

AMY T HANSEN, Ph.D.
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RESEARCH QUESTIONS

- 1) How does the structure of a watershed influence its ability to process contaminants?
 - 2) How does local aquatic biophysical complexity affect nutrient transformation rates?
 - 3) How can freshwater biological processes be leveraged to improve water quality?
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EDUCATION

University of Minnesota, Twin Cities, MN

Ph.D. (2012) Civil Engineering, with Ecology Evolution and Behavior Minor
Thesis: *The Effects of Fluid Flow and Epiphytes on Submerged Aquatic Vegetation*
Advisors: Prof. Miki Hondzo (Dept. of Civil and Environmental Engineering) and Prof. Jacques Finlay (Dept. of Ecology and Evolutionary Behavior)

University of Michigan, Ann Arbor, MI

M.S. (1995) Mechanical Engineering
Final report: *A Biomimetic Approach to Compliant Mechanisms*
Advisor: Dr. Sridhar Kota

California Institute of Technology (Caltech), Pasadena, CA

B.S. (1993) Engineering & Applied Science

POST-DOCTORATE PROFESSIONAL EXPERIENCE

Assistant Professor, Department of Civil, Environmental and Architectural Engineering, University of Kansas
2018 - present

Research Associate, St. Anthony Falls Laboratory, University of Minnesota
2015 - 2018

Postdoctoral Research Associate, National Center for Earth-Surface Dynamics, University of Minnesota
2012 - 2014

PUBLICATIONS

Peer-reviewed and Published:

1. **Hansen, A.T.**, T.D. Campbell, S.J. Cho, J.A. Czuba, B.J. Dalzell, C.L. Dolph, P.L. Hawthorne, S. Rabotyagov, Z. Lang, K. Kumarasamy, P. Belmont, J.C. Finlay, E. Foufoula-Georgiou, K.B. Gran, C.L. Kling, P. Wilcock (2021). Economically viable pathways to sustainable water quality in Midwestern agricultural watersheds. *Proceedings of the National Academy of Sciences*, 118(28) e2024912118; <https://doi.org/10.1073/pnas.2024912118>.
2. Brookfield, A.E., **A.T. Hansen**, P.L. Sullivan, J. Czuba, M.F. Kirk, L. Li, M. Newcomer, G. Wilkinson (2021). Predicting algal blooms: Are we overlooking groundwater? *Science of the Total Environment*, 769, 14442. <https://doi.org/10.1016/j.scitotenv.2020.144442>.

