

Hilary A Dugan

Curriculum Vitae
March 2022

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Center for Limnology,
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Research interests

Lakes; landscape limnology; salt; polar environments; carbon cycling; watershed modeling; lake ice; geophysical surveys; long-term changes in lake function; high-frequency sensor data; data science/machine learning

Employment and education

Professional appointments

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| 2018– | Assistant Professor | Department of Integrative Biology, Center for Limnology University of Wisconsin-Madison |
| 2014–2017 | Postdoctoral Researcher | Center for Limnology, University of Wisconsin-Madison |
| 2014–2016 | Postdoctoral Researcher | Cary Institute of Ecosystem Studies |

Education

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|------|-------------|-----------------------------------|----------------------------------|
| 2008 | B.Sc.(Hons) | Queen's University | Geography/Biology |
| 2010 | M.Sc | Queen's University | Geography |
| 2014 | Ph.D. | University of Illinois at Chicago | Earth and Environmental Sciences |

Publications

Refereed research papers

1. Cunillera-Montcusí, D, Beklioglu, M, Cañedo-Argüelles, M, Jeppesen, E, Ptacnik, R, Amorim, CA, Arnott, SE, Berger, SA, Brucet, S, Dugan, HA, Gerhard, M, Horváth, Z, Langenheder, S, Nejstgaard, JC, Reinikainen, M, Striebel, M, Urrutia-Cordero, P, Vad, CF, Zadereev, E, & Matias, M. (2022). Freshwater salinisation: A research agenda for a saltier world. *Trends in Ecology & Evolution*. <https://doi.org/10.1016/j.tree.2021.12.005>
2. Castendyk, DN, Dugan, HA, Gallagher, HA, Pujara, N, Doran, PT, Priscu, JC, & Lyons, WB. (2022). Barotropic seiches in a perennially ice-covered lake, East Antarctica. *Limnology and Oceanography Letters*, 7(1), 26–33. <https://doi.org/10.1002/lol2.10226>
3. Gorsky, AL, Lottig, NR, Stoy, PC, Desai, AR, & Dugan, HA. (2021). The Importance of Spring Mixing in Evaluating Carbon Dioxide and Methane Flux From a Small North-Temperate Lake in Wisconsin, United States. *Journal of Geophysical Research: Biogeosciences*, 126(12). <https://doi.org/10.1029/2021jg006537>
4. Dugan, HA, Rock, LA, Kendall, AD, & Mooney, RJ. (2021). Tributary chloride loading into Lake Michigan. *Limnology and Oceanography Letters*. <https://doi.org/10.1002/lol2.10228>
5. Cavaliere, E, Fournier, IB, Hazuková, V, Rue, GP, Sadro, S, Berger, SA, Cotner, JB, Dugan, HA, Hampton, SE, Lottig, NR, McMeans, BC, Ozersky, T, Powers, SM, Rautio, M, & O'Reilly, CM. (2021). The Lake Ice Continuum Concept: Influence of Winter Conditions on Energy and Ecosystem Dynamics. *Journal of Geophysical Research: Biogeosciences*, 126(11). <https://doi.org/10.1029/2020jg006165>
6. Ladwig, R, Rock, LA, & Dugan, HA. (2021). Impact of salinization on lake stratification and spring mixing. *Limnology and Oceanography Letters*. <https://doi.org/10.1002/lol2.10215>
7. Moore, TN, Mesman, JP, Ladwig, R, Feldbauer, J, Olsson, F, Pilla, RM, Shatwell, T, Venkiteswaran, JJ, Delany, AD, Dugan, H, Rose, KC, & Read, JS. (2021). LakeEnsemblR: An R package that facilitates ensemble modelling of lakes. *Environmental Modelling & Software*, 143, 105101. <https://doi.org/10.1016/j.envsoft.2021.105101>
8. Myers, KF, Doran, PT, Tulaczyk, SM, Foley, NT, Bording, TS, Auken, E, Dugan, HA, Mikucki, JA, Foged, N, Grombacher, D, & Virginia, RA. (2021). Thermal legacy of a large paleolake in Taylor Valley, East Antarctica, as evidenced by an airborne electromagnetic survey. *The Cryosphere*, 15(8), 3577–3593. <https://doi.org/10.5194/tc-15-3577-2021>
9. Dugan, HA. (2021). A Comparison of Ecological Memory of Lake Ice-Off in Eight North-Temperate Lakes. *Journal of Geophysical Research: Biogeosciences*, 126(6). <https://doi.org/10.1029/2020jg006232>

