

CHARLES E. MILLER

**DEPUTY SCIENCE LEAD, ARCTIC-BOREAL VULNERABILITY EXPERIMENT (ABOVE)
PRINCIPAL INVESTIGATOR, THE CARBON BALANCE OBSERVATORY (CARBO)**

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Education

Ph.D., Physical Chemistry, University of California, Berkeley (1991)
B.S., Chemistry and History, Duke University, *cum laude and Departmental Prize in Chemistry* (1986)

Areas of Expertise

Carbon Cycle Science, Arctic-Boreal Systems, Greenhouse Gas Emissions, Megacity Emissions and Remote Sensing, Atmospheric Chemistry and Photochemistry, Molecular Spectroscopy

Professional Experience

Jet Propulsion Laboratory (2003 – present)
Capture Lead, Surface Biology & Geology Designated Observable (2018 – present)
Principal Investigator, Carbon Balance Observatory (CARBO) (2016 – present)
Deputy Science Lead, Arctic-Boreal Vulnerability Experiment (2015 – present)
Discipline Program Manager, Carbon Cycle & Ecosystems (2015 – present)
Mentor, NASA Postdoctoral Program (2012 –)
Mentor, Keck Institute for Space Studies Postdoctoral Fellow at JPL (2010 –2012)
Principal Investigator, Carbon in Arctic Reservoirs Vulnerability Experiment EV-S1 (2010 – 2016)
Deputy Project Scientist, OCO-2 (2010)
Deputy Principal Investigator, Orbiting Carbon Observatory (2001–2009)
Supervisor, Orbiting Carbon Observatory Science Group (2005–2008)
Science Element Manager, Orbiting Carbon Observatory (2003–2009)
Principal Scientist (2010 – present)
Project Scientist (2005 – present)
Research Scientist (2003-2005)
Visiting Associate in Environmental Science & Engineering, Division of Geological and Planetary Sciences, California Institute of Technology (2012 – present)
Assistant Professor, Department of Chemistry, Haverford College (1997–2003)
National Research Council Resident Research Associate, NASA Jet Propulsion Laboratory (1994–1997)
Welch Postdoctoral Fellow, Rice University (1991-1994)

Current Projects

NASA ESAS 2017 Designated Observables: *Surface Biology & Geology*, Capture Lead
NASA Instrument Incubator Program: *CARBO: The Carbon Balance Observatory*, Principal Investigator
NASA Terrestrial Ecology Program: *Characterizing Microtopographic Hot-spots and Landscape-scale Methane Emissions Across the ABoVE Domain*, Principal Investigator
NASA Terrestrial Ecology Program: *Imaging Arctic Methane Plumes*, Principal Investigator
NASA Terrestrial Ecology Program: *Variation in Foliar Functional Traits across Environmental Gradients in ABoVE Landscapes*, Co-Investigator
NASA Terrestrial Ecology Program: *Integrating ABoVE airborne datasets and field campaigns to identify hotspots of surface water inundation and carbon flux across Arctic-Boreal ecosystems*, Collaborator
NASA US Participating Investigator Program (USPI): *HISUI L2 reflectance and L3 Plant Functional Trait Retrievals*, Co-Investigator

NIST: *Megacities Carbon Project*, Principal Investigator
 NASA Atmosphere Composition Program: *Laboratory Spectroscopy in Support of Atmospheric Composition Research*, Co-Investigator
 NASA: *The Orbiting Carbon Observatory (OCO-2) Mission*, Science Team member
 Canadian Space Agency: *AIM-North*, Science Team member
 DOE: *Next Generation Ecological Experiments (NGEE-Arctic)*, Collaborator
 Keck Institute for Space Studies (KISS): *Unlocking a New Era in Biodiversity Science: Linking Integrated Space Based and In-Situ Observations*, Participant