3. Michalek, A.; Husic, A.; Roundy, J.; **Hansen, A.T.** (2021). Assessment of Climatic and Anthropogenic Controls on Bridge Deck Drainage and Sediment Removal. *Water*, 13, 3556. <https://doi.org/10.3390/w13243556>.
4. Ahlen, I, G. Vigouroux, G. Destouni, J. Piétron, N. Ghajarnia, J.A. Adolfo, J. Blanco, S. Borja, S. Chalov, K.P. Chun, N. Clerici, A. Desormeaux, P. Girard, O. Gorelits, **A. Hansen**, F. Jaramillo, Z. Kalantari, A. Labbaci, L. Licero, J. Livsey, G. Maneas, K.L. McCurley, D. Moshir Pahani, S.A. Palomino Sebastian, R. Price, C. Ricaurte-Villota, V.H Rivera-Monroy, A. Rodriguez, E. Rodriguez, J. Salgado, B. Sannel Britta, S. Seifollahi, M. Simard, Y. Sjöberg, P. Tersky, J. Thorslund Eriksson, D.A. Zamora, J. Jarsjö, (2021). Hydro-climatic changes of wetlandscapes across the world, *Scientific Reports*, 11(1), <https://doi.org/10.1038/s41598-021-81137-3>.
5. Tague, C.L., S.A. Papuga, C. Gerlein-Safdi, S. Dymond, R.R. Morrison, E.W. Boyer, D. Riveros-Iregui, E. Agee, B. Arora, Y.G. Dialynas, **A. Hansen**, S. Krause, S. Kuppel, S.P. Loheide, S.J. Schymanski, S.C. Zipper (2020) Adding our leaves: a community-wide perspective on research directions in ecohydrology. *Hydrological Processes*. DOI: 10.1002/hyp.13693.
6. N. Ghajarnia, Georgia Destouni, J. Thorslund, Z. Kalantari, I. Åhlén, J.A. Anaya-Acevedo, J.F. Blanco-Libreros, S. Borja, S. Chalov, A. Chalova, K.P. Chun, N. Clerici, A. Desormeaux, B.B. Garfield, P. Girard, O. Gorelits, **A. Hansen**, F. Jaramillo, J. Jarsjö, A. Labbaci, J. Livsey, G. Maneas, K. McCurley, S. Palomino-Ángel, J. Pietroń, R. Price, V.H. Rivera-Monroy, J. Salgado, A.B.K. Sannel, S. Seifollahi-Aghmiuni, Y. Sjöberg, P. Terskii, G. Vigouroux, L. Licero-Villanueva, and D. Zamora (2019). Data for wetlandscapes and their changes around the world. *Earth System Science Data*. DOI: 10.5194/essd-2019-207.
7. Dolph, C.L., E. Boardman, M. Danesh, J. C. Finlay, **A.T. Hansen**, A. Baker, B. Dalzell (2019). Phosphorus Transport in Intensively Managed Watersheds, *Water Resources Research*, DOI: 10.1029/2018WR024009.
8. Terui, A., J.C. Finlay, **A.T. Hansen**, J.L. Kozarek (2019). Quantifying cryptic function loss during community disassembly, *Journal of Applied Ecology*, 56(12), 2710-2722. DOI: 10.1111/1365-2664.13507.
9. Jaramillo, F. A. Desormeaux, J. Hedlund, J. Jawitz, N. Clerici, L. Piemontese, A. Rodriguez, J.A. Anaya, J.F. Blanco, S. Borja, J. Celi, S. C., KwokPan Chun, M. Cresso, L. Dahir, G. Destouni, D. Xu, G. Di Baldassarre, A. Downing, L. Espinosa, N. Ghajarnia, P. Girard, **A.T. Hansen**, T. Hu, J. Jarsjö, Z. Kalantary, L. Licero-Villanueva, J. Livsey, E. Machotka, K. McCurley, S. Palomino, J. Pietron, R. Price, C. Ricaurte, L.F. Ricaurte, V. Rivera-Monroy, E. Rodriguez, J. Salgado, A. Britta K. Sannel, A.C. Santos, S. Seifollahi, M. Simard, Y. Sjöberg, L. Sun, J. Thorslund, G. Vigouroux, D. Zamora, I. Åhlén, Ö. Bodin, A.D. Ziegler, S. J. Ramchundar (2019). Priorities and Interactions of Sustainable Development Goals (SDGs) with Focus on Wetlands. *Water*, 11(3). DOI: 10.3390/w11030619.
10. Gran, K., C. Dolph, A. Baker, M. Bevis, S.J. Cho, J.A. Czuba, B. Dalzell, **A. Hansen**, S. Kelly, Z. Lang, J. Schwenk, P. Belmont, J.C. Finlay, P. Kumar, S. Rabotyagov, G. Roehrig, P. Wilcock, E. Foufoula-Georgiou (2019). The power of environmental observatories for advancing multidisciplinary research, outreach, and decision support: the case of the Minnesota River Basin, *Water Resources Research*, 55(4) 3576-3592. DOI: 10.1029/2018WR024211.
11. Stefan, H.; C. Ellis; J. Gulliver; M. Hondzo; C. Paola; J. Marr; K. Hill; M. Guala; A. Ebtehaj; V. Voller; A. Erickson; J.L. Kozarek; and **A.T. Hansen** (2018). The St. Anthony Falls Laboratory: 80 Years of Progress Part 2A Transition to Environmental Research. *ASCE EWRI Conference Proceedings*. DOI: 10.1061/9780784481394.016.
12. Wollheim, W.W., S. Bernal, D Burns, J.A. Czuba, C.T. Driscoll, **A.T. Hansen**, R.T. Hensley, J.D. Hosen, S.S. Kaushal, L. Koenig, Y. Lu, A. Marzadri, P. Raymond, D. Scott, R.J. Stewart, P.G. Vidon, E. Wohl (2018). River network saturation concept: factors influencing the balance of biogeochemical supply and demand of river networks *Biogeochemistry*. DOI: 10.1007/s10533-018-0488-0.