10. Grombacher, D, Auken, E, Foged, N, Bording, T, Foley, N, Doran, PT, Mikucki, J, Dugan, HA, Garza-Giron, R, Myers, K, Virginia, RA, & Tulaczyk, S. (2021). Induced polarization effects in airborne transient electromagnetic data collected in the McMurdo Dry Valleys, Antarctica. *Geophysical Journal International*, 226(3), 1574–1583. <https://doi.org/10.1093/gji/ggab148>
11. Topp, SN, Pavelsky, TM, Dugan, HA, Yang, X, Gardner, J, & Ross, MRV. (2021). Shifting Patterns of Summer Lake Color Phenology in Over 26,000 US Lakes. *Water Resources Research*, 57(5). <https://doi.org/10.1029/2020wr029123>
12. Dugan, HA, & Rock, LA. (2021). The slow and steady salinization of Sparkling Lake, Wisconsin. *Limnology and Oceanography Letters*. <https://doi.org/10.1002/lol2.10191>
13. Jones, JA, Groffman, PM, Blair, J, Davis, FW, Dugan, H, Euskirchen, EE, Frey, SD, Harms, TK, Hinckley, E, Kosmala, M, Loberg, S, Malone, S, Novick, K, Record, S, Rocha, AV, Ruddell, BL, Stanley, EH, Sturtevant, C, Thorpe, A, White, T, Wieder, WR, Zhai, L, & Zhu, K. (2021). Synergies Among Environmental Science Research and Monitoring Networks: A Research Agenda. *Earth's Future*, 9(3). <https://doi.org/10.1029/2020ef001631>
14. Yang, B, Wells, MG, McMeans, BC, Dugan, HA, Rusak, JA, Weyhenmeyer, GA, Brenttrup, JA, Hrycik, AR, Laas, A, Pilla, RM, Austin, JA, Blanchfield, PJ, Carey, CC, Guzzo, MM, Lottig, NR, MacKay, MD, Middel, TA, Pierson, DC, Wang, J, & Young, JD. (2021). A New Thermal Categorization of Ice-Covered Lakes. *Geophysical Research Letters*, 48(3). <https://doi.org/10.1029/2020gl091374>
15. Meyer, MF, Ladwig, R, Dugan, HA, Anderson, A, Bah, AR, Boehrer, B, Borre, L, Chapina, RJ, Doyle, C, Favot, EJ, Flaim, G, Forsberg, P, Hanson, PC, Ibelings, BW, Isles, P, Lin, F-P, Lofton, D, Moore, TN, Peel, S, Peters, JA, Pierson, D, Domis, LNS, Schloss, JA, Shikhani, M, Smagula, AP, Stockwell, JD, Thomas, P, Thomas, RQ, Tietjen, T, & Weathers, KC. (2021). Virtual Growing Pains: Initial Lessons Learned from Organizing Virtual Workshops, Summits, Conferences, and Networking Events during a Global Pandemic. *Limnology and Oceanography Bulletin*, 30(1), 1–11. <https://doi.org/10.1002/lob.10431>
16. Ladwig, R, Hanson, PC, Dugan, HA, Carey, CC, Zhang, Y, Shu, L, Duffy, CJ, & Cobourn, KM. (2021). Lake thermal structure drives interannual variability in summer anoxia dynamics in a eutrophic lake over 37 years. *Hydrology and Earth System Sciences*, 25(2), 1009–1032. <https://doi.org/10.5194/hess-25-1009-2021>
17. Hanson, PC, Stillman, AB, Jia, X, Karpatne, A, Dugan, HA, Carey, CC, Stachelek, J, Ward, NK, Zhang, Y, Read, JS, & Kumar, V. (2020). Predicting lake surface water phosphorus dynamics using process-guided machine learning. *Ecological Modelling*, 430, 109136. <https://doi.org/10.1016/j.ecolmodel.2020.109136>
18. Dugan, HA, Skaff, NK, Doubek, JP, Bartlett, SL, Burke, SM, Krivak-Tetley, FE, Summers, JC, Hanson, PC, & Weathers, KC. (2020). Lakes at Risk of Chloride Contamination. *Environmental Science & Technology*, 54(11), 6639–6650. <https://doi.org/10.1021/acs.est.9b07718>
19. Weng, W, Boyle, KJ, Farrell, KJ, Carey, CC, Cobourn, KM, Dugan, HA, Hanson, PC, Ward, NK, & Weathers, KC. (2020). Coupling Natural and Human Models in the Context of a Lake Ecosystem: Lake Mendota, Wisconsin, USA. *Ecological Economics*, 169, 106556. <https://doi.org/10.1016/j.ecolecon.2019.106556>
20. Shannon, TP, Ahler, SJ, Mathers, A, Ziter, CD, & Dugan, HA. (2020). Road salt impact on soil electrical conductivity across an urban landscape. *Journal of Urban Ecology*, 6(1). <https://doi.org/10.1093/jue/juaa006>
21. Helmueller, G, Magnuson, JJ, & Dugan, HA. (2019). Spatial and Temporal Patterns of Chloride Contamination in a Shallow, Urban Marsh. *Wetlands*, 40(3), 479–490. <https://doi.org/10.1007/s13157-019-01199-y>
22. Foley, N, Tulaczyk, S, Auken, E, Grombacher, D, Mikucki, J, Foged, N, Myers, K, Dugan, H, Doran, PT, & Virginia, RA. (2019). Mapping geothermal heat flux using permafrost thickness constrained by airborne electromagnetic surveys on the western coast of Ross Island, Antarctica. *Exploration Geophysics*, 51(1), 84–93. <https://doi.org/10.1080/08123985.2019.1651618>
23. Foley, N, Tulaczyk, SM, Grombacher, D, Doran, PT, Mikucki, J, Myers, KF, Foged, N, Dugan, H, Auken, E, & Virginia, R. (2019). Evidence for Pathways of Concentrated Submarine Groundwater Discharge in East Antarctica from Helicopter-Borne Electrical Resistivity Measurements. *Hydrology*, 6(2), 54. <https://doi.org/10.3390/hydrology6020054>
24. Duffy, CJ, Dugan, HA, & Hanson, PC. (2018). The age of water and carbon in lake-catchments: A simple dynamical model. *Limnology and Oceanography Letters*, 3(3), 236–245.
25. Reed, DE, Dugan, HA, Flannery, AL, & Desai, AR. (2018). Carbon sink and source dynamics of a eutrophic deep lake using multiple flux observations over multiple years. *Limnology and Oceanography Letters*, 3(3), 285–292.
26. Mantzouki, E, Beklioglu, M, Brookes, J, Senerpont Domis, LN de, Dugan, HA, Doubek, JP, Grossart, H-P, Nejstgaard, JC, Pollard, AI, Ptacnik, R, & Others. (2018). Opinion: Snapshot surveys for lake monitoring, more than a shot in the dark. *Frontiers in Ecology and Evolution*, 6, 201.

