

# Colette LaMonica Kelly

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## Education

- Stanford University** May 2023 (expected)  
Ph.D. in Earth System Science  
Dissertation: *Quantifying Pacific Ocean Nitrous Oxide Cycling using Intramolecular Isotope Measurements and Modeling.*
- Barnard College of Columbia University** 2017  
B.A. in Environmental Science and Dance (double major)  
*Summa Cum Laude*  
Theses: *Drivers of Seasonal and Interannual Variability of Waquoit Bay Carbonate Chemistry;*  
*Dancing Up the Glass Escalator: Institutional Advantages for Men In Ballet Choreography.*

## Research Experience

- Graduate research assistant, Stanford University** 2017-present  
Advisor: Karen Casciotti  
Using isotopic measurements, field experimentation, and modeling, I explore the dynamics of nitrous oxide cycling in oxygen deficient zones. My research focuses on determining the rates of nitrous oxide production from the intramolecular isotopes, or isotopomers, of the nitrous oxide molecule.
- Summer Student Fellow, Woods Hole Oceanographic Institution** 2016  
Advisor: Daniel McCorkle  
Modeled the effects of submarine groundwater discharge on inorganic carbonate chemistry in an estuary.
- Undergraduate researcher, Lamont-Doherty Earth Observatory** 2015-2016  
Advisor: Brian Mailloux  
Wrote Python code for mobile phone photometry of groundwater arsenic test strips and prepared samples for ICP-MS arsenic analysis.

## Publications

(\* = Authored by undergraduate mentee)

- C. L. Kelly, N. M. Travis, P. A. Baya, C. Frey, X. Sun, B. B. Ward, & K. L. Casciotti. Isotopomer Labeling in Hybrid Nitrous Oxide Production. *In prep.*
- C.L. Kelly, C. Manning, C. Frey, J. Kaiser, N. Gluschkoff, & K.L. Casciotti. pyisotopomer: A Python package for obtaining nitrous oxide isotopomers from isotope ratio mass spectrometry. *In review for Rapid Communications in Mass Spectrometry.* <https://doi.org/10.31223/X58S63>
- P.J. Monreal\*, C.L. Kelly, N.M. Travis, & K.L. Casciotti (2022). Identifying the sources and drivers of nitrous oxide accumulation in the eddy-influenced Eastern Tropical North Pacific oxygen-deficient zone. *Global Biogeochemical Cycles*, 36(6). <https://doi.org/10.1029/2022GB007310>
- N.M. Travis, C.L. Kelly, M.R. Mulholland, & K.L. Casciotti. Nitrite Cycling in the Primary Nitrite Maxima of the Eastern Tropical North Pacific. *Biogeosciences*, 20(2). <https://doi.org/10.5194/bg-20-325-2023>
- C. Frey, X. Sun, L. Szemlerski, K. Casciotti, E. García Robledo, A. Jayakumar, C.L. Kelly, M. Lehmann, & B.B. Ward. Nitrous oxide production kinetics from ammonia oxidation in the Eastern Tropical North Pacific. *Limnology and Oceanography*, in press. <https://doi.org/10.1002/lno.12283>
- T. Cinay, D. Dumit, R.J. Woosley, E. Boles, J.V. Kwiecinski, S. Mullen, T.J. Tamasi, M.J. Wolf, C.L. Kelly, N.M. Travis, K.L. Casciotti, & A.R. Babbitt (2022). Coincident biogenic nitrite and pH maxima arise