Select Past Projects

NASA Terrestrial Ecology Program: *Quantifying CO₂ and CH₄ Fluxes from Vulnerable Arctic-Boreal Ecosystems Across Spatial and Temporal Scales*, Principal Investigator
 NASA Terrestrial Ecology Program: *Airborne Seasonal Survey of CO₂ and CH₄ across the ABoVE Domain*, Co-Investigator
 NASA Terrestrial Ecology Program: *GEOS-5 Forecasting and Modeling for ABoVE airborne research*, Co-Investigator
 NASA Interdisciplinary Science Program (IDS): *Permafrost Vulnerability in a Seasonally Sea Ice-free Arctic*, Principal Investigator
 NASA Carbon Cycle Science Program: *Quantification and Attribution of Greenhouse Gas Emissions from the Los Angeles Megacity*, Co-I
 NASA Carbon Cycle Science Program: *CARVE Airborne Observations of Carbon Dynamics in the Vulnerable Arctic-Boreal Ecosystems of Northwestern Canada – CARVE-CAN*, Principal Investigator
 NASA Earth Systems Science Pathfinder (ESSP)/Ventures (EV-S1): *Carbon in Arctic Reservoirs Vulnerability Experiment (CARVE)*, Principal Investigator
 DOE Atmospheric Radiation & Monitoring Program: *Airborne Carbon Measurements (ACME)*, Collaborator
 DOE Office of Science: *Model-Data Fusion Approaches for Retrospective and Predictive Assessment of the Pan-Arctic Scale Permafrost Carbon Feedback to Global Climate*, Collaborator
 Keck Institute for Space Studies (KISS): *Methane on Mars*, Participant
 NASA Rapid Response Program (RRNES): *Quantifying Methane Emissions in the San Joaquin Valley*, Principal Investigator
 Keck Institute for Space Studies (KISS): *Space-based Strategies to Monitor Megacity Greenhouse Gas Emissions*, JPL Principal Investigator
 NASA Terrestrial Ecology Program: *Arctic Boreal Vulnerability Experiment (ABoVE)*, Science Definition Team member
 JPL DRDF: *Creating a High-resolution Greenhouse Gas Emissions Inventory for the LA Megacity*, Co-I
 Keck Institute for Space Studies: *Quantifying Sources and Sinks of CO₂*, Co-lead
 GOSAT Research Announcement: *Validation of GOSAT Data Using OCO Methods and Algorithms*, Co-I
 DOE Atmospheric Radiation & Monitoring Program: *OCO FTS Validation Intensive Operation Period*, PI
 NASA Advanced Information Systems Technology: *Geostatistical Data Fusion for Remote Sensing Applications*, Co-Investigator
 NASA Earth Science: *Atmospheric CO₂ Observations from Space (ACOS)*, Deputy Project Scientist
 NASA Atmospheric Composition/Tropospheric Chemistry: *Improving Atmospheric CO₂ Retrievals*, PI
 NASA Earth Systems Science Pathfinder (ESSP): *The Orbiting Carbon Observatory (OCO) Mission*, Deputy PI (2001-2009); OCO-2 Deputy Project Scientist (2010)
 NASA Atmospheric Composition Program: *Remaining Challenges for Atmospheric Chemistry: Quantifying Measurement Requirements for Remote Sensing*, Co-Investigator
 NASA Advanced Information Systems Technology Program: *Sensor Web Operation Explorer (SOX)*, Co-I
 NASA Upper Atmosphere Research Program: *Spectroscopy in Support of Upper Atmospheric Research*, Co-Investigator
 NASA Instrument Incubator Program: *Development and Evaluation of a 2-micron Differential Absorption Lidar for Profiling CO₂*, Co-Investigator
 NOAA Requirements, Planning and System Integration Program: *EDR Verification from L1*, PI
 JPL DRDF FY2010: *Developing a Prototype Megacity Greenhouse Gas Monitoring Network*, PI

JPL DRDF FY2008: *Defining Science Measurement Requirements for Atmospheric Methane*, PI
 JPL DRDF/SURP FY2007: *Characterization of spatio-temporal covariance of remote sensing data from earth-observing satellites*, PI
 JPL RTD FY2006: *Defining Science & Instrument Requirements for MEO/GEO/L1 Earth Observations*, PI
 JPL EIC FY2006: *Laboratory Spectroscopy to Enable 21st Century NASA Missions*, PI
 JPL RTD FY2005: *Exploiting the Lagrange Points L1, L2, and the Moon for Earth Observation*, PI

