ANNIE BOURBONNAIS
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RESEARCH INTERESTS

Marine and lacustrine biogeochemistry, Marine nitrogen cycle, Nitrogen and carbon stable isotopes, Greenhouse gas (N_2O) production and consumption, Chemosynthetic deep-sea ecosystems, Oxygen minimum zones**,** Dissolved gases (N_2, O_2, Ar) as tracers of oceanic physical and biological processes, Harmful cyanobacterial blooms

I. EDUCATION

A. Earned Degrees

2007 – 2012 **PhD Earth and Ocean Sciences**, University of Victoria (UVic), Victoria, BC, Canada (Advisor: Prof. S. Kim Juniper). Dissertation Title: "*Fixed Nitrogen Loss in Two Variably Anoxic Marine Environments: The Subsurface Biosphere of Hydrothermal Vents (Juan De Fuca Ridge, Northeast Pacific) and Saanich Inlet, a British Columbia Fjord"*

2005 – 2007 **MS Earth Sciences**, Université du Québec à Montréal (UQAM), GEOTOP UQAM-McGill Research Center, Montréal, QC, Canada (Advisor: Prof. Moritz F. Lehmann). Thesis title: "*Nitrate isotope anomalies as indicator of N_2 fixation in the Azores Front region (subtropical N-E Atlantic)"*

2001 – 2005 **BSc Environmental Sciences** with Honours in Environmental Geochemistry (*Summa Cum Laude*), University of Ottawa, Ottawa, ON, Canada

B. Additional Courses and Training

2020 Arctic Data Center Training (offered by the National Center for Ecological Analysis and Synthesis), 1 week (Oct 19-23), virtual workshop

2013 Satellite Remote Sensing Training for Biological Oceanographers Course, Cornell University, Ithaca, NY, USA. 2 weeks

1998 – 2001 Analytical Chemistry Diploma, Cégep de l'Outaouais, Hull, Québec, Canada

II. EMPLOYMENT HISTORY

2018 – present **Assistant Professor**, School of the Earth, Ocean and Environment, University of South Carolina (USC), Columbia, SC, USA

2018 – present **Adjunct Professor**, School for Marine Science and Technology, University of Massachusetts (UMass) Dartmouth, New Bedford, MA, USA

2015 – 2018 **Research Assistant Professor**, School for Marine Science and Technology, UMass Dartmouth, New Bedford, MA, USA

2016 – 2017	**Postdoctoral Fellow** with Dr. Scott C. Doney, Woods Hole Oceanographic Institution (WHOI), Woods Hole, MA, USA
2016	**Adjunct Professor**, Northeast Maritime Institute, College of Maritime Science, Fairhaven, MA, USA
2013 – 2015	**Postdoctoral Research Fellow** with Prof. Mark A. Altabet, School for Marine Science and Technology, UMass Dartmouth, New Bedford, MA, USA
2007 – 2012	**Research Assistant** (Marine Microbiology and Isotope Biogeochemistry), Principal Investigator: S. Kim Juniper, UVic, BC, Canada
2005 – 2007	**Research Assistant** (Marine Isotope Biogeochemistry), Principal Investigator: Moritz F. Lehmann, UQAM, QC, Canada
2004 –2005	**Research Assistant** (Groundwater Isotope Geochemistry), Principal Investigator: Ian D. Clark, University of Ottawa, ON, Canada
2001	**Analytical Chemist** (internship) at CANMET Mining and Mineral Sciences Laboratories, Natural Resources Canada, Ottawa, ON, Canada
2000	**Analytical Chemist** (internship), University of Franche-Comté, Besançon, France

III. HONORS, AWARDS AND OTHER RECOGNITION

A. Honors and Awards

2021	Outstanding *Limnology & Oceanography* reviewer
2011	InterRidge Student Award for the "hottest" oral presentation, session: Biochemical function and diversity of chemosynthetic deep-sea ecosystems, European Geosciences Union (EGU) meeting, Vienna, Austria
2007	Excellent Mention, MS Earth Sciences, UQAM
2005	Highest standing in the Honours Baccalaureate in Science in Environmental Sciences, University of Ottawa
2001 – 2005	Dean's Honour List, faculty of Sciences, University of Ottawa

B. Fellowships and Scholarships

2022	McCausland Faculty Fellowship, College of Arts and Sciences, USC ($10,000 salary supplement during three academic year and one-time research fund of $10,000)
2018	Postdoctoral Research Leave Fellowship, The American Association of University Women (AAUW) ($30,000, declined)
2016 – 2017	U.S. GO-SHIP (Repeat hydrography) Postdoctoral Fellowship, NSF ($55,000/year)
2013 – 2015	Postdoctoral Fellowship, Natural Sciences and Engineering Research Council of Canada (NSERC) ($40,000/year)
2011 – 2012	PEO Scholar Award ($15,000)
2009 – 2011	Rix Family Leading Edge Student Award ($5,000/year)
2008 – 2010	University of Victoria President's Scholarship ($4,000/year)
2008 – 2010	Doctoral Canada Postgraduate Scholarship (PGS D), NSERC ($25,000/year)

2008 – 2010	Doctoral Research Scholarship, Fonds Québeçois de Recherche sur la Nature et les Technologies (FQRNT) ($20,000/year, declined)
2007 – 2008	University of Victoria Fellowship ($10,000/year)
2007 – 2008	University of Victoria Pacific Century Scholarship ($7,800/year)
2005 – 2007	Canada Graduate Scholarship-Master's (CGS M), NSERC ($17,500/year)
2005 – 2007	Master's Graduate Scholarship, FQRNT ($15,000/year, declined)
2005	Undergraduate Student Research Award (USRA), NSERC (4500$)
2004	Undergraduate Student Research Award (USRA), NSERC (4500$)
2000 – 2005	Admission Scholarship, University of Ottawa (2,500$/year)

IV. RESEARCH, SCHOLARSHIP AND CREATIVE ACTIVITIES

A. Published Books, Book Chapters, and Edited Volumes

A1. Books
No data

A2. Refereed Book Chapters
No data

A3. Book Chapters in Edited Volumes

2. Voss, M., Bartoli, M., Bonaglia, S., **Bourbonnais**, **A.**, Choisnard, N., Frey, C., Holtermann, P., Jennerjahn, T. C., Jickells, T., & Weston, K. (2023). Coastal Nitrogen Cycling – Biogeochemical Processes and the Impacts of Human Activities and Climate Change. In Treatise on Estuarine and Coastal Science, 2nd edition, 26 pages. DOI https://doi.org/10.1016/B978-0-323-90798-9.00042-1.

1. Wankel, S. D., **Bourbonnais, A**., & Charoenpong, C. N. (2017). Microbial nitrogen cycling processes at submarine hydrothermal vents. In Kallmeyer, Jens and Wagner, Dirk (Ed.), *Life in Extreme Environments, Life at Vents and Seeps*, Volume 5, Berlin, Boston: De Gruyter, pp. 179-221.

B. Refereed Publications and Submitted Articles

(1467 citations in Google Scholar, h-index = 20, i10-index = 23)

B1. Published and Accepted Journal Articles

Supervised students are indicated with *.

35. Peng, X., Yousavich, D. J., **Bourbonnais, A.**, Wenzhöfer, F., Janssen, F., Treude, T., Valentine, D. L. (2024). The fate of fixed nitrogen in Santa Barbara Basin sediments during seasonal anoxia, Biogeosciences, 21, 3041 – 3052.

34. Palevsky, H., Clayton, S., Benway, H., Maheigan, M., Atamanchuk, D., Battisti, R., Batryn, J., **Bourbonnais, A**., Briggs, E., Carvalho, F., Chase, A. P., Eveleth, R., Fatland, R., Fogaren, K., Fram, J. P., Hartman, S., Le Bras, I., Manning, C. C. M., Needoba, J., Neely, M. B., Oliver, H., Reed, A. C., Rheuban, J. E., Schallenberg, C., Walsh, I., Wingard, C., Bauer, K., Chen, B., Cuevas, J., Flecha, S., Horwith, M., Melissa, M., Menz, T., Rivero-Calle, S., Roden, N. P., Steinhoff, T., Trucco-Pignata, P. N., Vardaro, M. F., & Yoder, M. (2024), A Model for

Community-driven Development of Best Practices: The Ocean Observatories Initiative Biogeochemical Sensor Data Best Practices and User Guide, *Frontiers in Marine Science*, 11, 1358591.

33. Venkatachari*, A., Salman, I. J., Shingai, Q. K., Bruesewitz, D., Quattrini Li, A., Arsenault, E., Ewing, H., Cottingham, K. L., Rekleitis, I., **Bourbonnais, A**. (2024). Use of autonomous surface vehicles to collect spatial resolution water quality data in Lake Wateree, SC, *Journal of South Carolina Water Resources*, 9 (2), 10

32. **Bourbonnais, A**., Chang, B. X., Sonnerup, R., Doney, S., Altabet, M. A. (2023). Marine N_2O cycling from high spatial resolution concentration, stable isotopic and isotopomer measurements along a meridional transect in the eastern Pacific Ocean. *Frontiers in Marine Science*, 10, 671, doi: 10.3389/fmars.2023.1137064.