13. **Hansen, A.T.**, A. Singh. (2018). Extracting watershed scale biogeochemistry from high frequency sensor data in intensively managed agricultural basins, *Journal of Geophysical Research – Biogeosciences*. DOI: 10.1029/2017JG004310
14. Czuba, J.A., **A.T. Hansen**, E. Foufoula-Georgiou, and J.C. Finlay (2018). Contextualizing wetlands within a river network to assess nitrate removal and inform watershed management, *Water Resources Research*. DOI: 10.1002/2017WR021859.
15. **Hansen, A.T.**, C.L. Dolph, E. Foufoula-Georgiou, J.C. Finlay (2018). Contribution of wetlands to nitrate removal at the watershed scale, *Nature Geosciences*. DOI: 10.1038/s41561-017-0056-6.
16. **Hansen, A. T.**, C. D. Dolph, and J. C. Finlay (2016). Do wetlands enhance downstream denitrification in agricultural landscapes? *Ecosphere*. 7(10): e01516. DOI: 10.1002/ecs2.1516
17. **Hansen, A. T.**, J. A. Czuba, J. Schwenk, A. Longjas, M. Danesh-Yazdi, D. J. Hornbach, and E. Foufoula-Georgiou (2016). Coupling freshwater mussel ecology and river dynamics using a simplified dynamic interaction model. *Freshwater Science*. 35(1): 200-215, DOI: 10.1086/684223.
18. Dolph, C. D., **A. T. Hansen**, J. C. Finlay (2016). Flow-related dynamics in suspended algal biomass and its contribution to suspended particulate matter in an agricultural river network of the Minnesota River Basin, USA. *Hydrobiologia*, 1-21, DOI:10.1007/s10750-016-2911-7.
19. Khosronejad, A., **A. T. Hansen**, J. L. Kozarek, K. Guentzel, M. Hondzo, M. Guala, P. Wilcock, J. C. Finlay, and F. Sotiropoulos (2016). Large eddy simulation of turbulence and solute transport in a forested headwater stream. *Journal of Geophysical Research : Earth Surface*. 121(1):146-167, DOI:10.1002/2014JF003423.
20. **Hansen A. T.**, M. Hondzo, J. Sheng, and M.J. Sadowsky (2014). Microscale measurements reveal contrasting effects of photosynthesis and epiphytes on frictional drag on the surfaces of filamentous algae. *Freshwater Biology*. 59(2):1365-2427, DOI: 10.1111/fwb.12266.
21. **Hansen A. T.** , M. Hondzo, and C.L. Hurd (2011). Photosynthetic oxygen flux by *Macrocystis pyrifera*: A mass transfer model with experimental validation. *Marine Ecology-Progress Series* 434:45-55, DOI: 10.3354/meps09196.
22. **Hansen, A. T.**, R. A. Stark, and M. Hondzo (2011). Uptake of dissolved nickel by *Elodea canadensis* and epiphytes influenced by fluid flow conditions. *Hydrobiologia*. 658: 127-138, DOI: 10.1007/s10750-010-0456-8.
23. Lang, J. S., J. J. Giron, **A. T. Hansen**, R. R. Trussell, W. E. Hodges (1993). Investigating Filter Performance as a Function of the Ratio of Filter Size to Media Size. *Journal Amer. Water Works Assoc.* 85: 122-130, DOI: 10.1002/j.1551-8833.1993.tb06087.x.

Published reports (not peer-reviewed):

1. Michalek, A., Roundy, J., Hansen, A.T., Husic, A. (2021). Bridge Deck Drainage: Evaluation of KDOT's Current Design Guidance. Submitted to Kansas Department of Transportation.

Published datasets:

1. Singh, A.; **A.T. Hansen** (2018). Gap-filled USGS sensor data for nitrate, discharge and temperature for selected sites in Iowa, U.S.A. Retrieved from the Data Repository for the University of Minnesota, <https://doi.org/10.13020/D6T106>.
2. Dolph, C.L.; **A.T. Hansen**, K.L. Kemmitt, B. Janke, M. Rorer, S. Winikoff, A. Baker, E. Boardman, J.C. Finlay (2017). Characterization of streams and rivers in the Minnesota River Basin Critical Observatory:

water chemistry and biological field collections, 2013-2016. Data Repository for the University of Minnesota, DOI: 10.13020/D6FH44.

FUNDED RESEARCH GRANTS

PI: United States Department of Agriculture NRCS CEAP: “Develop integrated watershed modeling framework to inform multi-party partnership on effects on conservation on in-stream aquatic biota in the UMRB”.
(\$269,311), 2020 - 2023

Co-PI: United States Department of Agriculture AFRI-NIFA Program: “Robust incentive design for sustainable agricultural systems”.
(\$500,000), 2020 - 2023

PI: The Nature Conservancy: “Integrated Watershed Modeling”.
(\$93,000), 2020 - 2021

PI: Kansas University Center of Research (KUCR) New Faculty General Research Fund: Blurred Boundaries: An Investigation of Mass Transfer and Lateral Mixing at Vegetation-Open Water Interfaces”
(\$19,994.05), 2020-2022

Co-PI: Kansas NSF Established Program to Stimulate Competitive Research (EPSCoR): Towards Integrated Groundwater and Surface Water Modeling for Predicting Aquatic Microbiomes.
(\$69,039), 2019-2020

Co-PI: Kansas K-TRAN: Bridge Deck Drainage: Evaluation of KDOT’s Current Design Guidance.
(\$65,956), 2019-2021

PI: NSF SEES Fellow: Leveraging the waterscape to increase agricultural landscape sustainability, (National Science Foundation Water, Sustainability and Climate Program (NSF WSC), NSF Science, Engineering and Education for Sustainability (SEES) Postdoctoral Fellow grant. NSF-EAR 1415206).
(\$476,039), 2015-2017

Co-PI: Conserving Minnesota’s native mussel legacy: Quantifying habitat interactions (Minnesota Environment and Natural Resources Trust Fund (ENRTF)).
(\$350,000), 2015-2018

