# GALEN A. MCKINLEY

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## EDUCATION

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

## RESEARCH AND PROFESSIONAL EXPERIENCE

| | | |
|---|---|---|
| | **Columbia University / Lamont Doherty Earth Observatory.** | New York, NY / Palisades, NY |
| 2017 to present | *Professor, Earth and Environmental Sciences* | |
| | *Affiliate Professor, Earth and Environmental Engineering* | |
| | 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. | |
| 2021 to present | *Deputy Director, Learning the Earth with Artificial Intelligence and Physics (LEAP), NSF STC* | |
| | LEAP's mission is to increase the reliability, utility, and reach of climate projections through the integration of climate and data science. As Deputy Director, my primary responsibility is to oversee the research portfolio. | |
| | **University of Wisconsin - Madison** | Madison, WI |
| 2017 to 2020 | *Adjunct Professor, Atmospheric and Oceanic Sciences* | |
| 2016 to 2017 | *Professor, Atmospheric and Oceanic Sciences and Bryson Professor, Center for Climatic Research* | |
| 2011 to 2016 | *Associate Professor, Atmospheric and Oceanic Sciences* | |
| 2004 to 2011 | *Assistant Professor, Atmospheric and Oceanic Sciences* | |
| summer 2011 | **Woods Hole Oceanographic Institution** | Woods Hole, MA |
| | *Institution Visiting Scholar in Physical Oceanography and Marine Chemistry and Geochemistry* | |
| | **Princeton University / University of Wisconsin - Madison** | Princeton, NJ |
| 2003 to 2004 | *Visiting Research Staff / Anna Julia Cooper Postdoctoral Fellow* | |
| | Ar and $N_2$ in ocean and atmospheric models, ocean $^{14}C$ and inverse techniques; and $CO_2$ and $O_2$ fluxes. | |
| | **Instituto Nacional de Ecología (National Institute of Ecology)** | Mexico City, Mexico |
| 2002 to 2003 | *Consultant* | |
| | Analyzed potential public health co-benefits from the simultaneous control of air pollutant and greenhouse gas emissions in Mexico City; capacity building for integrated environmental protection. | |
| | **Massachusetts Institute of Technology** | Cambridge ,MA |
| 1996 to 2002 | *Graduate Research assistant and Postdoctoral associate* | |
| | **Brown and Root Environmental** | Houston, TX |
| 1995 to 1996 | *Environmental specialist* | |
| | Assisted industrial clients with environmental compliance; duties included water and soil sampling, hazardous waste abatement, and air pollution modeling. | |
| | **Clivius Multrum, USA** | Newton, MA |
| summer 1993 | *Project consultant* | |

# GALEN A. MCKINLEY

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

Crisp, D., H. Dolman, T. Tanhua, G.A. McKinley, J. Hauck, A. Bastos, S. Sitch, S. Eggleston, V. Aich (2022) How well do we understand the land-ocean-atmosphere carbon cycle? *Rev. Geophysics*, 60, e2021RG000736. doi:10.1029/2021RG000736. (68)

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 $pCO_2$ data, *Journal of Advances in Modeling Earth Systems*, 14, e2021MS002620. doi: 10.1029/2021MS002620. (67)

Laughner, J.L, J.L. Neu, D. Schimel, P.O. Wennberg, K. Barsanti, K. Bowman, A. Chatterjeee, B. Croes, H. Fitzmaurice, D. Henze, J. Kim, E.A. Kort, Z. Liu, Kazuyuki 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, 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, J. Zeng (2021) Harmonization of global surface ocean $pCO_2$ 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 $pCO_2$ 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 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)

McKinley, G.A., A.L. Ritzer*, and N.S. Lovenduski (2018) Mechanisms of northern North Atlantic biomass variability, *Biogeosciences* 15, 6049-6066, doi:10.5194/bg-15-6049-2018. (52)

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 $pCO_2$, *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)

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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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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)

Lovenduski, N., G.A. McKinley, A.R. Fay,* K. Lindsay and M.C. Long (2016) Partitioning uncertainty in ocean carbon uptake projections, *Global Biogeochem. Cycle*s, 29, 416–426*, doi:* 10.1002/2016GB005426. (40)

McKinley, G.A., D.J. Pilcher*, A.R. Fay*, K. Lindsay, M.C. Long, and N. Lovenduski (2016) Timescales for detection of trends in the ocean carbon sink, *Nature,* 530, 469–472, doi:10.1038/nature16958. (39)

Breeden, M.** and G.A. McKinley (2016) Climate impacts on multidecadal $pCO_2$ variability in the North Atlantic: 1948-2009, *Biogeosciences,* 13, 3387-3396, doi:10.5194/bg-13-3387-2016. (38)

McKinley, G.A., C.A. Carlson, A. Andrews, D. Brown, P. Romero-Lankao, and G. Shrestha (2015) Managing the carbon cycle requires strong science, *Eos,* 96, doi:10.1029/2015EO040161. (37)

Dave, A., A.D. Barton, M.S. Lozier, G.A. McKinley (2015) What drives seasonal change in oligotrophic area in the subtropical North Atlantic? *J. Geophys. Res,* doi: 10.1002/2015JC010787. (36)

Phillips, J.*, G.A. McKinley, V. Bennington*$^{+}$, H. Bootsma, D. Pilcher*, R.W. Sterner, N.R. Urban (2015) Evaluating the potential for $CO_2$-induced acidification of the Laurentian Great Lakes, *Oceanography 28(2),* 136–145. doi:10.5670/oceanog.2015.37. (35)

Lovenduski, N., A.R. Fay*, G.A. McKinley (2015) Observing multi-decadal trends in Southern Ocean $CO_2$ uptake: What can we learn from an ocean model? *Global Biogeochem. Cycles,* doi: 10.1002/2014GB004933. (34)

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)

Kitchell, J.F., T. Cline, V. Bennington*$^{+}$ and G.A. McKinley (2015) Challenges of managing invasive sea lamprey in Lake Superior. In Bioeconomics of Invasive Species: Integrating Ecology, Economics, Policy and Management. ed: R. P. Keller, D. M. Lodge, M. A. Lewis, J. F. Shogren, University of Chicago Press. (32)

Fay, A.R.*, G.A. McKinley and N. Lovenduski (2014) Southern Ocean carbon trends: Sensitivity to methods, *Geophys. Res. Lett.* doi: 10.1002/2014GL061324. (31)

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Cline, T., J.F. Kitchell, V. Bennington*$^{+}$, G.A. McKinley, E.K. Moody and B.C. Weidel (2014) Climate impacts on landlocked sea lamprey: Implications for host-parasite interactions and invasive species management, *Ecosphere 5(6), art68.* dx.doi.org/10.1890/ES14-00059.1. (29).

Fay, A.R.* and G.A. McKinley (2013) Global trends in surface ocean $pCO_2$ from in situ data*, Global Biogeochem. Cycles,* 27, doi:10.1002/gbc.20051. (28).