Awards

NASA Outstanding Public Leadership Medal: *Advancing NASA's Carbon Cycle Science Program*, 2016
 NASA Group Achievement Award: *OCO-2 Science Team*, 2018
 NASA Group Achievement Award: *ABOVE Airborne Campaign Team*, 2018
 NASA Group Achievement Award: *CARVE Implementation Team*, 2016
 NASA Group Achievement Award: *CARVE Team*, 2014
 NASA Group Achievement Award: *SMD American Recovery and Reinvestment Act Team*, 2011
 NASA Group Achievement Award: *Molecular Spectroscopy Team*, 2006
 NASA/ASEE Summer Faculty Fellowship, 1998
 Remote Sensing [Best Paper Award 2015](#): Hartmut Boesch, David Baker, Brian Connor, David Crisp and Charles Miller, Global Characterization of CO₂ Column Retrievals from Shortwave-Infrared Satellite Observations of the Orbiting Carbon Observatory-2 Mission, Remote Sens. 2011, 3(2), 270-304; doi:[10.3390/rs3020270](#)
 Camille and Henry Dreyfus Teacher/Scholar, 1997
 National Research Council Associateship, NASA Jet Propulsion Laboratory, 1994-97
 Department of Energy Global Change Distinguished Postdoctoral Fellowship, Los Alamos National Laboratory, 1994 (declined)
 Robert A. Welch Postdoctoral Fellowship, Rice University, 1991-1994
 Regents Fellowship, University of California, Berkeley 1986-1987
 Department of Chemistry Award, Duke University, 1986
 NSF Nuclear Chemistry Summer School, 1985
 National Lead Industries Scholar, Duke University, 1984-1986
 Phi Lambda Upsilon Chemistry Honor Society, 1984-1986

Professional Activities

Oak Ridge National Laboratory Energy and Environmental Sciences Directorate Science Advisory Committee (2018 –)
 NGEE-Arctic Science Advisory Board (2016 –)
 SEARCH Arctic Atmospheric Methane Synthesis Lead (2015 -)
 WMO CO₂ Experts Science Advisory Group (2009 –)
 US Carbon Cycle Science Steering Group (2008 – 2014)
 Contributing author, A US Carbon Cycle Science Plan 2010-2020 (2008 – 2011)
 ASCENDS Science Steering Committee co-chair (2008 – 2010)
 Organizer: 6th International Workshop on Greenhouse Gas Measurements from Space, Kyoto, Japan, January 2010; 5th International Workshop on Greenhouse Gas Measurements from Space, California Institute of Technology, Pasadena, CA, June 2008; Organizing Committee: 4th International Workshop on Greenhouse Gas Measurements from Space, CNES Headquarters, Paris, France, June 2007; Organizer: 2nd International Workshop on Greenhouse Gas Measurements from Space, California Institute of Technology, Pasadena, CA, March 2005
 Atmospheric Radiation & Monitoring (ARM) ACRF Review Panel member (2007)
 Department of Energy Climate Change Science Program Review Panel (2007, 2010)
 Expert Reviewer, Intergovernmental Panel on Climate Change (IPCC) 4th Assessment Review (2005-6)
 Contributing Author: North America Carbon Program Plan (2002)
 Contributor: NASA Carbon Cycle Roadmap 2002 – 2012 definition, 2002 – 2004
 Organizer: Atmospheric Chemistry Symposium, ACS National Meeting, March 2000, San Francisco, CA
 EPA Tropospheric Ozone Review Panel, 1995 - 1999

Member: American Geophysical Union; American Physical Society; American Chemical Society

Publications (more than 170 total)

