1002/eap.2590>

Orr, D., Bui, A., Klope, M., **McCullough, I. M.**, Lee, M., Motta, C., Mayorga, I., Konicek, K. and H. Young. Context-dependent effects of shifting large herbivore assemblages on plant structure and diversity. (2022). *Journal of Ecology*. <https://doi.org/10.1111/1365-2745.13871>

McCullough, I. M., Fergus., C. E. and C. Scott. Macrosystems limnology and beyond: reenvisioning the scale of limnology. (2022). *Encyclopedia of Inland Waters, 2nd edition*. ISBN 9780124095489. <https://doi.org/10.1016/B978-0-12-819166-8.00026-8>

Cheruvilil, K. S., Soranno, P. A., **McCullough, I. M.**, Webster, K. E., Rodriguez, L. and N. J. Smith. LAGOS-US LOCUS v1.0: Data module of location, identifiers, and physical characteristics of lakes and their watersheds in the conterminous U.S. (2021). *Limnology and Oceanography Letters*. <https://doi.org/10.1002/lol2.10203>

Soranno, P. A., Cheruvilil, K. S., Liu, B., Wang, Q, Tan, P., Zhou, J., King, K. B. S., **McCullough, I. M.**, Stachelek, J., Bartley, M., Filstrup, C. T., Hanks, E. M., Lapierre, J., Lottig, N. R., Schliep, E. M., Wagner T. and K. E. Webster. Ecological prediction at

macroscales using big data: Does sampling design matter? (2020). *Ecological Applications*. <https://doi.org/10.1002/eap.2123>.

Wagner, T., Lottig, N., Bartley, M., Hanks, E., Schliep, E., Wikle, N., King, K., **McCullough, I. M.**, Stachelek, J., Cheruvilil, K., Filstrup, C., Lapierre, J., Liu, B., Smith, N., Soranno, P., Tan, P., Wang, Q., Webster, K. and J. Zhou. (2020). Increasing accuracy of lake nutrient predictions in thousands of lakes by leveraging water clarity data. *Limnology and Oceanography Letters*. <https://doi.org/10.1002/lol2.10134>.

Poisson, A. C.*, **McCullough, I. M.**, Cheruvilil, K. S., Elliot, K. C., Latimore, J. A. and P. A. Soranno. (2020). Quantifying the contribution of citizen science to broad-scale ecological databases. *Frontiers in Ecology and the Environment*. <https://doi.org/10.1002/fee.2128>.

McCullough, I. M., Skaff, N. K., Soranno, P. A. and K. S. Cheruvilil. (2019). No lake left behind: how well do US protected areas meet lake conservation targets? *Limnology and Oceanography Letters*, 4(6): 183-192. <https://doi.org/10.1002/lol2.10123>.

Filstrup, C. T., King, K. B. S. and **I. M. McCullough**. (2019). Evenness effects mask richness effects on ecosystem functioning at macro-scales in lakes. *Ecology Letters*, 22(12): 2120-2129. <https://doi.org/10.1111/ele.13407>.

McCullough, I. M., King, K. B. S., Stachelek, J., Díaz, J.***, Soranno, P. A. and K. S. Cheruvilil. (2019). Applying the patch-matrix model to lakes: a connectivity-based conservation framework. *Landscape Ecology*, 34(11): 2703-2718. <https://doi.org/10.1007/s10980-019-00915-7>.

McCullough, I. M., Cheruvilil, K. S., Lapierre, J., Lottig, N. R., Moritz, M. A., Stachelek, J. and P. A. Soranno. (2019). Do lakes feel the burn? Ecological consequences of increasing exposure of lakes to fire in the continental United States. *Global Change Biology*, 25(9): 2841-2854. <https://doi.org/10.1111/gcb.14732>.

Davis, F. W., Synes, N. W., Fricker, G. A., **McCullough, I. M.**, Serra-Diaz, S. M., Franklin, J. and A. Flint. (2019). LiDAR-derived topography and forest structure predict fine-scale variation in daily surface temperatures in oak savanna and conifer forest landscapes. *Agricultural and Forest Meteorology*, 269:192-202. <https://doi.org/10.1016/j.agrformet.2019.02.015>.

McCullough, I. M., Cheruvilil, K. S., Collins, S. C. and P. A. Soranno. Geographic patterns of the climate sensitivity of lakes. (2019). *Ecological Applications*, e01836. <https://doi.org/10.1002/eap.1836>.

McCullough, I. M., Dugan, H. A., Farrell, K. J., Morales-Williams, A. M., Ouyang, Z., Roberts, D. C., Scordo, F., Bartlett, S. L., Burke, S. M., Doubek, J. P., Krivak-Tetley, F. E., Skaff, N. K., Summers, J. C., Weathers, K. C. and P. C. Hanson. (2018). Dynamic modeling of organic carbon fates in lake ecosystems. *Ecological Modelling*, 386:71-82. <https://doi.org/10.1016/j.ecolmodel.2018.08.009>.

Engel, F., Farrell, K. J., **McCullough, I. M.**, Scordo, F., Denfeld, B. A., Dugan, H. A., de Eyto, E., Hanson, P. C., McClure, R. P., Noges, P., Noges, T., Ryder, E., Weathers, K. C. and G. A. Weyhenmeyer. (2018). A lake classification concept for a more accurate global estimate of the dissolved inorganic carbon export from terrestrial ecosystems to inland waters. *The Science of Nature*, 105:25. <https://doi.org/10.1007/s00114-018-1547-z>.