Khatiwala, S., T. Tanhua, S. Mikaloff Fletcher, M. Gerber, S.C. Doney, H.D. Graven, N. Gruber, G.A. McKinley, A. Murata, A.F. Rios, C.L. Sabine and J.L. Sarmiento (2013) Global Ocean Carbon Storage, *Biogeosciences* 10, 2169-2191, doi:10.5194/bg-10-2169-2013. (27).

Wanninkhof, R., G.H. Park, T. Takahashi, C. Sweeney, R. Feely, Y. Nojiri, N. Gruber, S. C. Doney, G.A. McKinley, A. Lenton, C. Le Quéré, C. Heinze, J. Schwinger, H. Graven and S. Khatiwala (2013) Global ocean carbon uptake: magnitude, variability and trends, *Biogeosciences* 10, 1983-2000, doi:10.5194/bg-10-1983-2013. (26).

Mouw, C.B.$^{+}$, H. Chen*, G.A. McKinley, S. Effler, D. O'Donnell, M.G. Perkins and C. Strait (2013) Evaluation and optimization of bio-optical inversion algorithms for remote sensing of Lake Superior's optical properties*, J. Geophys. Res.-Oceans* 118, doi:10.1002/jgrc.20139. (25)

Schuster, U., G.A. McKinley, N. Bates, F. Chevallier, S.C. Doney, A.R. Fay*, M. González-Dávila, N. Gruber, S. Jones, J. Krijnen, P. Landschützer, N. Lefèvre, M. Manizza, J. Mathis, N. Metzl, N., A. Olsen, A.F. Rios, C. Rödenbeck, J. M.

Santana-Casiano, T. Takahashi, R. Wanninkhof, and A.J. Watson (2013) Atlantic and Arctic sea-air CO2 fluxes, 1990–2009. *Biogeosciences* **10**, 607-627, doi:10.5194/bg-10-607-2013. (24)

Bennington, V.*[+], G.A. McKinley, N. Urban, and C. McDonald (2012) Can spatial heterogeneity explain the perceived imbalance in Lake Superior's carbon budget? a model study*, J. Geophys. Res. – Biogeosci.* **117**, G03020 doi:10.1029/2011JG00189. (23)

McDonald, C.P., V. Bennington*[+], N. Urban and G.A. McKinley (2012) Test-bed calibration of a Lake Superior biogeochemical model, *Ecol. Model*. **225**, 115–126, doi: 10.1016/j.ecolmodel.2011.11.021. (22)

Vasys, V.N.**, A.R. Desai, G.A. McKinley, V. Bennington*, A.M. Michalak, and A.E. Andrews (2011). Influence of large lake carbon exchange on regional tracer transport inversions. *Envi. Res. Lett*., **6** *034016*. (21)

McKinley, G.A, A. Fay*, T. Takahashi and N. Metzl (2011) Convergence of atmospheric and North Atlantic $CO_2$ trends on multidecadal timescales*. Nature Geoscience,* doi:10.1038/ngeo1193. (20)

Atilla, N.[+], G. A. McKinley, V. Bennington*, M. Baehr, N. Urban, M. DeGrandpre, A. Desai and C. Wu (2011), Observed variability of Lake Superior $pCO_2$, *Limnol. Oceanogr.,* 56(3), 775–78, doi:10.4319/lo.2011.56.3.0775. (19)

Bennington, V.*[+], G. A. McKinley, N. Kimura[+] and C. Wu (2010) The general circulation of Lake Superior: Mean and interannual variability from 1979-2008*, J. Geophys. Res.* 115, C12015, doi:10.1029/2010JC006261. (18)

Saba, V. S., M. A. M. Friedrichs, M.-E. Carr, D. Antoine, R. A. Armstrong, I. Asanuma, O. Aumont, N. R. Bates, M. J. Behrenfeld, V. Bennington*, L. Bopp, J. Bruggeman, E. T. Buitenhuis, M. J. Church, A. M. Ciotti, S. C. Doney, M. Dowell, J. P. Dunne, S. Dutkiewicz, W. Gregg, N. Hoepffner, K. J. W. Hyde, J. Ishizaka, T. Kameda, D. M. Karl, I. Lima, M. W. Lomas, J. Marra, G. A. McKinley, F. Mélin, J. K. Moore, A. Morel, B. Salihoglu, M. Scardi, T. J. Smyth, S. Tang, J. Tjiputra, J. Uitz, M. Vichi, K. Waters, T. K. Westberry, and A. Yool (2010) The challenges of modeling marine primary productivity through multidecadal climate shifts: A case study at BATS and HOT, *Global Biogeochem. Cycles.* 24, GB3020, doi:10.1029/2009GB003655. (17)

Illari L., J. Marshall, P. Bannon, J. Botella, R. Clark, T. Haine, A. Kumar, S. Lee, K. J. Mackin, G.A. McKinley, M. Morgan, R. Najjar, T. Sikora, and A. Tandon (2009) Weather in a Tank: Exploiting laboratory experiments in the teaching of meteorology, oceanography and climate. *Bull. Amer. Meteorol. Soc. 90(11),* doi:10.1175/2009BAMS2658.1. (16)

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global air-sea gas exchange for $CO_2$ with recent bomb $^{14}C$ measurements, *Global Biogeochem. Cycles* 21, GB2015, doi:10.1029/ 2006GB002784. (9)

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**PUBLICATIONS IN REVIEW**

Olivarez, H., N.S. Lovenduski, R. Brady, A.R. Fay*, M. Gehlen, L. Gregor, P. Landschützer, G.A. McKinley, K. McKinnon, and D. Munro. Replaying the tape of history: Synthetic large ensembles of sea-air CO2 flux, *Global Biogeochem. Cycles, in review.* doi:10.1002/essoar.10507917.1

Ciais, P., S. Davis, S. Saatchi, Z. Deng, B. Poulter, F. Chevallier, G. Grassi, Z. Liu, R. L. Thompson, G.A. McKinley, N. Gruber, J.P. Wigneron, P. Gentine, A. d'Aspremont, T. Lauvaux, C. Albergel and D. Crisp. Towards near-real-time estimates of greenhouse gas budgets, *Nature, in review.*

Bennington, V.S.*$^{+}$, T. Galjanic, G.A. McKinley. Estimating historical air-sea $CO_2$ fluxes: Incorporating physical knowledge within a data-only approach, *JAMES, in review.*

Bennington, V.S.*$^{+}$, L. Gloege*, and G.A. McKinley. Observation-based variability in the global ocean carbon sink: 1959-2018, *GRL in review.*

**PUBLICATIONS IN PREPARATION**

G.A. McKinley and V.S. Bennington*$^{+}$. Modern flux distributions constrain the future ocean carbon sink, *in prep.*

Wong, S.*, R. Seager, G.A. McKinley. Evaluation of equatorial Pacific ENSO carbon dynamics in CMIP6, *in prep.*

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

# GALEN A. MCKINLEY

## SCIENTIFIC PLANNING AND REVIEW DOCUMENTS

Bingham, F., L. Juranek, M. Mazloff, G.A. McKinley, N. Nelson, S. Wijffels (2019) Review of US GO-SHIP (Global Oceans Ship-Based Hydrographic Investigators Program) An OCB and US CLIVAR Report. Report 2019 (OCB) and 2019-6 (US CLIVAR).112pp. doi:10.1575/1912/24897.

