

PUBLICATIONS and ACADEMIC PRESENTATIONS:

Papers published

1. Zhang, L. E.G. Xu, Y.-B. Li, H.-L. Liu, D.E. Vidal-Dorsch and J.P. Giesy. 2018. Ecological Risks of Posed by Ammonia Nitrogen (AN) and Un-Ionized Ammonia (NH₃) in Seven Major River Systems of China. *Chemosphere*. 202:136-144.
2. Zhang, Z.-H., S. Tang, M. Wang, W.-M. Sun, Y.-W. Xie, H. Peng, A. Zhong, H.-L. Liu, X.-W. Zhang, H.-X. Yu, J.P. Giesy and M. Hecker. 2019. Acid Mine Drainage Affects the Diversity and Metal Resistance Gene Profile of Sediment Bacterial Community Along a River. *Chemosphere*. 217:790-799.
3. Markwart B., Liber K. *, Xie Y.-W., Raes K., Hecker M., Janz D., Doig L. E.. Selenium Oxyanion Bioconcentration in Natural Freshwater Periphyton. *Ecotox. Environ Safety*, 30, 2019, 693-704.
4. Li, C.-C., W.-Y. Feng, H.-Y. Chen, X.-F. Li, F.-H. Song, W.-J. Guo, J.P. Giesy and F.-H. Sun. 2019. Temporal Variation in Zooplankton and Phytoplankton Community Species Composition and the Affecting Factors of Lake Taihu-a Large Freshwater Lake in China. *Environ. Pollut.* 245:1050-1057.
5. Xie Y.-W., Zhang X.-W. *, Yang J.-H., Kim, Hong S., S., Giesy J.P., Yim U. H., Won Joon Shing, Hongxia Yu, Jong Seong Khim**. eDNA-Based Bioassessment of Coastal Sediments Impacted by an Oil Spill. *Environ Pollut.* 2018 Jul; 238:739-748.
6. Xie X.-W., Floehr T., Zhang X.-W. *, Xiao H.-X., Yang J.-H., Xia P., Burton G. A. Jr., and Hollert H.. In situ microbiota distinguished primary anthropogenic stressor in freshwater sediments. *Environ Pollut.* 2018 Aug; 239:189-197. doi: 10.1016/j.envpol.2018.03.099.
7. Chen, L.-G., C.-Y. Hu, M.M.P. Tsui, Q. Wang, J.P. Giesy, P.K.S. Lam and J.C.W. Lam. 2018. Perfluorobutanesulfonate Exposure Causes Durable and Transgenerational Dysbiosis of Gut Microbiota in Marine Medaka. *Environ. Sci. Technol. Lett.*, 2018, 5 (12), pp 731–738.
8. Li F.-L., Peng Y., Fang W.-D., Altermatt F., Xie Y.-W., Yang J.-H., and Zhang X.-W. *. Application of Environmental DNA Metabarcoding for Predicting Anthropogenic Pollution in Rivers. *Environ. Sci. Technol.*, 2018, 52 (20), pp 11708–11719.
9. Ruso, G.E., Morrissey, C.A., Hogan, N.S., Sheedy, C., Gallant, M.J., and Jardine, T.D.. Detecting amphibians in agricultural landscapes using eDNA reveals the importance of wetland condition. *Environment Toxicology and Chemistry* (In Press).
10. Hu, D., I.-C. Lou, M. Guo, W.-K. Ung, Y.-J. Kong, K.-M. Mok, J.P. Giesy and S., M.-Y. Lee. 2019. Temporal Changes in Microbial Community Composition in Eutrophic Reservoirs of Macau Determined by 16s rRNA Gene Sequences and Viral Metagenomics. (2018). *Nature: Scientific Reports* (In Press).
11. Li F.-L., Xie Y.-W., Wang J.-W. and Zhang X.-W. 2019. Sedimentary DNA reveals over 150 years' ecosystem change by human activities in Lake Chao, China. *Environ. Internat.* (In Press)

Reports

1. Zee, J., Jardine, T., and Hecker, M. 2018. Monitoring of Saskatchewan lakes for invasive zebra mussels (*Dreissena polymorpha*) and quagga mussels (*Dreissena bugensis*) using eDNA. University of Saskatchewan. Report prepared for Saskatchewan Environment. 17 pp.