Co-author: Significant contribution to the writing of funded proposal: Measuring and modeling watershed phosphorus loss and transport for improved management of agricultural landscapes (Minnesota Clean Water Fund Research Program, Minnesota Department of Agriculture).
(\$249,419), 2015-2018

FELLOWSHIPS AND AWARDS

2019	American Society of Civil Engineers (ASCE) ExCEED Teaching Fellow
2016	Travel award recipient, American Geophysical Union (AGU) Chapman Conference: Extreme Climate Event Impacts in Aquatic Biogeochemical Cycles and Fluxes
2015	NSF SEES Fellow (Science, Engineering and Education for Sustainability)
2011	Edward Silberman Fellowship, St. Anthony Falls Laboratory, U. of Minnesota (\$10,000)
2008	Louise T. Dossdall Fellowship, University of Minnesota
2007	International Research Experience Grant, National Center for Earth Surface Dynamics

2005 – 2007 NSF IGERT Traineeship (Integrative Graduate Education and Research), University of Minnesota

1992 Society of Women Engineers (SWE) Chapter President, Caltech

TEACHING AND MENTORING

Instructor of Record:

Wetland Hydrology and Introduction to Management (CE 756)

Spring 2021

Department of Civil, Environmental, and Architectural Engineering, University of Kansas, Lawrence, KS

A study of the basic structure and functions of wetlands; the physical, chemical, and biological processes involved; and an introduction to the management of wetlands. Also a brief introduction to the legal aspects of wetlands, the Section 404 permitting processes, and mitigation requirements.

Water Quality Modeling (CE 759)

Fall 2021, Spring 2022

Department of Civil, Environmental, and Architectural Engineering, University of Kansas, Lawrence, KS

Analytical and numerical modeling of transport and transformation processes in the aquatic environment. Mass balance principles in multi-dimensional transport phenomena including advection, turbulent diffusion, and dispersion.

Environmental Monitoring and Field Methods (CE 736)

Spring 2020, Spring 2022

Department of Civil, Environmental, and Architectural Engineering, University of Kansas, Lawrence, KS

A lecture-field sampling course to familiarize students with environmental monitoring techniques and open source environmental monitoring data. Dimensions of environmental monitoring are considered for air, soil, and water measurements. The major emphasis is on surface water monitoring techniques and their principles, utility, and limitations.

Fluid Mechanics (CE 330) and Fluid Mechanics Laboratory (CE 331)

Fall 2018 – 2021

Department of Civil, Environmental, and Architectural Engineering, University of Kansas, Lawrence, KS

Instructed class of ~70 junior-senior level students on fundamentals of fluid mechanics.

Environmental Mass Transport (CE 895)

Spring 2019

Department of Civil, Environmental, and Architectural Engineering, University of Kansas, Lawrence, KS

Graduate level course on environmental mass transport phenomena in surface waters.

Teaching assistant:

Teaching Assistant – Mechanical Design II (M.E. 350)

Dept. of Mechanical Engineering, University of Michigan – Ann Arbor

Course description: Principles of machine and mechatronic design and manufacturing. Analysis, synthesis and selection of mechanisms, machine components, mechatronic components, and associated manufacturing processes. Semester-long, model-based design/build/test project in a team setting. Instructed two sections of ~ 25 students each section. Weekly recitations (lecture and Q &A), office hours.

Teaching Assistant – Mechanical Design III (M.E. 450)

Dept. of Mechanical Engineering, University of Michigan – Ann Arbor

Course description: A mechanical engineering design project by which the student is exposed to the design process from concept through analysis to prototype validation and report. Projects are proposed

from the different areas of study within mechanical engineering and reflect the expertise of instructing faculty. Facilitated design teams in two three-hour laboratory sessions per week. ~30 students.

Student Advisees:

Post-doctoral: 2020: 1 post-doc
Graduate: 2020: 2 Ph.D. students, 2 M.S. student
2019: 1 Ph.D. student, 1 M.S. student, 1 M.C.E. student
Undergraduate: 2021-2022: 15
2020-21: 14
2019-20: 12
2018-19: 5

Guest lecturer:

2017 **Hansen, A.T.** Global nitrogen cycle: pools and fluxes (EEB 4611). University of Minnesota, St. Paul, MN
2014 **Hansen, A.T.** Water, sediment and transport in the Minnesota River Basin, Aquatic Ecology (BIOL 344). Macalester College, St. Paul, MN.
2013 **Hansen, A.T.** Water quality in the Minnesota River. Graduate level course 5203: Ecological Dimensions of Space Making, Department of Landscape Architecture, University of Minnesota, Minneapolis, MN.

