

GALEN A. MCKINLEY

Professor of Earth and Environmental Sciences
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EDUCATION

2002	Massachusetts Institute of Technology <i>Ph.D. Climate Physics and Chemistry</i> Thesis: <i>Interannual Variability of Air-Sea Fluxes of Carbon Dioxide and Oxygen</i>	Cambridge, MA
1995	Rice University <i>B.S. Civil Engineering – Environmental option</i>	Houston, TX

RESEARCH AND PROFESSIONAL EXPERIENCE

2017 to present	Columbia University / Lamont-Doherty Earth Observatory <i>Professor, Earth and Environmental Sciences</i> <i>Senior Scientist, Lamont-Doherty Earth Observatory</i> <i>Affiliate Professor, Earth and Environmental Engineering</i> I study the ocean carbon cycle and its role in the global carbon cycle. Understanding physical and biogeochemical drivers of carbon cycle variability and distinguishing this from anthropogenic trends is a key interest. My primary tools are numerical models and machine learning.	New York, NY / Palisades, NY
2021 to 2023	<i>Deputy Director, Learning the Earth with Artificial Intelligence and Physics (LEAP), NSF STC</i>	
spring 2024	ETH-Zürich <i>Guest Professor, Environmental Physics</i>	Zürich, Switzerland
2017 to 2020	University of Wisconsin - Madison <i>Adjunct Professor, Atmospheric and Oceanic Sciences</i>	Madison, WI
2016 to 2017	<i>Professor, Atmospheric and Oceanic Sciences and Bryson Professor, Center for Climatic Research</i>	
2011 to 2016	<i>Associate Professor, Atmospheric and Oceanic Sciences</i>	
2004 to 2011	<i>Assistant Professor, Atmospheric and Oceanic Sciences</i>	
summer 2011	Woods Hole Oceanographic Institution <i>Institution Visiting Scholar in Physical Oceanography and Marine Chemistry and Geochemistry</i>	Woods Hole, MA
2003 to 2004	Princeton University / University of Wisconsin - Madison <i>Visiting Research Staff / Anna Julia Cooper Postdoctoral Fellow</i> Ar and N ₂ in ocean and atmospheric models, ocean ¹⁴ C and inverse techniques; and CO ₂ and O ₂ fluxes.	Princeton, NJ
2002 to 2003	Instituto Nacional de Ecología (National Institute of Ecology) <i>Consultant</i> Public health co-benefits from air pollution/greenhouse gas emission control in Mexico City	Mexico City, Mexico
1996 to 2002	Massachusetts Institute of Technology <i>Graduate Research assistant and Postdoctoral associate</i>	Cambridge, MA
1995 to 1996	Brown and Root Environmental <i>Environmental specialist</i> Environmental compliance; water and soils, hazardous waste, air pollution modeling.	Houston, TX
summer 1993	Clivius Multrum, USA <i>Project consultant</i>	Newton, MA

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PEER-REVIEWED PUBLICATIONS (McKinley group: grad*, undergrad**, postdoc⁺)

Heimdal, T.H.⁺, A.P. Shaum, V. Acquaviva, A.R. Fay*, D. Samant*, J. Busecke and G.A. McKinley. Targeting bias in algorithm optimization improves reconstructions of surface ocean pCO₂, *Machine Learning: Earth in press*. (85)

Muller, J.D., N. Gruber, A. Schneuwly, D.C.E. Bakker, M. Gehlen, L. Gregor, J. Hauck, P. Landschützer and G.A. McKinley. Unexpected decline of the ocean carbon sink under record-high sea surface temperatures in 2023, *Nature Climate Change in press*. (84)

Olivarez, H., N.S. Lovenduski, E. Maroon, A.R. Fay*, K.M. Krumhardt, M.N. Levy, K. Lindsay, G.A. McKinley, J.D. Muller, and J.K. Rader (2025) Internal climate variability modulates decadal changes in ocean anthropogenic carbon storage, *Environ. Res. Lett.* 20 014070, doi:10.1088/1748-9326/ada2ad. (83)

Fay, A.R.* D. Carroll, G.A. McKinley, D. Menemenlis, H. Zhang (2024) Scale-dependent drivers of air-sea CO₂ flux variability, *Geophys. Res. Lett.* 51, e2024GL11191, doi:10.1029/2024GL111911. (82)

Heimdal, T.H.⁺ and G.A. McKinley (2024) Using observing system simulation experiments to assess impacts of observational uncertainties in surface ocean pCO₂ machine learning reconstructions, *Scientific Reports*, doi:10.1038/s41598-024-70617-x. (81)

Fay, A.R.* D.R. Munro, G.A. McKinley, D. Pierrot, S.C. Sutherland, C. Sweeney, and R. Wanninkhof (2024) Updated climatological mean delta fCO₂ and net sea–air CO₂ flux over the global open ocean regions, *Earth Sys. Sci. Data* 16, 2123–2139, doi:10.5194/essd-16-2123-2024. (80)

Heimdal, T.H.⁺, G.A. McKinley, A.J. Sutton, A.R. Fay*, and L. Gloege* (2024) Assessing improvements in global ocean pCO₂ machine learning reconstructions with Southern Ocean autonomous sampling, *Biogeosciences* 21, 2159–2176, doi:10.5194/bg-21-2159-2024. (79)

Guan Y., G.A. McKinley, A.R. Fay*, S.C. Doney, G. Keppel-Aleks (2024) Ocean-driven interannual variability in atmospheric CO₂ quantified using OCO-2 observations and atmospheric transport simulations, *Frontiers in Marine Science* 11, doi:10.3389/fmars.2024.1272415. (78)

Olivarez, H., N.S. Lovenduski, Y. Eddebbar, A.R. Fay*, G.A. McKinley, M. Levy, and M. Long. How does the Pinatubo eruption influence our understanding of long-term changes in ocean biogeochemistry? (2024) *Geophys. Res. Lett.* 51, e2023GL10543, doi:10.1029/2023gl105431. (77)

Friedlingstein, P., M. O'Sullivan, M.W. Jones, R.M. Andrew, D. C. E. Bakker, Hauck, J., Landschützer, P., Le Quéré, C., Luijkx, I. T., Peters, G. P., Peters, W., Pongratz, J., Schwingshackl, C., Sitch, S., Canadell, J. G., Ciais, P., Jackson, R. B., Alin, S. R., Anthoni, P., Barbero, L., Bates, N. R., Becker, M., Bellouin, N., Decharme, B., Bopp, L., Brasika, I. B. M., Cadule, P., Chamberlain, M. A., Chandra, N., Chau, T.-T.-T., Chevallier, F., Chini, L. P., Cronin, M., Dou, X., Enyo, K., Evans, W., Falk, S., Feely, R. A., Feng, L., Ford, D. J., Gasser, T., Ghattas, J., Gkritzalis, T., Grassi, G., Gregor, L., Gruber, N., Gürses, Ö., Harris, I., Hefner, M., Heinke, J., Houghton, R. A., Hurtt, G. C., Iida, Y., Ilyina, T., Jacobson, A. R., Jain, A., Jarníková, T., Jersild, A., Jiang, F., Jin, Z., Joos, F., Kato, E., Keeling, R. F., Kennedy, D., Klein Goldewijk, K., Knauer, J., Korsbakken, J. I., Körtzinger, A., Lan, X., Lefèvre, N., Li, H., Liu, J., Liu, Z., Ma, L., Marland, G., Mayot, N., McGuire, P. C., G.A. McKinley, Meyer, G., Morgan, E. J., Munro, D. R., Nakaoka, S.-I., Niwa, Y., O'Brien, K. M., Olsen, A., Omar, A. M., Ono, T., Paulsen, M., Pierrot, D., Pocock, K., Poulter, B., Powis, C. M., Rehder, G., Resplandy, L., Robertson, E., Rödenbeck, C., Rosan, T. M., Schwinger, J., Séférian, R., Smallman, T. L., Smith, S. M., Sospedra-Alfonso, R., Sun, Q., Sutton, A. J., Sweeney, C., Takao, S., Tans, P. P., Tian, H., Tilbrook, B., Tsujino, H., Tubiello, F., van der Werf, G. R., van Ooijen, E., Wanninkhof, R., Watanabe, M., Wilmart-Rousseau, C., Yang, D., Yang, X., Yuan, W., Yue, X., Zaehle, S., Zeng, J., and Zheng, B. (2023) Global Carbon Budget 2023, *Earth Sys. Sci. Data* 15, doi:10.5194/essd-15-5301-2023. (76)

McKinley, G.A., V.S. Bennington*, M. Meinshausen, and Z. Nicholls (2023) Modern air-sea flux distributions reduce uncertainty in the future ocean carbon sink, *Envi. Res. Lett.* doi:10.1088/1748-9326/acc195. (75)

Fay, A.R.* G.A. McKinley, N. Lovenduski, Y. Eddebbar, M. Levy, M. Long, H. Olivarez and R. Rustagi* (2023) Immediate and long-lasting impacts of the Mt. Pinatubo eruption on ocean oxygen and carbon inventories, *Global Biogeochem. Cycles* 37(2), doi:10.1029/2022GB007513. (74)

Gruber, N., D.C.E. Bakker, T. DeVries, L. Gregor, J. Hauck, P. Landschützer, G.A. McKinley and J.D. Muller (2023) Recent trends and variability in the ocean carbon sink, *Nature Reviews Earth and Environment* 4, 119–134, doi:10.1038/s43017-022-00381-x. (73)

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Wong, S.C.W.*, G.A. McKinley, and R. Seager (2022) Equatorial Pacific pCO₂ interannual variability in CMIP6 models, *JGR-Biogeoscience*, doi:10.1029/2022JG007243. (72)

Bennington, V.S.***, T. Galjanic*, and G.A. McKinley (2022) Explicit physical knowledge in machine learning for ocean carbon flux reconstruction: The pCO₂-Residual method, *J. Adv. Model. Earth Sys.*, e2021MS002960, doi:10.1029/2021MS002960. (71)

Bennington, V.S.***, L. Gloege*, and G.A. McKinley (2022) Variability in the global ocean carbon sink from 1959-2020 by correcting models with observations, *Geophys. Res. Lett.* e2022GL098632, doi:10.1029/2022GL098632. (70)

Olivarez, H., N.S. Lovenduski, R. Brady, A.R. Fay*, M. Gehlen, L. Gregor, P. Landschützer, G.A. McKinley, K. McKinnon, and D. Munro (2022) Replaying the tape of history: Synthetic large ensembles of sea-air CO₂ flux, *Global Biogeochem. Cycles*, 36, e2021GB007174, doi:10.1029/2021GB007174. (69)

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Gloege, L.*, M. Yan*, T. Zheng and G.A. McKinley (2022) Improved quantification of ocean carbon uptake by using machine learning to merge global models and pCO₂ data, *J. Adv. Model. Earth Sys.*, 14, e2021MS002620. doi: 10.1029/2021MS002620. (67)