Graduate and Undergraduate Theses (under project investigator supervision)

1. Burton, E. Undergraduate Thesis in Department of Biology under supervision of Prof Mark Servos and Dr. Patricija Marjan, entitled “Optimization of brook trout (*Salvelinus fontinalis*) environmental DNA collection methods”. 2019.
2. Liu E. Undergraduate Thesis in Toxicology Centre under supervision of Prof John Giesy and Dr. Yuwei Xie, entitled “Application of environmental DNA metabarcoding for determining community responses of sedimentary protozoa to Selenium in a freshwater mesocosm study”. 2019. *Awarded Fisher Scientific Toxicology Undergraduate Research Award.*

Manuscripts under preparation

1. Environmental DNA (eDNA) reveals changes in seasonal dynamics of wild brook trout (*Salvelinus fontinalis*) population in Grand River streams. Potential Authors: Patricija Marjan, Erika Burton, Paul M. Craig, Hadi Dhiyebi, Andrew C. Doxey, John P. Giesy, Nathanael BJ Harper, Barb A. Katzenback, Jacqueline Peters, Yuwei Xie and Mark R. Servos.
2. From challenges to recommendations for brook trout (*Salvelinus fontinalis*) environmental DNA (eDNA) method development. Potential Authors: Patricija Marjan, Erika Burton, Paul M. Craig, Hadi Dhiyebi, Andrew C. Doxey, John P. Giesy, Barb A. Katzenback, Jacqueline Peters, Yuwei Xie and Mark R. Servos.
3. Temporal and spatial patterns of eDNA in vernal pools. Environmental DNA. Expected submission summer 2020. Partner: rare Charitable Research Reserve. Potential Authors: Harper NBJ, Ikert HA, Lynch MDJ, Marjan P, Doxey AC, Servos MR, Giesy JP, Craig PM and Katzenback BA.
4. Validating eDNA metabarcoding over multiple seasons using 3-pass electrofishing. Environmental DNA. Expected submission Feb 2020. Potential Authors: Harper NBJ, Ikert HA, Lynch MDJ, Marjan P, Doxey AC, Servos MR, Giesy JP, Craig PM and Katzenback BA.
5. Identification of altered microRNA in blood plasma, epidermal mucus, and water of acutely stressed rainbow trout. Environmental DNA. Expected submission 2020. Potential authors: Ikert H, Lynch MDJ, Doxey AC, Servos MR, Giesy JP, Katzenback BA, Craig PM
6. Ecogenomics based assessment of ecological effects of Selenium: a lake mesocosm study Expected submission 2020. Potential authors: Xie Y.-W., Graves S., Giesy J.P., Janz D., Palace V., Hecker M., Jones P., Servos M., Hanson M.,
7. Ecological effects of diluted bitumen on zooplankton and their associated microbiotas: a lake mesocosm study (BOREAL). Expected submission 2020. Potential authors: Xie Y.-W., Black T., Jose Luis Rodriguez Gil, Giesy J.P., Janz D., Palace V., Paterson M., Hecker M., Jones P., Servos M., Hanson M., Blais J., Orihel D.
8. Ecological effects of diluted bitumen on pelagic microbiome: a lake mesocosm study (FOReST). Expected submission 2020. Potential authors: Xie Y.-W., Giesy J.P., Palace V., Paterson M., Hecker M., Jones P., Servos M., Jose Luis Rodriguez Gil
9. Benchmarking water eDNA metabarcoding for biomonitoring of Canadian Freshwater Fishes. Expected submission 2020. Potential authors: Xie Y.-W., Marjan P, Prestie K., DeBofsky A., Srayko S., Ankley P., Vien A., Jardine T. D., Giesy J.P., Hecker M., Jones P. Servos M.
10. Sex-specific responses of gut microbiota of fathead minnow to low-level aqueous exposure of benzo[a]pyrene. Expected submission 2020. Potential authors: DeBofsky, A., Xie, Y., Challis, J., Grimard, C., Brinkmann, M., Hecker, M., Giesy, J.P.