31. Lazo-Murphy*, B. M., Larson, S., Staines, S., Bruck, H., McHenry, J., **Bourbonnais**, **A.**, & Peng, X. (2022). Nitrous oxide production and isotopomer composition by fungi isolated from salt marsh sediments. *Frontiers in Marine Science*, 9, 2645, doi: 10.3389/fmars.2022.1098508.

30. Mashifane, T. B., **Bourbonnais**, **A.**, & Fawcett, S. E. (2022). Nitrous oxide dynamics in the southern Benguela upwelling system. *Journal of Geophysical Research: Oceans*, 127(11), e2022JC019129.

29. Bif, M. B., **Bourbonnais**, **A.**, Hansell, D. A., Granger, J., Westbrook*, H., & Altabet, M. A. (2022). Controls on surface distributions of dissolved organic carbon and nitrogen in the southeast Pacific Ocean. *Marine chemistry*, 244, 104136.

28. Izett, R. W., Hamme, R., McNeil, C., Manning, C., **Bourbonnais, A.**, & Tortell, P. (2021). $\Delta O_2/N_2$' as a new tracer of marine net community production: Application and evaluation in the Subarctic Northeast Pacific and Canadian Arctic Ocean. *Frontiers in Marine Science*, 8:718625, doi: 10.3389/fmars.2021.718625.

27. **Bourbonnais, A.**, Frey, C., Sun, X., Bristow, L. A., Jayakumar, A., Ostrom, N. E., Casciotti, K. L., & Ward, B. B. (2021). Protocols for assessing transformation rates of nitrous oxide in the water column. *Frontiers in Marine Science*, 8:611937, doi:10.3389/fmars.2021.611937.

26. Sayedi, S. S., Abbott, B. W., Thornton, B. F., Frederick, J., Vonk, J. E., Overduin, P., Schädel, C., Schuur, E. A. G., **Bourbonnais**, **A**., Demidov, N., Gavrilov, A., He, S., Hugelius, G., Jakobsson, M., Jones, M., Joung, D., Kraev, G., Macdonald, R. W., McGuire, A. D., Mu, C., O'Regan, M., Schreiner, K. M., Stranne, C., Pizhankova, E., Vasiliev, A., Westermann, S., Zarnetske, J. P., Zhang, T., Ghandehari, M., Baeumler, S., Brown, B. C., & Frei R. J. (2020). Subsea permafrost carbon stocks and climate change sensitivity estimated by expert assessment. *Environmental Research Letters*, 15, 124075.

25. Wilson, S. T., Al-Haj, A. N., **Bourbonnais, A**., Frey, C., Fulweiler, R. W., Kessler, J. D., Marchant, H. K., Milucka, J., Ray, N. E., Suntharalingam, P., Thornton, B. F., Upstill-Goddard, R. C., Weber, T. S., Arévalo-Martínez, D. L., Bange, H. W., Benway, H. M., Bianchi, D., Borges, A. V., Chang, B. X., Crill, P. M., del Valle, D. A., Farías, L., Joye, S. B., Tortell, P. D., Labidi, J., Manning, C. C., Pohlman, J. W., Rehder, G., Sparrow, K. J., Tortell, P. D., Treude, T., Valentine, D. L., Ward, B. B., Yang, S., and Yurganov, L. N. (2020). Ideas and perspectives: A strategic assessment of methane and nitrous oxide measurements in the marine environment. *Biogeosciences*, 17(22), 5809-5828.

24. Yang, S., Chang, B. X., Warner, M. J., Weber, T. S., **Bourbonnais**, **A.,** Santoro, A. E., Kock, A., Sonnerup, R. E., Bullister, J. L., Wilson, S. T., & Bianchi, D. (2020). Global reconstruction reduces the uncertainty of oceanic nitrous oxide emissions and reveals a vigorous seasonal cycle. *Proceedings of the National Academy of Sciences*, *117*(22), 11954-11960.

23. White, A. E., Granger, J., Selden, C., Gradoville, M. R., Potts, L., **Bourbonnais**, **A.,** Fulweiler, R. W., Knapp, A. N., Mohr, W., Moisander, P. H., Tobias, C. R., Caffin, M., Wilson, S. T., Benavides, M., Bonnet, S., Mulholland, M. R., & Chang, B. X. (2020). A critical review of the $^{15}N_2$ tracer method to measure diazotrophic production in pelagic ecosystems, *Limnology and Oceanography Methods*, doi: 10.1002/lom3.10353.

22. Moos, S. B., Boyle, E. A., Altabet, M. A., & **Bourbonnais, A.** (2020). Investigating the cycling of chromium in the oxygen deficient waters of the Eastern Tropical North Pacific Ocean and the Santa Barbara Basin using stable isotopes. *Marine Chemistry*, 10.1016/j.marchem.2020.103756.

21. Altabet, M. A., & **Bourbonnais**, **A.** (2019). N-loss stoichiometry in a Peru ODZ eddy. *Journal of Marine Research, 77*(2), 169-189.

20. Lehmann, N., Kienast, M., Granger, J., **Bourbonnais, A**., Altabet, M. A., & Tremblay, J-É. (2019). Remote western Arctic nutrients fuel remineralization in the deep Baffin Bay. *Global Biogeochemical Cycles*, doi.org/10.1029/2018GB006134.

19. Dale, A., **Bourbonnais**, **A.,** Altabet, M. A., Wallmann, K., & Sommer, S. (2019). Isotopic fingerprints of benthic nitrogen cycling in the Peruvian oxygen minimum zone, *Geochemica et Cosmochimica Acta*, 245, 406-425.

18. Fassbender, A. J., **Bourbonnais**, **A**., Clayton, S., Gaube, P., Omand, M., Franks, P. J. S., Altabet, M. A., & McGillicuddy D. J. Jr. (2018). Interpreting mosaics of ocean biogeochemistry, *Eos*, 99, https://doi.org/10.1029/2018EO109707.

17. Reed, A., McNeil, C., D'Asaro, E., Altabet, M., **Bourbonnais**, **A.,** & Johnson, B. (2018). A gas tension device for the mesopelagic zone. *Deep-Sea Research I*, https://doi.org/10.1016/j.dsr.2018.07.007.

16. Ganesh, S., Bertagnolli, A. B., Bristow, L. A., Padilla, C. C., Blackwood, N., Aldunate, M., **Bourbonnais**, **A.**, Altabet, M. A., Malmstrom, R. R., Woyke, T., Ulloa, O., Konstantinidis, K. T., Thamdrup, B., & Stewart, F. J. (2018). Genomic evidence for the use of alternative nitrogen substrates by anammox bacteria. *The ISME Journal*, https://doi.org/10.1038/s41396-018-0223-9.

15. **Bourbonnais, A**., Letscher, R. T., Bange, H. W., Échevin, V., Larkum, J., Mohn, J., Yoshida, N., & Altabet, M. A. (2017). N_2O production and consumption from stable isotopic and concentration data in the Peruvian coastal upwelling system. *Global Biogeochemical Cycles*, 31, doi:10.1002/2016GB005567.

14. Löscher, C. R., **Bourbonnais**, **A**., Dekaezemacker, J., Charoenpong, C. N., Altabet, M. A., Bange, H. W., Czeschel, R., Hoffmann, C., & Schmitz, R. A. (2016). N_2 fixation in eddies of the eastern tropical South Pacific Ocean. *Biogeosciences, 13,* 2889-2899.

13. Dale, A, Sommer, S., Lomnitz, U., **Bourbonnais**, **A**., & Wallmann, K. (2016). Biological nitrate transport in sediments on the Peruvian margin mitigates benthic sulfide emissions and drives pelagic N loss during stagnation events. *Deep-Sea Research Part I*, *112*, 123-136.

12. Hu, H.*, A. **Bourbonnais*, A**., Larkum, J., Bange, H. W., & Altabet, M. A. (2016). Nitrogen cycling in shallow low oxygen coastal waters off Peru from nitrite and nitrate nitrogen and oxygen isotopes. *Biogeosciences*, *13*, 1453-1468. *These authors contributed equally to this work.

11. Padilla, C. C., Bristow, L. A., Sarode, N., Garcia-Robledo, E., Gómez Ramírez, E., Benson, C. R., **Bourbonnais, A**., Altabet, M. A., Girguis, P. R., Thamdrup, B., Stewart, F. J. (2016). NC10 bacteria in marine oxygen minimum zones. *The ISME Journal, 10,* 2067-2071.

10. **Bourbonnais, A.,** Altabet, M. A., Charoenpong, C. N., Larkum, J., Hu, H., Bange, H. W., & Stramma, L. (2015). N-loss isotope effects in the Peru oxygen minimum zone studied using a mesoscale eddy as a natural tracer experiment. *Global Biogeochemical Cycles*, *29*, 793-811.