Laughner, J.L., J.L. Neu, D. Schimel, P.O. Wennberg, K. Barsanti, K. Bowman, A. Chatterjee, B. Croes, H. Fitzmaurice, D. Henze, J. Kim, E.A. Kort, Z. Liu, K. Miyazaki, A.J. Turner, S. Anenberg, J. Avise, H. Cao, D. Crisp, J. de Gouw, A. Eldering, J.C. Fyfe, D.L. Goldberg, K.R. Gurney, S. Hasheminassa, F. Hopkins, C. E. Ivey, D.B.A. Jones, J. Liu, N.S. Lovenduski, R.V. Martin, G.A. McKinley, L. Ott, B. Poulter, M. Rua, S.P. Sander, N. Swart, Y.L. Yung, Z-C Zeng, and the rest of the Keck Institute for Space Studies “COVID-19: Identifying Unique Opportunities for Earth System Science” study team (2021) Societal shifts due to COVID-19 reveal large-scale complexities and feedbacks between atmospheric chemistry and climate change, *PNAS*, doi:10.1073/pnas.2109481118. (66)

Fay, A.R.*, L. Gregor, P. Landschützer, G.A. McKinley, N. Gruber, M. Gehlen, Y. Iida, G.G. Laurelle, C. Rödenbeck, A. Roobaert and J. Zeng (2021) SeaFlux: Harmonization of global surface ocean pCO₂ mapped products and flux calculations for an improved estimate of the ocean carbon sink, *Earth Sys. Sci. Data*, doi:10.5194/essd-13-4693-2021. (65)

Fay, A.R.*, and G.A. McKinley (2021) Observed regional fluxes to constrain modeled estimates of the ocean carbon sink, *Geophys. Res. Lett.*, doi:10.1029/2021GL095325. (64)

Ridge, S.M.*, and G.A. McKinley (2021) Ocean carbon uptake under aggressive emission mitigation, *Biogeosciences*. doi:10.5194/bg-18-2711-2021. (63)

Gloege, L.*, G.A. McKinley, P. Landschützer, N.S. Lovenduski, K.B. Rodgers, A. Fay*, T. Frölicher, J.C. Fyfe, T. Illyina, S.D. Jones, C. Rödenbeck, S. Schlunegger and Y. Takano (2021) Quantifying errors in observationally-based estimates of ocean carbon sink variability, *Global Biogeochem. Cycles*, 10.1029/2020GB006788. (62)

Lovenduski, N.S., N.C. Swart, A.J. Sutton, J.C. Fyfe, G.A. McKinley, C. Sabine and N.L. Williams (2021) The ocean carbon response to COVID-related emissions reductions, *Geophys. Res. Lett.*, 10.1029/2020GL092263. (61)

Stamell, J.*, R.R. Rustagi**, L. Gloege*, and G.A. McKinley (2020) Strengths and weaknesses of three Machine Learning methods for pCO₂ interpolation, *Geoscientific Model Development Discuss.* doi: 10.5194/gmd-2020-311. (60)

Diffenbaugh, N.S., C.B. Field, E. Appel, I. Azevedo, D. Baldocchi, M. Burke, J. Burney, P. Ciais, S.J. Davis, A.M. Fiore, S. Fletcher, T. Hertel, D.E. Horton, S. Hsiang, R.B. Jackson, X. Jin, M. Levi, D. Lobell, G.A. McKinley, F.C. Moore, A. Montgomery, K.C. Nadeau, D. Pataki, J.T. Randerson, M. Reichstein, J.L. Schnell, S.I. Seneviratne, D. Singh, A. Steiner and G. Wong-Parodi (2020) The COVID-19 Lockdowns: A Window into the Earth System, *Nature Reviews Earth & Environment*, doi:10.1038/s43017-020-0079-1. (59)

Ridge, S.M.* and G.A. McKinley (2020) Advective controls on the North Atlantic anthropogenic carbon sink, *Global Biogeochem. Cycles*, doi:10.1029/2019GB006457. (58)

McKinley, G.A., A.R. Fay*, Y. Eddebbar, L. Gloege* and N.S. Lovenduski (2020) Forced mechanisms explain recent variability of the ocean carbon sink, *AGU Advances*, doi: 10.1029/2019AV000149. (57)

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- Uchida, T., D. Balwada, R. Abernathey, G.A. McKinley, S. Smith & M. Levy (2020) Eddy iron fluxes control primary production in the open Southern Ocean, *Nature Communications*, doi:10.1038/s41467-020-14955-0. (55)
- Uchida, T., D. Balwada, R. Abernathey, G.A. McKinley, S. Smith and M. Levy (2019) The contribution of submesoscale over mesoscale eddy iron transport in the open Southern Ocean, *J. Adv. Model. Earth Sys.*, doi:10.1029/2019MS001805. (54)
- Chen, H.*, and G.A. McKinley (2019) Isopycnal processes allow for summertime net heterotrophy despite net oxygen accumulation in the lower euphotic zone of the North Atlantic subtropical gyre, *Global Biogeochem. Cycles*, doi: 10.1029/2018GB006094. (53)
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- Fay, A.R.*, N.S. Lovenduski, G.A. McKinley, D.R. Munro, C. Sweeney, A.R. Gray, P. Landschützer, B. Stephens, T. Takahashi, N. Williams (2018) Utilizing the Drake Passage Time-series to understand variability and change in subpolar Southern Ocean pCO₂, *Biogeosciences*, 15, 3841-3855, doi:10.5194/bg-15-3841-2018. (51)
- Muller-Karger, Frank, E. Hestir, C. Ade, K. Turpie, D. Roberts, D. Siegel, R. Miller, D. Humm, N. Izenberg, M. Keller, F. Morgan, R. Frouin, A. Dekker, R. Gardner, J. Goodman, B. Schaeffer, B. Franz, N. Pahlevan, A. Mannino, J. Concha, S. Ackleson, K. Cavanaugh, A. Romanou, M. Tzortziou, E. Boss, R. Pavlick, A. Freeman, C. Rousseaux, J. Dunne, M. Long, E. Klein, G.A. McKinley, R. Letelier, M. Kavanaugh, M. Roffer, J. Goes, A. Bracher, K. Arrigo, H. Dierssen, X. Zhang, F. Davis, B. Best, R. Guralnick, J. Moisan, H. Sosik, R. Kudela, C. Mouw, A. Barnard, S. Palacios, C. Roesler, E. Drakou, W. Appeltans (2018) Satellite Sensor Requirements for Monitoring Essential Biodiversity Variables of Coastal Ecosystems. *Ecological Applications*, 18, doi: 10.1002/eap.1682. (50)
- Peters, G.P., C. LeQuere, R.M. Andrew, J.G. Canadell, P. Friedlingstein, T. Ilyina, R.B. Jackson, F. Joos, J.I. Korsbakken, G.A. McKinley, S. Sitch, and P. Tans (2017) Towards real-time verification of CO₂ emissions, *Nature Climate Change*, doi: 10.1038/s41558-017-0013-9. (49)
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- Pilcher, D.J.*, G.A. McKinley, J. Kralj**, H.A. Bootsma and E.D. Reavie (2017) Modeled sensitivity of Lake Michigan productivity and zooplankton to changing nutrient concentrations and quagga mussels, *J. Geophys. Res. Biogeosci.*, 122, 2017–2032, doi:10.1002/2017JG003818. (47)
- Gloege, L.*, G.A. McKinley, Mouw, C.B.⁺ and A. Ciochetto (2017) Global evaluation of particulate organic carbon flux parameterizations, *Global Biogeochem. Cycles*, 31, 1192–1215, doi:10.1002/2016GB005535. (46)
- Orr, J. C., Najjar, R. G., Aumont, O., Bopp, L., Bullister, J. L., Danabasoglu, G., Doney, S. C., Dunne, J. P., Dutay, J.-C., Graven, H., Griffies, S. M., John, J. G., Joos, F., Levin, I., Lindsay, K., Matear, R. J., McKinley, G. A., Mouchet, A., Oschlies, A., Romanou, A., Schlitzer, R., Tagliabue, A., Tanhua, T., and Yool, A. (2017) Biogeochemical protocols and diagnostics for the CMIP6 Ocean Model Intercomparison Project (OMIP), *Geosci. Model Dev.*, 10, 2169-2199, doi:10.5194/gmd-10-2169-2017. (45)
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- McKinley, G.A., A.R. Fay*, N. Lovenduski, and D.J. Pilcher* (2017) Natural variability and anthropogenic trends in the ocean carbon sink, *Ann. Rev. Mar. Sci.* 9: 125-150, doi: 10.1146/annurev-marine-010816-060529. (43)
- Mouw, C.B.⁺, A. Barnett, G.A. McKinley, L. Gloege* and D.J. Pilcher* (2016) Phytoplankton size impact on export flux in the global ocean, *Global Biogeochem. Cycles*, 30, doi:10.1002/2015GB005355. (42)
- Mouw, C.B.⁺, A. Barnett, G.A. McKinley, L. Gloege* and D.J. Pilcher* (2016) Global ocean particulate organic carbon flux merged with satellite parameters. *Earth Sys. Sci. Data*, 8, 531-541, doi:10.5194/essd-8-531-2016. (41)
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- Pilcher, D.J.*, G.A. McKinley, V. Bennington*⁺ and H. Bootsma (2015) Physical and biogeochemical mechanisms of internal carbon cycling in Lake Michigan, *J. Geophys. Res.*, doi: 10.1002/2014JC010594. (33)
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GALEN A. MCKINLEY

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PUBLICATIONS IN REVIEW

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Moseley, L.A.* , G.A. McKinley, A. Nguyen, D. Carroll, D. Menemenlis. Using a data constrained regional model to understand Labrador Sea oxygen dynamics, *JAMES in review*.

Fay, A.R.* , T.H. Heimdal⁺, V. Acquaviva, A.P. Shaum*, G.A. McKinley, Sensitivity of ocean carbon sink estimates to rare observations, GRL, *in review*.

PUBLICATIONS IN PREPARATION

Moseley, L.A.* , G.A. McKinley, D. Atamanchuk, J. Koelling, D.W.R. Wallace, Examining an oxygen budget of the central Labrador Sea. *in prep*.

Moseley, L.A.* , G.A. McKinley, A.R. Fay*, D. Atamanchuk, Subpolar North Atlantic air-sea CO₂ fluxes: Validating models and products with direct observations, *in prep*.

Shaum, A.P.* and G.A. McKinley. Explainable machine learning to enhance model assessments with sparse data, *in prep*.

Fay, A.R.* , Y. Eddebbar and G.A. McKinley. Quantifying the impact of Mt Pinatubo on upper ocean oxygen trends, *in prep*.