11. Effects of dietary exposure of benzo[a]pyrene on gut microbiota of juvenile fathead minnow. Expected submission 2020. Potential authors: DeBofsky, A., Xie, Y., Brinkmann, M., Hecker, M., Giesy, J.P.
12. A shared microbiome between wild and captive fathead minnows. Expected submission 2020. Potential authors: DeBofsky, A., Xie, Y., Hecker, M., Giesy, J.P.
13. Alterations of gut microbiota in walleyes from the North Saskatchewan River following an oil spill. Expected submission 2020. Potential authors: DeBofsky, A., Xie, Y., Hecker, M., Giesy, J.P.
14. Zooplankton metabarcoding to assess the ecological impact of remediation efforts after diluted bitumen spills: A mesocosm study. Expected submission 2020. Potential authors: Ankley P., Xie Y.-W., Giesy J.P., Perry O., Higgins S. and Palace V.

Upcoming presentations

1. Harper NBJ, Ikert HA, Lynch MDJ, Marjan P, Doxey AC, Servos MR, Giesy JP, Craig PM and Katzenback BA. Comparing electrofishing observations to environmental DNA metabarcoding detections along Bauman Creek, a tributary of Ontario's Grand River. *Society of Environmental Toxicology and Aquatic Chemistry - North America*. Toronto, Ontario, Canada. November 3-7, 2019.
2. Ikert, H., M.J. Lynch, A.C. Doxey, M.R. Servos, J.P. Giesy, B.A. Katzenback, P.M. Craig. Development of a novel, non-invasive method of measuring fish stress using water samples. *Society of Environmental Toxicology and Aquatic Chemistry - North America*. Toronto, Ontario, Canada. November 3-7, 2019.
3. Burton, E., Marjan, P., Dhiyebi, H., Bragg, L., Craig, P., Katzenback, B., Doxey, A., Giesy, J., Servos, M. Impacts of stream disturbance on brook trout (*Salvelinus fontinalis*) eDNA recovery. *Society of Environmental Toxicology and Aquatic Chemistry - North America*. Toronto, Ontario, Canada. November 3-7, 2019.
4. Marjan, P., E. Burton, P.M. Craig, H. Dhiyebi, A.C. Doxey, J.P. Giesy, N.B.J. Harper, B.A. Katzenback, J. Peters, Y. Xie, M.R. Servos. Environmental DNA (eDNA) reveals changes in seasonal dynamics of wild brook trout (*Salvelinus fontinalis*) population in Grand River streams. *Society of Environmental Toxicology and Aquatic Chemistry - North America*. Toronto, Ontario, Canada. November 3-7, 2019.
5. Marjan, P., E. Burton, P.M. Craig, H. Dhiyebi, A.C. Doxey, J.P. Giesy, N.B.J. Harper, B.A. Katzenback, J. Peters, Y. Xie, M.R. Servos. From challenges to recommendations for brook trout (*Salvelinus fontinalis*) environmental DNA (eDNA) method development *Society of Environmental Toxicology and Aquatic Chemistry - North America*. Toronto, Ontario, Canada. November 3-7, 2019.
6. Ankley P., Xie Y.-W., Giesy J.P., Perry O., Higgins S. and Palace V.. Zooplankton metabarcoding to assess the ecological impact of remediation efforts after diluted bitumen spills: A mesocosm study. *Society of Environmental Toxicology and Aquatic Chemistry - North America*. Toronto, Ontario, Canada. November 3-7, 2019.
7. Xie Y.-W., Graves S., DeBofsky A., Giesy J.P., Janz D., Palace V., Hecker M., Jones P.. Ecogenomics based assessment of ecological effects of Selenium: a lake mesocosm study. *Society of Environmental Toxicology and Aquatic Chemistry - North America*. Toronto, Ontario, Canada. November 3-7, 2019.
8. Xie Y.-W., Prestie K., DeBofsky A., Srayko S., Ankley P., Vien A., Jardine T. D., Giesy J.P., Hecker M., Jones P. Benchmarking water eDNA metabarcoding for biomonitoring of Canadian Freshwater