McCullough, I. M., Davis, F. W. and A. P. Williams. (2017). A range of possibilities: assessing geographic variation in climate sensitivity of ponderosa pine using tree-rings. *Forest Ecology and Management*, 402: 223-233. <https://doi.org/10.1016/j.foreco.2017.07.025>.

Dugan, H. A., Bartlett, S. L., Burke, S. M., Doubek, J. P., Krivak-Tetley, F. E., Skaff, N. K., Summers, J. C., Farrell, K. J., **McCullough, I. M.**, Morales-Williams, A. M., Roberts, D., Scordo, F., Yang, Z., Hanson, P. C. and K. C. Weathers. (2017). Salting our freshwater lakes. *Proceedings of the National Academy of Sciences*, 114(17): 4453-4458. <https://doi.org/10.1073/pnas.1620211114>.

Davis, F. W., Sweet, L., Serra-Diaz, J. M., Franklin, J., **McCullough, I. M.**, Flint, A., Flint, L., Dingman, J. R., Regan, H. M., Syphard, A., Hannah, L., Redmond, K. and M. A. Moritz. (2016). Shrinking windows of opportunity for oak seedling establishment in southern California mountains. *Ecosphere*, 7(11), article e01573. <https://doi.org/10.1002/ecs2.1573>.

McCullough, I. M., Davis, F. W., Dingman, J. R., Flint, L. E., Flint, A. L., Serra-Diaz, J. M., Syphard, A. D., Moritz, M. A., Hannah, L. and J. Franklin. (2016). High and dry: high elevations disproportionately exposed to regional climate change in Mediterranean-climate landscapes. *Landscape Ecology*, 31(5): 1063-1075. <https://doi.org/10.1007/s10980-015-0318-x>.

Serra-Diaz, J. M., Franklin, J., Sweet, L., **McCullough, I. M.**, Syphard, A. D., Regan, H., Flint, L., Flint, A., Dingman, J., Moritz, M. A., Redmond, K., Hannah, L. and F. W. Davis. (2016). Averaged 30 year climate change projections mask opportunities for species establishment. *Ecography*. 844-845. <https://doi.org/10.1111/ecog.02074>.

Hannah, L., Flint, L. E., Syphard, A. D., Moritz, M. A., Buckley, L. B. and **I. M. McCullough**. (2015). Place and process in conservation planning for climate change: a reply to Keppel and Wardell-Johnson. *Trends in Ecology and Evolution* 30(5): 233-234. <https://doi.org/10.1016/j.tree.2015.03.008>.

Aceves-Bueno, E., Adeleye, A. S., Bradley, D., Brandt, W. T., Callery, P., Feraud, M., Garner, K. L., Gentry, R., Huang, Y., **McCullough, I. M.**, Pearlman, I., Sutherland, S. A., Wilkinson, W., Yang, Y., Zink, T., Anderson, S. E. and C. Tague. (2015). Citizen science as a tool for overcoming insufficient monitoring and inadequate stakeholder buy-in in adaptive management: Criteria and evidence. *Ecosystems*, 18(3): 493-506. <https://doi.org/10.1007/s10021-015-9842-4>.

Hannah, L., Flint, L., Syphard, A. D., Moritz, M. A., Buckley, L. B. and **I. M. McCullough**. (2014). Fine-grain modeling of species' response to climate change: holdouts, stepping-stones and microrefugia. *Trends in Ecology and Evolution*, 29(7): 390-397. <https://doi.org/10.1016/j.tree.2014.04.006>.

Dingman, J. R., Sweet, L. C., **McCullough, I. M.**, Davis, F. W., Flint, A., Franklin, J. and L. E. Flint (2013). Cross-scale modeling of surface temperature and seedling establishment to improve projections of tree distribution shifts under climate change. *Ecological Processes*, 2-30. <https://doi.org/10.1186/2192-1709-2-30>.

McCullough, I. M., Loftin, C. S. and S. A. Sader. (2013). Landsat imagery reveals declining clarity of Maine's lakes during 1995-2010. *Freshwater Science*, 32(3): 741-752. <https://doi.org/10.1899/12-070.1>.

McCullough, I. M., Loftin, C. S. and S. A. Sader. (2013). Lakes without Landsat? An alternative approach to remote lake monitoring with MODIS 250 m imagery. *Lake and Reservoir Management*, 29: 89-98. <https://doi.org/10.1080/10402381.2013.778926>.

McCullough, I. M., Loftin, C. S. and S. A. Sader. (2012). High-frequency remote monitoring of large lakes with MODIS 500 m imagery. *Remote Sensing of Environment*, 124: 234-241. <https://doi.org/10.1016/j.rse.2012.05.018>.

McCullough, I. M., Loftin, C. S. and S. A. Sader. (2012). Combining lake and watershed characteristics with Landsat TM data for remote estimation of regional lake clarity. *Remote Sensing of Environment*, 123: 109-115. <https://doi.org/10.1016/j.rse.2012.03.006>.

Technical Reports and Other Publications

The 10 Climate Adaptation Lifeboats across Central America - A conservation regional approach to rebuild ecological connectivity along elevational gradients. (2023). Soto-Navarro C., Beirne C., **McCullough I.**, Lebbin E., Aubert M., Whitworth A.