Formal Mentor Experience:

2017, 2015 NSF-funded Sustainable Land and Water Resources Research Experiences for Undergraduates (SLAWR REU)
• Allison Acosta Clemson University
• LeAnn Charwood Leech Lake Tribal College
• Maria Roubert University of Puerto Rico
• Lizbeth Aguirre-Jaimes Univ. of Calif – Santa Cruz
• Olivia Cacciatore Villanova University
2011, 2014 NSF Louis Stokes Alliance for Minority Participation Program (LSAMP), Multicultural Summer Research Opportunity Program
• Audra Huffmeyer University of Minnesota (2011)
• Morgan Anderson University of Minnesota (2014)
• Vincent Knox University of Minnesota (2014)
2007 National Center for Earth Surface Dynamics, International Research Experience Program, University of Otago, Dunedin, New Zealand
• Jordan Theissen Lawrence University

Short course instructor:

2004 Operation and Maintenance of Drinking Water System (developed and instructed), three-day workshop for technical personnel from 8 watershed districts, Peace Corps
2003, 2004 General Environmental Education, developed course material and instructed high school students. Curriculum covered; basic ecology, biodiversity, waste management, watershed ecology and was taught using traditional and participatory methods. Supervised student community engagement in completion of; community clean-up day, multiple tree planting activities, outreach at local elementary schools and high school (2 years, 18 students), Peace Corps

2004 HIV/AIDs Prevention and Awareness, developed course material, co-instructed with high school students, taught to 209 high school students through series of dynamic presentations (209 students), Peace Corps

SCIENTIFIC PRESENTATIONS

(Underlined names are mentored or advised students).

- 2021 [INVITED] **Hansen, A.T.**, T. Campbell, S.J. Cho, J.A. Czuba, B.J. Dalzell, C.L. Dolph, P.L. Hawthorne, S. Rabotyagov, Z. Lang, K. Kumarasamy, P. Belmont, J.C. Finlay, E. Foufoula-Georgiou, K.B. Gran, C.L. Kling, P. Wilcock. Cost effective solutions to improve water quality in intensively managed agricultural landscapes prioritize wetlands and other near-channel approaches, AGU Fall Meeting, New Orleans, LA, 13 - 17 December.
- 2021 [INVITED] **A.T. Hansen**, Fluvial wetlands improve water quality in agricultural landscapes. University of Virginia Department of Environmental Sciences Seminar, Charlottesville, VA, 16 September.
- 2021 [INVITED] **A.T. Hansen**. Constructed Wetlands are Best Protection for Agricultural Runoff into Waterways. Minnesota Clean Water Council Meeting, virtual format, 18 October.
- 2021 [INVITED] **A.T. Hansen**. Constructed Wetlands are Best Protection for Agricultural Runoff into Waterways. Upper Mississippi River Basin Association Meeting, virtual format, 29 September.
- 2021 [INVITED] **A.T. Hansen**. Fluvial wetlands improve water quality in agricultural landscapes: Multiple lines of evidence. University of Kansas Department of Atmospheric Sciences and Geography Colloquium Series, Lawrence, KS, 15 October.
- 2021 [INVITED] **A.T. Hansen**. Constructed Wetlands are Best Protection for Agricultural Runoff into Waterways. Minnesota Board of Soil and Water Resources Presentation, virtual format, 17 November.
- 2021 [INVITED] **A.T. Hansen**, Contributions of Wetlands to Nitrate Removal at a Watershed Scale. Baker University Biology Department Seminar, virtual format, 21 April.
- 2021 **Hansen, A.T.**, Vegetative Contribution to Nitrate Removal in Agriculturally Impacted Wetlands. SFS Annual Meeting, virtual format, 23 – 27 May.
- 2021 Rivera Waterman, B., **A.T. Hansen**. Exploring how different aquatic plant types participate in nutrient removal under varying flow conditions in Kansas wetland. Kansas Governor's Water Conference, virtual format, 17 – 18 November.
- 2021 Sarker, S., **A.T. Hansen**. Water quality implications of land conversion to corn-soy cultivation in Northeastern Kansas, Kansas Governor's Water Conference, virtual format, 17 – 18 November.
- 2021 Czuba, J.A., P. Hawthorne, **A.T. Hansen**. Assessing multi-wetland restoration strategies for reducing nitrate at the watershed scale, ASABE Annual International Meeting, virtual format, 12-16 July.
- 2020 Bolade, O.O., **AT Hansen**. Hysteresis analysis of turbidity and nitrate dynamics in two agricultural watersheds within the Mississippi River Basin of Midwestern United States, AGU Fall Meeting, virtual format, 1 – 17 December
- 2020 Andrea Brookfield, Will Farmer, **Amy Hansen**, Mary Hill, Tony Layzell, Misty Porter, Pamela Sullivan and Sam Zipper. Untangling the implications of water management on hydrologic systems, GSA 2020 Connects Online, virtual format, 26-30 October.