- Fishes. *Society of Environmental Toxicology and Aquatic Chemistry - North America*. Toronto, Ontario, Canada. November 3-7, 2019.
9. De Bofsky, A., Xie, Y., Jardine, T., Jones, P., Giesy, J.P. Gut microbiota in fishes from the North Saskatchewan River following an oil spill. *Society of Environmental Toxicology and Aquatic Chemistry - North America*. Toronto, Ontario, Canada. November 3-7, 2019.
 10. Xie Y.-W., Graves S., Giesy J.P., Janz D., Palace V., Hecker M., Jones P.. Effects of Selenium on zooplankton and their associated microbiotas: a lake mesocosm study. Canadian Ecotoxicity Workshop, Quebec, Canada. October 6th to 9th, 2019
 11. DeBofsky, A., Xie, Y., Challis, J., Grimard, C., Brinkmann, M., Hecker, M., Giesy, J.P. Fathead minnow gut microbiota and the impacts of exposure to aqueous and dietary benzo[a]pyrene. Canadian Ecotoxicology Workshop. Quebec City, Quebec. October 6-9, 2019.
 12. Hecker M., Zee J., Jardine T. eDNA as an Early Detection Tool for Invasive Species in Aquatic Ecosystems in the Canadian Prairies. Presentation to the “Lake Winnipeg: Where Waters Meet” Conference. Gimli, MB; September 30 – October 2, 2019.

Conference Presentations

1. DeBofsky, A., Xie, Y., Jones, P., Jardine, T., Giesy, J.P. Gut microbiota in fish from the North Saskatchewan River following an oil spill. Prairie Northern Chapter Meeting. Society of Environmental Toxicology and Chemistry (SETAC). June 10-11, 2019.
2. Prestie, K., Phillips, I., Janz, D., Xie, Y., Giesy, J., and Jardine, T.D. 2019. A critical evaluation of traditional fish surveys and environmental DNA methods for biomonitoring stream fish communities. Society for Freshwater Science, May 23, Salt Lake City, USA.
3. Giesy, J., Xie Y.-W. (Oral presenter), P.D. Jones, M. Hecker, T. Jardine, B. Noble, M. Servos, P. Marjan, P. Craig, A. Craig, A. Doxey, B. Katzenback. Environmental DNA (eDNA) for ecotoxicological assessment of anthropogenic activities. Global Water Futures 2nd Annual Science Meeting, Saskatoon, Saskatchewan. May 15-17, 2019.
4. Ikert, H., N.B.J. Harper, M.D.J. Lynch, A.C. Doxey, M.R. Servos, J.P. Giesy, B.A. Katzenback and P.M. Craig. Identification of Secreted microRNA from Acutely Stressed *Oncorhynchus mykiss*. Global Water Futures 2nd Annual Science Meeting, Saskatoon, Saskatchewan. May 15-17, 2019.
5. Harper, N.B.J., H. Ikert, M.D.J. Lynch, P. Marjan, A.C. Doxey, M.R. Servos, J.P. Giesy, P.M. Craig, B.A. Katzenback. Optimization of environmental DNA extraction for use in detecting aquatic vertebrate biodiversity. Global Water Futures 2nd Annual Science Meeting, Saskatoon, Saskatchewan. May 15-17, 2019.
6. Peters, J., P. Marjan, J. Giesy, M. Servos, D. Rudolph. Comparing the transport of environmental DNA and free DNA in a fluvial system. Global Water Futures 2nd Annual Science Meeting, Saskatoon, Saskatchewan. May 15-17, 2019.
7. Marjan, P., E. Burton, P. Craig, H. Dhiyebi, A. Doxey, J.P. Giesy, B. Katzenback, J. Peters, M.R. Servos. Can seasonal changes in brook trout (*Salvelinus fontinalis*) abundance be detected using environmental DNA (eDNA)? – A case study in a small headwater stream in southern Ontario, Canada. Global Water Futures 2nd Annual Science Meeting, Saskatoon, Saskatchewan. May 15-17, 2019.
8. Burton, E., P. Marjan, H. Dhiyebi, L. Bragg, J. Giesy, M. Servos. Optimization of brook trout (*Salvelinus fontinalis*) environmental DNA collection methods. Global Water Futures 2nd Annual Science Meeting, Saskatoon, Saskatchewan. May 15-17, 2019.
9. Ikert H, Lynch M, Doxey AC, Servos MR, Giesy JP, Katzenabck BA, Craig PM. Identification of secreted microRNA from acutely stressed *Oncorhynchus mykiss*. Canadian Society of Zoologists. Windsor, Ont., May 13-17, 2019