McKinley, G.A., A.R. Fay*, A.P. Shaum*, L.A. Moseley, Heimdal, T.H.⁺, and V. Aquaviva. Uncertainty in surface ocean pCO₂ at the scale of mCDR, *in prep*.

SCIENTIFIC PLANNING AND REVIEW DOCUMENTS

Sabine, C., Robinson, C., Isensee, K., Bastian, L., Batten, S., Bellerby, R., Blasiak., R., Laarissa, S., Lira Loarca, A., McGeachy, C., McKinley, G.A., Melbourne Thomas, J., Ortega Cisneros, K., Qiao, F., Samanta, D., Sanders, R. & Sarma, V. V. S. S. (2024). *Ocean Decade Vision 2030 White Papers – Challenge 5: Unlock Ocean-Based Solutions to Climate Change*. Paris, UNESCO-IOC. (The Ocean Decade Series, 51.5.). <https://doi.org/10.25607/kbtq-nm78>.

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Michalak, A.M., R.B. Jackson, G. Marland, C. Sabine and The Carbon Cycle Working Group: R.F. Anderson, D. Bronk, K.J. Davis, R.S. Defries, A. S. Denning, L. Dilling, A. Jacobson, S. Lohrenz, A.D. McGuire, G.A. McKinley, C. Miller, B. Moore III, D.S. Ojima, B. O'Neill, J.T. Randerson, S.W. Running, B. Sohngen, P.P. Tans, P.E. Thornton, S.C. Wofsy, N. Zeng (2011) A U.S. Carbon Cycle Science Plan, a UCAR report.

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OTHER PUBLICATIONS AND PRODUCTS

Acquaviva, V., E.A. Barnes, D.J. Gagne II, G.A. McKinley, and S. Thais (2024) Ethics in climate AI: From theory to practice. *PLOS Clim* 3(8): e0000465. doi:10.1371/journal.pclm.0000465.

Carroll, D., D. Menemenlis, Z. Hong, M. Mazloff, G.A. McKinley, A.R. Fay*, S. Dutkiewicz, J. Lauderdale and I. Fenty (2024). Evaluation of the ECCO-Darwin Ocean Biogeochemistry State Estimate vs. In-situ Observations (ver 1.0). *Zenodo*. doi:10.5281/zenodo.10627664.

Levy, M., Y. A. Eddebbar, A. R. Fay*, M. C. Long, N. S. Lovenduski, G.A. McKinley, H. C. Olivarez, and R. R. Rustagi* (2023) CESM Large Ensemble with Different Pinatubo Forcings. Research Data Archive at the National Center for Atmospheric Research, Computational and Information Systems Laboratory. <https://doi.org/10.5065/VRD4-7X93>.

Crisp, D., H. Dolman, T. Tanhua, G.A. McKinley, J. Hauck, A. Bastos, S. Sitch, S. Eggleston and V. Aich (2022) Mysteries of the global carbon cycle, *Eos*, 103, doi:10.1029/2022EO225018.

Mouw, C.B.+ A. Barnett, G.A. McKinley, L. Gloege* and D.J. Pilcher* (2016) Global Ocean Particulate Organic Carbon flux merged with satellite parameters. *PANGEA*. doi:10.1594/PANGAEA.855600.

Ocean Carbon and Biogeochemistry Program (2015) Temporal and Spatial Perspectives on the Fate of Anthropogenic Carbon: A Carbon Cycle Slide Deck for Broad Audiences with explanatory notes. Contributors: S. Khattiwala, T. DeVries, J. Cook, G.A. McKinley, C. Carlson and H. Benway. doi:10.1575/1912/7670.

Bracco, A., M.C. Long, N.M. Levine, R.Q. Thomas, C. Deutsch and G.A. McKinley (2015) NCAR's Summer Colloquium: Capacity Building in Cross-Disciplinary Research of Earth System Carbon–Climate Connections. *Bull. Amer. Meteor. Soc.*, 96, 1381–1384. doi:10.1175/BAMS-D-13-00246.1.

Fay, A.R.* and G.A. McKinley (2014) Global Ocean Biomes: Mean and time-varying maps. *PANGEA*. doi:10.1594/PANGAEA.828650.

Thomas, R.Q., G.A. McKinley, and M.C. Long (2013) Examining uncertainties in representations of the carbon cycle in Earth System Models. *EOS* 94:460.

Mooney, M.E., S. Ackerman, S., G.A. McKinley, T. Whittaker and T. Jasmin (2012) Lesson plans and classroom activities from the Climate Literacy Ambassadors community. *The Earth Scientist* 28, 30-32.

McKinley, G.A., N. Urban, V. Bennington*+, D. Pilcher* and C. McDonald (2011) Preliminary carbon budgets for the Laurentian Great Lakes, *OCB News*, Spring/Summer 2011.

McKinley, G. A. (2008), Fixing Climate: What Past Climate Changes Reveal About the Current Threat—And How to Counter It (*Book review*), *Eos Trans. AGU*, 89(43), 422–422, doi:10.1029/2008EO430009.

GALEN A. MCKINLEY

PROFESSIONAL SERVICE

2025 to present **Marine Carbon Dioxide Removal (mCDR) Standing Committee, NASEM**
Member

2024 to present **Science Advisory Committee on Great Lakes Ocean Acidification, Michigan Tech**
Member

2022 to present **Ocean Studies Board, National Academies of Sciences, Engineering, and Medicine**
Member

2022 to present **Climate and Global Dynamics Advisory Panel, National Center for Atmospheric Research**
Member

2022 to present **US National Committee for UN Decade of Ocean Sciences for Sustainable Development**
Member

2019 to present **Annual Reviews of Earth and Planetary Science, Editorial Board**
Member

2022 to 2025 **Climate Security Roundtable, National Academies of Sciences, Engineering, and Medicine**
Member

December 2024 **AGU 2024, Washington DC**
Co-convenor and chair: “The Global Carbon Cycle and Its Feedbacks with Anthropogenic Change”

November 2024 **Senate of Canada Standing Committee on Fisheries and Oceans**
Individual testimony on ocean carbon

July 2024 **International Conference on Machine Learning, Vienna Austria**
ML4ESM @ ICML Program Committee

2021 to 2024 **PICES/ICES, Working Group 46, Ocean Negative Carbon Emissions**
Member

October 2023 **World Climate Research Program Open Science Conference, Kigali Rwanda**
Session convenor, S13 Global Carbon Cycle

2020 to 2022 **The Oceanography Society**
Chemical Oceanography Councilor

2020 to 2022 **Ocean Carbon and Biogeochemistry program, Working Group on Ocean Carbon Gaps**
Chair

2019 to 2022 **Defense Science Study Group Alumni Outreach Committee**
Committee of 10 recent DSSG alumni; tasked by IDA to advise on alumni engagement

March 2022 **AGU/ASLO/TOS Ocean Sciences 2022, virtual**
Co-convenor and chair: “Quantifying the Ocean Carbon Sink”

December 2021 **North Atlantic Biogeochemical Carbon Pump, virtual**
Invited participant and plenary speaker

April 2020 **ECCO Review Panel, NASA, Washington DC**
Member

February 2020 **AGU/ASLO/TOS Ocean Sciences 2020, San Diego CA**
Co-convenor and chair: “The Evolving Ocean Carbon Sink: Processes and Impacts ”

October 2019 **Expert Workshop on Integrated Ocean Carbon Research (IOCR), Paris, France**
Invited participant and speaker

October 2019 **CMIP6 Hackathon, Boulder CO / Palisades NY / Seattle WA / ETH Zürich**
Co-organizer of OCB and CLIVAR sponsored hackathon

September 2019 **Vetlesen Prize Selection Committee**
Awarded bi-annually for distinction in earth science research

2018 to 2019 **GO SHIP Program Review Committee**
Committee of 6; tasked by OCB and US CLIVAR to review the repeat hydrography program

2017 to 2019 **AGU Chapman Conference, La Jolla CA**
Program committee for conference: “Understanding carbon climate feedbacks”, August 2019

December 2018 **American Geophysical Union Fall Meeting, Washington DC**
Co-convenor and chair: “Understanding changing ocean biogeochemistry”

December 2018 **Ocean carbon uptake in CMIP6 models, Washington DC**
Co-organizer of OCB-sponsored workshop

2014 to 2018 **Global Carbon Project Scientific Steering Committee (GCP-SSC)**
The GCP coordinates international carbon cycle activities under Future Earth.

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June 2018	The effects of climate change on the world's oceans , Washington DC Co-convener and chair: "Carbon uptake, ocean acidification, and ecosystem and human impacts"
February 2018	AGU/ASLO/TOS Ocean Sciences 2018 , Portland OR Co-convener and chair: "The ocean carbon cycle across timescales"
2016 to 2018	MPOWIR mentor Co-lead of monthly mentoring teleconferences with 10 junior women in physical oceanography
2014 to 2017	Ocean Model Intercomparison Project Scientific Steering Committee (OMIP6-SSC) This is the 6 th round of ocean model intercomparison under the CMIP6 umbrella.
2015 to 2017	NASA Ocean Biology and Biogeochemistry Pre-Decadal Survey / Advanced Plan Review Team Reviewed community-proposed input to the NASA Decadal Survey for the OBB program
2016 to 2017	Great Lakes Advisory Board Science and Information Subcommittee Appointed by the EPA administrator to advise the Great Lakes Interagency Task Force
2015 to 2017	CONCORDE Scientific Advisory Panel CONCORDE was a GoMRI-funded group pursuing science needs identified with Deepwater Horizon.
January 2017	Panelist, NOAA Climate Program Office, Ocean Observing & Monitoring , Washington DC Review panelist for OOM program
2011 to 2016	Carbon Cycle Science Scientific Steering Group (CCSSG) CCSSG discusses science with the US Carbon Cycle Interagency Working Group (CCIWG)
2008 to 2016	North American Carbon Program / Ocean Carbon and Biogeochemistry Coastal CARBON Synthesis , Leader: Great Lakes Working Group; Co-author of final CCARS Science Plan
February 2016	AGU/ASLO/TOS Ocean Sciences 2016 , New Orleans, LA Co-convener: "How do the carbon pumps pump? Mechanisms of the solubility and biological pumps"
2012 to 2015	US CLIVAR - OCB Working Group Oceanic carbon uptake in the CMIP5 models, Core Member
2011 to 2014	Global Biogeochemical Cycles Associate Editor
November 2014	External evaluator, Helmholtz Center Geesthacht , Germany Evaluation of candidates for director
April 2014	Planning Workshop: Int'l Research on the Coupled N. Atlantic-Arctic System , Washington DC Invited participant
February 2014	AGU/ASLO/TOS Ocean Sciences 2014 , Honolulu, HI Co-convener and session chair: "Mechanisms of biogeochemical variability in the global oceans"
2012 to 2013	Defense Science Study Group (DSSG) , Institute for Defense Analysis (IDA) Selected from 150+ nominees to join a group of 15 for study of STEM needs in national security.
2012 to 2013	NCAR ASP Colloquium, Summer 2013 Co-organizer and lecturer for workshop on "Carbon Climate Connections in the Earth System"
2012 to 2013	External Review Committee for US CLIVAR AMOC program Attendance and interviews at annual meeting, survey of AMOC PI community, report preparation
2010 to 2013	REgional Carbon Cycle Assessment and Processes (RECCAP) Co-lead: Arctic and Atlantic; co-author: Global Carbon Storage and Global Air-Sea Flux
2008 to 2011	Carbon Cycle Science Working Group (CCS-WG) The CCS-WG wrote the New US Carbon Cycle Science Plan (2012)
October 2011	Patullo Conference , MPOWIR, Warrenton, VA Senior participant; Meeting goal is to promote retention of women in physical oceanography
December 2010	NACP/OCB Coastal Carbon Synthesis Workshop , San Francisco, CA Co-organizer and speaker
March 2010	Caltech Keck Institute for Space Studies (KISS) , Pasadena, CA Invited participant in study program "Quantifying the Sources and Sinks of Atmospheric CO ₂ "
February 2010	AGU/ASLO/TOS Ocean Sciences 2010 , Portland, OR Co-convener and session chair: "Carbon Cycling in the Coastal Oceans"
May 2009	International Association of Great Lakes Research Annual Meeting , Toldeo, OH Co-convener and session chair: "Carbon Cycling in the Laurentian Great Lakes"
2005 to 2008	Ocean Carbon and Biogeochemistry Scientific Steering Committee (OCB-SSC) Committee member, tasked to advise NSF, NASA and NOAA on research directions
2005 to 2008	Earth Science Women's Network (ESWN) Leadership Board member