Webster, K. E., **McCullough, I. M.** and P. A. Soranno. (2022). Deeper by the dozen: Diving into a database of 17,675 depths for U.S. lakes and reservoirs. *Limnology and Oceanography Bulletin*. <https://doi.org/10.1002/lob.10482>.

McCullough, I. M., Cheruvilil, K. S., Collins, S. C. and P. A. Soranno. Geographic patterns of the climate sensitivity of lakes. *Bulletin of the Ecological Society of America: Photo Gallery*. (2019). <https://doi.org/10.1002/bes2.1505>.

Moritz, M.A., Topik, C, Allen, C. D., Hessburg, P. F., Morgan, P., Odion, D. C., Veblen, T. T. and **I. M. McCullough** (2018). A Statement of Common Ground Regarding the Role of Wildfire in Forested Landscapes of the Western United States. Fire Research Consensus Working Group Final Report. <https://www.nceas.ucsb.edu/featured/fire-research-consensus>.

McCullough, I. M., Loftin, C. S. and S. A. Sader. A manual for remote sensing of Maine lake clarity. (2013). *Maine Agricultural and Forest Experimentation Station*, University of Maine. Technical Bulletin 207. ISSN: 1070-1054.

Published Datasets and Data/Code Repositories

Shuvo, A. K., N. R. Lottig, K. E. Webster, A. Delany, K. Reinl, C. Gries, N. J. Smith, A. C. Poisson, I. M. McCullough, S.M. Collins, K. B. King, E. Phillips, K. S. Cheruvellil, and P. A. Soranno. (2023). LAGOS-US LIMNO: Data module of surface water chemistry from 1975-2021 for lakes in the conterminous U.S. ver 5. Environmental Data Initiative. <https://doi.org/10.6073/pasta/2c58f5a50ab813919f99cc1f265f271c>.

McCullough, I. M., Brentrup, J. A., Henneck, J., Paul, A. M., Belair, M., & Filstrup, C. T. (2023). Monthly lake water quality data (May-September 2022) following the Greenwood Fire in northeastern Minnesota v1.0 [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.8213144>.

McCullough, I. M., Hanly, P. J., King, K. B. S., & Wagner, T. (2022). Data and code for Freshwater corridors in the conterminous US: a coarse-filter approach based on lake-stream networks (1.0) [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.7011322>.

DePalma-Dow, A., **McCullough, I. M.** and J. A. Brentrup. (2022). Data and R code for long-term study of fire and climate effects on water quality in Clear Lake, California (1.0) [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.6815236>.

Díaz Vázquez, J., **McCullough, I. M.**, Haite, M., Soranno, P. A. and K. S. Cheruvellil. (2021). LAGOS-US Race and Ethnicity: Dataset classifying conterminous US lake communities based on racial and ethnic demographic data (v 1.0). Zenodo. <https://doi.org/10.5281/zenodo.5847270>.

Stachelek, J., Rodriguez, L. K., Díaz Vázquez, J., Hawkins, A., Phillips, E., Shoffner, A., **McCullough, I. M.**, King, K. B. S., Namovich, J., Egedy, L. A., Haite, M., Hanly, P. J., Webster, K. E., Cheruvellil, K. S. and P.A. Soranno (2021). LAGOS-US DEPTH v1.0: Data module of observed maximum and mean lake depths for a subset of lakes in the conterminous U.S. ver 1. Environmental Data Initiative. <https://doi.org/10.6073/pasta/64ddc4d04661d9aef4bd702dc5d8984f>.

McCullough, I. M. (2019). cont-limno/LivinOnTheEdge: Aquatic and semi-aquatic connectivity among lakes in relation to protected areas (Version 1.0). Zenodo. <http://doi.org/10.5281/zenodo.3463394>.

Filstrup, C. T., King, K and **I. M. McCullough**. (2019). Macro-scale analysis of biodiversity-ecosystem functioning relationships in lakes (github repository) [Data set]. Zenodo. <http://doi.org/10.5281/zenodo.3440182>.

McCullough, I. M. and N. K. Skaff. (2019). No lake left behind: Lake protection in the continental US (github repository) (Version 1.0) [Data set]. Zenodo. <http://doi.org/10.5281/zenodo.3361751>.

Poisson, A. C., and **I. M. McCullough**. (2019). Quantifying the contribution of citizen science to broad-scale ecological databases (github repository) (Version 1.0). Zenodo. <http://doi.org/10.5281/zenodo.3236490>.

McCullough, I. M. (2019). Fire in US lake watersheds (1500 m lake buffers) from 1984-2015 (github repository) [Data set]. Global Change Biology. Zenodo.
<http://doi.org/10.5281/zenodo.2654989>.

McCullough, I. M. (2018). Geographic patterns of the climate sensitivity of lakes (github repository) (Version 1.0.0). Ecological Applications. Zenodo.
<http://doi.org/10.5281/zenodo.1488201>.

Collins S. M., **McCullough, I. M.**, Oliver, S. K and N. K. Skaff. 2018. LAGOS-NE Annual, seasonal, and monthly climate data for lakes and watersheds in a 17-state region of the U.S. Environmental Data Initiative.

<http://doi.org/10.6073/pasta/4abe86a2c00dc9a628924aa149d7bf34>.