27. Engel, F, Farrell, KJ, McCullough, IM, Scordo, F, Denfeld, BA, Dugan, HA, Eyto, E de, Hanson, PC, McClure, RP, Nöges, Pothers. (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(3-4), 25.
28. McCullough, IM, Dugan, HA, Farrell, KJ, Morales-Williams, AM, Ouyang, Z, Roberts, D, Scordo, F, Bartlett, SL, Burke, SM, Doubek, J, Pothers. (2018). Dynamic modeling of organic carbon fates in lake ecosystems. *Ecological Modelling*, 386, 71–82.
29. Cobourn, KM, Carey, CC, Boyle, KJ, Duffy, C, Dugan, HA, Farrell, KJ, Fitchett, L, Hanson, PC, Hart, JA, Henson, V, Rothers. (2018). From concept to practice to policy: Modeling coupled natural and human systems in lake catchments. *Ecosphere*, 9(5), e02209.
30. Ward, NK, Fitchett, L, Hart, JA, Shu, L, Stachelek, J, Weng, W, Zhang, Y, Dugan, H, Hetherington, A, Boyle, K, Pothers. (2018). Integrating fast and slow processes is essential for simulating human–freshwater interactions. *Ambio*, 1–14.
31. Dugan, HA, Helmueller, G, & Magnuson, JJ. (2017). Ice formation and the risk of chloride toxicity in shallow wetlands and lakes. *Limnology and Oceanography Letters*, 2(5), 150–158. <https://doi.org/10.1002/lol2.10045>
32. Dugan, HA, Summers, JC, Skaff, NK, Krivak-Tetley, FE, Doubek, JP, Burke, SM, Bartlett, SL, Arvola, L, Jarjanazi, H, Korponai, J, Kleeberg, A, Monet, G, Monteith, D, Moore, K, Rogora, M, Hanson, PC, & Weathers, KC. (2017). Long-term chloride concentrations in North American and European freshwater lakes. *Scientific Data*, 4(1). <https://doi.org/10.1038/sdata.2017.101>
33. Dugan, HA, Bartlett, SL, Burke, SM, Doubek, JP, Krivak-Tetley, FE, Skaff, NK, Summers, JC, Farrell, KJ, McCullough, IM, Morales-Williams, AM, Roberts, DC, Ouyang, Z, Scordo, F, Hanson, PC, & Weathers, KC. (2017). Salting our freshwater lakes. *Proceedings of the National Academy of Sciences*, 114(17), 4453–4458. <https://doi.org/10.1073/pnas.1620211114>
34. Read, EK, Carr, L, Cicco, LD, Dugan, HA, Hanson, PC, Hart, JA, Kreft, J, Read, JS, & Winslow, LA. (2017). Water quality data for national-scale aquatic research: The Water Quality Portal. *Water Resources Research*, 53(2), 1735–1745. <https://doi.org/10.1002/2016wr019993>
35. Snorheim, CA, Hanson, PC, McMahon, KD, Read, JS, Carey, CC, & Dugan, HA. (2017). Meteorological drivers of hypolimnetic anoxia in a eutrophic, north temperate lake. *Ecological Modelling*, 343, 39–53.
36. Ruan, G, Hanson, PC, Dugan, HA, & Plale, B. (2017). Mining lake time series using symbolic representation. *Ecological informatics*, 39, 10–22.
37. Lewis, T, Lamoureux, SF, Normandeau, A, & Dugan, HA. (2017). Hyperpycnal flows control the persistence and flushing of hypoxic high-conductivity bottom water in a High Arctic lake. *Arctic Science*, 4(1), 25–41.
38. Dugan, HA, Iestyn Woolway, R, Santoso, AB, Corman, J, Jaimes, A, Nodine, ER, Patil, VP, Zwart, J, Brentrup, JA, Hetherington, AL, Oliver, SK, Read, JS, Winters, KM, Hanson, PC, Read, EK, Winslow, L, & Weathers, KC. (2016). Consequences of gas flux model choice on the interpretation of metabolic balance across 15 lakes. *Inland Waters*, 6(4). <https://doi.org/10.5268/IW-6.4.836>
39. Winslow, LA, Zwart, JA, Batt, RD, Dugan, HA, Woolway, RI, Corman, JR, Hanson, PC, & Read, JS. (2016). LakeMetabolizer: An R package for estimating lake metabolism from free-water oxygen using diverse statistical models. *Inland Waters*, 6(4), 622–636.
40. Read, EK, Patil, VP, Oliver, SK, Hetherington, AL, Brentrup, JA, Zwart, JA, Winters, KM, Corman, JR, Nodine, ER, Woolway, RI, Dugan, HA, Jaimes, A, Santoso, AB, Hong, GS, Winslow, LA, Hanson, PC, & Weathers, KC. (2015). The importance of lake-specific characteristics for water quality across the continental United States. *Ecological Applications*, 25(4), 943–955.
41. Dugan, HA, Doran, PT, Wagner, B, Kenig, F, Fritsen, CH, Arcone, SA, Kuhn, E, Ostrom, NE, Warnock, JP, & Murray, AE. (2015). Stratigraphy of Lake Vida, Antarctica: Hydrologic implications of 27 m of ice. *Cryosphere*, 9(2), 439–450.
42. Dugan, HA, Doran, PT, Tulaczyk, S, Mikucki, JA, Arcone, SA, Auken, E, Schamper, C, & Virginia, RA. (2015). Subsurface imaging reveals a confined aquifer beneath an ice-sealed Antarctic lake. *Geophysical Research Letters*, 42(1), 96–103.
43. Dugan, HA, Arcone, SA, Obryk, MK, & Doran, PT. (2015). High-resolution ground-penetrating radar profiles of perennial lake ice in the McMurdo Dry Valleys, Antarctica: Horizon attributes, unconformities, and subbottom penetration. *Geophysics*, 81(1), WA13–WA20.
44. Mikucki, JA, Auken, E, Tulaczyk, S, Virginia, RA, Schamper, C, Sørensen, KI, Doran, PT, Dugan, H, & Foley, N. (2015). Deep groundwater and potential subsurface habitats beneath an Antarctic dry valley. *Nature Communications*, 6.
45. Foley, N, Tulaczyk, S, Auken, E, Schamper, C, Dugan, H, Mikucki, J, Virginia, R, & Doran, P. (2015). Helicopter-borne transient electromagnetics in high-latitude environments: An application in the McMurdo Dry Valleys, Antarctica. *Geophysics*, 81(1), WA87–WA99.