- in the upper anoxic layer in the Eastern Tropical North Pacific. *Global Biogeochemical Cycles*, 36(12). <https://doi.org/10.1029/2022GB007470>
- C.L. Kelly**, N.M. Travis, P.A. Baya, & K.L. Casciotti (2021). Quantifying Nitrous Oxide Cycling Regimes in the Eastern Tropical North Pacific Ocean With Isotopomer Analysis. *Global Biogeochemical Cycles*, 35(2). <https://doi.org/10.1029/2020GB006637>
- X. Sun, A. Jayakumar, J.C. Tracey, E. Wallace, **C.L. Kelly**, K.L. Casciotti, & B.B. Ward (2020). Microbial  $N_2O$  consumption in and above marine  $N_2O$  production hotspots. *The ISME Journal*, 15(5). <https://doi.org/10.1038/s41396-020-00861-2>
- L.R. Damgaard, **C.L. Kelly**, K.L. Casciotti, B.B. Ward, & N.P. Revsbech (2020). Amperometric sensor for nanomolar nitrous oxide analysis. *Analytica chimica acta*, 1101. <https://doi.org/10.1016/j.aca.2019.12.019>
- E. Haque, B.J. Mailloux, D. De Wolff, S. Gilioli, **C.L. Kelly**, E. Ahmed, C. Small, K.M. Ahmed, A. Van Geen, & B. Bostick (2018). Quantitative drinking water arsenic concentrations in field environments using mobile phone photometry of field kits. *Science of the Total Environment*, 618. <https://doi.org/10.1016/j.scitotenv.2016.12.123>
- C.L. Kelly** (2017). Dancing up the glass escalator: Institutional advantages for men in ballet choreography. *Columbia Undergraduate Research Journal*, 2(1). <https://doi.org/10.52214/curj.v2i1.4113>

## Presentations

- C. L. Kelly**, "Quantifying Pacific Ocean nitrous oxide cycling using intramolecular isotope measurements and modeling," Dissertations Symposium in Chemical Oceanography (DISCO) XXVIII, October 2022, Kailua-Kona, Hawai'i. *Talk*.
- C. L. Kelly**, N. M. Travis, P. A. Baya, C. Frey, X. Sun, B. B. Ward, & K. L. Casciotti, "Identifying a potentially variable site preference for hybrid nitrous oxide production via isotopomer labeling experiments," 10th International Symposium on Isotopomers (ISI) & 12th Isotopes Conference, May 2022, Dübendorf, Switzerland. *Talk*.
- C. L. Kelly**, "Quantifying Pacific Ocean nitrous oxide cycling using intramolecular isotope measurements and modeling," Paleo/Environmental Seminar, University of Southern California, March 2022, Virtual. *Invited talk*.
- C. L. Kelly**, N. M. Travis, P. A. Baya, C. Frey, X. Sun, B. B. Ward, & K. L. Casciotti, "Isotopomer Labeling in Hybrid Nitrous Oxide Production," 2022 Ocean Sciences Meeting, February 2022, Virtual. *Talk*.
- C. L. Kelly**, C. Manning, C. Frey, N. Gluschkoff, & K.L. Casciotti, "pyisotopomer: A software package for  $N_2O$  isotopomer data corrections," 7th International Conference on Nitrification and Related Processes (ICoN7), July 2021, Virtual. *Poster*.
- C. L. Kelly**, N. M. Travis, P. A. Baya, C. Frey, X. Sun, B. B. Ward, & K. L. Casciotti, "Determining rates of hybrid archaeal  $N_2O$  production in the eastern tropical North Pacific Ocean with intramolecular isotope measurements," 2020 Ocean Sciences Meeting, February 2020, San Diego, CA. *Talk*.
- C. L. Kelly**, N. M. Travis, P. A. Baya, & K. L. Casciotti, "Quantifying nitrous oxide cycling regimes in the eastern tropical North Pacific Ocean with isotopomer analysis," What can we learn from  $N_2O$  isotope data?, October 2019, Dübendorf, Switzerland. *Talk*.
- C. L. Kelly**, N. M. Travis, P. A. Baya, & K. L. Casciotti, "Quantifying nitrous oxide cycling regimes in the eastern tropical North Pacific Ocean with isotopomer analysis," 2019 Gordon Research Conference on Chemical Oceanography, July 2019, Holderness, NH. *Invited talk*.
- C. L. Kelly**, B. X. Chang, C. Buchwald, M. S. Forbes, A. R. Babbin, & K. L. Casciotti, "Using Isotopomer Analysis to Determine Drivers of Nitrous Oxide Cycling in the Eastern Tropical North Pacific Ocean," 2018 Ocean Sciences Meeting, February 2018, Portland, OR. *Talk*.
- C. L. Kelly** & D. C. McCorkle, "Drivers of Seasonal and Interannual Variability in Waquoit Bay Carbonate Chemistry," 2017 ASLO Aquatic Sciences Meeting, February 2017, Honolulu, HI. *Poster*.