9. **Bourbonnais, A.**, Juniper, S. K., Butterfield, D. A., Anderson, R. E., Lehmann, M. F. (2014). Diversity and abundance of Bacteria and *nirS*-encoding denitrifiers associated with the Juan de Fuca Ridge hydrothermal system. *Annals of Microbiology, 64*, 1691–1705.

8. **Bourbonnais, A.**, Lehmann, M. F., Hamme, R. C., Manning, C. C., & Juniper, S. K. (2013). Nitrate elimination and regeneration as evidenced by dissolved inorganic nitrogen isotopes in Saanich Inlet, a seasonally anoxic fjord. *Marine Chemistry, 157*, 194–207.

7. Wenk, C. B., Blees, J., Zopfi, J., Veronesi, M., **Bourbonnais**, **A**., Schubert, C. J., Niemann, H., & Lehmann, M. F. (2013). Anammox bacteria and sulfide-dependent denitrifiers co-exist in the water column of a meromictic south-alpine lake. *Limnology and Oceanography, 58*, 1–12.

6. **Bourbonnais, A**., Juniper, S. K., Butterfield, D. A., Devol, A. H., Kuypers, M. M. M., Lavik, G., Hallam, S. J., Wenk, C. B., Chang, B. X., Murdock, S. A., & Lehmann, M. F. (2012b). Activity and abundance of denitrifying bacteria in the subsurface biosphere of diffuse hydrothermal vents of the Juan de Fuca Ridge. *Biogeosciences, 9*, 4661–4678.

5. **Bourbonnais, A**., Lehmann, M. F., Butterfield, D. A., & Juniper, S. K. (2012a). Subseafloor nitrogen transformations in diffuse hydrothermal vent fluids of the Juan de Fuca Ridge evidenced by the isotopic composition of nitrate and ammonium. *Geochemistry Geophysics Geosystems*, *13*, Q02T01, doi:10.1029/2011GC003863.

4. Somes, C, A. Schmittner, A., Galbraith, E. D., Lehmann, M. F., Altabet, M. A., Montoya, J. P., Letelier, R. M., Mix, A. C., **Bourbonnais**, **A**., & Eby, M. (2010). Simulating the global distribution of nitrogen isotopes in the Ocean. *Global Biogeochemical Cycles*, *24*, GB4019, doi: 10.1029/2009GB003767.

3. Manning, C. C, Hamme, R. C., & **Bourbonnais, A**. (2010). Impact of deep-water renewal events on fixed nitrogen loss from seasonally-anoxic Saanich Inlet. *Marine Chemistry*, *122*(1-4), 1–10, doi:10.1016/j.marchem.2010.08.002.

2. **Bourbonnais, A**., Lehmann, M. F., Waniek J. J., & Schultz-Bull, D. E. (2009). Nitrate isotope anomalies as indicator of N_2 fixation in the Azores Front region (subtropical N-E Atlantic). *Journal of Geophysical Research*, *114*, C03003, doi:1029/2007JC004617.

1. Clark, I. D., Timlin, R., **Bourbonnais, A**., Jones, & Wickens, K. (2008). Origin and fate of industrial ammonia in municipal groundwaters – tracing anaerobic oxidation (anammox) and apportionment with $^{15}N\text{-}NH_4^+$. *Ground Water Monitoring and Remediation, 28*, 73–82.

B2. Conference Presentations with Proceedings (Refereed)

Supervised students are indicated with *.

4. Salman, I., Hite*, D, Bourbonnais, A., & Rekleitis, I. (2023, September). Optimizing autonomous sampling for improved detection of dissolved nitrogen inputs sustaining harmful cyanobacterial blooms in freshwater lakes. In OCEANS 2023-MTS/IEEE US Gulf Coast, Hampton Roads, pp. 1-5.

3. Salman, I., Raiti, J., Karapetyan, N., Venkatachari*, A., **Bourbonnais**, **A.**, O'Kane, J. M., & Rekleitis, I. (2022, October). Confined water body coverage under resource constraints. *In 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pp. 8465-8471. IEEE.

2. Salman, I., Karapetyan, N., Venkatachari*, A., Li, A. Q., **Bourbonnais**, **A.**, & Rekleitis, I. (2022, October). Multi-Modal Lake Sampling for Detecting Harmful Algal Blooms. *In OCEANS 2022,* Hampton Roads, pp. 1-9. IEEE.

1. Mohammadzadeh, H., Clark, I., Aravena, R., **Bourbonnais**, A., & Middlestead, P. (2006, August). Isotopic analysis of ammonium ($\delta^{15}N$), nitrate ($\delta^{18}O$ & $\delta^{15}N$) and dissolved carbon ($\delta^{13}C$) in landfill leachate plum. *In* Steven K. Starrett, Jihua Hong, & William G. Lyon (Ed.), *2ed International Conference on Environmental Science and Technology*, Volume 2, American Science Press, Houston, USA, pp. 145-150.

B3. Other Refereed Material

1. Palevsky, H. I., Clayton, S., Atamanchuk, D., Battisti, R., Batryn, J., **Bourbonnais**, **A.**, Briggs, E. M., Carvalho, F., Chase, A. P., Eveleth, R., Fatland, R., Fogaren, K. E., Fram, J. Peter., Hartman, S. E., Le Bras, I., Manning, C. C.M., Needoba, J. A., Neely, M. B., Oliver, H., Reed, A. C., Rheuban, J. E., Schallenberg, C., Vardaro, M. F., Walsh, I., and Wingard, C. (2022). OOI Biogeochemical Sensor Data: Best Practices & User Guide, Version 1.0.0. Ocean Observatories Initiative, Biogeochemical Sensor Data Working Group, 134pp. DOI: http://dx.doi.org/10.25607/OBP-1865 (**community peer- reviewed**)

B4. Submitted Journal Articles

Supervised students are indicated with *.

2. Whitmore, L. M., Jensen, L., Granger, J., **Bourbonnais, A**., Xiang, Y., Kipp Rowan, L., Pasqualini, A., Newton, R., Black, E. E., Charette, M. A. A U.S. GEOTRACES synthesis of the Arctic Ocean Upper Halocline: multielemental tracers in the Amerasian Basin reveal interlinked biogeochemical and physical processes. Submitted to: *Progress in Oceanography* (August 2023).

1. Westbrook, H. C., **Bourbonnais**, A., Manning, C. C., Tremblay, J. E., Ahmed, M., Else, B. G. T., & Granger, J. (2023). Dissolved Nitrogen Cycling in The Eastern Canadian Arctic Archipelago and Baffin Bay from Stable Isotopic Data. Submitted to *Global Biogeochemical Cycles* (manuscript # 2023GB007926), July 2023. Available as a preprint on *Authorea*, August 02, 2023, https://doi.org/10.22541/essoar.169100436.64462698/v1

C. Other Publications and Creative Products

3. **Bourbonnais**, A., Valliyodan, S., Altabet, M. A., Jayakumar, A., Naqvi, S. W. A., & TR, G. K. (2023). Editorial: Recent developments in oxygen minimum zones biogeochemistry. *Frontiers in Marine Science*, 10:1333731. doi:10.3389/fmars.2023.1333731. (Invited, refereed by editorial board only, no external review)

2. **Bourbonnais**, **A.**, Ho, S. L., Kinnard, C., Lenaerts, J., Sugiyama, S., and Altabet, M. A. (2021). Global change on the Blue Planet. *Communications Earth & Environment, 2*, 163, doi: 10.1038/s43247-021-00227-2. (Invited, refereed by editorial board only, no external review)

1. McNeil, C., D'Asaro, E., Reed, A., Altabet, M. A., **Bourbonnais**, **A.,** & Beaverson, C. (2018). Innovative nitrogen sensor maps the North Pacific oxygen minimum zone. *Oceanography – Supplement - New Frontiers in Ocean Exploration*, 31, p. 96. (Refereed by editorial board only)

D. Presentations

D1. Invited Seminars

All were oral presentations.