46. Winslow, LA, Dugan, HA, Buelow, HN, Cronin, KD, Priscu, JC, Takacs-Vesbach, C, & Doran, PT. (2014). Autonomous year-round sampling and sensing to explore the physical and biological habitability of permanently ice-covered antarctic lakes. *Marine Technology Society Journal*, 48(5), 8–17.
47. Dugan, HA, Obryk, MK, & Doran, PT. (2013). Lake ice ablation rates from permanently ice-covered Antarctic lakes. *Journal of Glaciology*, 59(215), 491–498.
48. Dugan, HA, Lamoureux, SF, Lewis, T, & Lafrenière, MJ. (2012). The Impact of Permafrost Disturbances and Sediment Loading on the Limnological Characteristics of Two High Arctic Lakes. *Permafrost and Periglacial Processes*, 23(2), 119–126.
49. Dugan, HA, Gleeson, T, Lamoureux, SF, & Novakowski, K. (2012). Tracing groundwater discharge in a High Arctic lake using radon-222. *Environmental Earth Sciences*, 66(5), 1385–1392.
50. Dugan, HA, & Lamoureux, SF. (2011). The chemical development of a hypersaline coastal basin in the High Arctic. *Limnology and Oceanography*, 56(2), 495–507.
51. Dugan, HA, Lamoureux, SF, Lafrenière, MJ, & Lewis, T. (2009). Hydrological and sediment yield response to summer rainfall in a small high Arctic watershed. *Hydrological Processes*, 23(10), 1514–1526.

Book chapters

1. Hanson, PC, Weathers, KC, Dugan, HA, & Gries, C. (2018). The global lake ecological observatory network. in F. Recknagel & W. Michener (eds.), *Ecological informatics: Data management and knowledge discovery* (pp. 415–433). Springer.
- Forthcoming (2022?). “Salinity in Inland Waters.” Chapter 12 in Wetzel, RG *Limnology. Lake and River Ecosystems*; Academic Press: San Diego, 4th Edition. Eds: John Smol and Ian Jones.

R-packages

1. Moore, T, Mesman, J, Ladwig, R, Feldbauer, J, Read, JS, Pilla, R, Dugan, H, & more. (2020). Run ensemble of lake models in R: Package LakeEnsemblR. in *GitHub repository*. GitHub. <https://github.com/aemon-j/LakeEnsemblR>
2. Winslow, L, Read, J, Dugan, H, & Ladwig, R. (2019). *GLM3r: A general lake model (GLM) base package* (version 3.1.16) [Computer software]. <https://github.com/GLEON/GLM3r>
3. Winslow, L, Zwart, J, Batt, R, Corman, J, Dugan, H, Hanson, P, Holtgrieve, G, Jaimes, A, Read, J, & Woolway, R. (2014). *LakeMetabolizer: Tools for the analysis of ecosystem metabolism* (version 1.5) [Computer software]. <http://cran.r-project.org/web/packages/LakeMetabolizer/index.htm>

Proceedings

1. Gil, Y, Michel, F, Ratnakar, V, Read, J, Hauder, M, Duffy, C, PC Hanson, & Dugan, H. (2015). *Supporting open collaboration in science through explicit and linked semantic description of processes*.

Grants

Award total to UW-Madison (+ total award amount)

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|-----------|--|--------------------------|
| 2022–2027 | Lead-PI. “CAREER: Expanding Our Understanding of Freshwater Salinization Through Data-Driven Limnology”. <i>Funding from NSF Division Of Environmental Biology</i> . Collaborators: None. | \$902,621 |
| 2021–2027 | Co-PI. “LTER: Comparative Study of a Suite of Lakes in Wisconsin”. <i>Funding from NSF Division Of Environmental Biology</i> . Collaborators: Emily Stanley (lead PI) + 10 coPIs. | \$7,680,000 |
| 2021–2023 | Co-PI. “Understanding landscape-scale patterns in winter conditions in the Upper Mississippi River System”. <i>Funding from USGS CESU</i> . Collaborators: Kathi-Jo Jankowski (lead PI), Becky Kreiling, Madeline Magee. | \$99,878 |
| 2021–2023 | Lead-PI. “Climate, Storms, and the Drivers of Cyanobacteria Blooms in Lake Superior”. <i>Funding from USGS Midwest Climate Adaptation Science Center</i> . Collaborators: Bob Sterner, Kathryn Schreiner, Byron Steinman. | \$169,971 (\$475,230) |
| 2020–2021 | Co-PI. “Workshop: Integrating remote sensing, in situ, and physically-based modeling approaches to understand global lake ice dynamics”. <i>Funding from NSF Division of Environmental Biology</i> . Collaborators: Catherine O’Reilly (lead PI), Tamlin Pavelsky, Sapna Sharma. | \$0 (\$45,353) |

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| 2019–2025 | Co-PI. “Host of Northeast Climate Adaptation Science Center”. <i>Funding from USGS Climate Adaptation Science Center</i> . Collaborators: Lead Institution: UMASS. | \$328,450 (\$6,383,605) |
| 2019–2021 | Lead-PI. “The ecosystem ecology of lake ice loss in north-temperate lakes”. <i>Funding from NSF Division Of Environmental Biology</i> . Collaborators: Noah Lottig. | \$199,945 |
| 2019–2021 | Lead-PI. “Full season science in the northwoods”. <i>Funding from University of Wisconsin-Madison, UW2020</i> . Collaborators: Noah Lottig. | \$188,908 |
| 2019–2021 | Co-PI. “Knowledge Guided Machine Learning: A Framework for Accelerating Scientific Discovery”. <i>Funding from NSF Office of Advanced Cyberinfrastructure</i> . Collaborators: Vipin Kumar (lead PI), Michael Steinbach, Aidong Zhang, Imme Ebert-Uphoff, Elizabeth Barnes, Kevin Janes, Paul Hanson, Christopher Duffy, John Nieber. | \$165,250 (\$933,890) |
| 2018–2021 | Lead-PI. “ABI Development: Building advanced numerical simulation technology for the lake ecology community”. <i>Funding from NSF Advances in Biological Informatics, Division of Biological Infrastructure</i> . Collaborators: Paul Hanson. | \$470,000 |
| 2018–2020 | Co-PI. “National-Scale Freshwater Research through Data Science”. <i>Funding from University of Wisconsin-Madison, Data Science Initiative</i> . Collaborators: Paul Hanson (lead PI), AnHai Doan. | \$249,000 |
| 2017–2020 | Co-PI. “ANTarctic Airborne ElectroMagnetics (ANTAEM): Revealing Subsurface Water in Coastal Antarctica”. <i>Funding from NSF Antarctic Research, Antarctic Integrated System Science</i> . Collaborators: Slawek Tulaczyk (lead PI), Jill Mikucki, Peter Doran, Ross Virginia. | \$65,725 (\$959,779) |