Benway, H., S. Alin, E. Boyer, W.-J. Cai, P. Coble, J. Cross, M. Friedrichs, M.,Goñi, P. Griffith, M. Herrmann, S. Lohrenz, J. Mathis, G.A. McKinley, R. Najjar, C. Pilskaln, S. Siedlecki, R. Smith (2016). A Science Plan for Carbon Cycle Research in North American Coastal Waters. Report of the Coastal CARbon Synthesis (CCARS) community workshop, August 19-21, 2014, Ocean Carbon and Biogeochemistry Program and North American Carbon Program, 84 pp., doi: 10.1575/1912/7777.

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. Thorton, S.C. Wofsy, N. Zeng (2011) A U.S. Carbon Cycle Science Plan, a UCAR report.

Alin S.R., J. Day, G.A. McKinley, C. Stow, M. Baker, E. Brody, R. Bohne, T. Nalepa, T. Heatlie, A.J. Sutton, and R.A. Feely (2010) Great Lakes Region Acidification Research Plan—NOAA Ocean Acidification Steering Committee: NOAA Ocean and Great Lakes Acidification Research Plan, NOAA Special Report, 143 pp.

## OTHER PUBLICATIONS AND PRODUCTS

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. 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. Khatiwala, 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. 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.

**PROFESSIONAL SERVICE**

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| 2022 to present | **Ocean Studies Board, National Academy of Sciences**<br>Member |
| 2022 to present | **US National Committee for UN Decade of Ocean Sciences for Sustainable Development**<br>Member |
| 2022 to present | **Climate and Global Dynamics Advisory Panel, National Center for Atmospheric Research**<br>Member |
| 2021 to present | **PICES/ICES, Working Group 46, Ocean Negative Carbon Emissions**<br>Member |
| 2020 to present | **Ocean Carbon and Biogeochemistry program, Working Group on Ocean Carbon Gaps**<br>Chair |
| 2020 to present | **The Oceanography Society**<br>Chemical Oceanography Councilor, 2020-2022 |
| 2019 to present | **Annual Reviews of Earth and Planetary Science, Editorial Board**<br>Editorial Board, 2020-2024; Guest, 2019 |
| 2019 to present | **Defense Science Study Group Alumni Outreach Committee**<br>Committee of 10 recent DSSG alumni; tasked by IDA to advise on alumni engagement |
| March 2022 | **AGU/ASLO/TOS Ocean Sciences 2022,** virtual<br>Co-convener and chair: "Quantifying the Ocean Carbon Sink" |
| December 2021 | **North Atlantic Biogeochemical Carbon Pump**, virtual<br>Invited participant and plenary speaker |
| April 2020 | **ECCO Review Panel, NASA,** Washington DC<br>Invited panel member |
| February 2020 | **AGU/ASLO/TOS Ocean Sciences 2020,** San Diego CA<br>Co-convener and chair: "The Evolving Ocean Carbon Sink: Processes and Impacts " |
| October 2019 | **Expert Workshop on Integrated Ocean Carbon Research (IOCR),** Paris, France<br>Invited participant and speaker |
| October 2019 | **CMIP6 Hackathon**, Boulder CO / Palisades NY / Seattle WA / ETH Zurich<br>Co-organizer of OCB and CLIVAR sponsored hackathon |
| September 2019 | **Vetlesen Prize Selection Committee**<br>Awarded bi-annually for distinction in earth science research |
| 2018 to 2019 | **GO SHIP Program Review Committee**<br>Committee of 6; tasked by OCB and US CLIVAR to review the repeat hydrography program |
| 2017 to 2019 | **AGU Chapman Conference**, La Jolla CA<br>Program committee for conference: "Understanding carbon climate feedbacks", August 2019 |
| December 2018 | **American Geophysical Union Fall Meeting**, Washington DC<br>Co-convener and chair: "Understanding changing ocean biogeochemistry" |
| December 2018 | **Ocean carbon uptake in CMIP6 models**, Washington DC<br>Co-organizer of OCB-sponsored workshop |
| 2014 to 2018 | **Global Carbon Project Scientific Steering Committee** (GCP-SSC)<br>The GCP coordinates international carbon cycle activities under Future Earth. |
| June 2018 | **The effects of climate change on the world's oceans,** Washington DC<br>Co-convener and chair: "Carbon uptake, ocean acidification, and ecosystem and human impacts" |
| February 2018 | **AGU/ASLO/TOS Ocean Sciences 2018,** Portland OR<br>Co-convener and chair: "The ocean carbon cycle across timescales" |
| 2016 to 2018 | **MPOWIR mentor**<br>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)<br>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**<br>Reviewed community-proposed input to the NASA Decadal Survey for the OBB program |
| 2016 to 2017 | **Great Lakes Advisory Board Science and Information Subcommittee**<br>Appointed by the EPA administrator to advise the Great Lakes Interagency Task Force |
| 2015 to 2017 | **CONCORDE Scientific Advisory Panel**<br>CONCORDE is a GoMRI-funded group pursuing science needs identified with Deepwater Horizon. |