15. **Bourbonnais, A.** (2023), Radboud University, December 8th, Nijmegen, Netherlands

14. **Bourbonnais, A.** (2023), Department for Environmental Science, Basel University, December 6th, Basel, Switzerland

13. **Bourbonnais, A.** & Venkatachari, A. (2023), Lake Wateree Association Annual Meeting, March 18th, Camden, SC

12. **Bourbonnais**, **A.** (2022), Water Chats 2022 Webinar Series (coordinated through the SC Sea Grant Consortium, Clemson Extension, and Clemson University's SC Water Resources Center), Session 2: Harmful Algal Blooms, July 26 & 28 (online)

11. **Bourbonnais, A.** (2022), Lake Wateree Association Annual Meeting, March 19th, Camden, SC

10. **Bourbonnais, A**., (2021), The School for Marine Science and Technology (SMAST), Department of Estuarine and Ocean Sciences (DEOS) Seminar, UMass Dartmouth, March 31st 2021, online

9. **Bourbonnais, A.** (2021), Lake Wateree Association Annual Meeting, March 20th, online

8. Zaengle, A., & **Bourbonnais**, **A.** (2020), SC HABNet Drinking Water Workshop, July 22, virtual meeting hosted by the University of Maryland, Center of Environmental Sciences (UMCES), USA, online

7. **Bourbonnais, A.** (2020), March 25, Environmental Health Sciences Spring 2020 Seminar Series, Arnold School of Public Health, USC, Columbia, SC

6. **Bourbonnais, A.** (2018), USC, SEOE seminars, January 29, Columbia, SC

5. **Bourbonnais, A**. (2017), Moss Landing Marine Laboratories seminars series, December 20, Moss Landing, CA

4. **Bourbonnais, A**, (2017), WHOI Marine Chemistry and Geochemistry (MC&G) Seminar Series, December 5, Woods Hole, MA

3. **Bourbonnais, A.** (2017), OCB summer workshop, June 26-30, WHOI, Woods Hole, USA

2. **Bourbonnais, A.** (2014), The School for Marine Science and Technology (SMAST), Department of Estuarine and Ocean Sciences (DEOS) Seminar, UMass Dartmouth, September 19th 2014, New Bedford, MA

1. **Bourbonnais, A.** (2012), SFB754 lunch colloquium, June 22nd, GEOMAR, Kiel, Germany

D2. Selected Presentations – Contributed Conference Posters or Seminars

The contributed presentations at professional meetings presented by Bourbonnais are indicated with (+). Supervised students are indicated with *.

63. Perin* D, **Bourbonnais, A**., Smith, E., & Matta, C. (2023) Nitrogen removal in stormwater control measures along a vegetation gradient in coastal SC. Coastal & Estuarine Research Federation, November 12-16, Portland, Oregon. USA (oral presentation).

62. Perin*, D., Smith, E. M., Matta*, C., & **Bourbonnais, A**. (2023), Nitrogen removal in stormwater control measures along a vegetation gradient in coastal SC, Aquatic Science Meeting – ASLO, June 4 – 9, Palma de Mallorca, Spain (poster).

61. **Bourbonnais(+), A.,** Perin*, D., Bristow, L., & Altabet, M. (2023), Stable isotopic investigation of nitrous oxide dynamics under varying oxygen and productivity regimes in the eastern tropical North Pacific, Aquatic Science Meeting – ASLO, June 4 – 9, Palma de Mallorca, Spain (poster).

60. Venkatachari*, A., Gordon*, M., Hurley*, G., Perin*, D., & **Bourbonnais, A**. (2023), Distinguishing sources of nitrogen at Lake Wateree, South Carolina, using stable isotopes, 10th Southeastern Biogeochemistry Symposium, May 12 – 14, USC, Columbia, SC, USA (oral presentation)

59. Perin*, D., Smith, E. M., Matta*, C., & **Bourbonnais, A**. (2023), Nitrogen removal in stormwater control measures along a vegetation gradient in coastal SC, 10th Southeastern Biogeochemistry Symposium, May 12 – 14, USC, Columbia, SC, USA (oral presentation).

58. Lazo-Murphy*, B. M., Larson, S., Staines, S., Bruck, H., McHenry, J., **Bourbonnais**, **A.**, & Peng, X. (2023). Nitrous oxide assay from salt marsh sediment isolated fungi under sulfidic conditions, 10th Southeastern Biogeochemistry Symposium, May 12 – 14, USC, Columbia, SC, USA (oral presentation).

57. Gaspar*, M., **Bourbonnais**, **A.**, Perin*, D., Altabet, M., & Bristow, L. (2023), Investigating nitrous oxide cycling in the Eastern Tropical North Pacific oxygen deficient zone using concentration, stable isotope and isotopomer measurements, 10th Southeastern Biogeochemistry Symposium, May 12 – 14, USC, Columbia, SC, USA (oral presentation).

56. Venkatachari, A., Gordon*, M., Hurley*, G., Perin*, D., & **Bourbonnais, A**. (2023), Distinguishing sources of nitrogen at Lake Wateree, South Carolina, using stable isotopes, Discover USC, April 21, USC, Columbia, SC, USA (poster).

55. Perin*, D., Smith, E. M., Matta*, C., & **Bourbonnais, A**. (2023), Nitrogen removal in stormwater control measures along a vegetation gradient in coastal SC, Discover USC, April 21, USC, Columbia, SC, USA (poster).

54. Lumsden*, E., Venkatachari*, A., Perin*, D., & **Bourbonnais, A**. (2023), Investigating the role of the cyanobacterium *Microseira Wollei* for benthic nutrient fluxes, Discover USC, April 21, USC, Columbia, USA (poster).

53. Levicki*, E., Venkatachari*, A., Wang, C., & **Bourbonnais, A**. (2023), Investigating environmental controls on the distribution of *Microseira wollei* in Lake Wateree, SC, Discover USC, April 21, USC, Columbia, USA (poster).

52. Perin*, D., **Bourbonnais, A**., Matta*, C., & Smith, E. (2022), Nitrogen removal in stormwater control measures along a vegetation gradient in coastal SC, SEOE Grad Day Conference, School of the Earth Ocean and Environment, October 28, USC, Columbia, SC, USA (oral presentation)**.**

51. Gaspar*, M., **Bourbonnais**, **A.**, Perin*, D., Altabet, M., & Bristow, L. (2022), Investigating nitrous oxide cycling in the Eastern Tropical North Pacific oxygen deficient zone using concentration, stable isotope and isotopomer measurements. SEOE Grad Day Conference, School of the Earth Ocean and Environment, October 28, USC, Columbia, SC, USA (poster).

50. Venkatachari*, A., Perin*, D., Gordon*, M., Gaspar*, M., Hurley*, G., **Bourbonnais**, **A.**, Rekletis, I., Porter, D., Scott, G., Willis, R., Clyburn, K., Tufford, D., Gantz, S., Kloot, R., & Hogan, T. (2022), Seasonal variability in nutrients controlling the proliferation of harmful freshwater benthic cycanobacteria, 9th Annual Southeastern Biogeochemistry Symposium, April 30 – May 1, Georgia State University, Atlanta, USA (poster).

49. Perin*, D., **Bourbonnais**, **A.**, Altabet, M., & Mnich, A. (2022), Spatial variability in nitrogen loss from dissolved gas measurements in the eastern tropical North Pacific oxygen deficient zone, 9th Annual Southeastern Biogeochemistry Symposium, April 30 – May 1, Georgia State University, Atlanta, USA (poster).

48. Gordon*, M., Venkatachari*, A., Hurley*, G., & **Bourbonnais**, **A.** (2022), Investigating nitrogen sources sustaining harmful cyanobacterial blooms in South Carolina Lakes using stable isotopes, 9th Annual Southeastern Biogeochemistry Symposium, April 30 – May 1, Georgia State University, Atlanta, USA (poster).

47. Gaspar*, M., **Bourbonnais, A.**, Perin*, D., Altabet, M., & Bristow, L. (2022), Impact of submesoscale variability on nitrous oxide concentrations, stable isotopic signatures and

production pathways in the Eastern Tropical North Pacific oxygen deficient zone, 9th Annual Southeastern Biogeochemistry Symposium, April 30 – May 1, Georgia State University, Atlanta, USA (poster).

46. Perin*, D., **Bourbonnais**, **A.**, Altabet, M., & Mnich, A. (2022), Local-scale variability in nitrogen loss from dissolved gas measurements in the Eastern Tropical North Pacific Oxygen Deficient Zone, Discover UofSC, April 22, USC, Columbia, USA (poster).

45. Gordon*, M., Venkatachari*, A., Hurley*, G., & **Bourbonnais**, **A.** (2022), Investigating sources of nitrogen sustaining harmful cyanobacterial blooms in South Carolina Lakes using stable isotopes, Discover UofSC, April 22, USC, Columbia, USA (poster).

44. de Souza Franco, G., Duggan, B., **Bourbonnais**, **A.**, Perin*, D., Jackson, E., & Scher, H. (2022), REE distribution in the water column of the Eastern Pacific Oxygen Minimum Zone, Discover UofSC, April 22, USC, Columbia, USA (poster).

43. Wallschuss*, S., **Bourbonnais**, **A.**, Perin*, D., Flynn, R., Burger, J., Granger, J., Altabet, M. A., Pillay, K., & Fawcett, S. (2022), Nitrous oxide production in the northern and southern Benguela upwelling system from concentrations and stable isotopes, Ocean Sciences Meeting, 28 February – 4 March, Hawaii, USA, virtual meeting (oral presentation).

42. Perin*, D., **Bourbonnais**, **A.**, Mnich, A., & Altabet, M. (2022), Local-scale variability in nitrogen loss from dissolved gas measurements in the Eastern Tropical North Pacific Oxygen Deficient Zone, Ocean Sciences Meeting, 28 February – 4 March, Hawaii, USA, virtual meeting (poster).

41. Gaspar*, M., **Bourbonnais**, **A.**, Perin*, D., Altabet, M., & Bristow, L. (2022), Impact of submesoscale variability on nitrous oxide concentrations, stable isotopic signatures and production pathways in the Eastern Tropical North Pacific oxygen deficient zone, Ocean Sciences Meeting, 28 February – 4 March, Hawaii, USA, virtual meeting (poster).