Honours and awards

Fellowships and Symposia

- 2015 New Generation of Polar Researchers Symposium
- 2013 GLEON Graduate Student Fellowship
- 2010 IPY International Polar Field School

Select Awards

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| 2014–2010 | University of Illinois at Chicago University Fellowship | \$40,000 |
| 2012–2010 | NSERC Alexander Graham Bell Canadian Graduate Scholarship (accepted PGS) | \$42,000 |
| 2010– | Antarctic Science International Bursary | \$4,900 |
| 2010– | ArcticNet Training Fund Award | \$1,900 |
| 2010–2008 | NSERC Alexander Graham Bell Canadian Graduate Scholarship | \$42,000 |
| 2008– | Ontario Graduate Scholarship (Declined) | |
| 2008– | Nortek Student Equipment Grant | |
| 2008– | NSERC Undergraduate Student Research Award (USRA) | |
| 2008– | Queen’s University Tri-Council Award | |
| 2008– | Queen’s University Medal in Geography | |

Conference Awards

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| 2010 | XXXII SCAR Meeting | Best Poster |
| 2010 | Canadian Geophysical Union (CGU) Annual Meeting | Runner-up Best Student Talk |
| 2008 | Canadian Geophysical Union (CGU) Annual Meeting | Campbell Scientific Best Poster Award |

Invited Academic Talks

- 2021-Dec "The impact of road salt on our freshwaters". University of Minnesota Conservation Science Seminar.
- 2021-Sep "Salinization of our freshwater ecosystems". Alberta Lake Management Society (Virtual).
- 2020-Dec "Chloride pollution in freshwater lakes". Society of Canadian Limnologists (Virtual).
- 2020-Nov "Phenological Whiplash". Universite du Quebec a Montreal (Virtual).
- 2020-Oct "Salinization". AQUACOSMplus webinar series: Salinization of freshwater ecosystems (Virtual).
- 2020-Sep "Phenological Whiplash". Northeast Climate Adaptation Science Center Seminar Series (Virtual).
- 2020-Mar "Freshwater is the bestwater". CWEST Distinguished Speaker, University of Colorado, Boulder, CO.
- 2020-Mar "Salinization of our freshwater ecosystems". Dept of Forestry and Wildlife Ecology, University of Wisconsin-Madison.
- 2020-Mar "Chloride contamination across a 17-state area". Michigan Inland Lakes Partnership (Virtual).
- 2019-Mar "Reconsidering groundwater in Antarctic limnology". Northwestern University, Evanston, IL.
- 2019-Feb "Reconsidering groundwater in Antarctic limnology". Dept of Geosciences, University of Wisconsin-Madison.
- 2018-Oct "The ecology of lake ice loss". Wisconsin Ecology Symposium, University of Wisconsin-Madison.
- 2018-Feb "Chloride, concrete, and the state of our lakes". Dept of Geography, University of Wisconsin-Madison.
- 2017-Dec "Groundwater in Antarctica". Center for Limnology, University of Wisconsin-Madison.
- 2014-Nov "Where is the water in a Dry Valley? A geophysical investigation of groundwater in Antarctica". Queen's University, Kingston, ON.
- 2011-Apr "The formation of Lake Vida". U.S. Army Cold Regions Research and Engineering Laboratory (CRREL).

Teaching

University of Wisconsin-Madison

- Zoology 101: Animal Biology (Ecology and Evolution: 3 weeks)
 - Fall 2020: 755 students
- Zoology 315: Conservation of Aquatic Resources Zoology and Environmental Studies
 - Fall 2018: 2 credits, 122 students
 - Fall 2019: 2 credits, 92 students
 - Fall 2020: 2 credits, 92 students
 - Fall 2021: 2 credits, 108 students
- Zoology 400: Ecological Data
 - Fall 2021: 3 credits, 15 students (undergrad + grad)
- Zoology 955:
 - Spring 2018: 1 credit, 9 students
 - * Introduction to spatial analysis and GIS in R (<https://github.com/hdugan/Zoo955>)
 - Fall 2019: 1 credit, 11 students
 - * An introduction to lake modeling
 - Spring 2020: 1 credit, 7 students
 - * Aquatic sensor technology and implementation

Guest Lectures

- 2020-March "Lake Mendota, the best studied lake in the world". ENV ST 101, University of Wisconsin-Madison.