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| January 2017 | **Panelist, NOAA Climate Program Office, Ocean Observing & Monitoring,** Washington DC<br>Review panelist for OOM program |
| 2011 to 2016 | **Carbon Cycle Science Scientific Steering Group** (CCSSG)<br>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<br>Co-convener: "How do the carbon pumps pump? Mechanisms of the solubility and biological pumps" |
| 2012 to 2015 | **US CLIVAR - OCB Working Group**<br>Oceanic carbon uptake in the CMIP5 models, Core Member |
| 2011 to 2014 | **Global Biogeochemical Cycles**<br>Associate Editor |
| November 2014 | **External evaluator, Helmholtz Center Geesthacht,** Germany<br>Evaluation of candidates for director |
| April 2014 | **Planning Workshop: Int'l Research on the Coupled N. Atlantic-Arctic System,** Washington DC<br>Invited participant |
| February 2014 | **AGU/ASLO/TOS Ocean Sciences 2014,** Honolulu, HI<br>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)<br>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**<br>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**<br>Attendance and interviews at annual meeting, survey of AMOC PI community, report preparation |
| 2010 to 2013 | **REgional Carbon Cycle Assessment and Processes** (RECCAP)<br>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)<br>The CCS-WG wrote the New US Carbon Cycle Science Plan (2012) |
| October 2011 | **Patullo Conference**, MPOWIR, Warrenton, VA<br>Senior participant; Meeting goal is to promote retention of women in physical oceanography |
| December 2010 | **NACP/OCB Coastal Carbon Synthesis Workshop**, San Francisco, CA<br>Co-organizer and speaker |
| March 2010 | **Caltech Keck Institute for Space Studies (KISS)**, Pasadena, CA<br>Invited participant in study program "Quantifying the Sources and Sinks of Atmospheric $CO_2$" |
| February 2010 | **AGU/ASLO/TOS Ocean Sciences 2010,** Portland, OR<br>Co-convener and session chair: "Carbon Cycling in the Coastal Oceans" |
| May 2009 | **International Association of Great Lakes Research Annual Meeting**, Toldeo, OH<br>Co-convener and session chair: "Carbon Cycling in the Laurentian Great Lakes" |
| 2005 to 2008 | **Ocean Carbon and Biogeochemistry Scientific Steering Committee** (OCB-SSC)<br>Committee member, tasked to advise NSF, NASA and NOAA on research directions |
| 2005 to 2008 | **Earth Science Women's Network** (ESWN)<br>Leadership Board member |
| December 2008 | **American Geophysical Union Fall Meeting**, San Francisco, CA<br>Co-convener and session chair: "Ocean Carbon Cycle: Decadal Trends" |
| July 2007 | **Ocean Carbon and Biogeochemistry Summer Workshop**, Woods Hole, MA<br>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 $CO_2$ 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<br>Co-convener and session chair for Union session: "Health, Air Pollution and Climate" |

2002 to present **Reviewer for Papers and Proposals**

*Papers and books:* AGU Books, 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, OS/OSD, PNAS, Prog. Oceanog., Princeton U. Press, Science, Springer, Tellus B, U. Chicago Press

*Assessment Reports:* National Academy of Science review of SOCCR2 (2018), IPCC SROCC (2018)

*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), Marsten Fund (NZ), U. Michigan Water Center

*Proposal Panels:* NASA (2004, 2011, 2013, 2021); NSF (2008, 2017); NOAA (2021)

# GALEN A. MCKINLEY

**AWARDS AND HONORS**

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| 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 Association for the Advancement of Science (2020-present)
American Geophysical Union (1998-present)
American Society of Limnology and Oceanography (2011-present)
Earth Science Women's Network (2003-present)
The Oceanography Society (2008-present)

**SERVICE at COLUMBIA UNIVERSITY**

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| 2018 to present | **Diversity Committee,** Earth and Environmental Sciences, Chair 2019-present |
| 2020 to present | **STEM DEI Committee**, Arts and Sciences |
| 2022 | **Carbon Cycle & Decarbonization Implementation Team**, LDEO |
| 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**

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| 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**

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| 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 |

**SELECTED PRESENTATIONS**

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| May 2022 | **Gordon Research Conference: Ocean Biogeochemistry 2022,** Barcelona, Spain<br>Invited plenary speaker "Constraining models of the future ocean carbon sink with machine learning" |
| March 2022 | **AGU/ASLO/TOS Ocean Sciences 2022,** virtual<br>Oral, "Constraining the future ocean carbon sink" |
| February 2022 | **BGC-Argo Group Meeting**, virtual<br>Invited speaker, "LEAP STC and connections to float based biogeochemistry" |
| December 2021 | **North Atlantic Biogeochemical Carbon Pump**, virtual<br>Invited plenary speaker, "Models to understand the North Atlantic carbon sink" |
| October 2021 | **University of California-Irvine,** Irvine CA<br>Invited seminar, "Models, data and theory to understand the ocean carbon sink" |
| April 2021 | **NOAA Global Monitoring Laboratory**, Boulder CO<br>Invited seminar, "Decadal variability in the ocean carbon sink" |
| April 2021 | **European Geophysical Union, Fall Meeting**<br>Oral, "Quantifying the ocean carbon sink for 1994-2007: Combined evidence from multiple methods" |
| February 2021 | **Earth and Environmental Engineering**, Columbia University<br>Invited seminar, "Decadal variability in the ocean carbon sink" |
| December 2020 | **Machine Learning in Science & Engineering**, Columbia Data Science Institute<br>Invited, "Quantifying the ocean carbon sink with sparse data, physical models and machine learning" |
| December 2020 | **American Geophysical Union, Fall Meeting**<br>Oral, "Quantifying the ocean carbon sink for 1994-2007: Combined evidence from multiple methods" |
| April 2020 postponed | **Atmospheric and Oceanic Sciences, University of Wisconsin**, Madison WI<br>Invited seminar, "Understanding change in ocean carbon sink" |
| April 2020 | **Woods Hole Oceanographic Institution**, Woods Hole MA<br>Invited seminar, "Understanding change in ocean carbon sink" |
| April 2020 | **Geochemistry Seminar**, Lamont Doherty Earth Observatory, Palisades NY<br>Seminar, "Mechanisms of decadal variability in the ocean carbon sink" |
| February 2020 | **AGU/ASLO/TOS Ocean Sciences 2020**, San Diego CA<br>Oral, "Forced mechanisms of decadal variability in the ocean carbon sink" |
| October 2019 | **Atmospheric and Oceanic Sciences, University of Colorado,** Boulder CO<br>Distinguished Lecture, "Understanding recent decadal variability of the global ocean carbon sink" |
| August 2019 | **Observing Carbon Climate Feedbacks, Chapman Conference,** La Jolla CA<br>Invited Plenary Speaker, "Forced change in the ocean carbon sink" |
| July 2019 | **Chemical Oceanography, Gordon Conference,** Holderness NH<br>Invited Plenary Speaker, "Forced change in the ocean carbon sink" |
| May 2019 | **Princeton University,** Princeton NJ<br>Invited seminar, "Forced change in the ocean carbon sink" |
| April 2019 | **University of Connecticut,** Avery Point CT<br>Invited seminar, "Forced change in the ocean carbon sink" |
| December 2018 | **Ocean carbon uptake in CMIP6 models workshop,** Washington DC<br>Oral, "Forced changes and internal variability in the ocean carbon sink" |
| June 2018 | **The Effects of Climate Change on the World's Oceans, 4$^{th}$ Int'l Symposium,** Washington DC<br>Oral, "Variability and trends in ocean carbon uptake: 1981-2016" |
| April 2018 | **Massachusetts Institute of Technology,** Earth Atmospheric and Planetary Sciences, Cambridge MA<br>Invited seminar, "Diagnosing change in the ocean carbon sink" |
| April 2018 | **University of Pennsylvania,** Philadelphia, PA<br>Invited seminar, "Diagnosing change in the ocean carbon sink" |
| February 2018 | **AGU/ASLO/TOS Ocean Sciences 2018**, Portland OR<br>Poster, "Correlations of surface ocean $pCO_2$ to satellite chlorophyll, monthly to interannual" |
| January 2018 | **NASA GISS,** New York, NY<br>Invited seminar, "Variability in the ocean carbon sink" |
| November 2017 | **Geophysical Fluid Dynamics Laboratory,** Princeton NJ<br>Invited seminar, "Variability in the ocean carbon sink: Drivers and challenges to detection" |
| October 2017 | **Distinguished Scientist Seminar, Marine Biological Laboratory**, Woods Hole MA<br>Invited seminar, "Understanding the ocean's role in the global carbon cycle" |