## Honors, Awards, and Fellowships

<b>Registration grant</b> 2022 Ocean Sciences Meeting (\$355).	2022
<b>Special Service Award for Diversity, Equity, and Inclusion</b> Stanford School of Earth, Energy, and Environmental Sciences.	2021
<b>Certificate of Achievement in Mentoring</b> Stanford School of Earth, Energy, and Environmental Sciences.	2021
<b>Centennial TA Award</b> Stanford School of Earth, Energy, and Environmental Sciences.	2020
<b>Community Impact Award</b> Stanford Alumni Association.	2020
<b>Creative Expression Course Development Support</b> Stanford Vice Provost for Undergraduate Education (\$2,200).	2019
<b>Student Projects for Intellectual Community Enhancement Grant</b> Stanford Vice Provost of Graduate Education (\$2,200).	2018
<b>Mel Lane Student Grant</b> Stanford Woods Institute for the Environment (\$1,500).	2018
<b>McGee-Levorsen Research Grant</b> Stanford School of Earth, Energy, and Environmental Sciences (\$3,000).	2018
<b>National Science Foundation Graduate Research Fellowship Program</b> awardee (\$138,000)	2018
<b>Enhancing Diversity in Graduate Education (EDGE) fellow</b> Stanford University (\$11,800).	2017
<b>Henry Sharp Prize for Outstanding Senior in Environmental Science</b> Barnard College of Columbia University.	2017
<b>Phi Beta Kappa</b> Barnard College of Columbia University.	2016

## Multimedia Outreach Projects

<b>"Small Bugs in the Big City"</b> Video. Choreography and direction by R. Gellman with W-S. Law and C. Culha. Danced by <b>C. L. Kelly</b> , C. Culha, K. Foster, & W-S. Law, with R. Gellman. Filming/editing by C. O'Keefe. Sound editing by W-S. Law. Produced by R. Gellman, <b>C. L. Kelly</b> , & C. Culha. Based on R. Gellman's PhD work, "Differential carbohydrate metabolism impacts colonization by Hadza Bacteroidetes isolates." <a href="https://youtu.be/ut0Q7ubHsxs">youtu.be/ut0Q7ubHsxs</a>	2022
<b>"N<sub>2</sub>O in Drag"</b> Video. Choreography and direction by <b>C. L. Kelly</b> . Danced by R. Gellman, C. Culha, & K. Foster, with <b>C. L. Kelly</b> . Filming/editing by C. O'Keefe. Music by S.C. Dobbs. Produced by <b>C. L. Kelly</b> , R. Gellman, & C. Culha. Based on C.L. Kelly's publication, "Quantifying Nitrous Oxide Cycling Regimes in the Eastern Tropical North Pacific Ocean With Isotopomer Analysis." <a href="https://youtu.be/R4KE-IKrpII">youtu.be/R4KE-IKrpII</a>	2021
<b>"Deceptive Crystals"</b> Video. Choreography and direction by C. Culha. Danced by C. Culha, R. Gellman, & <b>C. L. Kelly</b> . Filming/editing by C. O'Keefe. Music by B. Guneş. Produced by C. Culha, <b>C. L. Kelly</b> , & R. Gellman. Based on C. Culha's publications, "Crystal fractionation by crystal-driven convection" & "Evolution of thermal crystal zonation and their heterogeneity in crystal populations during magma cooling." <a href="https://youtu.be/H2cnAjppogg">youtu.be/H2cnAjppogg</a>	2021
<b>"Ocean Trilogy"</b> In-person performance. Choreography and direction by F. Spector-Atkins. Danced by the members of the SpectorDance company. Produced by <b>C. L. Kelly</b> & C. Culha. Based on interviews with scientists at the Monterey Bay Aquarium Research Institute.	2019