Technical, Leadership and Communication Skills

- Analytical techniques: geospatial data analysis and processing, geostatistics, regression, ordination, clustering, meta-analysis, species distribution modeling, landscape connectivity analysis, remote sensing
- Analysis platforms: ArcGIS, R
- Version control: Git/GitHub
- Team science: managing, leading, facilitating and participating within interdisciplinary research groups
- Communication: peer-reviewed publication, technical reports, white papers, presentations for scientific and non-scientific audiences, blog posts, press releases, Spanish language skills

Teaching Experience

Adjunct Instructor, Sustainability Studies/Ecosystem Science and Stewardship, Colorado Mountain College

2023 SUS/ESS 4100 Conservation Biology

Instructor, Department of Fisheries and Wildlife, Michigan State University

2021-2022 FW 444 Conservation Biology (fully online in 2021, partly online in 2022)

2018 FW 472 Limnology

Instructor, Department of Plant Biology/Integrative Biology, Michigan State University

2020 IBIO 355 Ecology (online; co-taught)

Teaching Assistant, Bren School of Environmental Science and Management, University of California, Santa Barbara

2015-2017 ESM 263 Geographic Information Systems

2015-2016 ESM 270P Conservation Planning Practicum

Teaching Assistant, Department of Wildlife Ecology, University of Maine

2011 WLE 201 Ecology

Other Professional Appointments

2012-2017 Graduate Student Researcher, University of California, Santa Barbara
2015-2017 Global Lake Ecological Observatory Network (GLEON) Fellow
2015-2016 Graduate Intern, National Center for Ecological Analysis and Synthesis,
University of California, Santa Barbara
2012 Geographic Information Systems Specialist and Data Analyst, University of
Maine
2010-2012 Graduate Research Assistant, University of Maine
2008-2010 Undergraduate Research Assistant, Colby College

Invited Talks

McCullough, I. M. Buscando refugia al cambio climático en las montañas de California. *Osa Conservation Science Meetings* (virtual). October 17, 2023.

McCullough, I. M. Setting the stage for conservation: how to sustain wildlife without studying wildlife. *MSU Zoology Club* (guest lecture). Nov 30, 2021.

McCullough, I. M. Six ways to answer burning questions in science. *IBIO 355 Ecology Honors Section* (guest lecture). Nov 9, 2021.

McCullough, I. M. Do lakes feel the burn? A continental-scale perspective on lakes and wildfires. *California Cyanobacteria Harmful Algal Bloom Network*. Virtual Conference. Mar 29, 2021.

McCullough, I. M., Cheruvilil, K. S., Lappiere, J., Lottig, N. R., Moritz, M. A. and P. A. Soranno. A fireside chat: large wildfires are a looming threat to US lakes. *American Geophysical Union Annual Meeting*. Virtual conference. Dec 1-17, 2020.

McCullough, I. M., Cheruvilil, K. S., Díaz, J., Haite, M., Hanly, P. J., King, K. B. S., Rodriguez, L. K., Smith, N. J. and J. Stachelek. Data synthesis: no picnic, but no need to panic. *Ecological Society of America Annual Meeting*. Virtual conference. Aug 3-6, 2020.

McCullough, I. M. Peculiar patterns of exposure and sensitivity to climate change in mountainous western North American landscapes. *Fisheries and Wildlife Graduate Student Organization Seminar Series*. Department of Fisheries and Wildlife, Michigan State University, East Lansing, MI. Nov 8, 2017.

McCullough, I. M., Loftin, C. S. and S. A. Sader. Implementing satellite-based remote lake monitoring in Maine. Maine Department of Environmental Protection, Augusta, ME. Jun 8, 2012

McCullough, I. M., Loftin, C. S. and S. A. Sader. Remote estimation of regional lake clarity with Landsat TM and MODIS satellite imagery. Earth Systems Research Center, University of New Hampshire, Durham, NH. Mar 23, 2012.

McCullough, I. M. Back from the future! Lakes, GIS and graduate school after Colby. *Colby College Environmental Studies Colloquia*. Waterville, ME. Feb 24, 2012.

Presentations at Scientific Meetings

Belair, M., **McCullough, I. M.**, Filstrup, C. T., Brentrup, J. A. and J. Lapierre. Regional environmental factors drive postfire DOC dominance in lake carbon total. *Association of Limnology and Oceanography Aquatic Sciences Meeting*. Palma de Mallorca, Spain. Jun 4-9, 2023.

Webster, K. E., Cheruvilil, K. S., Soranno, P. A., Smith, N. J., Hanly, P. J., Shuvo, A., Lottig, N. R., King, K. B. S., Stachelek, J., Rodriguez, K. and **I. M. McCullough**. The LAGOS-US open-access research platform: building understanding of U.S. lakes at regional to continental scales. *Association of Limnology and Oceanography Aquatic Sciences Meeting*. Palma de Mallorca, Spain. Jun 4-9, 2023.

McDonald, A., Hanly, P. J., Webster, K. E., Wagner, T., Shuvo, A., Lottig, N., Stanley, E. H., Reinl, K., **McCullough, I. M.**, Schliep, E. M., Cheruvilil, K. S., Tan, P. and P. A. Soranno. The lake is greener on the other side: A continental-scale study of the nonlinearities and heterogeneity in lake productivity response to climate change. *American Geophysical Union Annual Meeting*. Chicago, IL. Dec 12-16, 2022.