Professional Development

- Madison Teaching and Learning Excellence Program (2019-2020)
 - Two-semester program in teaching that helps early-career faculty succeed with personalized support from a cross-disciplinary community of peers and teaching and learning experts
- EDSIN workshop on Culturally Relevant Education in Environmental Data Science (2021)

Professional service and other appointments

Service

- 2018 - Present: Water@UW executive committee member
- 2019 - Present: Wisconsin Salt Wise member
- 2019 - Present: University of Wisconsin-Madison Faculty Senate representative
- 2019 - Present: WICCI (Wisconsin Initiative on Climate Change Impact) Science Advisory Board

- 2021: WISE freshman faculty dinner

Society Memberships

- ASLO, GLEON, AGU

Reviewer

- NASA Habitable Worlds
- National Science Foundation (NSF) Office of Polar Programs
- National Science Foundation (NSF) Division of Environmental Biology
- National Science Foundation (NSF) Graduate Research Fellowship Program
- United States Environmental Protection Agency (EPA)
- Mitacs Canada
- Italian Antarctic Committee
- Annals of Glaciology, Applied Ecology, Applied Geochemistry, Bioscience, Ecosphere, Geophysical Research Letters, Inland Waters, Journal of Hydrology, Limnology and Oceanography, Limnology and Oceanography Letters, Nature Geoscience, Nature Sustainability, PNAS, Sedimentology, Water Resources, Water Resources Research Management
- University of Wisconsin - Hatch Proposals
- University of Wisconsin - Graduate Women in Science Ruth Dickie Scholarship
- 2015 and 2016 Hudson Data Jam Competition Judge (Grades 6-12)

Other

Analyst for the Canadian Polar Commission (2015)

- Provided analytical support to produce a Results Bulletin of long-term scientific monitoring in northern Canada

Developed workshop series on Gender, Workplace Climate, and Limnology (2015)

- Successful grant application to Women in Science and Engineering Leadership Institute at UW-Madison (\$1500)

Outreach and broader impacts

Hosted Workshops

- 2020 Workshop on Knowledge Guided Machine Learning. University of Minnesota, Virtual Meeting
- 2020 Process-based lake modeling in R using GLM (General Lake Model). GLEON 21.5, Virtual Meeting
- 2019 The General Lake Model: Introduction to modeling in R. GLEON 21 Meeting, Ontario, Canada
- 2018 A new paradigm in lake and reservoir research and management through global monitoring, modeling, and engaging and empowering people networks. Alexandria, Virginia
- 2017 Calibration workflows for General Lake Model users. University of Wisconsin-Madison
- 2016 Doing the most with your data: Processing, products, metadata and web applications. GLEON 18 Meeting, Gaming, Austria
- 2015 How to Build a Dynamic Model in R. GLEON 17 Meeting, Chuncheon, South Korea
- 2015 General Lake Model workshop: calibration and simulations. University of Wisconsin-Madison
- 2014 The Age of Carbon and Water in the Lake Catchment System. GLEON 16 Meeting, Orford, Quebec

Media and Public Talks

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| 2022-Mar | UW-Madison Wednesday Nite at the Lab | Topic: Salinization |
| 2022-Mar | Badger Talk: The Atkinson Club, Jefferson County | Topic: Salinization |
| 2022-Feb | Interviewed: AGU EOS | Topic: Chloride Pollution |
| 2022-Feb | Interviewed: USA Today | Topic: Chloride Pollution |
| 2022-Feb | Interviewed: Badger Herald | Topic: Chloride Pollution |
| 2022-Feb | Live Interview: Wisconsin Public Radio Morning Show: Discussion on road salt solutions in Wisconsin | Topic: Chloride Pollution |
| 2021-Nov | Accuweather Segment | Topic: Salinization of freshwater |
| 2021-Oct | Midvale Sunday Adult Forum | Topic: Salinization |
| 2021-Oct | Wisconsin Science Festival Big Ideas for Busy People | Topic: Lakes and climate change |
| 2021-Sep | Live Interview: WORT Public Radio | Topic: What's new in Limnology |
| 2021-Feb | Live Interview: Wisconsin Public Radio Morning Show: Discussion on road salt solutions in Wisconsin | Topic: Chloride Pollution |
| 2021-Jan | Wi Salt Wise: Salt Awareness Week | Topic: Salinization |

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| 2021-Jan | Interviewed: WORT Public Radio | Topic: Local |
| 2021-Jan | Interviewed: WXPR | Topic: Winter Limnology |
| 2020-Aug | Magazine article: Environmental Monitor | Topic: Salinization |
| 2020-Jun | Podcast Interview: The Story of Nitrogen | Topic: Salinization |
| 2020-Jan | Interviewed: WXPR | Topic: Chloride Pollution |
| 2020-Jan | Interviewed: Channel 3000 | Topic: Chloride Pollution |
| 2020-Jan | Interviewed: WXPR | Topic: Lake ice |
| 2019-Dec | Speaker: Badger Café, Milwaukee, WI | Topic: Chloride Pollution |
| 2019-Dec | Interviewed: USA Today | Topic: Chloride Pollution |
| 2019-Nov | Panelist and Speaker: Lake Science for Muskoka: A global perspective on problems and solutions. Canada | Topic: Chloride Pollution |
| 2019-Nov | Speaker: Caring for Creation Lecture Series, Bethel Lutheran Church, Madison WI | Topic: Chloride Pollution |
| 2019-Nov | Live Interview: Wisconsin Public Radio Morning Show: Discussion on road salt solutions in Wisconsin | Topic: Chloride Pollution |
| 2019-Nov | Interviewed: Wall Street Journal: "In Effort to Avoid Rock Salt, States Look to Briny Solutions" | Topic: Chloride Pollution |
| 2019-Oct | Speaker: WisDOT, Wisconsin Rapids, WI (207 attendees) | Topic: Chloride Pollution |
| 2019-Jun | Speaker: Federation of Environmental Technologists, Clean Water in a Changing Wisconsin Seminar, Madison, WI (12 attendees) | Topic: Chloride Pollution |
| 2019-Jun | Speaker: WisDOT Bureau of Highway Maintenance, Madison WI (30 attendees) | Topic: Chloride Pollution |
| 2019-May | Speaker: Water@UW symposium: Madison, WI (200 + attendees) | Topic: Chloride Pollution |
| 2019-Apr | Interviewed: Daily Cardinal, WI | Topic: Algal Blooms |
| 2019-Mar | Speaker: Yahara Watershed Academy, Madison, WI | Topic: Chloride Pollution |
| 2019-Mar | Interviewed: Channel 3000 News | Topic: Chloride Pollution |
| 2019-Feb | Speaker: Brining Technical Advisory Committee, Jefferson, WI | Topic: Chloride Pollution |
| 2019-Feb | Speaker: Science on Tap, Madison, WI (80 attendees) | Topic: Chloride Pollution |
| 2019-Feb | Speaker: Central Waters - Science on Tap, Amherst, WI (15 attendees) | Topic: Chloride Pollution |
| 2019-Feb | Live Interview: Wisconsin Public Radio Morning Show: Discussion on road salt | Topic: Chloride Pollution |
| 2019-Feb | Speaker: Clean Lakes Alliance Breakfast, Madison, WI (60 attendees) | Topic: Chloride Pollution |
| 2019-Feb | Interviewed: ABC27 News | Topic: Chloride Pollution |
| 2019-Feb | Interviewed: WORT Public Radio, Madison WI | Topic: Chloride Pollution |
| 2019-Jan | Interviewed: Chemical and Engineering News | Topic: Chloride Pollution |
| 2018-Dec | Interviewed: Wisconsin State Journal, Know your Madisonian | Topic: Madison |
| 2018-Aug | Interviewed: Wisconsin State Journal, Yahara Lakes Series | Topic: Yahara Lakes |
| 2018-Jul | Interviewed: WORT radio, Madison, WI | Topic: Algal Blooms |
| 2018-Jul | Interviewed: National Wildlife Magazine | Topic: Chloride Pollution |
| 2018-Apr | Speaker: Nicolet college - Teaching in Retirement | Topic: Chloride Pollution |
| 2018-Apr | Speaker: Minocqua Science on Tap | Topic: Chloride Pollution |
| 2018-Mar | Interviewed: Yahara watershed flim | Topic: Wisconsin Lakes |
| 2018-Mar | Interviewed: WPR Northwoods | Topic: Chloride Pollution |
| 2018-Feb | Interviewed: CBS Milwaukee | Topic: Chloride Pollution |
| 2018-Feb | Speaker: Minnesota Road Salt Symposium | Topic: Chloride Pollution |
| 2018-Jan | Interviewed: Associated Press | Topic: Chloride Pollution |
| 2018-Jan | Interviewed: CBC, The Current | Topic: Chloride Pollution |
| 2018-Jan | Interviewed: Global News Radio 640 | Topic: Chloride Pollution |
| 2017-Oct | Speaker: WWF Great Lakes Chloride Symposium | Topic: Chloride Pollution |
| 2017-Apr | Interviewed: CBC TV, WPR | Topic: Chloride Pollution |
| 2017-Mar | Interviewed: Channel 3 TV | Topic: Chloride Pollution |