In Preparation

- Wallace, J. Kent, Mayer Rud, Yuri Beregovski, Shannon Kian Zareh, Amanda Mainzer, Annmarie Eldering, Cynthia B. Brooks, Daniel T. Jaffe, Dan Wilson, Christian Frankenberg, Dejian Fu, Andre Wong, Thomas S. Pagano, Didier Keymeulen, Peter Sullivan, Elliott Liggett, Michael Bernas, Charles E. Miller, Compact, High-Sensitivity, Wide Field-of-View Spectrometer for Space-based Detection of CO₂, CH₄, CO and SIF, to be submitted to *Applied Optics*
- Miller, John B., et al, Unexpected and significant biospheric CO₂ fluxes in the Los Angeles megacity indicated by atmospheric radiocarbon, to be submitted to *Geophysical Review Letters*
- Worden, John, Sassan Saatchi, Michael Keller, Anthony Bloom, Rong Fu, Junjie Liu, Nicholas Parazoo, Josh Fisher, Helen Worden, Christian Frankenberg, Yi Yin, Kevin Bowman, Pierre Gentine, Alex Konings, Mathew Williams, J.T. Reager, Armineh Barkhordarian, Charles Miller, Satellite Observations of The Changing Tropical Carbon and Water Cycles, to be submitted to *Annual Reviews of Geophysics*
- Zona, D et al., Latency effects of warming--induced summer carbon sequestration on autumn CO₂ emissions help explain recent variation in Arctic carbon balance, to be submitted to *Global Biogeochemical Cycles*
- Byrne, Brendan, Junjie Liu, Meemong Lee, Ian Baker, Kevin W. Bowman, Matthäus Kiel, John S. Kimball, **Charles E. Miller**, Nicholas C. Parazoo, Improved constraints on northern extratropical CO₂ fluxes obtained by combining surface-based and space-based atmospheric CO₂ measurements, to be submitted to *Journal of Geophysical Research – Atmospheres*
- Bogue, R, C Sweeney, K McKain, S Wolter, T Newburger, A Chatterjee, **CE Miller**, Arctic-CAP: Northern High Latitude CO₂ Airborne Vertical Profile Surveys during the Arctic-Boreal Vulnerability Experiment (ABOVE), to be submitted to *Environmental Research Letters* (ABOVE Special Collection)
- Wiggins, E.B., A. Andrews, C. Sweeney, J.B. Miller, **C.E. Miller**, S. Veraverbeke, J.T. Randerson, Evidence for a larger contribution of smoldering combustion to boreal forest fire emissions from tower observations in Alaska, to be submitted to *Atmospheric Chemistry and Physics*
- Foster, Kelsey T., Andrew K. Thorpe, Kristal R. Verhulst, Brian D. Bue, David R. Thompson, Talha Rafiq, Francesca M. Hopkins, **Charles E. Miller**, Riley M. Duren, Understanding CH₄ Emissions from Oil Refineries in California, in preparation
- Kumar, Manoj, **Charles E. Miller**, James Shee, Benjamin Rudshteyn, Richard A. Friesner,* Joseph S. Francisco, Multiple Stable Isoprene-Ozone Complexes Reveal Complex Entrance Channel Dynamics in the Isoprene + Ozone Reaction, to be submitted to *Journal of the American Chemical Society*
- Manizza, Manfredi, Dimitris Menemenlis, H. Zhang, **Charles E. Miller**, Modeling the impact of recent climate change on the phytoplankton blooms phenology of the Arctic Ocean (2006–2013), to be submitted to *Geophysical Research Letters*
- Schwandner, FM, HM. Nguyen, C Frankenberg, F Kataoka, A Kuze, K Shiomi, CR. Sealing, SA. Carn, N Goto, H Suto, T Takeda, S Kanekon, Y Yoshida, M Ajiro, **C.E. Miller**, Satellite Detection of Enhanced Pre-Eruptive CO₂ Emissions, to be submitted to *Science Advances*

Submitted/In Review

- Thorpe, Andrew K., Riley M. Duren, Stephen Conley, Kuldeep R. Prasad, Brian D. Bue, Vineet Yadav, Kelsey T. Foster, Talha Rafiq, Francesca M. Hopkins, Mackenzie L. Smith, Marc L. Fischer, David R. Thompson, Christian Frankenberg, Ian B. McCubbin, Michael L. Eastwood, Robert O. Green, **Charles E. Miller**, Methane emissions from underground gas storage in California, submitted to *Environmental Research Letters*
- Cusworth, Daniel H., Riley M. Duren, Vineet Yadav, Andrew K. Thorpe, Kristal Verhulst, Stanley Sander, Francesca Hopkins, Talha Rafiq, **Charles E. Miller**, Synthesis of methane observations across scales: Strategies for deploying a multi-tiered observing network, submitted to *Geophysical Review Letters*, MS 2019GL085698