Farruggia, M. J., Brahney, J., Brentrup, J. A., Brighenti, L. S., Burnet, S. H., Chandra, S., Córtes, A., Culpepper, J., Fernandez, R. L., Fischer, J., Flock, R., Jin, Y., **McCullough, I. M.**, Oleksey, I. A., Pilla, R. M., Rusak, J. A., Sarkar, S., Schladow, G., Scordo, F., Smits, A. P., Symons, C. C., Tantetzap, A. J., Tang, M., Woodman, S., Watanabe, S. and S. Sadro. Extent and impact of wildfire smoke on lakes. *Global Lake Ecological Observatory Network Annual Meeting*. Lake George, NY. Oct 30-Nov 4, 2022.

Brentrup, J. A., **McCullough, I. M.**, Bélair, M., Cheruvilil, K. S., Henneck, J., Lapierre, J., Moritz, M. A., Paul, A. M., Wagner, T., Wasen, E. and C. T. Filstrup. Lakes under fire: responses of lakes to a wildfire in northern Minnesota. *Global Lake Ecological Observatory Network Annual Meeting*. Lake George, NY. Oct 30-Nov 4, 2022.

McCullough, I. M., DePalma-Dow, A. and J. Brentrup. Turning up the heat: Long-term wildfire and climate impacts on a hypereutrophic California lake. *Joint Aquatic Sciences Meeting*. Grand Rapids, MI. May 16-20, 2022.

Díaz Vázquez, J., Haite, M., **McCullough, I. M.**, Soranno, P. A. and K. S. Cheruvellil. Environmental justice: Communities of color & Hispanic communities lack data on lake health. *Joint Aquatic Sciences Meeting*. Grand Rapids, MI. May 16-20, 2022.

Lapierre, J., Hanks, E., Webster, K. E., **McCullough, I. M.**, Wagner, T., Reinl, K. L., Soranno, P. A., Domka, M., Wikle, N., Hanly, P., King, K., Matuszak, D., Liang, Z., Bartley, M., Liu, B., Wang, Q., Smith, N., Stachelek, J., Downing, J., Collins, S., Filstrup, C. T., Schliep, E., Zhou, J., Lottig, N., Gries, C., Stanley, E. H., Tan, P., Shuvo, A., Haite, M. Classification of US lakes as continuous mixtures of geographic archetypes. *Joint Aquatic Sciences Meeting*. Grand Rapids, MI. May 16-20, 2022.

McCullough, I. M., King, K. B. S., Hanly, P. and T. Wagner. Highways and hubs: connectivity for freshwater conservation under climate change. *Ecological Society of America Annual Meeting*. Virtual. Aug 2-6, 2021.

DePalma-Dow, A., **McCullough, I. M.** and J. A. Brentrup. Turning up the heat: long-term climate warming masks wildfire effects on water quality of a hypereutrophic California lake. *Association for the Sciences of Limnology and Oceanography Summer Meeting*. Madison, WI. Jun 7-12, 2020. CANCELED due to COVID-19.

McCullough, I. M., Cheruvellil, K. S., Lapierre, J., Lottig, N. R., Moritz, M. A., Stachelek, J. and P. A. Soranno. A fireside chat: leveraging big data to study fire effects on fresh waters. *Association for the Sciences of Limnology and Oceanography Summer Meeting*. Madison, WI. Jun 7-12, 2020. CANCELED due to COVID-19.

McCullough, I. M., King, K. B. S., Stachelek, J., Diaz, J., K.S. Cheruvellil and P. A. Soranno, No lake left behind: do protected areas facilitate biological connectivity among lakes? *Ecological Society of America Annual Meeting*. Louisville, KY. Aug 11-16, 2019.

McCullough, I. M., Cheruvellil, K. S., Lapierre, J, Liu, B., Lottig, N. R., Moritz, M. A., Stachelek, J., Wang, Q. and P. A. Soranno. Do lakes feel the burn? Effects of fire on North American lake ecosystems. *Ecological Society of America Annual Meeting*. New Orleans, LA. Aug 5-10, 2018.

McCullough, I. M., Cheruvellil, K. S., Collins, S. M. and P. A. Soranno. Geographic patterns of the climate sensitivity of lakes. *Association for the Sciences of Limnology and Oceanography Summer Meeting*. Victoria, Canada. Jun 10-15, 2018.

Davis, F. W., Synes, N. W., Fricker, A. G., Franklin, J., Serra-Diaz, J. M. and **I. M. McCullough**. Seasonally dynamic influence of forest canopy and topography on surface temperatures in California mountain landscapes. *Ecological Society of America Annual Meeting*. Portland, OR. Aug 6-11, 2017.

Dugan, H. A., Bartlett, S. L., Burke, S. M., Krivak-Tetley, F., Doubek, J. P., Skaff, N. K., Summers, J. C., Farrell, K. J., **McCullough, I. M.**, Morales-Williams, A. M., Roberts, D.,

Scordo, F., Yang, Z., Hanson, P. C. and K. C. Weathers. Salting freshwater lakes. *Ecological Society of America Annual Meeting*. Portland, OR. Aug 6-11, 2017.

McCullough, I. M., Davis, F. W. and A. P. Williams. A range of possibilities: geographic variation in climate sensitivity of ponderosa pine. *Ecological Society of America Annual Meeting*. Portland, OR. Aug 6-11, 2017.