Outreach

- 2019-Aug Venue: Trout Lake Station open house
- 2019-Jun Venue: Hasler Lab open house
- 2019-Jun Venue: UW-Madison CIMMS Summer Camp (18 students)
- 2018-Aug Venue: Trout Lake Station open house
- 2018-Jun Venue: UW-Madison CIMMS Summer Camp (18 students)
- 2018-Jun Venue: Hasler Lab open house
- 2017-Sep Venue: Jumping Worm Survey Leader
- 2017-Jul Venue: Museum Camp
- 2017-Jun Venue: UW-Madison CIMMS Summer Camp (17 students)
- 2017-Jun Venue: Clean Lakes Alliance watershed academy - Tour guide
- 2017-Jun Venue: CFL Press Day - Buoy tour
- 2017-Jun Venue: Hasler Lab open house
- 2017-May Venue: UW People Program - Limnology Bootcamp

Select conference presentations

1. Dugan, H, Gorsky, A, Whitaker, E, Socha, E, & Lottig, N. (2021). *Under-ice physical and biological responses to a multi-year snow removal*. ASLO Aquatic Sciences Meeting.
2. Dugan, H. (2019). *Salting wisconsin's lakes*. Wisconsin Lakes Convention.
3. Dugan, H. (2019). *Panel discussion: Using the water quality portal for regional and national water-quality studies*. "National Water Quality Monitoring Conference."
4. Dugan, H, Whitaker, E, Gavin, Q, & Stanley, E. (2019). *Ice and light: A tale of two winters on lake mendota*. "AGU Chapman Conference on Winter Limnology."
5. Desai, A, Reed, D, Dugan, H, Loken, L, Schramm, P, Golub, M, Huerd, H, Baldocchi, A, Roberts, R, Taebel, Z, Hart, J, Hanson, P, Stanley, E, & Cartwright, E. (2018). *Advancing approaches for multi-year high-frequency monitoring of temporal and spatial variability in carbon cycle fluxes and drivers in freshwater lakes*. AGU Fall Meeting.
6. Dugan, H. (2018). *Is the loss of lake ice ecology relevant?* ASLO Summer Meeting.
7. Foley, N, Tulaczyk, S, Gooseff, M, Myers, K, Doran, P, Auken, E, Dugan, H, Mikucki, J, & Virginia, R. (2018). *Thin, conductive permafrost surrounding lake fryxell indicates salts from past lakes, McMurdo dry valleys, antarctica*. AGU Fall Meeting.
8. Lottig, N, Schramm, P, Dugan, H, Powers, S, & Stanley, E. (2018). *Lake metabolism under ice*. ASLO Summer Meeting.
9. Hanson, P, Khandelwal, A, Karpatne, A, Jia, X, Dugan, H, Read, J, & Kumar, V. (2018). *Global monitoring system leads to new insights for our changing inland waters*. ASLO Summer Meeting.
10. Doran, P, Myers, K, Foley, N, Tulaczyk, S, Dugan, H, Auken, E, Mikucki, J, & Virginia, R. (2018). *Groundwater and thaw legacy of a large paleolake in taylor valley, east antarctica as evidenced by airborne electromagnetic and sedimentological techniques*. AGU Fall Meeting.
11. Dugan, H, Bartlett, S, Burke, S, Doubek, J, Krivak-Tetley, F, Skaff, N, Summers, J, Farrell, K, McCullough, I, Morales-Williams, A, Roberts, D, Scordo, F, Yang, Z, Hanson, P, & Weathers, K. (2017). *Salting freshwater lakes*. ESA Annual Meeting.
12. Dugan, H, KC Weathers, & Hanson, P. (2016). *Outcomes from the GLEON fellowship program. Training graduate students in data driven network science*. AGU Fall Meeting.
13. Dugan, H, Bartlett, S, Burke, S, Doubek, J, Krivak-Tetley, F, Skaff, N, Summers, J, Farrell, K, McCullough, I, Morales-Williams, A, Roberts, D, Scordo, F, Yang, Z, Hanson, P, & Weathers, K. (2016). *Salting our freshwaters*. GLEON 18 Meeting.
14. Myers, K, Dugan, H, Doran, P, Foley, N, Tulaczyk, S, Auken, E, Mikucki, J, Virginia, R, Hawes, I, & Leidman, S. (2016). *Active layer hydrologic controls on the geochemistry of lake vanda, antarctica*. SCAR 2016.
15. Hanson, P, CC Cary, & Dugan, H. (2016). *Exploring the controls over carbon storage and emission in lakes through simulation models*. ASLO Summer Meeting.
16. Dugan, H, Weathers, K, Hanson, P, Hong, G, & Read, E. (2015). *Training graduate students in an era of "big ecology and team science": The GLEON fellowship program*. LTER All Scientists Meeting.
17. Dugan, H, Bartlett, S, Burke, S, Doubek, J, Krivak-Tetley, F, Skaff, N, Summers, J, Farrell, K, McCullough, I, Morales-Williams, A, Roberts, D, Scordo, F, Yang, Z, Hanson, P, Hong, G, & Weathers, K. (2015). *A macrosystems study of global chloride trends, drivers, and ecological impacts in lakes*. GLEON 17 Meeting.