- Elder, CD, DR Thompson, AK Thorpe, P Hanke, KM Walter Anthony, **CE Miller**, 2019. Airborne Mapping Reveals Emergent Power Law Nature of Arctic Methane Emissions, submitted to *Science Advances*, Ms. No. aaz4611
- Shi, Mingjie; Parazoo, Nicholas; Jeong, Sujong; Birch, Leah; Lawrence, Peter; Euskirchen, Eugenie; **Miller, Charles**. Exposure to Cold Temperature Affects the Spring Phenology of Alaskan Deciduous Vegetation Types, in revision, *Environmental Research Letters*, ERL-106456 (ABOVE Special Collection)
- Yi, Yonghong, Richard H. Chen, Dmitry Nicolsky, Mahta Moghaddam, John S. Kimball, Vladimir E. Romanovsky, **Charles E. Miller**, Developing a soil inversion model framework for regional permafrost monitoring, IGARRS (2019).
- Zareh, Shannon Kian, **Charles Miller**, J. Kent Wallace, Amy Mainzer, Thomas S. Pagano, Cynthia B. Brooks, Daniel T. Jaffe, Dan Wilson, Annmarie Eldering, Dejian Fu, Randall Bartos, Yuri Beregovski, Mayer Rud, James P. McGuire, Andre Wong, Didier Keymeulen, Peter Sullivan, Elliott Liggett, Michael The Carbon Balance Observatory (CARBO) Instrument for Space-based Observation of Greenhouse Gases, Submitted to Asia-Pacific SPIE, Honolulu 2018.
- Floerchinger, Cody, Kathryn McKain, Timothy Bonin, **Charles E. Miller**, Steven Wofsy, Colm Sweeney, Methane emissions from oil and gas production on the North Slope of Alaska, accepted, *Atmospheric Environment*, Manuscript No.: ATMENV-D-19-00448R2
- Cawse-Nicholson, K., S. Hook, **C.E. Miller**, D.R. Thompson, Intrinsic dimensionality in combined visible to thermal infrared imagery, accepted, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, MS JSTARS-2019-00075.R2
- Cusworth, D. H., Jacob, D. J., Varon, D. J., Chan Miller, C., Liu, X., Chance, K., Thorpe, A. K., Duren, R. M., **Miller, C. E.**, Thompson, D. R., Frankenberg, C., Guanter, L., and Randles, C. A.: Potential of next-generation imaging spectrometers to detect and quantify methane point sources from space, *Atmos. Meas. Tech. Discuss.*, <https://doi.org/10.5194/amt-2019-202>, accepted, 2019.
- Cui, Yuyan; Vijayan, Abhilash; Falk, Matthias; Hsu, Ying-Kuang; Yin, Dazhong; Chen, Xuemeng; Zhao, Zhan; Avise, Jeremy; Chen, Yanju; Verhulst, Kristal; Duren, Riley; Yadav, Vineet; **Miller, Charles**; Weiss, Ray; Keeling, Ralph; Kim, Jooil; Iraci, Laura; Tanaka, Tomoaki ; Johnson, Matthew; Kort, Eric; Bianco, Laura; Fischer, Marc; Stroud, Kenneth; Herner, Jorn; Croes, Bart. A multi-platform inversion estimation of statewide and regional methane emissions in California during 2014-2016. *Environmental Science & Technology*, Manuscript ID: es-2019-017692.R3, accepted
- Duren, Riley, Andrew Thorpe, Kelsey T. Foster, Talha Rafiq, Francesca M. Hopkins, Vineet Yadav, Brian Bue, David R. Thompson, Steve Conley, Nadia Colombi, Christian Frankenberg, Ian McCubbin, Michael Eastwood, Mathias Falk, Jorn Herner, Bart E. Croes, Robert Green, **Charles Miller**, California's Methane Super-Emitters, accepted, *Nature* 2018-11-17032A