- 2020 Dobie, A., A.T. Hansen. Investigation of Flow Conditions at the Boundary of Vegetation and Open Water, University of Kansas Undergraduate Research Symposium, Lawrence, KS, April.
- 2020 Craft, J., A.T. Hansen. Effects of Unionid Mussel Distribution Patterns on Water Quality, University of Kansas Undergraduate Research Symposium, Lawrence, KS, April.
- 2020 **A.T. Hansen,** Finlay, J.C., Dolph, C.L. Multiscale contributions of lentic water bodies to lotic nitrate reduction in agricultural watersheds, ASLO-SFS 2020 Summer Meeting, Conference cancelled due to pandemic.
- 2020 O.O. Bolade, A.T. Hansen. Hydrological and Biogeochemical Processes: insights from high frequency sensor data, ASLO-SFS 2020 Summer Meeting, Conference cancelled due to pandemic.
- 2020 [INVITED] **Hansen, A.T.** Treatment Wetlands for Watershed Nutrient Control, Kansas Department of Health and the Environment (KDHE) Annual Harmful Algal Blooms Meeting, Topeka, Kansas, 22 January.
- 2019 **Hansen, A.T.,** A. Singh. Using High Frequency Sensor Data to Assess Watershed Water Quality Vulnerability to Changes in Precipitation Magnitude and Frequency, AGU Fall Meeting, San Francisco, California, 9 – 13 December.
- 2019 **Hansen, A.T.,** Climate, Loss and Adaptation, Red Hot Research, University of Kansas, Lawrence, Kansas, 15 November.
- 2019 Czuba, J.A., P Hawthorne, **AT Hansen,** E Foufoula-Georgiou, JC Finlay, Optimizing wetland restorations for downstream versus spatially distributed nitrate reduction presents conflicting strategies, ESA Annual Meeting, 11 – 16 August.
- 2019 **Hansen, A.T.,** The Potential of Near-Channel Management to Improve Water Quality in Agricultural Landscapes, Kansas Biological Survey seminar, 22 March.
- 2018 **Hansen, A.T.,** et. al, Multi-Model Optimization of Field and In-Channel Management Actions in Agricultural Watersheds to Reduce Nitrate, Phosphorus, and Sediment Loads, AGU Fall Meeting, Washington D.C., 10 – 14 December.
- 2018 [INVITED] **Hansen, A.T.,** J. Kozarek, A. Tomasek, J.C. Finlay, Quantifying nutrient removal in floodplains and other fluvial wetlands. Upper Mississippi River Conference, October 24-25. Moline, IL
- 2018 **Hansen, A.T.,** L. Aguirre-Jaimes, O. Cacciatore, A. McCulloch, A. Acosta, L. Charwood, M. Roubert. Characterizing Denitrification Variability within an Agricultural Constructed Wetland. American Society of Civil Engineers (ASCE) World Environmental and Water Resources Congress. Minneapolis, Minnesota, 3-7 June.
- 2018 [INVITED] **Hansen, A.T.,** Panel speaker. Sustainability Hot topics in the Land of (more than) 10,000 Lakes. American Society of Civil Engineers (ASCE) World Environmental and Water Resources Congress. Minneapolis, Minnesota, 3-7 June.
- 2017 **Hansen, A.T.,** C. Dolph, E. Foufoula-Georgiou, P. Belmont, P. Wilcock, C. Kling, J. Finlay, S. Rabotyagov, et al. Improving the effectiveness of conservation in the Le Sueur River basin. Minnesota Water Resources Conference, St. Paul, Minnesota, 13-14 October.
- 2017 **Hansen, A.T.,** Czuba, J.A., Foufoula-Georgiou, E., Finlay, J. C. The Potential of Wetlands to Contain Agricultural Nitrate. Association for the Sciences of Limnology and Oceanography (ASLO) Annual Meeting. Honolulu, HI.