18. Dugan, H, Bartlett, S, Burke, S, Doubek, J, Krivak-Tetley, F, Skaff, N, Summers, J, Farrell, K, McCullough, I, Morales-Williams, A, Roberts, D, Scordo, F, Yang, Z, Hanson, P, & Weathers, K. (2015). *Salting our freshwater: A macrosystems study of global chloride patterns and trends in lakes*. AGU Fall Meeting.
19. Hanson, P, Dugan, H, & Carey, C. (2015). *Seasonal lake metabolism and its consequences for long-term organic carbon cycling in lakes*. ESA Annual Meeting.
20. Hanson, P, Read, J, & Dugan, H. (2015). *Organic carbon cycling in lakes: Exploring the source and sink balance through process modeling*. CGU Annual Meeting.
21. Doran, P, Mikucki, J, Tulaczyk, S, Priscu, J, Obryk, M, Dugan, H, Virginia, R, & Auken, E. (2015). *New observations of hydrologic connectivity in McMurdo dry valley lakes*. Aquatic Sciences Meeting.
22. Dugan, H, Santoso, A, Corman, J, Jaimes, A, Nodine, E, Patil, V, Woolway, R, Zwart, J, Bentrup, J, Hetherington, A, Oliver, S, Read, J, Winters, K, Hanson, P, Read, E, Winslow, L, & Weathers, K. (2014). *Consequences of gas flux model choice on the interpretation of metabolic balance across 15 lakes*. Joint Aquatic Sciences Meeting.
23. Dugan, H, Hanson, P, Gil, Y, Michel, F, Duffy, C, Read, J, & Snorheim, C. (2014). *An organic collaborative approach to science in the northwoods*. 3rd Science in the Northwoods Meeting.
24. Dugan, H, Doran, P, Tulaczyk, S, Mikucki, J, Arcone, S, Acken, E, Schamper, C, & Virginia, R. (2014). *Subsurface imaging reveals aquifer beneath an ice-sealed antarctic lake*. SCAR Annual Meeting.
25. Dugan, H, Doran, P, Tulaczyk, S, Mikucki, J, Arcone, S, Aucken, E, & Schamper, C. (2014). *Geophysical imaging reveals brine beneath an ice-sealed antarctic lake*. AGU Fall Meeting.
26. Mikucki, J, Auken, E, Tulaczyk, S, Virginia, R, Schamper, C, Sørensen, K, Doran, P, Dugan, H, & Foley, N. (2014). *Aerial EM survey reveals groundwater systems beneath Taylor valley, Antarctica*. AGU Fall Meeting.
27. Dugan, H, MK Obryk, & Doran, P. (2012). *High-resolution monitoring of long term changes in physical limnology, McMurdo dry valleys, Antarctica*. LTER All Scientists Meeting.
28. Dugan, H, MK Obryk, & Doran, P. (2012). *Ablation rates of permanently ice-covered antarctic lakes*. XXXII SCAR Meeting.
29. Dugan, H, Doran, P, Wagner, B, Arcone, S, C Fritsen, & Murray, A. (2012). *Exposing lake Vida, Antarctica*. NASA Astrobiology Meeting.
30. Dugan, H, Doran, P, Fritsen, C, F Kenig, & Murray, A. (2011). *The formation of a 26 m ice cover on lake Vida, Antarctica*. 11th International Symposium on Antarctic Earth Sciences.
31. Dugan, H, Doran, P, Fritsen, C, Kenig, F, Murray, A, & Arcone, S. (2011). *A 26 m ice cover on lake Vida, Antarctica*. AGU Fall Meeting.
32. Dugan, HA, & Lamoureux, S. (2010). *The chemical evolution of a hypersaline coastal lake in the high arctic*. Arctic Workshop.
33. Dugan, H, Lamoureux, S, M Lafrenière, & Lewis, T. (2010). *The impact of permafrost disturbances and sediment loading on the seasonal mixing of two high arctic lakes*. Annual Meeting of the Canadian Geophysical Union.
34. Dugan, H, Lamoureux, S, M Lafrenière, & Lewis, T. (2008). *Hydrological and sediment yield response to rainfall in a high arctic watershed*. Annual Meeting of the Canadian Geophysical Union.
35. Dugan, H, Lewis, T, S Lamoureux, & Lafrenière, M. (2008). *Investigating the formation of high conductivity bottom water in a freshwater high arctic lake*. Arctic Change 2008.