Morales-Williams, A., **McCullough, I. M.**, Farrell, K. J., Roberts, D., Scordo, F., Yang, Z., Dugan, H. A., Hanson, P. C., Bartlett, S., Burke, S., Doubek, J. P., Krivak-Tetley, F., Skaff, N. K., Summers, J., Hong, G. and K. C. Weathers. Source or Sink: integrating biogeochemical, trophic and landscape processes to model lake carbon budgets. *Association for the Sciences of Limnology and Oceanography Meeting*. Honolulu, HI. Feb 26-Mar 3, 2017.

McCullough, I. M., Davis, F. W. and A. P. Williams. A range of possibilities: assessing geographic variation in climate sensitivity of ponderosa pine using tree-rings. *Bren PhD Research Symposium*. University of California, Santa Barbara, CA. Feb 24, 2017.

McCullough, I. M., Davis, F. W., Dingman, J. R., Flint, L. E., Flint, A. L., Serra-Diaz, J. M., Syphard, A. D., Moritz, M. A., Hannah, L. and J. Franklin. Mapping climate change exposure in a rugged Mediterranean climate landscape. *Ecological Society of America Annual Meeting*. Fort Lauderdale, FL. Aug 7-12, 2016.

Doubek, J. P., Burke, S. M., Summers, J. C., Bartlett, S. L., Dugan, H. A., Krivak-Tetley, F., Skaff, N. K., Farrell, K. J., **McCullough, I. M.**, Scordo, F., Hanson, P. C. and K. C. Weathers. Cyanobacteria like it hot, nutrient-rich, and a little salty: increased chloride alters phytoplankton and zooplankton community structure in lakes and reservoirs". *Global Lake Ecological Observatory Network All-Hands Meeting*, Gaming, Austria, July 4-9, 2016.

Dugan, H. A., Bartlett, S. L., Burke, S. M., Doubek, J. P., Krivak-Tetley, F., Skaff, N. K., Summers, J. C., Farrell, K. J., **McCullough, I. M.**, Morales-Williams, A. M., Roberts, D., Scordo, F., Yang, Z., Hanson, P. C., and K. C. Weathers. Salting our freshwaters. *Global Lake Ecological Observatory Network All-Hands Meeting*, Gaming, Austria, Jul 4-9, 2016.

Scordo, F., Farrell, K. J., **McCullough, I. M.**, Morales-Williams, A. M., Roberts, D., Yang, Z., Dugan, H. A., Hanson, P. C., Bartlett, S. L., Burke, S. M., Doubek, J. P. Krivak-Tetley, F., N Skaff, N. K., Summers, J. C., Hong, G. and Weathers K. C. Source or sink? Integrating biogeochemical, trophic, and landscape processes to model lake carbon budgets. *Global Lake Ecological Observatory Network All-Hands Meeting*, Gaming, Austria, Jul 4-9, 2016.

McCullough, I. M., Davis, F. W., Dingman, J. R., Flint, L. E., Flint, A. L., Serra-Diaz, J. M., Syphard, A. D., Moritz, M. A., Hannah, L. and J. Franklin. Climate change and conservation: Warming to the task. *Bren PhD Research Symposium*, University of California, Santa Barbara, CA. Feb 19, 2016.

Dugan, H. A., Bartlett, S. L., Burke, S. M., Doubek, J. P., Krivak-Tetley, F., Skaff, N. K., Summers, J. C., Farrell, K. J., **McCullough, I. M.**, Morales-Williams, A. M., Roberts, D., Scordo, F., Yang, Z., Hanson P. C. and K. C. Weathers. Salting our freshwater: A macrosystems study of global chloride patterns and trends in lakes. *American Geophysical Union Meeting*, Dec 14-18, 2015.

Dugan, H. A., Bartlett, S. L., Burke, S. M., Doubek, J. P., Krivak-Tetley, F., Skaff, N. K., Summers, J. C., Farrell, K. J., **McCullough, I. M.**, Morales-Williams A. M., Roberts, D., Scordo, F., Yang, Z., Hanson, P. C. Hong, G. and K. C. Weathers. A macrosystems study of global chloride trends, drivers, and ecological impacts in lakes. *Global Lake Ecological Observatory Network All-Hands Meeting*, Chuncheon, South Korea, Oct 12-16, 2015.

McCullough, I. M., Farrell, K. J., Morales-Williams, A., Roberts, D., Scordo, F., Yang, Z., Dugan, H. A., Hanson, P. C., Bartlett, S. L., Burke, S. M., Doubek, J. P., Krivak-Tetley, F., Skaff, N. K., Summers, J. C., Hong, G. and Weathers, K. C. Source or Sink? Integrating biogeochemical, trophic and landscape processes to model lake carbon budgets under environmental change. *Global Lake Ecological Observatory Network All-Hands Meeting*. Chuncheon, South Korea. Oct 12-16, 2015.

McCullough, I. M., Davis, F. W., Flint, A. L., Flint, L. E. and J. R. Dingman. The last stand? Using tree-rings and downscaled climate models to predict future ponderosa pine growth and distribution near its southern range limit. *Ecological Society of America Annual Meeting*. Baltimore, MD. Aug 9-15, 2015.

Serra-Diaz, J. M., Sweet, L. C., **McCullough, I. M.**, Davis, F. W., Dingman, J. R., Flint, A. L., Flint, L. E., Franklin, J., Hall, A., Hannah, L., Moritz, M. A., Redmond, K., Regan, H. M. and A. D. Syphard. Seedling establishment pulses in California forests: Migration versus potential for local persistence. *Ecological Society of America Annual Meeting*. Baltimore, MD. Aug 9-15, 2015.