## Research Cruises

- GEOTRACES Section GP15, Pacific Meridional Transect** 9/18/18-11/25/18  
 R/V *Roger Revelle*, Scripps Institution of Oceanography  
 Seattle, WA to Papeete, Tahiti  
 Chief Scientists: Karen Casciotti, Phoebe Lam, and Greg Cutter  
 Contributions: ODF "supertech": collection of samples for long-lived thorium isotopes and protactinium, neodymium and rare earth elements, silicon isotopes, and stable oxygen isotopes of water; collection of samples for  $N_2O$  isotopomer analysis and  $NO_3^-$ , and  $NO_2^-$  isotopic analysis.
- Measuring rates with in-situ incubators** 6/28/2018-7/21/2018  
 R/V *Falkor*, Schmidt Ocean Institute  
 San Diego, CA to San Diego, CA  
 Chief Scientists: Karen Casciotti and Andrew Babbin  
 Contributions: operation of in-situ incubator for nitrogen transformation experiments; collection of samples for  $N_2O$  isotopomer analysis and  $NO_3^-$ , and  $NO_2^-$  isotopic analysis; running incubations conducted with  $^{15}N$  tracer to determine  $N_2O$  production rates; assisting in onboard [ $NO_2^-$ ] analyses via spectrophotometer.
- Nitrous oxide cycling in the eastern tropical North Pacific** 3/16/2018-4/17/2018  
 R/V *Sally Ride*, Scripps Institution of Oceanography  
 San Diego, CA to Manzanillo, Mexico  
 Chief Scientist: Bess B. Ward  
 Contributions: collection of samples for  $N_2O$  isotopomer analysis and  $NO_3^-$ , and  $NO_2^-$  isotopic analysis; running incubations conducted with  $^{15}N$  tracer to determine  $N_2O$  production rates; assisting in onboard [ $NO_2^-$ ] analyses via spectrophotometer.

## Teaching and Mentoring

- Undergraduate Student Mentor** Summer 2020-Spring 2022  
*Stanford Earth Summer Undergraduate Research Program* Stanford University  
 Guided an undergraduate student developing models of nitrous oxide cycling in an oxygen minimum zone, culminating in the undergraduate's first peer-reviewed, first author paper.
- Teaching Assistant** Spring 2020  
*Marine Chemistry* Stanford University  
 Led weekly office hours via Zoom, graded, and taught chemical problem-solving skills.
- Teaching Assistant** Winter 2020  
*Atmosphere, Ocean, and Climate Dynamics: The Ocean Circulation* Stanford University  
 Led weekly in-person office hours, graded, helped students troubleshoot Python code in problem sets, and reviewed basic math concepts (partial differentials, integrals, etc.).
- Undergraduate Student Mentor** Summer 2019  
*Stanford Undergraduate Research in Geoscience and Engineering* Stanford University  
 Helped mentor an undergraduate comparing experimental results from shipboard incubations to *in-situ* incubators.

## Academic Service

- Chair-elect** 2023 Gordon Research Seminar in Chemical Oceanography 2019-present
- Peer reviewer** ES&T, Geophysical Research Letters, Atmosphere-Ocean 2021 - present
- Co-chair** Stanford Earth Graduate Student Activities Committee (GSAC) 2019-2020
- Department representative** Stanford Earth Graduate Student Activities Committee (GSAC) 2018-2019
- ODF Supertechician** GEOTRACES Pacific Meridional Transect (PMT, GP15) 2018

**Contributor** Respect in Stanford Earth (RiSE) working group

2018

## Outreach

**Co-founder** The Art in Science Communication Initiative

2018-present

**Volunter** National Ocean Sciences Bowl

2021

**Volunteer Teacher** Stanford Splash

2017-2021

**Volunteer Teacher** Stanford Geokids

2017-2019

## Professional Affiliations

American Chemical Society

2022-present

Out in Science, Technology, Engineering, and Mathematics

2021-present

American Geophysical Union

2017-present