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| September 2017 | **Ocean Carbon Hotspots Workshop of CLIVAR and OCB**, Monterey CA<br>Plenary, "Timescales and mechanisms of change in ocean carbon sink" |
| August 2017 | **International Carbon Dioxide Conference 10**, Interlaken, Switzerland<br>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<br>Moderator and Speaker**,** "What now? Preparing for Environmental Change" |
| January 2017 | **Cooperative Inst. Limnology & Ecosystems Research**, U. Michigan, Ann Arbor MI<br>Invited seminar, "Spatial variability and potential long-term trends in Great Lakes carbon" |
| December 2016 | **American Geophysical Union, Fall Meeting**, San Francisco CA<br>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<br>Seminar**,** "Mechanistic connections between carbon and chlorophyll in the global ocean" |
| October 2016 | **Kavli Frontiers of Science Symposium**, Irvine CA<br>Invited poster "Natural Variability and Anthropogenic Trends in the Ocean Carbon Sink" |
| July 2016 | **Ocean Carbon and Biogeochemistry Workshop**, Woods Hole MA<br>Invited plenary, "Detecting trends in the ocean carbon sink" |
| June 2016 | **Scripps Institution of Oceanography,** La Jolla CA<br>Seminar, "Detection of trends in the ocean carbon sink" |
| June 2016 | **Lamont-Doherty Earth Observatory of Columbia University,** Palisades NY<br>Invited colloquium, "Detection of trends in the ocean carbon sink" |
| April 2016 | **University of Wisconsin – Climate Change Symposium,** Madison WI<br>Invited plenary, "Ocean mitigation of climate change: past, present and future" |
| March 2016 | **Sarmiento Symposium**, Princeton NJ<br>Invited speaker and panelist, "The breath of life — a changing carbon cycle" |
| February 2016 | **AGU/ASLO/TOS Ocean Sciences 2016**, New Orleans LA<br>Oral, "Detectability of change in the ocean carbon sink" |
| February 2016 | **Climate People and the Environment Program,** University of Wisconsin, Madison WI<br>Invited seminar, "Variability and trends in ocean carbon uptake from models and data" |
| January 2016 | **NOAA –Pacific Marine Environmental Laboratory,** Seattle WA<br>Invited seminar, "Variability and trends in ocean biogeochemistry from models and data" |
| September 2015 | **University of Southern Mississippi,** Hattiesburg, MS<br>Invited seminar, "The ocean carbon sink: Separating trends from variability" |
| June 2015 | **Global Carbon Project Scientific Steering Committee Meeting,** Oslo, Norway<br>Invited plenary, "Ocean carbon research and integration in the global carbon cycle" |
| June 2015 | **JASON summer study,** La Jolla, CA<br>Invited brief, "Changing ocean carbon: Observations and models" |
| May 2015 | **University of Wisconsin Water Symposium,** Madison WI<br>Invited plenary, "Circulation and carbon: Oceans and Great Lakes" |
| March 2015 | **Pre-decadal survey workshop on Carbon and Climate,** Norman OK<br>Invited plenary, "Uncertainties and unknowns in the ocean carbon sink (+coastal and inland)" |
| December 2014 | **American Geophysical Union, Fall Meeting**, San Francisco CA<br>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<br>Invited plenary, "Quantifying carbon uptake and its trends" |
| November 2014 | **JASON 2014 fall meeting,** Washington DC<br>Invited plenary, "The changing ocean: Carbon, climate and coupled feedbacks" |
| November 2014 | **Carbon Cycle Interagency Working Group,** Washington DC<br>Invited plenary, "The ocean carbon sink: Present knowledge and critical gaps" |
| August 2014 | **Coastal Carbon Synthesis Community Workshop,** Woods Hole MA<br>Invited plenary, "Great Lakes carbon budgets" |
| June 2014 | **Oak Ridge National Lab**, Oak Ridge TN<br>Talk, "Carbon and biogeochemistry in the oceans and Great Lakes" |
| April 2014 | **Center for Climatic Research and Climate People and Environment Program,** Madison WI<br>Seminar, "Climate change and national security: Implications and preparedness" |
| March 2014 | **Institute for Defense Analysis,** Alexandria VA<br>Invited seminar, "What I learned and some recommendations" |

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| March 2014 | **Lamont-Doherty Earth Observatory of Columbia University,** Palisades NY<br>Invited seminar, "Natural variability and anthropogenic trends in the ocean carbon sink"<br>http://tinyurl.com/mrj3bo8 |
| February 2014 | **AGU/ASLO/TOS Ocean Sciences 2014**, Honolulu HI<br>Oral, "$CO_2$-acidification of the Laurentian Great Lakes" |
| August 2013 | **NCAR ASP Key Uncertainties in the Global Carbon Cycle**, Boulder CO<br>Invited plenary, "Using data to elucidate feedback mechanisms in the ocean carbon cycle" |
| August 2013 | **NCAR ASP Graduate Student Colloquium**, Boulder CO<br>Invited lecture, "Mechanisms of ocean carbon climate feedback: What do the data support?" |
| July 2013 | **NCAR ASP Graduate Student Colloquium**, Boulder,CO<br>Invited lecture, "Ocean carbon biogeochemistry: Productivity, export, remineralization" |
| June 2013 | **9th International Carbon Dioxide Conference**, Beijing, China<br>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<br>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<br>Seminar, "The ocean carbon sink: How strong? How vulnerable?" |
| January 2013 | **Ohio State University**, Climate Change Webinar<br>Invited, "Climate, carbon impacts on productivity, chemistry & invasive species in the Great Lakes." |
| July 2012 | **Ocean Carbon and Biogeochemistry Workshop**, Woods Hole MA<br>Invited Plenary, "RECCAP: Results from a global synthesis on ocean carbon uptake" |
| April 2012 | **NASA Ocean Color Research Team Meeting,** Seattle WA<br>Plenary, "Trends in ocean carbon uptake" |
| February 2012 | **AGU/ASLO/TOS Ocean Sciences 2012**, Salt Lake City UT<br>Oral, "Physical drivers of biogeochemical and carbon cycling in Lake Superior" |
| January 2012 | **Lake Superior Research Symposium, University of Minnesota,** St. Paul MN<br>Invited talk, "Modeling circulation, carbon and climate for Superior" |
| November 2011 | **Department of Chemistry and Biochemistry, University of Montana,** Boseman MT<br>Invited seminar, "Trends in ocean carbon uptake" |
| November 2011 | **School for Freshwater Science, University of Wisconsin - Milwaukee**, Milwaukee WI<br>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<br>Invited plenary, "Attribution: What drives $CO_2$ sink trends?" (given by A. Fay due to injury) |
| August 2011 | **Gordon Research Conference**, Andover NH<br>Poster, "Convergence of atmospheric and North Atlantic $CO_2$ trends on multidecadal timescales" |
| July 2011 | **Woods Hole Oceanographic Institution**, Woods Hole MA<br>Seminar, "Biogeochemistry, carbon cycling and invasive species in Lake Superior" |
| July 2011 | **Ocean Carbon and Biogeochemistry Workshop**, Woods Hole MA<br>Poster, "Convergence of atmospheric and North Atlantic $CO_2$ trends on multidecadal timescales" |
| July 2011 | **Woods Hole Oceanographic Institution**, Woods Hole MA<br>Seminar, "Convergence of atmospheric and North Atlantic $CO_2$ trends on multidecadal timescales" |
| February 2011 | **North American Carbon Program Meeting**, New Orleans LA<br>Poster, "Lake Superior's influence on regional carbon budgets" |
| December 2010 | **American Geophysical Union, Fall Meeting**, San Francisco CA<br>Poster, "The carbon cycle of Lake Superior: Balancing the budget with spatial heterogeneity" |
| December 2010 | **NACP/OCB Coastal Carbon Synthesis Workshop**, San Francisco CA<br>Oral, "Modeling carbon in the coastal zone" |
| November 2010 | **Environmental Chemistry and Technology Program,** University of Wisconsin, Madison WI<br>Invited seminar, "Spatio-temporal variability in the carbon cycle of Lake Superior" |
| October 2010 | **Michigan Technological University**, Houghton MI<br>Invited seminar, "Spatio-temporal variability in the carbon cycle of Lake Superior" |
| October 2010 | **Duke University**, Durham NC<br>Invited seminar, "Decadal variability and multidecadal trends in the North Atlantic carbon sink" |