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- December 2008 **American Geophysical Union Fall Meeting**, San Francisco, CA
Co-convenor and session chair: “Ocean Carbon Cycle: Decadal Trends”
- July 2007 **Ocean Carbon and Biogeochemistry Summer Workshop**, Woods Hole, MA
Co-organizer and session chair for “Changing ocean biogeochemistry: The prediction challenge”
- April 2005 **External Review Committee for JISAO at NOAA-University of Washington**, Seattle, WA
- September 2005 **North American Coastal Margins: The Coastal CO₂ Workshop**, Boulder, CO
- June 2004 **NOAA GCC Workshop: Understanding North Pacific Carbon-cycle Changes**, Seattle WA
- June 2004 **UCAR/NCAR Junior Faculty Forum on Future Scientific Directions**, Boulder, CO
- December 2003 **American Geophysical Union Fall Meeting**, San Francisco, CA
Co-convenor and session chair for Union session: “Health, Air Pollution and Climate”
- 2002 to present **Reviewer**
Assessment Reports: National Academy review of SOCCR2 (2018), IPCC SROCC (2018), BAMS State of the Climate (2020-2024)
Conferences: International Conference on Machine Learning (ICML)
Papers and books: AGU Books, Annual Reviews (Marine Science, Earth and Planetary), BAMS, BG/BGD, Cambridge U. Press, DSR, Ecology Lett, ESD/ESDD, EST, EI, EOS, Frontiers, GBC, GMD/GMDD, GRL, Inland Waters, JAMES, JES, JGR, L&O, Nature, Nature Climate Change, Nature Geoscience, Ocean Dynamics, Oceanography, OS/OSD, PNAS, Prog. Oceanog., Princeton U. Press, Science, Springer, Tellus B, U. Chicago Press
Proposals: NASA (Carbon Cycle, MAP, OBB), NOAA, NSF (CO, DEB, OTIC, PO), ArcticNet, Leaders Opportunity Fund (Quebec), Ocean Frontier Institute (CA), NERC (UK), NSERC (Canada), SeaGrant (WI, HI, OH), SCOR (International), Marsten Fund (NZ), U. Michigan Water Center
Proposal Panels: NASA (2004, 2011, 2013, 2021); NSF (2008; 2017; 2025; 2025); NOAA (2021, 2025)

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AWARDS AND HONORS

2025	Frontiers in Ocean Sciences symposium, National Science Foundation (NSF), Invited speaker
2024	Dissertations Symposium in Chemical Oceanography (DISCO), Keynote Speaker
2024	Senior Fellow, Collegium Helveticum (ETH-Zürich and University of Zürich)
2023	Leadership Award, LEAP Science and Technology Center
2020	Ocean Sciences Voyager Award, American Geophysical Union
2019	ATOC Distinguished Lecturer, University of Colorado Boulder
2016	Kavli Fellow / National Academy of Sciences
2012 to 2013	Defense Science Study Group
2011	Class of 1955 Distinguished Teaching Award, University of Wisconsin - Madison
2008 to 2011	NASA New Investigator
2010	Faculty teaching award from UW-Madison AOS Graduate Student Association
2003 to 2004	Anna Julia Cooper Postdoctoral Fellow, from University of Wisconsin – Madison
2000 to 2001	Martin Fellow for Sustainability, MIT
1999 to 2002	NASA Earth System Science Fellowship
1999	Teaching Assistant Prize, MIT Department of Earth, Atmospheric and Planetary Sciences

PROFESSIONAL MEMBERSHIPS

American Geophysical Union (1998-present)
Earth Science Women's Network (2003-present)
The Oceanography Society (2008-present)
American Association for the Advancement of Science (2020-present)
European Geophysical Union (2021-present)

SERVICE at COLUMBIA UNIVERSITY

2024 to present	Curriculum Committee , Earth and Environmental Sciences
2024 to 2025	Faculty Search Committee , Earth and Environmental Sciences
2018 to 2023	Diversity Committee , Earth and Environmental Sciences, Chair 2019-2022
2022 to 2023	Casa Muraro Vision Committee , Arts and Sciences
2022	Carbon Cycle & Decarbonization Implementation Team , LDEO
2020 to 2022	STEM DEI Committee , Arts and Sciences
2020	Diversity, Equity and Inclusion Task Force , Lamont-Doherty Earth Observatory
2020	Vision Committee , Lamont-Doherty Earth Observatory
2018 to 2020	Graduate Admissions Committee , Earth and Environmental Sciences
2017	RISE Competition , reviewer

SERVICE at UNIVERSITY OF WISCONSIN - MADISON

2015 to 2017	Physical Sciences Divisional Committee , Campus-level faculty tenure review committee
2013 to 2017	Curriculum Committee chair , AOS
2011 to 2017	Women Faculty Mentoring Program Advisory Committee
2004 to 2017	Curriculum, Strategic Planning, Budget, Faculty Recruitment, Computing, Qualifying Exam, Award, Graduate Recruitment Committees , AOS
2015 to 2016	Ad-hoc Committee on Post-Tenure Review , Campus-level faculty committee
2013 to 2016	Curriculum Committee , College of Letters & Science
2010 to 2015	Co-chair for Undergraduate Education , AOS
2013 to 2015	Major in Environmental Science, L&S Faculty Advisor, and Executive Committee
2013 to 2014	Center for Climatic Research Science Council
2013 to 2014	Ad-hoc Committee on Fossil Fuel Use and Climate Change , Campus-level committee
2011 to 2012	Nelson Institute Director Search and Screen Committee

PROFESSIONAL DEVELOPMENT

November 2004	UW System Women & Science, Workshop for STEM Faculty , Wisconsin Dells, WI
March 2003	Dissertations Initiative for the Advancement of Climate Change Research , Guanica, PR
May 2002	Carbon Cycle Data Assimilation Institute , Boulder, CO
June 2001	American Meteorological Society Summer Policy Colloquium , Washington, DC
January 1999	JGOFS Training Course on Biogeochemical Modeling of the Ocean , Bangalore, India

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SELECTED PRESENTATIONS

May 2025	ECCO Summer School , Pacific Grove CA Invited plenary, “Ocean carbon and biogeochemistry”
May 2025	Yale Center for Natural Carbon Capture, AI for NCC Symposium , New Haven CT Invited plenary, “Supporting ocean carbon MRV with sparse data and machine learning”
April 2025	GALCIT, Caltech , Los Angeles CA Invited Colloquium, “The ocean carbon sink: From global budgets to mCDR additionality”
April 2025	NASA Jet Propulsion Laboratory , Los Angeles CA Carbon Club, “The ocean carbon sink: From global budgets to mCDR additionality”
December 2024	American Geophysical Union 2024 , Washington DC Oral, “Uncertainty in the ocean carbon sink at the scales of mCDR”
November 2024	Lamont-Doherty Earth Observatory Symposium: Life & Earth , Palisades, NY Invited plenary, “The ocean carbon sink: Magnitudes, mechanisms, and future change”
October 2024	Dissertations Symposium in Chemical Oceanography (DISCO) XXIX , Lihue HI Keynote, “A career in chemical oceanography and climate”
September 2024	CLIVAR Phenomena, Observations, and Synthesis panel , virtual Invited presentation to the panel, “Quantification of the ocean carbon sink”
September 2024	JPL/CalTech Carbon Stocks Workshop , Pasadena, CA Invited plenary, “The Ocean Carbon Sink”
June 2024	NASEM Decadal Survey of Ocean Sciences panel , virtual Invited presentation to the panel, “Quantifying the ocean carbon cycle”
April 2024	European Geophysical Union 2024 General Assembly , Vienna, Austria Oral, “Drivers of ocean carbon sink variability across spatial scales”
April 2024	University of Bern , Bern, Switzerland Invited colloquium, “Improved ocean carbon sink estimates by combining models and data”
March 2024	Collegium Helveticum , Zürich, Switzerland Talk and panel discussion, “Can we be smarter than the phytoplankton? Thoughts on the global climate and sustainability”
February 2024	ETH-Zürich, Institute for Atmospheric and Climate Science , Zürich, Switzerland Invited colloquium, “Improved ocean carbon sink estimates by combining models and data”
February 2024	Max Planck Institute for Meteorology , Hamburg, Germany Invited colloquium, “Improved ocean carbon sink estimates by combining models and data”
January 2024	GEOMAR , Kiel, Germany Seminar, “All Hands on Deck! Improved ocean carbon sink estimates by combining models and data”
November 2023	Surface ocean pCO₂ observations, synthesis and data products , Oostende, Belgium Invited plenary, “pCO ₂ mapping and modeling”
October 2023	World Climate Research Program Open Science Conference , Kigali, Rwanda Oral, “Constraining historical ocean carbon uptake with models, machine learning and data”
May 2023	NASA Joint Carbon Cycle and Ecosystems Meeting , College Park MD Oral, “Ocean carbon and oxygen response to Mt. Pinatubo”
April 2023	Atmospheric and Oceanic Sciences, University of Wisconsin , Madison, WI Invited colloquium, “Tighter constraints on ocean carbon uptake from ML, models and data”
March 2023	Ecology, Evolution, and Environmental Biology, Columbia University , NY, NY Invited colloquium, “Change in the ocean carbon sink from sparse data and imperfect models”
January 2023	International GHG Monitoring Symposium at WMO , Geneva, Switzerland Plenary, “Sparse data and imperfect models to quantify and project the ocean carbon sink”
September 2022	Marine Carbon Dioxide Removal: Essential Science for MRV Workshop , Kingston, RI Invited plenary, “Understanding the ocean carbon sink models, data and machine learning”
September 2022	ICOS Science Conference 2022 , Utrecht, Netherlands Oral, “Physical knowledge to improve and extend machine learning pCO ₂ reconstructions”
June 2022	Ocean Carbon and Biogeochemistry Workshop , Woods Hole MA Invited plenary, “The variable air-sea CO ₂ flux: Insights models, observations, machine learning”
May 2022	Gordon Research Conference: Ocean Biogeochemistry 2022 , Barcelona, Spain Invited plenary, “Constraining models of the future ocean carbon sink with machine learning”
March 2022	AGU/ASLO/TOS Ocean Sciences 2022 , virtual Oral, “Constraining the future ocean carbon sink”