- 2017 **Hansen, A.T.** How much is enough? The potential use of wetlands to reduce agricultural nitrate losses. St. Anthony Laboratory Seminar Series. Minneapolis, MN.
- 2017 **Hansen, A.T.**, Czuba, J.A., Foufoula-Georgiou, E., Finlay, J. C. The Potential of Wetlands to Contain Agricultural Nitrate Under Extreme Streamflow Events. AGU Chapman Conference on Extreme Climate Event Impacts in Aquatic Biogeochemical Cycles and Fluxes. San Juan, Puerto Rico.
- 2016 **Hansen, A.T.** Linked Institutions for Future Earth (LIFE)- Ecopotential Meeting on Ecosystem Management of Protected Areas. Irvine, CA.
- 2016 **Hansen, A.T.**, Dolph, C. L., Finlay, J. C., Czuba, J.A., Foufoula-Georgiou, E. Assessing wetland effects on nitrogen reduction: A fluvial network perspective. National Science Foundation Water, Sustainability and Climate PI meeting, Arlington, VA.
- 2015 **Hansen, A.T.**, J.C. Finlay, J.A. Czuba, C. Dolph, and E. Foufoula-Georgiou (2015), “Assessing Wetland Effects on Nitrogen Reduction within a Fluvial Network Perspective: A Combined Field and Modeling Approach”, B53H-02, AGU Fall Meeting, San Francisco, California, 14-18 December.
- 2015 **Hansen, A.T.**, Czuba, J.A., Schwenk, J., Longjas, A., Danesh-Yazdi, M., Daniel J. Hornbach, Efi Foufoula-Georgiou, Coupling Freshwater Mussel Ecology and River Dynamics Using a Simplified Dynamic Interaction Model. Society for Freshwater Science Annual Meeting, Milwaukee, Wisconsin.
- 2015 **Hansen, A.T.**, C. Dolph, J.C. Finlay. Wetlands and Lakes Reduce Surface Water Nitrogen in Minnesota’s Agricultural Landscapes, Minnesota Water Resources Conference, St. Paul, Minnesota, 13-14 October.
- 2015 **Hansen, A. T.**, J. A. Czuba, J. Schwenk, A. Longjas, M. Danesh-Yazdi, D. J. Hornbach, and E. Foufoula-Georgiou. 2016. Coupling Freshwater Mussel Ecology and River Dynamics Using a Simplified Dynamic Interaction Model. National Science Foundation Water, Sustainability and Climate PI meeting, Arlington, VA.
- 2015 Charwood L. (2015) Potential Changes in Denitrification of Wetlands dominated by Invasive *Typha x glauca*, 11th annual First American Land Consortium (FALCON), Denver, CO.
- 2015 Acosta A., **Hansen, A.T.** Effects of Vegetation and Depth on Nitrate Reduction in Two Minnesota Wetlands, International Environmental Youth Symposium 2015: “One World, One Environment”, 1-2 October 2015 [2nd place student poster in subject category], Atlanta, GA.
- 2014 **Hansen, A.T.**, Finlay, J.C. Controls on Aquatic Nitrogen Uptake within an Agricultural Watershed Joint Aquatic Sciences Meeting, Portland, OR.
- 2014 **Hansen, A.T.** Biological nitrogen uptake in agriculturally influenced Minnesota streams and rivers. Water Resource Sciences Program Seminar Series, University of Minnesota, St. Paul, MN.
- 2013 **Hansen, A.T.**, Khosronejad, A., Guentzel, K., Kozarek, J., Mpagazihe, G., Velez, J., Sotiropoulos, F., Hondzo, M., Baker, D., Wilcock, P., Finlay, J.C. Quantifying stream reach nutrient processing: a comparison of experimental and modeling approaches used in Eagle Creek. Upper Midwest Stream Restoration Symposium, La Crosse, WI.
- 2013 **Hansen, A.T.** Quantifying In-stream Biological Nitrogen Uptake. Minnesota Water Resources Conference, St. Paul, MN.
- 2013 **Hansen, A.T.** The importance of biology in large river nutrient transport. Institute on the Environment Sustainability Symposium, St. Paul, MN.

- 2012 **Hansen, A.T.**, Hondzo, M., Finlay, J.C. Water quality implications of epiphytes on submerged aquatic vegetation. Upper Midwest Stream Restoration Symposium, Minneapolis, MN.
- 2012 **Hansen, A.T.**, Finlay, J.C., Hondzo, M. Epiphytes make bad houseguests: Implications for phosphorus sequestration by aquatic plants in constructed wetlands. Minnesota Water Resources Conference, St. Paul, MN.
- 2011 **Hansen, A.T.**, Hondzo, M. Epiphytes alter surface stresses of filamentous algae. Association for the Sciences of Limnology and Oceanography (ASLO) - Aquatic Sciences meeting, San Juan, Puerto Rico.
- 2008 **Hansen, A.T.**, Hondzo, M., Hurd, C.L. Mass transfer in canopy flow: An investigation of the effect of hydrozoan colonization on the giant kelp, *Macrocystis pyrifera*. Association for the Sciences of Limnology and Oceanography (ASLO) Ocean Sciences meeting, Orlando, FL.
- 2008 **Hansen, A.T.**, Hondzo, M. Mass transfer in canopy flow: An investigation of the effect of hydrozoan colonization on the giant kelp, *Macrocystis pyrifera*. National Center for Earth Surface Dynamics Video Conference.
- 2006 Stark, R., **Hansen, A.T.**, Hondzo, M., Cotner, J. The Effect of Flow Conditions on Nickel Accumulation by *Elodea canadensis* and Associated Epiphytes. Annual American Water Resources Association Conference, Baltimore, MD.

PRE-DOCTORAL PROFESSIONAL EXPERIENCE

Graduate Researcher, Department of Civil Engineering, University of Minnesota 2005 - 2012
Field experiments, laboratory experiments, and mathematical modeling investigation biological mediation of water quality under varying fluid flow conditions.