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| July 2010 | **Ocean Carbon and Biogeochemistry Workshop**, La Jolla CA<br>Poster, "Decadal variability and multidecadal trends in the North Atlantic carbon sink" |
| June 2010 | **JASON Study on Carbon Treaty Verification,** La Jolla CA<br>Invited talk, "Carbon in water: Open ocean, coastal zone and inland waters" |
| June 2010 | **Scripps Institution of Oceanography**, La Jolla CA<br>Seminar, "Understanding recent variability in the North Atlantic carbon sink" |
| May 2010 | **Aquatic Ecosystem Health and Management: Ecology of Lake Superior**, Duluth MN<br>Oral, "Carbon cycle variability in Lake Superior and impacts on the regional carbon budget" |
| May 2010 | **Subpolar North Atlantic Workshop,** Durham NC<br>Invited talk, "North Atlantic carbon uptake from biogeochemical models and data" |
| March 2010 | **Caltech Keck Institute for Space Studies (KISS),** Pasadena CA<br>Invited plenary, "Air-sea $CO_2$ fluxes: Climatology, variability and land-ocean links" |
| February 2010 | **AGU/ASLO/TOS Ocean Sciences 2010,** Portland OR<br>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<br>Invited oral, "Carbon cycling in North American coastal waters" |
| August 2009 | **Biogeochemistry and Carbon Cycle of Lake Superior**, Woodruff WI<br>Oral, "Biogeochemical variability in Lake Superior – A modeling perspective" |
| July 2009 | **Ocean Carbon and Biogeochemistry Workshop**, Woods Hole MA<br>Poster, "Understanding the carbon budget of Lake Superior" |
| May 2009 | **International Association of Great Lakes Research Annual Meeting,** Toledo OH<br>Oral, "The magnitudes and mechanisms determining the carbon budget of Lake Superior" |
| May 2009 | **NASA Ocean Color Research Team Meeting**, New York NY<br>Poster, "Do hurricanes drive variability of the air-sea $CO_2$ flux in the subtropical North Atlantic?" |
| December 2008 | **American Geophysical Union, Fall Meeting**, San Francisco CA<br>Oral, "The changing North Atlantic carbon sink: 1992-2006" |
| December 2008 | **University of Wisconsin - Madison**, Atmospheric and Oceanic Sciences, Madison WI<br>Seminar, "Variability in the ocean carbon cycle: A North Atlantic perspective" |
| October 2008 | **Colorado State University**, Fort Collins CO<br>Invited seminar, "Variability in the ocean carbon cycle: A North Atlantic perspective" |
| July 2008 | **Ocean Carbon and Biogeochemistry Workshop**, Woods Hole MA<br>Invited plenary, "Carbon sink trends in the Northern Oceans" |
| June 2008 | **Workshop on Teaching Weather and Climate Using Laboratory Experiments**, Chicago IL<br>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<br>Oral, "Trends in the North Atlantic carbon sink" |
| April 2008 | **NASA Ocean Color Research Team Meeting,** Adelphi MD<br>Plenary, "The changing North Atlantic carbon cycle" |
| March 2008 | **Princeton University,** Princeton NJ<br>Seminar "Trends and variability in the carbon cycle of the North Atlantic" |
| March 2008 | **AGU/ASLO/TOS Ocean Sciences 2008**, Orlando FL<br>Oral, "Carbon cycle variability and trends at Bermuda and across the North Atlantic" |
| January 2008 | **American Meteorological Society Annual Meeting,** New Orleans LA<br>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<br>Invited public lecture, "The oceans and the climate system" |
| July 2007 | **Ocean Carbon and Biogeochemistry Workshop**, Woods Hole MA<br>Poster, "Carbon cycle variability in the North Atlantic: Timescales of change" |
| April 2007 | **Johns Hopkins University**, Baltimore MD<br>Invited seminar, "Air-sea $CO_2$ flux variability: Physical and ecological drivers" |
| April 2007 | **Surface Ocean $CO_2$ Variability and Vulnerability Workshop**, UNESCO, Paris, France<br>Plenary, "North Atlantic $CO_2$ flux variability: Physical and ecological drivers" |
| April 2007 | **NASA Ocean Color Research Team Meeting**, Seattle WA<br>Poster, "Physical and biological drivers of carbon cycle variability in the North Atlantic" |
| April 2007 | **Michigan Technological University**, Houghton MI<br>Invited seminar, "Air-sea $CO_2$ flux variability: Physical and ecological drivers" |