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- February 2022 **BGC-Argo Group Meeting**, virtual
Invited speaker, “LEAP STC and connections to float based biogeochemistry”
- December 2021 **North Atlantic Biogeochemical Carbon Pump**, virtual
Invited plenary, “Models to understand the North Atlantic carbon sink”
- October 2021 **University of California-Irvine**, Irvine CA
Invited seminar, “Models, data and theory to understand the ocean carbon sink”
- April 2021 **NOAA Global Monitoring Laboratory**, Boulder CO
Invited seminar, “Decadal variability in the ocean carbon sink”
- April 2021 **European Geophysical Union, Fall Meeting**
Oral, “Quantifying the ocean carbon sink for 1994-2007: Combined evidence from multiple methods”
- February 2021 **Earth and Environmental Engineering**, Columbia University
Invited seminar, “Decadal variability in the ocean carbon sink”
- December 2020 **Machine Learning in Science & Engineering**, Columbia Data Science Institute
Invited, “Quantifying the ocean carbon sink with sparse data, physical models and machine learning”
- December 2020 **American Geophysical Union, Fall Meeting**
Oral, “Quantifying the ocean carbon sink for 1994-2007: Combined evidence from multiple methods”
- April 2020 **Woods Hole Oceanographic Institution**, Woods Hole MA
Invited seminar, “Understanding change in ocean carbon sink”
- April 2020 **Geochemistry Seminar**, Lamont-Doherty Earth Observatory, Palisades NY
Seminar, “Mechanisms of decadal variability in the ocean carbon sink”
- February 2020 **AGU/ASLO/TOS Ocean Sciences 2020**, San Diego CA
Oral, “Forced mechanisms of decadal variability in the ocean carbon sink”
- October 2019 **Atmospheric and Oceanic Sciences, University of Colorado**, Boulder CO
Distinguished lecture, “Understanding recent decadal variability of the global ocean carbon sink”
- August 2019 **Observing Carbon Climate Feedbacks, Chapman Conference**, La Jolla CA
Invited plenary, “Forced change in the ocean carbon sink”
- July 2019 **Chemical Oceanography, Gordon Conference**, Holderness NH
Invited plenary, “Forced change in the ocean carbon sink”
- May 2019 **Princeton University**, Princeton NJ
Invited seminar, “Forced change in the ocean carbon sink”
- April 2019 **University of Connecticut**, Avery Point CT
Invited seminar, “Forced change in the ocean carbon sink”
- December 2018 **Ocean carbon uptake in CMIP6 models workshop**, Washington DC
Oral, “Forced changes and internal variability in the ocean carbon sink”
- June 2018 **The Effects of Climate Change on the World’s Oceans, 4th Int’l Symposium**, Washington DC
Oral, “Variability and trends in ocean carbon uptake: 1981-2016”
- April 2018 **Massachusetts Institute of Technology**, Earth Atmospheric and Planetary Sciences, Cambridge MA
Invited seminar, “Diagnosing change in the ocean carbon sink”
- April 2018 **University of Pennsylvania**, Philadelphia, PA
Invited seminar, “Diagnosing change in the ocean carbon sink”
- February 2018 **AGU/ASLO/TOS Ocean Sciences 2018**, Portland OR
Poster, “Correlations of surface ocean pCO₂ to satellite chlorophyll, monthly to interannual”
- January 2018 **NASA GISS**, New York, NY
Invited seminar, “Variability in the ocean carbon sink”
- November 2017 **Geophysical Fluid Dynamics Laboratory**, Princeton NJ
Invited seminar, “Variability in the ocean carbon sink: Drivers and challenges to detection”
- October 2017 **Distinguished Scientist Seminar, Marine Biological Laboratory**, Woods Hole MA
Invited seminar, “Understanding the ocean’s role in the global carbon cycle”
- September 2017 **Ocean Carbon Hotspots Workshop of CLIVAR and OCB**, Monterey CA
Plenary, “Timescales and mechanisms of change in ocean carbon sink”
- August 2017 **International Carbon Dioxide Conference 10**, Interlaken, Switzerland
Plenary, “Detecting and understanding the changing ocean carbon sink with data and models”
- April 2017 **Nelson Institute Earth Day Conference**, University of Wisconsin, Madison WI
Moderator and Speaker, “What now? Preparing for Environmental Change”
- January 2017 **Cooperative Inst. Limnology & Ecosystems Research**, U. Michigan, Ann Arbor MI
Invited seminar, “Spatial variability and potential long-term trends in Great Lakes carbon”

GALEN A. MCKINLEY

- December 2016 **American Geophysical Union, Fall Meeting**, San Francisco CA
Oral, “Seasonal cycles and long-term growth in Southern Ocean carbon uptake”
- November 2016 **Climate People and the Environment Program**, University of Wisconsin, Madison WI
Seminar, “Mechanistic connections between carbon and chlorophyll in the global ocean”
- October 2016 **Kavli Frontiers of Science Symposium**, Irvine CA
Invited poster “Natural Variability and Anthropogenic Trends in the Ocean Carbon Sink”
- July 2016 **Ocean Carbon and Biogeochemistry Workshop**, Woods Hole MA
Invited plenary, “Detecting trends in the ocean carbon sink”
- June 2016 **Scripps Institution of Oceanography**, La Jolla CA
Seminar, “Detection of trends in the ocean carbon sink”
- June 2016 **Lamont-Doherty Earth Observatory of Columbia University**, Palisades NY
Invited colloquium, “Detection of trends in the ocean carbon sink”
- April 2016 **University of Wisconsin – Climate Change Symposium**, Madison WI
Invited plenary, “Ocean mitigation of climate change: past, present and future”
- March 2016 **Sarmiento Symposium**, Princeton NJ
Invited speaker and panelist, “The breath of life — a changing carbon cycle”
- February 2016 **AGU/ASLO/TOS Ocean Sciences 2016**, New Orleans LA
Oral, “Detectability of change in the ocean carbon sink”
- February 2016 **Climate People and the Environment Program**, University of Wisconsin, Madison WI
Invited seminar, “Variability and trends in ocean carbon uptake from models and data”
- January 2016 **NOAA –Pacific Marine Environmental Laboratory**, Seattle WA
Invited seminar, “Variability and trends in ocean biogeochemistry from models and data”
- September 2015 **University of Southern Mississippi**, Hattiesburg, MS
Invited seminar, “The ocean carbon sink: Separating trends from variability”
- June 2015 **Global Carbon Project Scientific Steering Committee Meeting**, Oslo, Norway
Invited plenary, “Ocean carbon research and integration in the global carbon cycle”
- June 2015 **JASON summer study**, La Jolla, CA
Invited brief, “Changing ocean carbon: Observations and models”
- May 2015 **University of Wisconsin Water Symposium**, Madison WI
Invited plenary, “Circulation and carbon: Oceans and Great Lakes”
- March 2015 **Pre-decadal survey workshop on Carbon and Climate**, Norman OK
Invited plenary, “Uncertainties and unknowns in the ocean carbon sink (+coastal and inland)”
- December 2014 **American Geophysical Union, Fall Meeting**, San Francisco CA
Oral, “Carbon cycle variability associated with AMO, NAO and AMOC”
- December 2014 **US CLIVAR / OCB Joint Workshop on ocean heat and carbon uptake**, San Francisco CA
Invited plenary, “Quantifying carbon uptake and its trends”
- November 2014 **JASON 2014 fall meeting**, Washington DC
Invited plenary, “The changing ocean: Carbon, climate and coupled feedbacks”
- November 2014 **Carbon Cycle Interagency Working Group**, Washington DC
Invited plenary, “The ocean carbon sink: Present knowledge and critical gaps”
- August 2014 **Coastal Carbon Synthesis Community Workshop**, Woods Hole MA
Invited plenary, “Great Lakes carbon budgets”
- June 2014 **Oak Ridge National Lab**, Oak Ridge TN
Talk, “Carbon and biogeochemistry in the oceans and Great Lakes”
- April 2014 **Center for Climatic Research and Climate People and Environment Program**, Madison WI
Seminar, “Climate change and national security: Implications and preparedness”
- March 2014 **Institute for Defense Analysis**, Alexandria VA
Invited seminar, “What I learned and some recommendations”
- March 2014 **Lamont-Doherty Earth Observatory of Columbia University**, Palisades NY
Invited seminar, “Natural variability and anthropogenic trends in the ocean carbon sink”
<http://tinyurl.com/mrj3bo8>
- February 2014 **AGU/ASLO/TOS Ocean Sciences 2014**, Honolulu HI
Oral, “CO₂-acidification of the Laurentian Great Lakes”
- August 2013 **NCAR ASP Key Uncertainties in the Global Carbon Cycle**, Boulder CO
Invited plenary, “Using data to elucidate feedback mechanisms in the ocean carbon cycle”