10. Ikert, Heather, P. Marjan, A.C. Doxey, M.R. Servos, J.P. Giesy, B.A. Katzenback, and P.M. Craig (2019). Can microRNA secreted from trout be used to detect their response to stress? 28th Comparative Physiology & Biochemistry Workshop. Poster presentation. Keene, Ontario, Jan. 25-27, 2019.
11. Harper, N, Ikert H, Lynch M, Doxey AC, Servos MR, Giesy JP, Craig PM, and BA Katzenback. Validating eDNA metabarcoding surveys via electrofishing in an inhibitor-laden stream. 28th Comparative Physiology and Biochemistry Workshop. Keene, Ontario. January 27, 2019.
12. Ikert H, Lynch M, Doxey AC, Sevos MR, Giesy JP, Katzenabck BA, Craig PM. (2019) Identification of Secreted microRNA from Acutely Stressed Oncorhynchus mykiss). Canadian Society of Zoologists. Oral presentation.
13. Harper, N, Ikert H, Lynch M, Doxey AC, Servos MR, Giesy JP, Craig PM, and BA Katzenback. Validating eDNA metabarcoding surveys via electrofishing in an inhibitor-laden stream. Oral Presentation. 28th Comparative Physiology and Biochemistry Workshop. Keene, Ontario. January 27, 2019.
14. Marjan, P. Environmental DNA (eDNA) of Brook Trout in Washington Creek. Trout Unlimited Middle Grand Chapter Annual General Membership Meeting, Five Oaks Centre, Brantford, Ont. January 26, 2019. Invited Keynote speaker at a meeting of key partners.
15. Ikert HA, Lynch M, Marjan P, Doxey AC, Servos MR, Giesy JP, Katzenback BA and Craig PM. Functional implications of altered miRNA following a multiple stressor exposure in zebrafish (*Danio rerio*). Society of Environmental Toxicology and Chemistry North America, Sacramento, California, USA from November 4 – 8, 2018.
16. DeBofsky, A., Xie, Y., Giesy, P. Shifts of microbiota of fish guts following exposure to dietary benzo[a]pyrene. Society of Environmental Toxicology and Chemistry (SETAC). Sacramento, USA. Nov. 4-8, 2018.
17. Craig, P. The role of microRNA regulation on phenotypic responses to environmental stressors in fish. American Physiology Society Intersociety Meeting: Complexity and Integration, New Orleans in October 2018.
18. Ikert HA, Lynch M, Marjan P, Doxey AC, Servos MR, Giesy JP, Katzenback BA and Craig PM. Alteration of secreted miRNA from stressed rainbow trout identified via high throughput sequencing. Canadian Ecotoxicity Workshop. Vancouver, British Columbia, Canada. Sept 30 – Oct 3, 2018.
19. Marjan P, Katzenback BA, Doxey AC, Craig PM, Giesy JP, Servos MR. From challenges to recommendations for brook trout (*Salvelinus fontinalis*) environmental DNA (eDNA) method development. Poster Presentation. Canadian Ecotoxicity Workshop. Vancouver, British Columbia, Canada. Sept 30 – Oct 3, 2018.
20. Marjan P, Katzenback BA, Doxey AC, Craig PM, Giesy JP, Servos MR. Temporal changes in brook trout (*Salvelinus fontinalis*) environmental DNA (eDNA) detection rates in the Grand River sub-watershed, Ontario – Washington Creek case study. Canadian Ecotoxicity Workshop. Vancouver, British Columbia, Canada. Sept 30 – Oct 3, 2018.
21. Harper N, Marjan P, Lynch M, Doxey AC, Servos MR, Giesy JP, Craig PM and Katzenback BA. Validating environmental DNA metabarcoding methods via conventional taxonomic identification in Ontario's Grand River watershed. Poster Presentation, Canadian Ecotoxicity Workshop. Vancouver, British Columbia, Canada. Sept 30 – Oct 3, 2018. *Awarded the Arthur J. Niimi Outstanding Student Poster Presentation Award.