McCullough, I. M., Davis, F. W., Flint, A. L., Flint, L. E. and J. R. Dingman. Going out on a limb? How tree-rings can teach us about future forest ecosystems. *Bren PhD Research Symposium*, University of California, Santa Barbara, CA. Feb 20, 2015.

McCullough, I. M., Davis, F. W., Flint, A. L., Flint, L. E. and J. R. Dingman. The last stand? Using tree-rings to forecast the effects of climate change on ponderosa pine at Tejon Ranch, CA. *Ecology, Evolution and Marine Biology Graduate Symposium*, University of California, Santa Barbara, CA. Feb 7, 2015.

Davis, F. W., Sweet, L. C., **McCullough, I. M.** and J. R. Dingman. Landscape dynamics of seedling recruitment microsites for foothill and montane tree species in the Sierra Nevada and Tehachapi Mountains. *Ecological Society of America Annual Meeting*. Sacramento, CA. Aug 10-15, 2014.

McCullough, I. M., Davis, F. W., Dingman, J. R., Flint, A., Flint L. E. and L. Hannah. Mapping potential microrefugia in rugged terrain. *Ecological Society of America Annual Meeting*. Sacramento, CA. Aug 10-15, 2014.

McCullough, I. M., Loftin, C. S. and S. A. Sader. Remote monitoring of regional lake water clarity with satellite imagery: a case study of Maine lakes. *Society for Freshwater Science Annual Meeting*. Louisville, KY. May 20-24, 2012.

McCullough, I. M., Loftin, C. S. and S. A. Sader. Predicting water quality in Maine's lakes by relating field-collected secchi disk transparency depth data with satellite imagery. *Maine Cooperative Fish and Wildlife Research Unit Annual Meeting*. University of Maine, Orono, ME. Mar 20, 2012.

McCullough, I. M., Loftin, C. S. and S. A. Sader. Remote monitoring of regional lake water clarity with satellite imagery. *Maine Water Conference*. Augusta, ME. Mar 14, 2012.

McCullough, I. M., Loftin, C.S. and S. A. Sader. Remote monitoring of lake water clarity with satellite imagery and physical lake parameters. *Student Conference on Conservation Science*. American Museum of Natural History, New York, NY. Oct 11-14, 2011.

McCullough, I. M., Loftin, C. S. and S. A. Sader. Remote monitoring of water clarity of Maine lakes with satellite imagery. *Maine Lakes Conference*. Colby College, Waterville, ME. Jun 25, 2011.

McCullough, I. M., Loftin, C. S. and S. A. Sader. Remote monitoring of water clarity of Maine lakes with satellite imagery. *Maine Cooperative Fish and Wildlife Research Unit Annual Meeting*. University of Maine, Orono, ME. Apr 12, 2011.

McCullough, I. M., Hart, S. E., Homeier, D, Cole, F. R. and P. J. Nyhus. Historic and future residential development in the Belgrade Lakes watershed. *Maine EPSCoR State Conference*. University of Maine, Orono, ME. Nov 8, 2010.

McCullough, I. M., Hart, S. E., Homeier, D., Cole, F. R. and P. J. Nyhus. The Impacts of land use and land cover patterns on phosphorus loading in the Belgrade Lakes. *Maine Lakes Conference*. Colby College, Waterville, ME. Jun 10, 2010.

Workshops Led

Firming up your soft skills: a crash course in team science for ecologists. *Ecological Society of America Annual Meeting*. Portland, OR. Aug 6-11, 2017.

The GLEON Graduate Fellowship Program: insights on a model for team science & interdisciplinary research training. *Ecological Society of America Annual Meeting*. Fort Lauderdale, FL. Aug 7-12, 2017.

Professional Service and Disciplinary Engagement

Student Mentorship

- Advised UCSB Bren School master's student thesis projects from study design to analysis and presentation (2015-2017)
 - *An analysis of wolf-livestock conflict hotspots and conflict reduction strategies in northern California*
 - *Sharing Canada's last frontier: creating a conservation network to ensure continued wildlife connectivity in the Mackenzie River Basin*
- Supervised undergraduate research assistants/independent study (Michigan State University)
 - Lindsie Egedy, spring 2018-present
 - Jessica Díaz Vázquez, fall 2018- present
 - Andrea Paul, summer 2022-spring 2023
 - Emily Wasen, summer 2022-fall 2022

Editorial positions

- Subject Matter Editor – *Ecosphere* (Macrosystems track). 2019-2023

Reviewer

- *Agricultural and Forest Meteorology, BioScience, Earth-Science Reviews, Ecography, Ecological Applications, Ecosphere, Frontiers in Ecology and the Environment, Frontiers in Zoology, Global Change Biology, Global Ecology and Conservation, Heliyon, Inland Waters, International Journal of Remote Sensing, Lake and Reservoir Management, Proceedings of the Royal Society B: Biological Sciences, Remote Sensing of Environment, Science of the Total Environment, Scientific Reports, Water Resources*
- Ecological Society of America annual meeting contributed abstracts (2020, 2021)