Peace Corps Volunteer, Engineer; Rural Water and Sanitation Program, Honduras 2003 - 2005

- GIS field data collection and mapping boundaries of 30 drinking water source watersheds
- Facilitated rural community with gaining national protected status for drinking water source watershed.
- Designed two gravity-fed drinking water systems and assessed system feasibility for four more.

Project Manager/Engineering Manager, Veeco Instruments, Santa Barbara, California 2000 - 2002

- Systems engineering design of environmental isolation for atomic force microscope
- Direct manager of six engineers with indirect responsibility for additional 20 technical staff on development team.

Lead Project Engineer, Veeco Instruments, Santa Barbara, California 1998 - 2000

- Systems engineering design of environmental isolation for atomic force microscope including: airborne particle control system, layout, system cable interconnect management, software recipe optimization, and CAD design drawing release.

Process Engineer, Ford Motor Company, Utica Trim Plant, Utica, Michigan 1997 - 1998

- Maintained equipment and maximized efficiency of two assembly lines running two shifts including more than 30 machines. Process improvement efforts resulted in 10% improvement in uptime.

Design Engineer, Ford Motor Company, Air Induction Systems, Dearborn, Michigan 1995 - 1997

- Engineering design of powertrain air induction system using computational and experimental techniques (FEA, CFD, acoustic modeling, dynamometer testing, in-vehicle testing).
- Design efforts directly resulted in higher capacity filtration capacity, optimized acoustic performance, and improved horsepower over previous generation design.

PROFESSIONAL SERVICE AND DEVELOPMENT

Committee Member

2019 – present AGU Ecohydrology Technical Committee, Hydrology Section
2021 – present CEAE Sabbatical Committee
2019 - present KU CEAE Graduate Studies Committee
2020 – present KU SOE Library Committee
2020 – present KU CEAE Advisory Board Membership Subcommittee
2012 - 2015 Partnership for River Restoration and Science in the Upper Midwest, Technical Committee

Session chair or co-chair:

2021 AGU Fall Meeting: Poster session, Quantifying Impacts of Near-Channel Dynamics on Water Quality
2021 AGU Fall Meeting: Oral session, H068 Frontiers in Ecohydrology
2021 AGU Fall Meeting: Poster session, H063 Frontiers in Ecohydrology
2020 AGU Fall Meeting: Oral session, H068 Frontiers in Ecohydrology
2020 AGU Fall Meeting: Poster session, H063 Frontiers in Ecohydrology

Ad-hoc proposal reviewer:

American Chemical Society
Natural Sciences and Engineering Research Council of Canada
National Science Foundation (2019)

Proposal review panel member:

Department of Energy (2019)
Iowa Nutrient Research Center (2020)

Journal referee:

Hydrological Processes, Environmental Science and Technology, Limnology and Oceanography: Fluids and Environments, Marine Ecology Progress Series, Biogeochemistry, Limnology and Oceanography, Environmental Science: Water Research and Technology, Functional Ecology, Journal of Geophysical Research: Biogeosciences

Community Outreach

2021 In-person video interview for documentary series, “RealAg”, Smoky Hills PBS
2021 Phone interview for Mankato Free Press
2021 Phone interview for Agri-Pulse

Teaching Excellence:

Spring 2019 Faculty Book Club member. KU Center for Teaching Excellence.
Fall 2019 Participant in study of teaching and learning practices using external reviewer & COPUS protocol (4 class periods).
Summer 2019 Attended ASCE ExCEED Teaching Workshop, West Point, New York.

Educational Outreach

2020 Professional trip mentor for five undergraduate engineering students on 12 day trip to Uganda to rehabilitate 2 drinking water catchment systems. Engineers without Borders (EWB): University of Kansas Student Chapter.
2019 - 2020 Student poster judge, AGU fall meeting
2017 Release of Nitrate Network Model web-based educational application (<http://maps.umn.edu/le-sueur-nitrates/#>). Part of development team of web application used for high school education module on nitrate cycling.
2015 Student presentation judge, Society of Freshwater Sciences Annual Meeting
2013 Student poster judge, Upper Midwest Stream Restoration Symposium

2011 Student poster judge, Twin Cities Regional Science Fair

Peace Corps Volunteer

2003 – 2005 Engineer; Rural Water and Sanitation Program, Honduras

- GIS field data collection and mapping boundaries of 30 drinking water source watersheds
- Facilitated rural community with gaining national protected status for drinking water source watershed.
- Designed two gravity-fed drinking water systems and assessed system feasibility for four more.

Further Relevant Training

2010 Post-Baccalaureate Certificate - Stream Restoration, University of Minnesota, Twin Cities.

2004 Advanced SCUBA certified

Languages

Spanish Oral Proficiency Interview score (2005): Advanced Mid (American Council on the Teaching of Foreign Language)