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| July 2006 | **Ocean Carbon and Biogeochemistry Workshop**, Woods Hole MA<br>Poster, "Modeling the seasonal cycle of $pCO_2$ in the North Atlantic" |
| June 2006 | **The Art of Climate Modeling, NCAR/ASP Summer School**, Boulder CO<br>Invited lecture, "Modeling ocean biogeochemistry" |
| February 2006 | **AGU/ASLO/TOS Ocean Sciences 2006,** Honolulu HI<br>Talk, "North Pacific carbon cycle response to climate variability on seasonal to decadal timescales" |
| February 2006 | **Old Dominion University**, Norfolk VA<br>Invited seminar, "Air-sea $CO_2$ flux variability on seasonal, interannual and decadal timescales" |
| November 2005 | **University of Maryland,** College Park MD<br>Invited seminar, "Air-sea $CO_2$ flux variability on seasonal, interannual and decadal timescales" |
| November 2005 | **Great Lakes Environmental Research Laboratory,** Ann Arbor MI<br>Invited seminar, "Air-sea $CO_2$ flux variability on seasonal, interannual and decadal timescales" |
| September 2005 | **Seventh International Carbon Dioxide Conference**, Broomfield CO<br>Invited plenary, "Pacific dominance to global air-sea $CO_2$ flux variability" |
| August 2005 | **Ocean Carbon Cycle and Climate Change Workshop**, Woods Hole MA<br>Poster "North Pacific carbon cycle response to climate variability on seasonal to decadal timescales" |
| March 2005 | **The Pennsylvania State University**, State College PA<br>Invited seminar, "$CO_2$ air-sea flux variability: Ocean models and atmospheric inversions" |
| March 2005 | **Princeton University**, Princeton NJ<br>Seminar, "Argon as a tracer of physical processes in the atmosphere and ocean" |
| December 2004 | **American Geophysical Union, Fall Meeting**, San Francisco CA<br>Poster, "Testing ocean models with argon and nitrogen" |
| November 2004 | **University of Wisconsin, Sustainability and the Global Environment (SAGE)**, Madison WI<br>Seminar, "Local and global benefits of air pollution control in Mexico City" |
| October 2004 | **University of Wisconsin, Chaos and Complexity Seminar Series**, Madison WI<br>Seminar, "$CO_2$ air-sea flux variability: Ocean models and atmospheric inversions" |
| October 2004 | **SOLAS Science 2004**, Halifax, Canada<br>Poster, "Atmospheric $Ar/N_2$: A Tool for Constraining Atmosphere and Ocean Models" |
| June 2004 | **NOAA GCC Workshop: Understanding North Pacific Carbon-cycle Changes**, Seattle WA<br>Invited plenary, "Modeled North Pacific carbon cycle variability" |
| May 2004 | **Geophysical Fluid Dynamics Laboratory**, Princeton NJ<br>Seminar, "$CO_2$ air-sea flux variability: Ocean models and atmospheric inversions" |
| March 2004 | **Princeton Environmental Institute Postdoctoral Colloquium**, Princeton NJ<br>Seminar, "Local and global benefits of air pollution control in Mexico City" |
| December 2003 | **American Geophysical Union, Fall Meeting**, San Francisco CA<br>Oral, "Local and global benefits of air pollution control in Mexico City" |
| June 2003 | **World Congress on Risk**, Brussels, Belgium<br>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<br>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<br>Invited seminar, "$CO_2$ air-sea flux variability: ocean models and atmospheric inversions" |
| May 2003 | **JGOFS Open Science Conference**, Washington DC<br>Poster, "Mechanisms of $CO_2$ air-sea flux variability in the North Atlantic and Equatorial Pacific" |
| April 2003 | **National University of Mexico, Center for Atmospheric Sciences,** Mexico City<br>Seminar, "Carbon sink variability from ocean models and atmospheric inversions" (in Spanish) |
| July 2002 | **Princeton University, Atmosphere and Ocean Sciences Program,** Princeton NJ<br>Invited seminar, "Interannual variability of air-sea fluxes of carbon dioxide and oxygen" |
| February 2002 | **AGU/ASLO/TOS Ocean Sciences 2002,** Honolulu HI<br>Poster, "Interannual variability in air-sea fluxes of $CO_2$ and $O_2$" |
| December 2000 | **American Geophysical Union, Fall Meeting**, San Francisco CA<br>Oral, "A novel approach to export parameterization with application to air-sea fluxes of $O_2$ and $CO_2$" |
| February 2000 | **American Geophysical Union, Ocean Sciences**, San Antonio TX<br>Oral, "Interannual variability of the air-sea flux of oxygen in the North Atlantic" |
| January 1999 | **JGOFS Arabian Sea Symposium,** Bangalore, India<br>Poster, "Interannual variability of the air-sea flux of oxygen in the North Atlantic" (best poster award) |

# GALEN A. MCKINLEY

## TEACHING

**Columbia University / Lamont Doherty Earth Observatory** New York, NY / Palisades, NY

**Semester Courses**

2022 *Climate Prediction Challenges / Applied Data Science (STAT 5243/4243)*
Graduate / undergraduate project-based course applying machine learning to climate science problems.

2018, 2021 *Humans and the Carbon Cycle (EESC GU4020)*
Graduate / undergraduate course on the global carbon cycle and its connections to climate.

2019, 2020 *The Climate System (EESC UN2100)*
Intensive undergraduate survey course on climate science, with weekly laboratory session.

2019, 2021 *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)*

# GALEN A. MCKINLEY

## ADVISING

**Columbia University / Lamont Doherty Earth Observatory** New York, NY / Palisades, NY

**Graduate Students**

2022-present Julia Simpson, PhD candidate in Earth and Environmental Sciences
2020-present Suki Wong, PhD candidate in Earth and Environmental Sciences
2018-present Lauren Moseley, PhD candidate in Earth and Environmental Sciences
2017-2020 Sean Ridge, PhD 2020 Earth and Environmental Sciences (now data scientist at Betterview)
2017-2020 Lucas Gloege, PhD 2020 Earth and Environmental Sciences (now postdoc at NASA GISS)

**Student Researchers at Columbia University / Lamont Doherty Earth Observatory**

2021 Tomislav Galjanic (MS student in Data Science)
2021 Aditya Koduri (MS student in Data Science)
2020 Jake Stamell (Data Science Institute Scholar, MS 2021, Statistics)
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, ENSTA ParisTech, summer student intern

**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 (now US Coast Guard)
2010-2015 Darren Pilcher, PhD AOS 2015 (now research scientist at NOAA PMEL/JISAO)
2010-2015 Haidi Chen, PhD AOS 2015 (postdoctoral fellow at Princeton University, 2015-2019)
2011-2014 Alexis Ritzer, MS AOS 2014 (now at Luminant Energy Services)
2010-2012 Jennifer Phillips, MS Envi. & Resources 2012 (Sr. Scientist, Governor's Planning and Research, CA)
2009-2012 Jesse Roberts, MS AOS 2012
2008-2010 Amanda Fay, MS AOS 2010 (now Researcher with McKinley)
2005-2010 Valerie Bennington, PhD AOS 2010
2005-2007 David Ullman, MS AOS 2008 (PhD Geoscience 2013, now Professor at Northland College, WI)