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August 2013	NCAR ASP Graduate Student Colloquium , Boulder CO Invited lecture, “Mechanisms of ocean carbon climate feedback: What do the data support?”
July 2013	NCAR ASP Graduate Student Colloquium , Boulder, CO Invited lecture, “Ocean carbon biogeochemistry: Productivity, export, remineralization”
June 2013	9th International Carbon Dioxide Conference , Beijing, China Oral, “Regional distribution and seasonal mechanisms of carbon uptake in the global oceans”
March 2013	Biogeochemistry of the Great Lakes System , Wayne State University, Detroit MI Invited plenary, “Spatio-temporal variability and long-term trends in Great Lakes carbon cycling”
January 2013	University of Wisconsin - Madison , Atmospheric and Oceanic Sciences, Madison WI Seminar, “The ocean carbon sink: How strong? How vulnerable?”
January 2013	Ohio State University , Climate Change Webinar Invited, “Climate, carbon impacts on productivity, chemistry & invasive species in the Great Lakes.”
July 2012	Ocean Carbon and Biogeochemistry Workshop , Woods Hole MA Invited Plenary, “RECCAP: Results from a global synthesis on ocean carbon uptake”
April 2012	NASA Ocean Color Research Team Meeting , Seattle WA Plenary, “Trends in ocean carbon uptake”
February 2012	AGU/ASLO/TOS Ocean Sciences 2012 , Salt Lake City UT Oral, “Physical drivers of biogeochemical and carbon cycling in Lake Superior”
January 2012	Lake Superior Research Symposium , University of Minnesota, St. Paul MN Invited talk, “Modeling circulation, carbon and climate for Superior”
November 2011	Department of Chemistry and Biochemistry , University of Montana, Bozeman MT Invited seminar, “Trends in ocean carbon uptake”
November 2011	School for Freshwater Science , University of Wisconsin - Milwaukee, Milwaukee WI Invited seminar, “Circulation, carbon cycling and invasive species in Lake Superior”
September 2011	The Ocean Carbon Cycle at A Time Of Change: Synthesis And Vulnerabilities , Paris, France Invited plenary, “Attribution: What drives CO ₂ sink trends?” (given by A. Fay due to injury)
August 2011	Gordon Research Conference , Andover NH Poster, “Convergence of atmospheric and North Atlantic CO ₂ trends on multidecadal timescales”
July 2011	Woods Hole Oceanographic Institution , Woods Hole MA Seminar, “Biogeochemistry, carbon cycling and invasive species in Lake Superior”
July 2011	Ocean Carbon and Biogeochemistry Workshop , Woods Hole MA Poster, “Convergence of atmospheric and North Atlantic CO ₂ trends on multidecadal timescales”
July 2011	Woods Hole Oceanographic Institution , Woods Hole MA Seminar, “Convergence of atmospheric and North Atlantic CO ₂ trends on multidecadal timescales”
February 2011	North American Carbon Program Meeting , New Orleans LA Poster, “Lake Superior’s influence on regional carbon budgets”
December 2010	American Geophysical Union, Fall Meeting , San Francisco CA Poster, “The carbon cycle of Lake Superior: Balancing the budget with spatial heterogeneity”
December 2010	NACP/OCB Coastal Carbon Synthesis Workshop , San Francisco CA Oral, “Modeling carbon in the coastal zone”
November 2010	Environmental Chemistry and Technology Program , University of Wisconsin, Madison WI Invited seminar, “Spatio-temporal variability in the carbon cycle of Lake Superior”
October 2010	Michigan Technological University , Houghton MI Invited seminar, “Spatio-temporal variability in the carbon cycle of Lake Superior”
October 2010	Duke University , Durham NC Invited seminar, “Decadal variability and multidecadal trends in the North Atlantic carbon sink”
July 2010	Ocean Carbon and Biogeochemistry Workshop , La Jolla CA Poster, “Decadal variability and multidecadal trends in the North Atlantic carbon sink”
June 2010	JASON Study on Carbon Treaty Verification , La Jolla CA Invited talk, “Carbon in water: Open ocean, coastal zone and inland waters”
June 2010	Scripps Institution of Oceanography , La Jolla CA Seminar, “Understanding recent variability in the North Atlantic carbon sink”
May 2010	Aquatic Ecosystem Health and Management: Ecology of Lake Superior , Duluth MN Oral, “Carbon cycle variability in Lake Superior and impacts on the regional carbon budget”
May 2010	Subpolar North Atlantic Workshop , Durham NC Invited talk, “North Atlantic carbon uptake from biogeochemical models and data”

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- March 2010 **Caltech Keck Institute for Space Studies (KISS)**, Pasadena CA
Invited plenary, “Air-sea CO₂ fluxes: Climatology, variability and land-ocean links”
- February 2010 **AGU/ASLO/TOS Ocean Sciences 2010**, Portland OR
Invited oral, “Reconciling observed and modeled trends in the North Atlantic carbon sink”
- November 2009 **North American Carbon Program 2nd Joint Workshop**, Oak Ridge TN
Invited oral, “Carbon cycling in North American coastal waters”
- August 2009 **Biogeochemistry and Carbon Cycle of Lake Superior**, Woodruff WI
Oral, “Biogeochemical variability in Lake Superior – A modeling perspective”
- July 2009 **Ocean Carbon and Biogeochemistry Workshop**, Woods Hole MA
Poster, “Understanding the carbon budget of Lake Superior”
- May 2009 **International Association of Great Lakes Research Annual Meeting**, Toledo OH
Oral, “The magnitudes and mechanisms determining the carbon budget of Lake Superior”
- May 2009 **NASA Ocean Color Research Team Meeting**, New York NY
Poster, “Do hurricanes drive variability of the air-sea CO₂ flux in the subtropical North Atlantic?”
- December 2008 **American Geophysical Union, Fall Meeting**, San Francisco CA
Oral, “The changing North Atlantic carbon sink: 1992-2006”
- December 2008 **University of Wisconsin - Madison**, Atmospheric and Oceanic Sciences, Madison WI
Seminar, “Variability in the ocean carbon cycle: A North Atlantic perspective”
- October 2008 **Colorado State University**, Fort Collins CO
Invited seminar, “Variability in the ocean carbon cycle: A North Atlantic perspective”
- July 2008 **Ocean Carbon and Biogeochemistry Workshop**, Woods Hole MA
Invited plenary, “Carbon sink trends in the Northern Oceans”
- June 2008 **Workshop on Teaching Weather and Climate Using Laboratory Experiments**, Chicago IL
Poster, “Rotating tank experiments in an atmospheric and oceanic science undergraduate curriculum”
- May 2008 **Effects of Climate Change on the World’s Oceans**, Gijon, Spain
Oral, “Trends in the North Atlantic carbon sink”
- April 2008 **NASA Ocean Color Research Team Meeting**, Adelphi MD
Plenary, “The changing North Atlantic carbon cycle”
- March 2008 **Princeton University**, Princeton NJ
Seminar “Trends and variability in the carbon cycle of the North Atlantic”
- March 2008 **AGU/ASLO/TOS Ocean Sciences 2008**, Orlando FL
Oral, “Carbon cycle variability and trends at Bermuda and across the North Atlantic”
- January 2008 **American Meteorological Society Annual Meeting**, New Orleans LA
Co-author on one talk and 2 posters on undergraduate teaching with the ‘Weather in a tank’ project
- October 2007 **Stony Brook University**, Stony Brook NY
Invited public lecture, “The oceans and the climate system”
- July 2007 **Ocean Carbon and Biogeochemistry Workshop**, Woods Hole MA
Poster, “Carbon cycle variability in the North Atlantic: Timescales of change”
- April 2007 **Johns Hopkins University**, Baltimore MD
Invited seminar, “Air-sea CO₂ flux variability: Physical and ecological drivers”
- April 2007 **Surface Ocean CO₂ Variability and Vulnerability Workshop**, UNESCO, Paris, France
Plenary, “North Atlantic CO₂ flux variability: Physical and ecological drivers”
- April 2007 **NASA Ocean Color Research Team Meeting**, Seattle WA
Poster, “Physical and biological drivers of carbon cycle variability in the North Atlantic”
- April 2007 **Michigan Technological University**, Houghton MI
Invited seminar, “Air-sea CO₂ flux variability: Physical and ecological drivers”
- July 2006 **Ocean Carbon and Biogeochemistry Workshop**, Woods Hole MA
Poster, “Modeling the seasonal cycle of pCO₂ in the North Atlantic”
- June 2006 **The Art of Climate Modeling**, NCAR/ASP Summer School, Boulder CO
Invited lecture, “Modeling ocean biogeochemistry”
- February 2006 **AGU/ASLO/TOS Ocean Sciences 2006**, Honolulu HI
Talk, “North Pacific carbon cycle response to climate variability on seasonal to decadal timescales”
- February 2006 **Old Dominion University**, Norfolk VA
Invited seminar, “Air-sea CO₂ flux variability on seasonal, interannual and decadal timescales”
- November 2005 **University of Maryland**, College Park MD
Invited seminar, “Air-sea CO₂ flux variability on seasonal, interannual and decadal timescales”

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- November 2005 **Great Lakes Environmental Research Laboratory**, Ann Arbor MI
Invited seminar, “Air-sea CO₂ flux variability on seasonal, interannual and decadal timescales”
- September 2005 **Seventh International Carbon Dioxide Conference**, Broomfield CO
Invited plenary, “Pacific dominance to global air-sea CO₂ flux variability”
- August 2005 **Ocean Carbon Cycle and Climate Change Workshop**, Woods Hole MA
Poster “North Pacific carbon cycle response to climate variability on seasonal to decadal timescales”
- March 2005 **The Pennsylvania State University**, State College PA
Invited seminar, “CO₂ air-sea flux variability: Ocean models and atmospheric inversions”
- March 2005 **Princeton University**, Princeton NJ
Seminar, “Argon as a tracer of physical processes in the atmosphere and ocean”
- December 2004 **American Geophysical Union, Fall Meeting**, San Francisco CA
Poster, “Testing ocean models with argon and nitrogen”
- November 2004 **University of Wisconsin, Sustainability and the Global Environment (SAGE)**, Madison WI
Seminar, “Local and global benefits of air pollution control in Mexico City”
- October 2004 **University of Wisconsin, Chaos and Complexity Seminar Series**, Madison WI
Seminar, “CO₂ air-sea flux variability: Ocean models and atmospheric inversions”
- October 2004 **SOLAS Science 2004**, Halifax, Canada
Poster, “Atmospheric Ar/N₂: A Tool for Constraining Atmosphere and Ocean Models”
- June 2004 **NOAA GCC Workshop: Understanding North Pacific Carbon-cycle Changes**, Seattle WA
Invited plenary, “Modeled North Pacific carbon cycle variability”
- May 2004 **Geophysical Fluid Dynamics Laboratory**, Princeton NJ
Seminar, “CO₂ air-sea flux variability: Ocean models and atmospheric inversions”
- March 2004 **Princeton Environmental Institute Postdoctoral Colloquium**, Princeton NJ
Seminar, “Local and global benefits of air pollution control in Mexico City”
- December 2003 **American Geophysical Union, Fall Meeting**, San Francisco CA
Oral, “Local and global benefits of air pollution control in Mexico City”
- June 2003 **World Congress on Risk**, Brussels, Belgium
Poster, “Mexico City Co-Benefits: Air pollution health risk reduction from GHG emission controls”
- June 2003 **MIT, Department of Earth, Atmospheric & Planetary Sciences**, Cambridge MA
Seminar, “Mexico City Co-Benefits: Air pollution health risk reduction from GHG emission controls”
- May 2003 **University of Wisconsin, Department of Atmospheric and Oceanic Sciences**, Madison WI
Invited seminar, “CO₂ air-sea flux variability: ocean models and atmospheric inversions”
- May 2003 **JGOFS Open Science Conference**, Washington DC
Poster, “Mechanisms of CO₂ air-sea flux variability in the North Atlantic and Equatorial Pacific”
- April 2003 **National University of Mexico, Center for Atmospheric Sciences**, Mexico City
Seminar, “Carbon sink variability from ocean models and atmospheric inversions” (in Spanish)
- July 2002 **Princeton University, Atmosphere and Ocean Sciences Program**, Princeton NJ
Invited seminar, “Interannual variability of air-sea fluxes of carbon dioxide and oxygen”
- February 2002 **AGU/ASLO/TOS Ocean Sciences 2002**, Honolulu HI
Poster, “Interannual variability in air-sea fluxes of CO₂ and O₂”
- December 2000 **American Geophysical Union, Fall Meeting**, San Francisco CA
Oral, “A novel approach to export parameterization with application to air-sea fluxes of O₂ and CO₂”
- February 2000 **American Geophysical Union, Ocean Sciences**, San Antonio TX
Oral, “Interannual variability of the air-sea flux of oxygen in the North Atlantic”
- January 1999 **JGOFS Arabian Sea Symposium**, Bangalore, India
Poster, “Interannual variability of the air-sea flux of oxygen in the North Atlantic” (best poster award)