40. **Bourbonnais**(+), **A.**, Chang, B., & Altabet, M. (2022), Investigating N_2O production pathways from the eastern tropical oxygen deficient zones using concentration, stable isotopic and isotopomer data, Ocean Sciences Meeting, 28 February – 4 March, Hawaii, USA, virtual meeting (**oral presentation**).

39. Wallschuss*, S., **Bourbonnais, A**., Flynn, R., Burger, J., Altabet, M. A., & Fawcett, S. (2021), Temporal changes in nitrous oxide sources and sea-air fluxes from concentrations and stable isotopic data in the Southern Benguela, ASLO 2021 Aquatic Sciences Meeting, 22 – 27 June, virtual meeting (oral presentation).

38. Westbrook*, H., Manning, C., Granger, J., & **Bourbonnais, A.** (2021), DON cycling in the Eastern Canadian Arctic Archipelago from isotopic data, 8th Annual Southeastern Biogeochemistry Symposium, May 15, University of Tennessee, Knoxville, USA, virtual meeting (oral presentation).

37. Shugart*, M., **A. Bourbonnais**, Altabet, M. A., & Bristow, L. (2021), N_2O cycling in the Gulf of Mexico from concentration and stable isotopic data, 8th Annual Southeastern Biogeochemistry Symposium, May 15, University of Tennessee, Knoxville, USA, virtual meeting (poster presentation).

36. Perin*, D., **Bourbonnais, A.**, J. High*, M. Hampton*, A. Webb*, A. Venkatachari*, and M. Altabet (2021), Constraining denitrification from dissolved N_2/Ar measurements in the Eastern Tropical North Pacific Ocean, 8th Annual Southeastern Biogeochemistry Symposium, May 15, University of Tennessee, Knoxville, USA, virtual meeting (poster presentation).

35. Westbrook*, H., Manning, C. C., Granger, J. & **Bourbonnais, A.** (2021), DON cycling in the Eastern Canadian Arctic Archipelago from isotopic data, Discover UofSC, April 23, USC, Columbia, USA, virtual meeting (three-minute thesis oral presentation).

34. Webb*, A., Pinckney, J., & **Bourbonnais, A.** (2021), Effects of swamp DOM on phytoplankton growth in North Inlet estuary, SC, Discover UofSC, April 23, USC, Columbia, USA, virtual meeting (poster presentation).

33. Perin*, D., **Bourbonnais**, **A.,** High*, J., Hampton*, M., Webb*, A., Venkatachari*, A., & Altabet, M. A. (2021), Constraining denitrification from dissolved N_2/Ar measurements in the Eastern Tropical North Pacific Ocean, Discover UofSC, April 23, USC, Columbia, USA, virtual meeting (poster presentation).

32. **Bourbonnais**(+)**, A**., Mordy, C. W., Magen, C., Cooper, L. W., Grebmeier, J. M., & Altabet, M. A. (2021), Investigating water-column and sediment N_2O cycling in the Western Arctic using stable isotopes, Arctic Science Summit Week 2021, 19 – 26 March, Portugal, virtual meeting (poster).

31. Wallschuss*, S., **Bourbonnais**, **A.,** Fawcett, S., Flynn, R., Burgen, J. & Altabet, M. A. (2020), The Biogeochemical cycle of nitrous oxide in the Benguela Upwelling system and its role in the climate system, 1st Perspective on Global Change" Research Conference, 8 – 10 December 2020, Cape Town, Africa, virtual meeting (oral presentation).

30. Westbrook*, H., Manning, C. C., Granger, J., & **Bourbonnais**, **A.** (2020), DON Cycling in the Eastern Canadian Arctic Archipelago from Isotopic Data, AGU Fall meeting, December 1 – 17, virtual meeting (poster). (abstract GC116-0012)

29. Shugart*, M., **Bourbonnais**, **A.,** Altabet, M. A., & Bristow, L. (2020), N_2O Cycling in the Gulf of Mexico from concentration and stable isotopic data, AGU Fall meeting, December 1 – 17, virtual meeting (poster). (Abstract OS036-0015)

28. Westbrook*, H., **Bourbonnais**, **A.,** & Manning, C. C. (2020), Investigating DON cycling in the eastern Canadian Arctic using an isotopic approach, 7th Southeastern Biogeochemistry Symposium, March 14 – 15, Georgia Tech, USA, virtual meeting (poster).

27. Raab*, J., Rekletis, I., & **Bourbonnais**, **A.** (2020), Nitrogen cycling in South Carolina lakes in relation to harmful algal blooms, 7th Southeastern Biogeochemistry Symposium, March 14 – 15, Georgia Tech, USA, virtual meeting (poster).

26. Perin*, D., Shugart*, M., Manning, C. C., Izett, R., Westbrook*, H., & **Bourbonnais**, **A.** (2020), Dissolved gases (O_2/N_2/Ar) concentrations in the eastern Canadian Arctic, 7th Southeastern Biogeochemistry Symposium, March 14 – 15, Georgia Tech, USA, virtual meeting (poster).

25. **Bourbonnais**(+)**, A**., Altabet, M. A., & Granger, J. (2020), Investigating water-column and sediment N_2O cycling in the western Arctic using stable isotopes and isotopomers, Ocean Sciences Meeting, February 16 – 21, San Diego, USA (poster). (abstract OB24E-0494)

24. **Bourbonnais**(+), **A.,** Altabet, M. A., & Granger, J. (2019), N_2O cycling in the Western Arctic from its concentration, stable isotopes and isotopomers, What can we learn from N_2O isotope data? Analytics, reaction mechanisms and modeling - workshop at EMPA Akademie, October 23 – 24, Dübendorf, Switzerland (**oral presentation**).

23. **Bourbonnais**(+), **A.**, Fawcett, S., Flynn, R., Burger, J., & Altabet, M. A. (2019), Temporal changes in nitrous oxide sources and sea-air fluxes in the Southern Benguela, Ocean Carbon & Biogeochemistry Summer Workshop, June 24 – 27, WHOI, MA, USA (poster).

22. **Bourbonnais**(+)**, A.**, Fawcett, S. E., Flynn, R., Burger, J., & Altabet, M. A. (2018), Nitrous oxide stable isotopes and isotopomers in the Benguela upwelling system, Oceanic Methane & Nitrous Oxide Workshop, October 28 – 31, Lake Arrowhead, California, USA (poster).

21. **Bourbonnais**(+)**, A**., Altabet, M. A., & Granger., J. (2018), N_2O cycling in the Western Arctic from its concentrations, stable isotopes and isotopomers, Ocean Sciences Meeting, February 11 – 16, Portland, USA (poster). (abstract BN24B-1083)

20. **Bourbonnais**(+)**, A.,** Altabet, M. A., & Granger, J. (2017), N_2O cycling in the Western Arctic from concentrations, stable isotopes and isotopomers, Gordon Research Seminar & Conference: Chemical Oceanography, July 22 – 28, Colby-Sawyer College, New Hampshire, USA (poster).

19. **Bourbonnais**(+)**, A.,** Altabet, M. A., & Granger, J. (2017), N_2O cycling in the Western Arctic as inferred from concentrations and stable isotopes, ASLO meeting, February 26 – March 3, Honolulu, Hawaii, USA (**oral presentation**).

18. **Bourbonnais**(+)**, A.,** Letscher, R., Larkum, J., Kock, A., Échevin, V., Bange, H. W., & Altabet, M. A. (2016), Spatial variations in N_2O concentration and isotopomer composition off the Peru coast, Ocean Sciences Meeting, February 21 – 26, New Orleans (LA), USA (**oral presentation**). (abstract B11A-08)

17. **Bourbonnais**(+), **A.,** Altabet, M. A., Kock, A., & Bange, H. (2015), Coastal N_2O concentrations and isotopomers off Peru, Gordon Research Conference: Chemical Oceanography, July 26 – 31, Holderness, New Hampshire, USA (poster).

16. **Bourbonnais**(+)**, A.,** Altabet, M. A., Larkum, J., Charoenpong, C., McNeil, C. L., Reed, A. C., & D'Asaro, E. A. (2014), Biogenic N_2 and $\delta^{15}N$-N_2 as proxies for N-loss in the eastern tropical North Pacific: A lagrangian float experiment, American Geophysical Union (AGU) fall meeting, December 13 – 19, San Francisco, USA (**oral presentation**). (abstract OS41F-03)

15. **Bourbonnais**(+)**, A.,** Altabet, M. A., Charoenpong, C., Larkum, J., Hu, H., Bange, H. W., & Stramma, L. (2014), A mesoscale eddy natural tracer experiment to investigate N-loss isotope effects off the Peru coast, OCB Summer Workshop, July 21 – 25, WHOI, Woods Hole, USA (poster).