Department and University Service

- Committee for Diversity, Equity and Inclusion, Department of Fisheries & Wildlife, Michigan State University (2017-2019)
- Dean's Advisory Council, Bren School of Environmental Science and Management, University of California, Santa Barbara (2016-2017)
- General Directives Committee, Bren School of Environmental Science and Management, University of California, Santa Barbara (2014-2016)
- Colloquium Committee, Bren School of Environmental Science and Management, University of California, Santa Barbara (2013-2014)
- Resident Assistant, University of California, Santa Barbara (2013-2014)
- Seminar Series Committee, Department of Wildlife Ecology, University of Maine (2011)
- Graduate Student Government Representative, University of Maine (2011)
- Head Resident/Community Advisor, Colby College (2008-2010)

Professional Membership

- Ecological Society of America (ESA; 2013-2022)
- Global Lake Ecological Observatory Network (GLEON; 2015-present)
- Association for the Sciences of Limnology and Oceanography (ASLO; 2017-2022)
- International Association for Landscape Ecology – N America (IALE-NA; 2017-2022)

Media Engagement

Press release by University of Minnesota. Wildfires contribute to nutrient-rich, murky water in lakes. Aug 22, 2023. <https://twin-cities.umn.edu/news-events/wildfires-contribute-nutrient-rich-murky-water-lakes>

Press release by Michigan State University College of Agriculture & Natural Resources to announce publication. *Highways and hubs: Helping freshwater wildlife keep up with climate change*. Dec 15, 2022. <https://www.canr.msu.edu/news/highways-and-hubs-helping-freshwater-wildlife-keep-up-with-climate-change>

Press release by Michigan State University College of Agriculture & Natural Resources to announce publication. *How an MSU alum is helping California navigate its water crisis*. Dec 13, 2022. <https://www.canr.msu.edu/news/how-an-msu-alum-is-helping-california-navigate-its-water-crisis>

Press release by Michigan State University College of Agriculture & Natural Resources to announce publication. *MSU researchers catalog 480,000 lakes in the lower 48 states*. Aug 3, 2021. <https://www.canr.msu.edu/news/msu-researchers-catalog-480-000-lakes-in-the-lower-48-states>

Announcement by Michigan State University College of Agriculture & Natural Resources of award for Outstanding Paper in Landscape Ecology from the International Association for Landscape Ecology, North America. Jul 21, 2020. <https://www.canr.msu.edu/news/fisheries-and-wildlife-postdoc-earns-award-for-outstanding-paper-in-landscape-ecology>

Press release by Michigan State University College of Agriculture & Natural Resources to announce publication. *Citizen scientists make a big impact on big data*. Oct 30, 2019. <https://www.canr.msu.edu/news/citizen-scientists-make-big-impact-on-big-data>

Press release by Michigan State University College of Agriculture & Natural Resources to announce publication. *US protected areas do not meet international conservation targets for lakes*. Oct 21, 2019. <https://www.canr.msu.edu/news/u-s-protected-areas-do-not-meet-international-conservation-targets-for-lakes>

Press release by Michigan State University College of Agriculture & Natural Resources to announce publication. *Does protecting land help freshwater species?* Oct 4, 2019. <https://www.canr.msu.edu/news/does-protecting-land-help-freshwater-species>

Press release by Michigan State University College of Agriculture & Natural Resources to announce publication. *Feeling the burn: Wildfires increasingly threaten US lakes*. Jul 15, 2019. <https://www.canr.msu.edu/news/feeling-the-burn-wildfires-increasingly-threaten-us-lakes>

Press release by Michigan State University College of Agriculture & Natural Resources to announce publication. *New MSU research suggests not all lakes respond to same to climate*

change. Jan 11, 2019. <https://www.canr.msu.edu/news/new-msu-research-suggests-not-all-lakes-respond-the-same-to-climate-change>

Press release by Cary Institute of Ecosystem Studies to announce publication. *North America's freshwater lakes are getting saltier*. Apr 10, 2017. <http://www.caryinstitute.org/newsroom/north-americas-freshwater-lakes-are-getting-saltier>

Interviewed by Maine Public Broadcasting Network for the radio show *Maine Things Considered*. Sep 13, 2013. <https://umaine.edu/news/blog/2013/09/13/former-umaine-researcher-talks-to-mpbn-about-water-clarity-study/>

Public Outreach and Engagement

Using tree rings to learn about future forests. Warm Springs Elementary (Grade 6). Fremont, CA. Feb 14, 2018. (virtual)

Fire and climate change in California's forests. Warm Springs Elementary (Grade 6). Fremont, CA. Jan 11, 2017. (virtual)

California's forests and climate change. Warm Springs Elementary (Grade 6). Fremont, CA. Feb 11, 2016. (virtual)

What is biogeography? St. Columbkille Partnership School (Grade 6). Brighton, MA. Oct 21, 2015. (virtual)

Integrating citizen science and satellite-based remote sensing for monitoring of Maine's lakes. Maine Volunteer Lake Monitoring Program, annual meeting. Turner, ME. Jul 21, 2012.

A watershed analysis of Salmon Lake and McGrath Pond. Salmon Lake and McGrath Pond Association. Rome, ME. Aug 3, 2010.

Theses

PhD: Exposure and sensitivity of ponderosa pine to climate change in mountainous western North American landscapes (2017, University of California, Santa Barbara)

MS: Remote estimation of regional lake clarity with Landsat TM and MODIS satellite imagery (2012. University of Maine)

BA: The impacts of land use and development patterns on water quality of the Belgrade Lakes (2010, Colby College)