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TEACHING

Columbia University / Lamont-Doherty Earth Observatory New York, NY / Palisades, NY
Semester Courses

- 2022, 25 *Climate Prediction Challenges (DEES 4243, joint with STAT 5243/4243)*
 Graduate / undergraduate project-based course applying machine learning to climate science problems.
- 2018, 21, 24 *Humans and the Carbon Cycle (EESC GU4020)*
 Graduate / undergraduate course on the global carbon cycle and its connections to climate.
- 2019, 20, 22 *The Climate System (EESC UN2100)*
 Intensive undergraduate survey course on climate science, with weekly laboratory session.
- 2019,21,23,25 *Idealized Models of Climate Processes (EESC GU6926)*
 Graduate course on applying idealized models to coupled physical-chemical-climate processes.

University of Wisconsin - Madison Madison, WI
Semester Courses

- 2016 *Physical-Biogeochemical Coupling in the Ocean and Lakes (ATM OCN 750)*
 Mechanisms of physical-biogeochemical coupling in oceans and lakes; hands-on data and modeling
- 2015, 2016 *The Science of Climate Change (ATM OCN 323)*
 Quantitative treatment of climate processes for science and engineering, non-AOS, students
- 2013,15,17 *Global Warming: Science and Impacts (ATM OCN 332)*
 Undergraduate intermediate level course on the science and expected impacts of climate change
- 2007-2014 *Introduction to Physical Oceanography (ATM OCN 660)*
 Graduate introduction to the physical structure and dynamics of the ocean
- 2004-2010 *Global Climate Processes (ATM OCN 425)*
 Global energy balance, circulation of the atmosphere and ocean, climate and climate modeling
- 2008-2016 *Laboratory in Rotating Fluid Dynamics (ATM OCN 801, 615)*
 Use rotating tank and data analysis to elucidate key principles of geophysical fluid dynamics
- 2005,06,14 *Dynamics of the Atmosphere and Ocean II (ATM OCN 311)*
 Intermediate geophysical fluid dynamics for undergraduate majors

Semester Seminars

- 2012, 2017 *Ocean Biogeochemical Cycles (ATM OCN 965)*
- Spring 2008 *Threats to Wildlife from Global Warming (ATM OCN 980)*
- Fall 2006 *The Ocean Carbon Cycle (ATM OCN 925)*
- Spring 2005,06 *Senior Capstone Seminar (ATM OCN 405)*
- Spring 2006 *Climate Change: Science and Impacts (ATM OCN 980)*

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ADVISING

Columbia University / Lamont-Doherty Earth Observatory

New York, NY / Palisades, NY

Graduate Students

2018-2024	Lauren Moseley, PhD 2024 in Earth and Environmental Sciences (postdoc U. Washington from 3/2025)
2020-2023	Suki Wong, PhD 2023 in Earth and Environmental Sciences (scientist at atdepthMRV)
2017-2020	Sean Ridge, PhD 2020 Earth and Environmental Sciences (senior data scientist at Sunairio)
2017-2020	Lucas Gloege, PhD 2020 Earth and Environmental Sciences (scientist at Yale University)

Undergraduate and Masters Student Researchers

2025	Arvind Nagabhirava, Data Science Institute Scholar (MS 2025)
2025	Nicoline Joensen, undergraduate researcher (Class of 2026, Physics)
2024	Amelie Sharples, undergraduate researcher (Class of 2025, Astrophysics and Computer Science)
2024	Junfu Su (Data Science Institute Scholar, MS 2024)
2022	Devan Samant (Data Science Institute Scholar, MS 2023, now at Federal Energy Reg. Commission)
2021	Tomislav Galjanic (Data Science Institute Scholar, MS 2022, now at Institute of Int'l Education)
2021	Aditya Koduri (Data Science Institute Scholar, MS 2022, now at JP Morgan)
2020	Jake Stamell (Data Science Institute Scholar, MS 2021, Statistics, now at Instacart)
2020-2022	Rea Rustagi, undergraduate researcher (Class of 2022, Applied Math)
2019	Monica Yan (Data Science Institute Scholar, MS 2020, now at JP Morgan)
2018	Leonard Boncenne, summer student intern (ENSTA ParisTech)

Postdoctoral Scholars

2024-present	Dr. Ce Bian
2024-2025	Dr. Lauren Moseley
2022-2023	Dr. Thea Heimdal (now Associate Research Scientist in McKinley group, Columbia/LDEO)
2023	Dr. Suki Wong
2020-2022	Dr. Val Bennington (UW-Madison CCR, 2012-14; Epic, 2014-20; now Makai Ocean Engineering)

University of Wisconsin – Madison

Madison, WI

Graduate Students

2015-2017	Sean Ridge, MS AOS 2017 (PhD 2020 Columbia Earth and Environmental Sciences)
2014-2017	Lucas Gloege, MS AOS 2017 (PhD 2020 Columbia Earth and Environmental Sciences)
2016-2017	Collin Tuttle, MS AOS 2018 (US Coast Guard)
2010-2015	Darren Pilcher, PhD AOS 2015 (research scientist at NOAA PMEL)
2010-2015	Haidi Chen, PhD AOS 2015 (Princeton University, 2015-2019, now Brevan Howard, Hong Kong)
2011-2014	Alexis Ritzer, MS AOS 2014 (Luminant Energy Services)
2010-2012	Jennifer Phillips, MS Envi. & Resources 2012 (Ass't Sec. Climate Change, CA Nat'l Res. Agency)
2009-2012	Jesse Roberts, MS AOS 2012
2008-2010	Amanda Fay, MS AOS 2010 (Researcher with McKinley)
2005-2010	Valerie Bennington, PhD AOS 2010 (Makai Ocean Engineering, Hawaii)
2005-2007	David Ullman, MS AOS 2008 (PhD Geoscience 2013, now Professor at Northland College, WI)

Undergraduate Student Researchers

2015-2017	Gabriela Negrete (BS Chemistry 2017, PhD 2023 Scripps/UCSD; now research scientist NOAA GFDL)
2012-2015	James Kralj (BS Microbiology 2015, MS 2018 U. Washington);
2012-2015	Melissa Breeden (BS AOS 2013, PhD AOS 2018; now research scientist at NOAA PSL)
2009-2010	Victoria Vasys (BS AOS 2010)
2007-2008	Jennifer Koch (BS AOS '08, EPA '08-11, MS Portland State '13, Rhodeside & Harwell '14-present)

Postdoctoral Scholars

2010-2011	Dr. Val Bennington (UW-Madison CCR, 2012-14; Epic, 2014-20; now Makai Ocean Engineering)
2009-2010	Dr. Colleen Mouw (Professor, University of Rhode Island; 2016 PECASE awardee)
2007-2009	Dr. Nazan Atilla (UW-Madison Department of Zoology)
2007	Dr. Nobuaki Kimura (Kyushu University, Japan)

Visiting Students

2008-2009	Nsikak Benson, Fulbright Scholar (Nigeria)
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STUDENT COMMITTEES (* = McKinley students)

Columbia University / Lamont-Doherty Earth Observatory PhD Thesis Committees

New York, NY / Palisades, NY

Ms. Annie Leal (PhD expected 2026)

PhD Theses at Columbia University / Lamont-Doherty Earth Observatory

Dr. Lauren Moseley* (PhD Earth and Environmental Sciences 2024)

Dr. Suki Wong* (PhD Earth and Environmental Sciences 2023)

Dr. Colleen Baublitz (PhD Earth and Environmental Sciences 2021)

Dr. Sean Ridge* (PhD Earth and Environmental Sciences 2020)

Dr. Lucas Gloege* (PhD Earth and Environmental Sciences 2020)

Dr. Takaya Uchida (PhD Earth and Environmental Sciences 2019)

PhD Theses at University of Wisconsin - Madison

Madison, WI

Dr. Erin Thomas (PhD AOS 2017)

Dr. Cristian Martinez (PhD AOS 2016)

Dr. Malgorzata Golub (PhD Freshwater and Marine Science 2016)

Dr. Jiaxu Zhang (PhD AOS 2016)

Dr. Benjamin Kraemer (PhD Freshwater and Marine Science 2015)

Dr. Darren Pilcher* (PhD AOS 2015)

Dr. Haidi Chen* (PhD AOS 2015)

Dr. Katherine Holman (PhD AOS 2013)

Dr. Benjamin Sulman (PhD AOS 2012)

Dr. Justin Bagley (PhD AOS 2011)

Dr. Fung He (PhD AOS 2011)

Dr. Wei Liu (PhD AOS 2011)

Dr. Val Bennington* (PhD AOS 2010)

Dr. Claudia Cyganowski (PhD Astronomy 2010)

Dr. Jerry Tjiputra (PhD AOS 2007)

Masters Theses at University of Wisconsin - Madison

Madison, WI

Mr. Lucas Gloege* (MS AOS 2017)

Mr. Sean Ridge* (MS AOS 2017)

Ms. Nicole Colasacco-Thumm (MS AOS 2015)

Ms. Amanda Stone (MS Freshwater and Marine Science, 2012)

Mr. Jesse Roberts* (MS AOS 2012)

Ms. Jennifer Phillips* (MS Environment and Resources 2012)