22. Xie Y.-W.. Environmental (DNA) metabarcoding for ecotoxicological assessment of anthropogenic activities. Toxicology 990 Seminar Series, University of Saskatchewan, Sept. 17, 2018.
23. Paul Craig. Cost of Living in the Grand River: energetics, stress and epigenetics. 13th International Congress on the Biology of Fish, Calgary, Alberta, Canada, July 15th-19th, 2018.
24. Ikert HA, Marjan P, Doxey AC, Servos MR, Giesy JP, Katzenback BA and Craig PM. Can microRNA secreted from trout be used to detect their response to stress? Laurentian Chapter of the Society of Environmental Toxicology and Chemistry. Kingston, Ontario. June 8, 2018. Awarded best PhD presentation
25. Ikert HA, Marjan P, Doxey AC, Servos MR, Giesy JP, Katzenback BA and Craig PM. Can microRNA secreted from trout be used to detect their response to stress? Global Water Futures Annual Science Meeting. Hamilton, Ontario. June 3 – 6, 2018.
26. Ikert HA, Marjan P, Doxey AC, Servos MR, Giesy JP, Katzenback BA and Craig PM. Can microRNA secreted from trout be used to detect their response to stress? Oral Presentation, *Canadian Society of Zoologists*. St. Johns, Newfoundland. May 7 – 11, 2018.
27. Hecker M., Zee J., Gerhart A., Doering J., Jardine T. eDNA as an Early Detection Tool for the Potential Spread of Zebra Mussels (*Dreissena polymorpha*) to Saskatchewan Lakes. The Annual Convention of the Saskatchewan Wildlife Federation. Prince Albert. March 9, 2018. ***Invited Keynote Presentation***
28. Hecker M., Zee J., Gerhart A., Doering J., Jardine T. Environmental DNA: A novel approach to characterize biodiversity. Presentation to Orano (former AREVA) Resources. February 27, 2018. ***Invited Keynote Presentation***
29. Giesy J. P.. Environmental Forensics: What is it and What can it Do? 1st Annual Science Meeting of the Global Water Futures Network, which was held in Hamilton, Ontario, Canada, June 6, 2018. ***Invited, plenary keynote presentation.***
30. Hecker M., Zee J., Gerhart A., Doering J., Jardine T. eDNA as an Early Detection Tool for the Potential Spread of Zebra Mussels (*Dreissena polymorpha*) to Saskatchewan Lakes. Presentation to Saskatchewan Environment Aquatic Invasive Species Task Force. Saskatoon. January 19, 2018. ***Plenary/keynote presentation.***
31. Servos, M. and J. Giesy. Next generation solutions to ensure healthy water resources for future generations Global Water Inception Meeting, Waterloo, Ont., Jan. 21-23, 2018.
32. Zee, J., Hecker, M., Gerhart, A., Doering, J., and Jardine, T. 2017. eDNA as an early detection tool for the potential spread of zebra mussels (*Dreissena polymorpha*) to Saskatchewan lakes. Canadian Ecotoxicity Workshop, Guelph, October 1-4.