**Postdoctoral Scholars**

2010-11, 20-22 Dr. Val Bennington (UW-Madison CCR, 2012-14; Epic, 2014-20; now Makai Ocean Engineering)
2009-2010 Dr. Colleen Mouw (now Professor, University of Rhode Island; 2016 PECASE awardee)
2007-2009 Dr. Nazan Atilla (now at UW-Madison Department of Zoology)
2007 Dr. Nobuaki Kimura (now at Kyushu University, Japan)

**Undergraduate Student Researchers at University of Wisconsin - Madison**

2015-2017 Gabriela Negrete (BS Chemistry 2017, now PhD student at Scripps with Prof. A. Barton)
2012-2015 James Kralj (BS Microbiology 2015, MS 2018 U. Washington);
2012-2015 Melissa Breeden (BS AOS 2013, PhD AOS 2018, NOAA Global Change Postdoc Fellow, 2019-2021)
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)

**Visiting Students**

2008-2009 Nsikak Benson, Fulbright Scholar (Nigeria)

**STUDENT COMMITTEES** (* = McKinley students)

**Columbia University / Lamont Doherty Earth Observatory** New York, NY / Palisades, NY
**PhD Thesis Committees**
Ms. Annie Leal (PhD expected 2026)
Ms. Lauren Moseley* (PhD expected 2023)
Ms. Suki Wong* (PhD expected 2023)

**PhD Theses at Columbia University / Lamont Doherty Earth Observatory**
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)

**PhD External Committees**
*PhD Committee Member*
Dr. Cory McDonald (PhD Michigan Technological University, 2010)
*PhD External Evaluator*
Dr. Precious Mongwe (PhD University of Cape Town, 2018)
Dr. Peisheng Huang (PhD University of Western Australia, 2010)

**OUTREACH, INTERVIEWS and EDITORIALS**

2009 to present **Lead developer for Carbon/Climate educational website, with interactive carbon budget applet**
English: carboncycle.ldeo.columbia.edu (Launch 12/2009, ~5,000 new sessions per month, 2021)
Spanish: carboncycle_spanish.ldeo.columbia.edu (Launch 2/2011, ~2,000 sessions/month, 2021)
Previously hosted at carboncycle.aos.wisc.edu and carboncycle.es.wisc.edu

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)

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

October 2014 **Wisconsin Science Festival,** Madison WI
Invited plenary talk "Ocean Acidification: The other $CO_2$ 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/mhzlxem)

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| November 2013 | **Adhoc Committee on Climate Change and Fossil Fuel Use, UW-Madison,** Madison WI<br>Panelist, Town Hall |
| October 2013 | **Wisconsin Energy Institute, UW-Madison,** Madison WI<br>Panelist, IPCC Report and EPA Rules |
| April, Oct 2013 | **Bradley Learning Center, UW-Madison,** Madison WI<br>Dinner speaker on climate change science and impacts |
| April 2013 | **Wisconsin Gazette,** Shorewood WI<br>"Extreme Wisconsin: Warmer, wetter, weirder weather ahead" L. Neff |
| September 2012 | **Women in Science and Engineering, UW-Madison,** Madison WI<br>Dinner speaker for living group supporting freshman women planning on STEM majors |
| April 2012 | **Aldo Leopold Nature Center**, Monona WI<br>Presenter on Antarctic response to climate change; Climate Education Center Grand Opening |
| November 2011 | **Wisconsin State Journal**, Madison WI<br>"Curiosities: Why does warm Coke go flat so much faster than cold Coke?" J. Sakai |
| September 2011 | **WORT**, Perpetual Notion Machine, Madison WI<br>Interview on air September 1, 2011 (archive.wort-fm.org/mp3/wort_110901_190001science.mp3) |
| July 2011 | **Voice of America**, Washington DC<br>**"**Study: Ocean Less Able to Mitigate Climate Change" R. Skirble |
| July 2011 | **CNN International**, London, UK<br>"Ocean carbon sinks feeling the heat" M. Knight |
| June 2011 | **In Common, Nelson Institute for Environmental Studies**, UW-Madison, Madison WI<br>"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<br>Organizer. Detailed G6-12 lesson plans developed to accompany carboncycle.aos.wisc.edu |
| January 2011 | **Climate Ambassadors Workshop, University of Wisconsin - Madison,** Madison WI<br>Lecturer, "Climate and Climate Change: Science Basics" |
| December 2010 | **NASA Television,** http://www.youtube.com/watch?v=hXg4ugCajkE<br>"NASA Science on the Road: Oceans, Carbon, and Climate" S. Cole |
| August 2010 | **Chicago Tribune,** Chicago IL<br>"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<br>Lecturer, "Climate and Climate Change: Science Basics" |
| April 2010 | **Whiteside Forum,** Morrison IL<br>Invited panelist for community forum on the oceans |
| November 2009 | **New York Times, Wisconsin Week, Science Daily, Bloomberg**<br>Reports, interviews on Nature Geoscience paper, Desai et al. (2009) |
| November 2009 | **Wisconsin Public Radio,** Superior WI<br>"Increasing winds over the Great Lakes" M. Simonson |
| September 2009 | **Badger Herald, University of Wisconsin - Madison,** Madison WI<br>"2050: Temperature to increase by 4 degrees" K. Mianulli |
| July 2009 | **AOS & CIMSS, University of Wisconsin - Madison,** Madison WI<br>Organizer and lead lecturer, Carbon Cycle and Climate Modeling - A Teacher's Workshop |
| July 2008 | **CIMSS, University of Wisconsin - Madison,** Madison WI<br>Invited lecturer, Geosciences Time Scales and Global Climate Change Teacher's Workshop |
| April 2008 | **Daily Cardinal, University of Wisconsin - Madison,** Madison WI<br>"Report finds public transit key to curb global warming in state", C. Brace |
| January 2008 | **"The Pulse" WTDY 1670AM**, Madison WI<br>Interview with host S. Wisniewski on the science of global climate change (on air 1/20/08) |
| October 2007 | **Wisconsin State Journal**, Madison WI<br>"Why is The Ocean Salty", J. Sakai. Also appeared in Science Daily |
| October 2007 | **Second Annual Wisconsin Climate Change Forum**, Madison, WI<br>Invited panelist |
| July 2007 | **CIMSS, University of Wisconsin - Madison,** Madison WI<br>Invited lecturer, Remote Sensing Applications in the Geosciences Teacher's Workshop |

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| June 2007 | **Capital Times**, Madison WI<br>"Local scientist calls global warming theory 'hooey'", S.K. Derby |
| February 2007 | **Capital Times**, Madison WI<br>"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<br>Invited panelist |
| September 2006 | **Women In Science and Engineering, UW-Madison,** Madison WI<br>Dinner speaker for living group supporting freshman women planning on STEM majors |
| September 2005 | **The Why Files**, Madison WI<br>"Hurricanes: The Heat is On", D. Tannebaum |
| March 2005 | **Capital Times,** Madison WI<br>"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<br>"Greenhouse gases further implicated in global warming", P. Dohnal |