Ms. Alexis Santos-Ritzer* (MS AOS 2012)

Ms. Amanda Fay* (MS AOS 2010)

Dr. David Ullman* (MS AOS 2008; PhD UW-Madison Geoscience 2013)

Mr. William Ahue (MS AOS 2008)

Ms. Erin Hokanson (MS AOS 2006)

Delta Teaching & Learning Internship Advisees at University of Wisconsin - Madison

Madison, WI

Dr. Andrew Winters (PhD AOS 2015, now Associate Professor, University of Colorado-Boulder)

PhD External Committees

PhD Committee Member

Dr. Cory McDonald (PhD Michigan Technological University, 2010)

PhD or MS External Evaluator

Dr. Laique Merlin Djeutchouang (PhD University of Cape Town, 2023)

Mr. Parsa Gooya (MS University of Victoria, 2022)

Dr. Precious Mongwe (PhD University of Cape Town, 2018)

Dr. Peisheng Huang (PhD University of Western Australia, 2010)

GALEN A. MCKINLEY

OUTREACH, INTERVIEWS and EDITORIALS

- 2009 to present **Lead developer for Carbon/Climate educational website, with interactive carbon budget applet**
 English: carboncycle.ldeo.columbia.edu (re-launched 2018. ~2,000 users in 2024)
 Spanish: carboncycle_spanish.ldeo.columbia.edu (re-launched 2018. ~8,000 users in 2024)
 From 2009-2017: carboncycle.aos.wisc.edu and carboncycle.es.wisc.edu
- June 2025 **Earth Observations: Conversations with Lamont Scientists** New York, NY
 Invited talk, “Understanding the ocean carbon sink”
- May 2025 **Weather and Climate Livestream, Part 9**, online
 Talk, “Ocean carbon and biogeochemistry”
<https://www.youtube.com/watch?v=r58FtmM4sDY> (final 30 minutes)
- October 2024 **Walden**, New York NY
 Informal consultant to an off-broadway play on climate change
- April 2022 **CFA (Chartered Financial Analyst) Society New York Sustainable Investing Group**, NY, NY
 Invited speaker on climate and carbon science
- April 2022 **Hunter College High School**, New York NY
 Invited speaker for Climate Day programming
- February 2021 **Roundtable on internalizing climate risk**, Columbia University, New York NY
 Invited speaker for financial services workshop from Columbia Center on Sustainable Investment
- October 2020 **Carbon Dioxide | Present and Future**, Columbia University, New York NY
 Invited panelist for public event of LDEO/Earth Institute Open House
- June 2020 **Radio Universidad Nacional de Mar del Plata**, Mar del Plata, Argentina
 Recorded interview, aired 27 June 2020, S. Buján (in Spanish; <http://www.programa-ecos.com.ar>)
- April 2020 **Earthx2020 Women’s conference**, online
 Invited panelist
- December 2019 **Field trip for Fieldston Ethical Culture High School**, Columbia University, New York NY
 Hosted Climate and Weather class for rotating tank experiments
- April 2019 **College Club of Northern New Jersey**, Ridgewood NJ
 Invited speaker “Carbon, climate and the oceans”
- October 2017 **LDEO Open House**, Columbia University, New York / Palisades NY
 Speaker for “A year in a life of a scientist”
- February 2017 **Field trip for Randall School 4th Grade**, Madison WI
 Hosted 56 4th graders for rotating tank experiments and “science on a sphere” presentations
- January 2017 **Perpetual Notion, WORT**, Madison WI
 On-air interview on “Stability of the Atlantic Meridional Overturning Circulation”, 19 Jan 2017
- December 2016 **Central Time, Wisconsin Public Radio**, Madison WI
 On-air interview on “Global warming snapshot for 2016”, 22 Dec 2016
- December 2016 **The Buzz, WORT**, Madison WI
 On-air interview on “NASA contributions to Earth Science”, 5 Dec 2016
- November 2016 **WISC TV 3 / Channel3000.com**, Madison WI
 On-air interview on “The Record Warmth of 2016” (<http://tinyurl.com/hy4pqb7>), 16 Nov 2016
- October 2016 **Nelson Institute and University of Wisconsin News**
 Q&A on climate change “Explaining ‘terrifying’ trends of climate change: Q&A” J. Peek
- February 2016 **UW News, Science Daily, Insurance Journal, phys.org, Eureka Alert, Nature News & Views**
 Various articles associated with McKinley et al. (2016), *Nature* doi:10.1038/nature16958
- December 2015 **The Daily Climate**, Charlottesville VA
 “Acid trip: Great Lakes could face similar acidification risks as the seas” B. Bienkowski
- November 2015 **Yale Environment 360**, New Haven CT
 “On thin ice: Big northern lakes are being rapidly transformed” C. Katz
- October 2015 **Wisconsin Science Festival**, Madison WI
 Invited plenary talk “Keeping the Great Lakes Great”
- July 2015 **Wisconsin Public Radio**, Madison WI
 Guest on “Joy Cardine Show”, 9 July 2015
- June 2015 **Capital Times**, Madison WI
 Op-ed, “Scott Walker, Legislature should stop swinging hammers at education”
- December 2014 **BioHouse, UW-Madison**, Madison WI
 Evening seminar speaker on the ocean and climate change

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- October 2014 **Wisconsin Science Festival**, Madison WI
Invited plenary talk “Ocean Acidification: The other CO₂ problem”
- September 2014 **National Geographic News**, Washington DC
“New reports offer clearest picture yet of rising greenhouse gas emissions” B.C. Howard
- June 2014 **Radio Ciudad**, Buenos Aires, Argentina
Radio interview on the new US EPA carbon rules (in Spanish)
- December 2013 **Climate Change: What it means for Wisconsin’s economy and natural resources**, Madison WI
Invited Panelist for Forum hosted by Wisconsin Legislature (Representatives Clark and Mursau) and Wisconsin Academy of Sciences, Arts and Letters (<http://tinyurl.com/mhzhxlem>)
- November 2013 **Adhoc Committee on Climate Change and Fossil Fuel Use, UW-Madison**, Madison WI
Panelist, Town Hall
- October 2013 **Wisconsin Energy Institute, UW-Madison**, Madison WI
Panelist, IPCC Report and EPA Rules
- April, Oct 2013 **Bradley Learning Center, UW-Madison**, Madison WI
Dinner speaker on climate change science and impacts
- April 2013 **Wisconsin Gazette**, Shorewood WI
“Extreme Wisconsin: Warmer, wetter, weirder weather ahead” L. Neff
- September 2012 **Women in Science and Engineering, UW-Madison**, Madison WI
Dinner speaker for living group supporting freshman women planning on STEM majors
- April 2012 **Aldo Leopold Nature Center**, Monona WI
Presenter on Antarctic response to climate change; Climate Education Center Grand Opening
- November 2011 **Wisconsin State Journal**, Madison WI
“Curiosities: Why does warm Coke go flat so much faster than cold Coke?” J. Sakai
- September 2011 **WORT**, Perpetual Notion Machine, Madison WI
Interview on air September 1, 2011 (archive.wort-fm.org/mp3/wort_110901_190001science.mp3)
- July 2011 **Voice of America**, Washington DC
“Study: Ocean Less Able to Mitigate Climate Change” R. Skirble
- July 2011 **CNN International**, London, UK
“Ocean carbon sinks feeling the heat” M. Knight
- June 2011 **In Common, Nelson Institute for Environmental Studies, UW-Madison**, Madison WI
“Illuminating water’s role in the carbon cycle and future climate” M. Lepisto
- Jan-Aug 2011 **Mini Workshop for Carbon Cycle Applet Lesson Plans**, Madison WI
Organizer. Detailed G6-12 lesson plans developed to accompany carboncycle.aos.wisc.edu
- January 2011 **Climate Ambassadors Workshop, University of Wisconsin - Madison**, Madison WI
Lecturer, “Climate and Climate Change: Science Basics”
- December 2010 **NASA Television**, <http://www.youtube.com/watch?v=hXg4ugCajkE>
“NASA Science on the Road: Oceans, Carbon, and Climate” S. Cole
- August 2010 **Chicago Tribune**, Chicago IL
“Sink or source? Figuring Great Lakes’ role in climate change” and “Could acidification threaten Great Lakes?” D. Lockwood
- June 2010 **Climate Ambassadors Workshop, University of Wisconsin - Madison**, Madison WI
Lecturer, “Climate and Climate Change: Science Basics”
- April 2010 **Whiteside Forum**, Morrison IL
Invited panelist for community forum on the oceans
- November 2009 **New York Times, Wisconsin Week, Science Daily, Bloomberg**
Reports, interviews on Nature Geoscience paper, Desai et al. (2009)
- November 2009 **Wisconsin Public Radio**, Superior WI
“Increasing winds over the Great Lakes” M. Simonson
- September 2009 **Badger Herald, University of Wisconsin - Madison**, Madison WI
“2050: Temperature to increase by 4 degrees” K. Mianulli
- July 2009 **AOS & CIMSS, University of Wisconsin - Madison**, Madison WI
Organizer and lead lecturer, Carbon Cycle and Climate Modeling - A Teacher’s Workshop
- July 2008 **CIMSS, University of Wisconsin - Madison**, Madison WI
Invited lecturer, Geosciences Time Scales and Global Climate Change Teacher’s Workshop

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April 2008	Daily Cardinal, University of Wisconsin - Madison, Madison WI "Report finds public transit key to curb global warming in state", C. Brace
January 2008	"The Pulse" WTDY 1670AM, Madison WI Interview with host S. Wisniewski on the science of global climate change (on air 1/20/08)
October 2007	Wisconsin State Journal, Madison WI "Why is The Ocean Salty", J. Sakai. Also appeared in Science Daily
October 2007	Second Annual Wisconsin Climate Change Forum, Madison, WI Invited panelist
July 2007	CIMSS, University of Wisconsin - Madison, Madison WI Invited lecturer, Remote Sensing Applications in the Geosciences Teacher's Workshop
June 2007	Capital Times, Madison WI "Local scientist calls global warming theory 'hooy'", S.K. Derby
February 2007	Capital Times, Madison WI "City lakes offer lesson in climate change – The winter's freeze was second latest", A. Weier
October 2006	First Annual Wisconsin Climate Change Forum, Madison WI Invited panelist
September 2006	Women In Science and Engineering, UW-Madison, Madison WI Dinner speaker for living group supporting freshman women planning on STEM majors
September 2005	The Why Files, Madison WI "Hurricanes: The Heat is On", D. Tannebaum
March 2005	Capital Times, Madison WI "Global warming debate is over, UW prof says – Calls new study as solid proof as that smoking causes cancer", A. Nathans
March 2005	Daily Cardinal, University of Wisconsin - Madison, Madison WI "Greenhouse gases further implicated in global warming", P. Dohnal