14. **Bourbonnais**(+)**, A.,** Altabet, M. A., Charoenpong, C., Larkum, J., Hu, H., Bange, H. W., & Stramma, L. (2014), Biogenic N_2 concentrations and stable nitrogen and oxygen isotope dynamics of dissolved N_2, nitrate and nitrite associated with eddies off the Coast of Peru, Ocean Sciences Meeting, February 23 – 28, Honolulu, Hawaii, USA (**oral presentation**).

13. Altabet, M. A., Charoenpong, C., **Bourbonnais**, **A.,** Bange, H. W., & Stramma, L. (2014), Testing Richards stoichiometry for fixed N-loss to N_2 in a Peru OMZ eddy, Ocean Sciences Meeting, February 23 – 28, Honolulu (Hawaii), USA (oral presentation).

12. **Bourbonnais**(+)**, A.,** Charoenpong, C., Larkum, J., Hu, H., Stramma, L., & Altabet, M. A. (2013), Mesoscale eddies as fixed N-loss hotspots in oxygen minimum zones, Ocean Carbon and Biogeochemistry (OCB) Summer Workshop, July 22 – 26, WHOI, Woods Hole, USA (poster).

11. **Bourbonnais**(+), **A**., Juniper, S. K., Butterfield, D. A., Anderson, R. E., & Lehmann, M. F. (2012), Diversity and abundance of nitrite reductase (*nirS*) genes in the subsurface biosphere of hydrothermal vents of the Juan de Fuca Ridge, The deep-sea & sub-seafloor frontiers conference, March 11 – 14, Sitges (Barcelona), Spain (poster).

10. **Bourbonnais**(+)**, A.,** Lehmann, M. F., Hamme, R. C., Manning, C. C., & Juniper, S. K. (2011), Nitrate isotope fractionation during denitrification in Saanich Inlet: water column versus sediment effects. 45th CMOS congress, June 5 – 9, Victoria (BC), Canada (**oral presentation**).

9. **Bourbonnais**(+)**, A.,** Lehmann, M. F., Butterfield, D. A., Hallam, S. J., Devol, A. H., Kuypers, M. M. M., Lavik, G., Roy, R., Chang, B. X., & Juniper, S. K. (2011), Activity, biodiversity and abundance of denitrifying bacteria in hydrothermal vents of the Juan de Fuca Ridge, North- East Pacific Ocean. EGU meeting, April 3 – 8, Vienna, Austria (**oral presentation**).

8. **Bourbonnais**(+)**, A.,** Lehmann, M. F., Butterfield, D. A., Kuypers, M. M. M., Lavik, G., & Juniper, K. S. (2010), Denitrication as the dominant N-elimination process in hydrothermal vents of the Juan de Fuca Ridge, Northeast Pacific Ocean, SEOS Graduate Students Workshop, April 23, University of Victoria, Victoria, British Columbia, Canada (**oral presentation**)

7. **Bourbonnais**(+)**, A**., Lehmann, M. F., Butterfield, D. A., Devol, A., Chang, B. X., & Juniper, K. S. (2009), Denitrification in diffuse hydrothermal vent fluids of Axial Volcano and the Endeavour Segment on the Juan de Fuca Ridge, AGU fall meeting, December 14 – 18, San Francisco, USA (poster). (abstract V51D-1736)

6. **Bourbonnais**(+)**, A**., Lehmann, M. F., & Butterfield, D. A. (2009), The isotopic composition of dissolved inorganic nitrogen in hydrothermal vent fluids, SEOS Graduate Students Workshop, April 20, University of Victoria, Victoria, British Columbia, Canada (poster).

5. **Bourbonnais**(+)**, A**., Lehmann, M. F., & Butterfield, D.A. (2007), Dual nitrogen and oxygen isotope composition of nitrate in hydrothermal vents systems, Fourth Interdisciplinary McGill Graduate Student Research Symposium, March 29 – 30, Montréal, Canada (poster).

4. Lehmann, M. F., **Bourbonnais**(+)**, A.,** & Butterfield, D.A. (2006), The isotopic composition of dissolved inorganic nitrogen in hydrothermal vent fluids. AGU fall meeting, December 10-15, San Francisco, USA (poster).

3. **Bourbonnais**(+), **A.**, Lehmann, M. F., & Waniek, J. J. (2006), The isotopic composition of nitrate, dissolved organic nitrogen and export particulate matter in the Azores Front region : Implications for N_2 fixation in the subtropical North-East Atlantic. AGU fall meeting, December 10 – 15, San Francisco, USA (**oral presentation**). (abstract H12C-03)

2. **Bourbonnais**(+), **A.** & Lehmann, M. F. (2006), Le $^{15}N/^{18}O$ du nitrate dans la région du Front des Açores : indication pour la fixation de l'azote dans l'Atlantique nord-est subtropical. 74th meeting of the Association Francophone pour le Savoir (ACFAS), May 15 – 19, Montréal, Canada **(oral presentation)**

1. **Bourbonnais**(+), **A.** & Lehmann, M. F. (2006), Dual nitrate isotope measurements in the Azores Front region: indication for N_2 fixation in the subtropical North-East Atlantic Ocean. GAC-MAC, May 14 – 17, Montréal, Canada (**oral presentation**).

E. Grants and Contracts

Total funding to Bourbonnais Lab only, excluding student funding: **$2,233,344**

E1. As Principal Investigator

2024 – 2027	**NSF** (award #2342606), Division of Ocean Sciences (Chemical Oceanography), *Collaborative Research: Multi-isotope and microbial ecology approaches to investigate sedimentary nitrous oxide production and consumption in the northern Benguela Upwelling System*, **lead PI**, $550,590 (total at USC), **$473,245** to Bourbonnais
2024 – 2027	**NSF** (award #2319096), NSF, Division of Ocean Sciences (Chemical Oceanography), *Collaborative Research: Deciphering the mechanisms of marine nitrous oxide cycling using stable isotopes, molecular markers and in situ rates*, lead PI (and sole PI at USC), **$467,675** to Bourbonnais
2023	**Lake Wateree Association, Inc.**: *Lake Wateree water quality data acquisition and analysis*, **lead PI**, **$14,000** to Bourbonnais

2022 **Lake Wateree Association, Inc.**: *Lake Wateree water quality data acquisition and analysis,* **lead PI**, **$14,000** to Bourbonnais

2021 – 2023 **SC. Sea Grant Consortium**: *Evaluating nitrogen removal strategies to improve stormwater management practices in coastal South Carolina*, **lead PI**, co-PI: Erik Smith (Baruch Institute), **$156,359** to Bourbonnais

2021 **SC EPSCoR**: MADE in SC Research Experience for Teachers (RET) Program, **lead PI**, **$2,000** to Bourbonnais

2021 **Lake Wateree Association, Inc.**: *Lake Wateree water quality data acquisition and analysis,* **lead PI**, **$14,601** to Bourbonnais

2020 – 2021 **ASPIRE I**, Office of the Vice President for Research, USC: *Fate of terrestrial dissolved organic nitrogen pulses in estuaries during high loading events*, **sole PI**, **$14,923**

2016 – 2020 **NSF** (award #: 1603596 and 1927755), Division of Polar Programs (PLR), Arctic Natural Sciences: *Nitrous oxide cycling in the Western Arctic Ocean from stable isotopic and concentration data*, **lead PI**, **$290,608** to Bourbonnais ($116,720 transferred to USC).

E2. As Co-Principal Investigator

2023 – 2026 **NSF** (award #2303089), Division of Environmental Biology (Ecosystem Science), *Nitrous oxide production by salt marsh sediment fungi: its significance and mechanisms,* **co-PI** (Lead PI at USC: Xuefeng Peng), $990,239 (total at USC), **$196,689** to Bourbonnais

2023 – 2027 **NSF** (award #2241433), NSF, Division of Ocean Sciences (Chemical Oceanography), *Collaborative Research: Exploring the dynamics of nitrous oxide in the Southern Benguela Upwelling System*, **co-PI**, **$147,450** to Bourbonnais

2022 – 2023 **ASPIRE II**, Office of the Vice President for Research, USC: *New Research Toward Renewal of the USC Oceans and Human Health Center: Sediment Nutrient Dynamics and Proliferation of Harmful Benthic Cyanobacteria in Lake Wateree, SC*, **co-PI**, $98,842 (total at USC), **$15,031** to Bourbonnais.

2022 – 2023 **NSF** (award #8188020), Division of Ocean Sciences (OCE), Ocean Technology & Interdisciplinary Coordination, *Collaborative Research: A novel carbon nanotube based phosphate sensor using potentiometric principles for oceanographic use*, **co-PI**, **$37,466** to Bourbonnais

2021 – 2024 **NSF** (award #2048962), OCE-Chemical Oceanography, *Collaborative Research: US GEOTRACES GP17-OCE: Mapping nitrous oxide sources and sinks through isotopic measurements in the Pacific Ocean*, **co-PI**, **$47,967** and one REU supplement (**$6,082**) to Bourbonnais

2019 – 2024 National Science Foundation **(NSF** award #: 1923004), EPSCoR Research Infrastructure Improvement Program: Track - 2 Focused EPSCoR Collaborations (RII Track-2 FEC): *Computational methods and autonomous robotics systems for modeling and predicting harmful cyanobacterial blooms,* **co-PI** at USC, Lead PI: Alberto Quattrini Li, Dartmouth College, $824,020 at USC, **$335,347** to Bourbonnais

2019 **ASPIRE III**, Office of the Vice President for Research, USC: *Quantifying turbulence and mixing across the estuary-ocean interface with a microstructure profiler*, **co-PI**, PI: Alexander Yankovsky, **$81,426**, no amount to Bourbonnais

F. Other Professional Activities

F1. Oceanographic Field Experience (>295 days at sea)

2021 – 2022 R/V *Sally Ride*, Eastern Tropical North Pacific, Chief Scientist: Mark Altabet, N_2O concentration, natural abundance, and production rate measurements (four weeks)

2019 CCGS *Amundsen*, (Pond Inlet to Resolute Bay, ArcticNet leg 2b), chief scientist: Jean-Carlos Montero-Serrano, dissolved gases (N_2. O_2, Ar), nitrous oxide isotopes and isotopomers and dissolved organic nitrogen isotopes (three weeks)

2017 R/V *Okeanos Explorer* (Eastern Tropical North Pacific, Hawaii to Panama), CTD lead, dissolved gases (N_2. Ar, O_2), and inorganic nitrogen (NO_2^- and NO_3^-) concentrations, and isotopes and N_2O isotopes and isotopomers in the water-column (four weeks)

2017 R/V *Healy* (Chukchi Sea), Chief Scientist: Robert Pickart, dissolved gases (N_2. Ar, N_2O), and inorganic nitrogen (NO_2^- and NO_3^-) concentrations, isotopes and isotopomers in the water-column and the sediments (three weeks)

2016 R/V *Ronald H. Brown* (NOAA), P18 US GO-SHIP, leg 1 (North and South Pacific, San Diego to Easter Island), Chief Scientist: Brendan Carter, **Co-chief Scientist**: **Annie Bourbonnais**, lead for floats, drifters and CTD deployments and recovery, dissolved gases (N_2, Ar, N_2O) and inorganic nitrogen (NO_2^-, NO_3^-) concentrations, isotopes and isotopomers, tritium and He isotopes (five weeks)

2014 R/V *New Horizon*, Eastern Tropical North Pacific, Chief Scientist: Frank Stewart/Mark Altabet, dissolved gases (O_2, N_2, Ar) and DIN isotopes; onboard N_2/Ar and nutrient analysis (four weeks)

2013 R/V *Meteor*, Eastern Tropical South Pacific, Chief Scientist: Stefan Sommer, dissolved gases (N_2, Ar, N_2O) and DIN isotopes (four weeks)

2012 R/V *Meteor*, Eastern Tropical South Pacific, Chief Scientist: Hermann Bange, dissolved gases (O_2, N_2, Ar, N_2O) and DIN isotopes (four weeks)

2009 R/V *Atlantis* (*HOV Alvin*), Northeast Pacific (Juan de Fuca Ridge), Chief Scientist: James Holden, diver, DIN isotopes and N-loss rate measurements (^{15}N-labeled incubations) and onboard nutrient analysis (two weeks)

2008 – 2009 R/V *Strickland*, Saanich Inlet, British Columbia, 9 one-day cruises, **Chief Scientist**: **Annie Bourbonnais** (Canada), dissolved gases (O_2, N_2, Ar) and DIN isotopes; onboard nutrient and O_2 analysis.

2008 R/V *Atlantis* (HOV *Alvin*), Northeast Pacific (Juan de Fuca Ridge), Chief Scientist: James Holden, diver, DIN isotopes and N-loss rate measurements and onboard nutrient analysis (three weeks)

2008 R/V *John P. Tully* (ROV *ROPOS*), Northeast Pacific (Juan de Fuca Ridge), Chief Scientist: Kim Juniper, DIN isotopes and N-loss rate measurements (1 week)

2007 R/V *Atlantis* (ROV *Jason2*), Northeast Pacific (Juan de Fuca Ridge), Chief Scientists: David Butterfield and Bill Chadwick, DIN isotopes and onboard nutrient analysis (17 days)

2005 R/V *Poseidon*, Subtropical Northeast Atlantic (Azores Front), Chief Scientist, Tom J. Müller: DIN and particulate organic N isotopes (9 days)

V. TEACHING AND STUDENT SUPERVISION

A. Course Taught

University of South Carolina (USC)

Spring 2024 **Instructor**, The Chemistry of the Sea (MSCI 313, 54 students)

Fall 2023 **Instructor**, Stable Isotope Geochemistry (GEOL 715, 9 students)

Spring 2023 **Instructor**, The Chemistry of the Sea (MSCI 313, 52 students)

Fall 2022 **Instructor**, Oceans and Society (MSCI 210, 316 students)

Spring 2022 **Instructor**, The Chemistry of the Sea (MSCI 313, 58 students)

Fall 2021 **Instructor**, Stable Isotope Geochemistry (GEOL 715, 12 students)

Spring 2021 **Instructor**, The Chemistry of the Sea, (MSCI 313, 66 students)

Fall 2020 **Instructor**, Oceans and Society (MSCI 210, 132 students)

Spring 2020 **Instructor**, The Chemistry of the Sea (MSCI 313, 62 students)

Fall 2019 **Instructor**, Stable Isotope Geochemistry (GEOL 715, 6 students)

Spring 2019 **Instructor**, The Chemistry of the Sea (MSCI 313, 77 students)

Northeast Maritime Institute

Spring 2016 **Instructor**, Introduction to Ocean Science (OS 101)

University of Massachusetts Dartmouth

Spring 2016 **Guest lecturer**, Marine Microbiology (BIO 471/571): Nitrogen cycling in hydrothermal vents

Spring 2015 **Guest lecturer**, Chemical Oceanography (MAR510): Dissolved gases, Ocean Data View virtual lab (carbonate system) and Radioisotopes as tracers

University of Victoria

Spring 2012 **Laboratory instructor**, General Biology II (190B)

Fall 2011 **Laboratory instructor**, Animal Behavior (345)

Spring 2011 **Laboratory instructor**, General Biology II (190B)

Fall 2010 **Laboratory instructor**, Oceans and Atmosphere (EOS/GEOG 110)

University of Québec in Montréal

Spring 2007 **Teaching assistant**, Oceanography (SCT 4320)

B. Individual Student Guidance

*All at USC unless otherwise indicated

B1. PhD Students

Archana Venkatachari (Marine Sciences, yr. 3, Investigating nitrogen cycling in relation to harmful cyanobacterial blooms in South Carolina Lakes using a stable isotopic approach)

Darcy Perin (Marine Sciences, yr. 2, Nitrogen removal in stormwater control measures along a vegetation gradient in coastal SC)

Birch Lazo-Murphy (Marine Sciences, yr. 2, Role of fungi for N_2O production in SC salt marshes, co-supervised with Dr. Xuefeng Peng, SEOE)

B2. MS Students

Melissa Shugart (Earth and Environment Resources Management (MERM), yr. 1, Using transdisciplinary approaches to help mitigate harmful cyanobacterial blooms in Lake Wateree, SC)

Margaret Gaspar (Marine Sciences, defended in June 2023, Investigating nitrous oxide cycling in the Eastern Tropical North Pacific oxygen deficient zone using concentration, stable isotope and isotopomer measurements)

Holly Westbrook (Marine Sciences, defended in July 2021, Dissolved organic nitrogen concentrations and stable isotopes in the Eastern Canadian Arctic)

B3. Undergraduate Students:

Kaelyn Felix (fall 2023 – present), Alyssa Raynor (fall 2023 – present), Emma Batson (fall 2023 – present), John Dalton Hite (summer 2023 – present), Emily Contract (spring 2023 – spring 2024), William Ostergaard (summers 2023, 2024), Kelley Strike (summer 2023), Claire Matta (summer 2023 – fall 2023), Ella Levicki (summer 2022 – spring 2023), Grace Hurley (fall 2021 – spring 2023), Elise Lumsden (fall 2020 – spring 2023), Adriana Webb (fall 2020 – spring 2021), Miles Hampton (fall 2020, spring 2021), Jaquan High (fall 2020- spring 2021), Olivia Szot (fall 2020), Margaret Gordon (spring 2020 – summer 2023), Margaret Gaspar (spring 2020 – spring 2022), Darcy Perin (spring 2019 – fall 2021), Olivia Melissa Shugart (fall 2019 – fall 2022), Hunter Damron (summer 2019)

University of Massachusetts Dartmouth:

Alan Andonian (summer 2018 and 2017), Erin Steele (summer 2017), Anne Cruz (summer 2014)

B4. Service on Thesis or Dissertation Committees

PhD committee member:

Brian Duggan (defended in October 2022, Advisor: Howie Scher, SEOE)
Gabriel de Souza Franco (yr. 2, Advisor: Michael Bizimis, SEOE)
Madelyn Petersen (yr. 3, Advisor: Susan Lang, WHOI)
Isabell Schlangen (yr. 2, Advisor: Carolin Löscher, University of Southern Denmark)
Madeleine Thompson (yr. 2, Advisor: Xuefeng Peng, SEOE)
Sina Wallschuss (yr. 3, Advisor: Sarah Fawcett, U. Cape Town, South Africa)

MS committee member:

Cat Schlenker (yr. 1, Advisor: Jay Pinckney, SEOE)
Margaret Bernish (defended in March 2023, Advisor: Xuefeng Peng, SEOE)
Curtis Szewczyk (defended in October 2021, Advisor: Claudia Benitez-Nelson, SEOE,)
Halley Carruthers (defended in April 2021, Advisor: Jay Pinckney, SEOE)
Sesha Manning (Advisor: yr. 2, Mark Altabet, UMass Dartmouth, USA)

University of Massachusetts Dartmouth:

Haibei Hu (defended in December 2014, Advisor: Dr. Mark Altabet)
Sheel Prajapati (defended in October 2017, Advisor, Dr. Mark Altabet)

B5. Mentorship of Postdoctoral Fellow and Visiting Scholars/Teachers

Visiting Graduate students:
Isabell Schlangen (PhD student, Syddansk Universitet, Odense, Denmark, 1 week, March 2023)
Sina Wallschuss (PhD student, University of Cape Town, Cape Town, South Africa, 1 month, summer 2022)

Visiting Teachers
Kimberly Hardin, Teacher at Brookland-Cayce High School, Cayce, South Carolina (1 month, summer 2021)

VI. SERVICE

A. Professional Contributions

2021 – present	**Editorial Board Member** for *Communication Earth & Environment* (handled >35 manuscripts to date)
2019 – present	**Panelist for NSF** (CNH2: Dynamics of Integrated Socio-Environmental Systems, OCE - Chemical Oceanography, & Major Research Instrumentation Program)
2018 – present	**Review Editor** for *Frontiers in Marine Science* (section Marine Biogeochemistry)
2015 – present	**External Reviewer**: US NSF (AGS – Paleo Perspectives on Present and Projected Climate (P4CLIMATE), EAR – Major Research Instrumentation, IOS – Integrative Ecological Physiology, OCE – Chemical Oceanography, OCE – Marine Geology & Geophysics, OCE – Postdoctoral Fellowships, OPP Arctic Natural Sciences, and OCE – Ocean Technology & Interdisciplinary Coordination) Connecticut/New York Sea Grant Chilean Government (Fondecyt Program), COFUND II 3rd call, Empa (Switzerland), Natural Environment Research Council (NERC) of the UK, Discovery Science Large Grants scheme The Israel Science Foundation, Personal Research Grants
2013 – present	**External Reviewer**: *Applied Environmental Microbiology, Aquatic Sciences*, *Biogeosciences, Chemical Geology, Chemosphere, Deep-Sea Research I & II, Environmental Microbiology Reports, Environmental Pollution*, *Environmental Science & Technology*, *Frontiers in Marine Science*, *Geochemica et Cosmochimica Acta*, *Geophysical Research Letters*, *Global Biogeochemical Cycles, Hydrobiologia, Journal of Geophysical Research, Journal of Marine Systems, Limnology & Oceanography, Limnology & Oceanography Letters, Marine Chemistry*, *Nature Communications Earth & Environment, Nature Geosciences, Oceanography*, *Philosophical Transactions A, Proceedings of the National Academy of Sciences, and Rapid Communications in Mass Spectrometry*
2023	**Chair/Organizer** of the 10th Southeastern Biogeochemistry Symposium, USC, May 12 – 14 (~70 participants).

2023	**Lead** of the **GESAMP** (Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) Working Group 45: Nutrients (Climate Change and Greenhouse Gas related Impacts on Contaminants in the Ocean)
2023	**Mentor** for the ASLO 2023 Aquatic Sciences Meeting Mentor/Mentee Program
2022 – 2023	**Guest Editor** for the special issue "Recent Development in Oxygen Minimum Zones Biogeochemistry" in *Frontiers in Marine Science* (section Marine Biogeochemistry) (handled 5 manuscripts and wrote the editorial)
2019 – 2023	**Faculty Steering Committee and Judge** for the 6th, 7th, 8th, 9th and 10th annual Southeastern Biogeochemistry Symposiums
2022	**Mentor** for the Ocean Sciences Meeting Mentor/Mentee Program, virtual conference
2022	**Session co-Chair**: "New approaches for the study of the biogeochemistry and microbial ecology of marine oxygen deficient zones", Ocean Sciences Meeting, February 24 - March 4, online
2020	**Session Chair:** "Approaches to study marine oxygen deficient zones from macro to micro scales", Ocean Sciences Meeting, San Diego, USA
2018	**Session Chair:** Evolution of biogeochemical cycles in the Arctic Ocean: predicting the impact from and on climate change, Ocean Sciences Meeting**,** Portland, USA
2018	**Seminar Organizer**, SMAST Seminar Series, UMass Dartmouth, MA, USA
2018	**Mentor** for component 2 of the Ocean Sciences Meeting Student Mentoring Program, Portland, OR, USA
2014 – 2018	**Steering Committee Member** for the Society for Women in Marine Science (SWMS), WHOI
2017	**Mentor** for the ASLO Meeting Student Mentoring Program, Honolulu, Hawaii, USA
2017	**Member** of the WHOI International's Committee
2016 – 2017	**Member** of the WHOI Women's Committee
2016 – 2017	**Postdoctoral Representative** for the Chemistry & Geochemistry department and **Vice President** of the WHOI Postdoctoral Association
2016	**Judge** for the UMass Dartmouth Intercampus Marine Science 2016 Research Symposium, Dartmouth, MA, USA
2016	**Mentor** for component 2 of the Ocean Sciences Meeting Student Mentoring Program, New Orleans, LA, USA
2009	**Seminar Organizer**, School of Earth and Ocean Sciences (SEOS)**,** UVic
2008 – 2009	**SEOS Graduate Student Representative** (UVic)
2005 – 2007	**Quebec Activities Representative** for the Canadian Water Network: organized two scientific conferences at UQAM

B. Contributions to Department, College, and University

University of South Carolina (USC)

2024 – 2027	**Marine Science Program Lead**
2022 – present	**Faculty Senator** (USC)
2021 – present	**Committee on Instructional Development**, USC Faculty Senate
2021 – present	**MSCI program committee**, SEOE, College of Arts and Sciences, USC
2023	**Departmental Search Committee** (SEOE, USC): Organic Geochemistry
2023	**Judge** for Discover USC (April 19th), USC, SC, USA
2022	**Departmental Search Committee** (SEOE, USC): Undergraduate Director
2021	**Reviewer** for the Magellan Scholar Program, Office of Undergraduate Research, USC, USA (4 proposals)
2021	**Reviewer** for the Advanced Support for Innovative Research Excellence (**ASPIRE-I**: Innovation, sub-track 1, junior faculty development) Research Grant Program, USC, USA (5 proposals)
2020 & 2021	**Reviewer** for the Support to Promote Advancement of Research and Creativity (**SPARC**) Graduate Research Grant Program, USC, USA (5 proposals/year)
2019 – 2021	**Graduate admissions committee**, SEOE, College of Arts and Sciences, USC
2019 – 2020	**Marine Science (MSCI) Undergraduate committee**, SEOE, College of Arts and Sciences

C. Public and Community Service

2021 – present	**USC liaison and Member of the WaterWatch steering committee** (Lake Wateree Association), SC, USA
2023	**Participated** in the career day at Carver-Lyon Elementary School (80% African American, 100% economically disadvantaged students), Columbia, SC
2021 – 2022	**Hosted 4 high-school students** (6 weeks internships) as part of the Summer Program for Research Interns organized by the Governor's School for Science and Math (Hartsville, SC)
2018	**Organized** a visit of the SMAST facilities as part of the afterschool program "Leading Senoritas" for disadvantaged girls from low-income families living in New Bedford, MA, USA
2016	**Judge** for the South Shore Regional Science Fair, Bridgewater State University, MA, USA
2015	**Participant** to the Morning Speaker Program at a middle school for disadvantaged girls from the New Bedford area (Our Sisters' school), MA, USA
2009 – 2012	Organization of meetings and symposiums for student members of the Explorers Club
2008, 2012	**Judge** for the Vancouver Island Science Fair for high-school students (UVic)
2008, 2011	**Volunteer** during the Experience UVic day for high-school students: performed short experimental demonstrations at the kiosk

2011	**Team leader** during the All Science Challenge Day (Uvic) for the educational outreach program "Let's Talk Science"
2004 – 2005	**Volunteer** for the educational outreach program "Let's Talk Science": Organized activities and presentations for elementary and high school students (University of Ottawa)

VII. PROFESSIONAL AFFILIATIONS

American Geophysical Union (AGU, since 2006)
Association for the Sciences of Limnology and Oceanography (ASLO, since 2017)
Canadian Water Network (since 2006)
European Geophysical Union (EGU, since 2011)
Golden Key Award Society (since 2003)
The Society for Women in Marine Science (since 2014)