Published

- Nassar, Ray, Chris McLinden, Christopher E. Sioris, C. T. McElroy, Joseph Mendonca, Johanna Tamminen, Cameron G. MacDonald, Cristen Adams, Céline Boissvenue, Adam Bourassa, Ryan Cooney, Doug Degenstein, Guillaume Drolet, Louis Garand, Ralph Girard, Markey Johnson, Dylan B.A. Jones, Felicia Kolonjari, Bruce Kuwahara, Randall V. Martin, Charles E. Miller, Norman O'Neill, Aku Riihelä, Sébastien Roche, Stanley P. Sander, William R. Simpson, Gurpreet Singh, Kimberly Strong, Alexander P. Trishchenko, Helena van Mierlo, Zahra Vaziri Zanjani, Kaley A. Walker & Debra Wunch (2019). The Atmospheric Imaging Mission for Northern Regions: AIM-North, *Canadian Journal of Remote Sensing*. <https://doi.org/10.1080/07038992.2019.1643707>
- Kevin R. Gurney, Risa Patarasuk, Jianming Liang, Yang Song, Darragh O'Keeffe, Preeti Rao, James Whetstone, Riley Duren, Annmarie Eldering, and **Charles E. Miller**, The Hestia Fossil Fuel CO₂ Emissions Data Product for the Los Angeles Megacity (Hestia-LA), *Earth System Science Data*, **11**, 1309–1335, 2019. <https://doi.org/10.5194/essd-11-1309-2019>
- He, L., Zeng, Z.-C., Pongetti, T., Wong, C., Liang, J., Gurney, K. R., et al. (2019). Atmospheric methane emissions correlate with natural gas consumption from residential and commercial sectors in Los Angeles. *Geophysical Research Letters*, **46**. <https://doi.org/10.1029/2019GL083400>
- Schimel, D., Schneider, F., JPL Carbon and Ecosystem Participants, 2019. Flux towers in the sky: Global ecology from space. (Tansley Review) *New Phytologist*. <https://doi.org/10.1111/nph.15934>

- Miller, CE**, PC Griffith, SJ Goetz, L Hoy, N Pinto, I McCubbin, A Thorpe, M Hofton, D Hodgkinson, C Hansen, J Woods, E Larson, ES Kasischke, and HA Margolis, An overview of ABoVE airborne campaign data acquisitions and science opportunities, *Environmental Research Letters*, **14**, no. 8 (2019) (ABOVE Special Collection). <https://iopscience.iop.org/article/10.1088/1748-9326/ab0d44>
- Yadav, Vineet, Kim Mueller, Kris Verhulst, Riley Duren, Thomas Nehrkorn, Jooil Kim, Ray F. Weiss, Ralph Keeling, Stanley Sander, Marc Fischer, Sally Newman, Matthias Falk, Toshihiro Kuwayama, Talha Rafiq, James Whetstone, Anna Karion, **Charles Miller** (2019), Spatio-temporally resolved methane fluxes from the Los Angeles Megacity, *Journal of Geophysical Research - Atmospheres*, **124**, 5131-5148. <https://doi.org/10.1029/2018JD030062>
- Manizza, M., Menemenlis, D., Zhang, H., **Miller, C. E.** (2019). Modeling the recent changes in the Arctic Ocean CO₂ sink (2006–2013). *Global Biogeochem. Cycles*, **33**, 420-438. <https://doi.org/10.1029/2018GB006070>
- Yi, Y., Kimball, J. S., Chen, R. H., Moghaddam, M., and **Miller, C. E.**: Sensitivity of active-layer freezing process to snow cover in Arctic Alaska, *The Cryosphere*, **13**, 197-218, <https://doi.org/10.5194/tc-13-197-2019>, 2019.
- Yung, Yuk L., Pin Chen, Kenneth Nealson, Sushil Atreya, Patrick Beckett, Jennifer G. Blank, Bethany Ehlmann, John Eiler, Giuseppe Etiope, James G. Ferry, Francois Forget, Peter Gao, Renyu Hu, Armin Kleinböhl, Ronald Klusman, Franck Lefèvre, **Charles Miller**, Michael Mischna, Michael Mumma, Sally Newman, Dorothy Oehler, Mitchio Okumura, Ronald Oremland, Victoria Orphan, Radu Popa, Michael Russell, Linhan Shen, Barbara Sherwood Lollar, Robert Staehle, Vlada Stamenković, Alexis Templeton, Ann C. Vandaale, Sébastien Viscardy, Christopher R. Webster, Paul O. Wennberg, Michael L. Wong, John Worden. *Astrobiology* **18**, 1221-1242 (2018). <http://doi.org/10.1089/ast.2018.1917>
- Wallace, J. Kent, **Charles Miller**, Shannon Kian Zareh, Amy Mainzer, Thomas S. Pagano, Cynthia B. Brooks, Daniel T. Jaffe, Dan Wilson, Annmarie Eldering, Dejian Fu, Randall Bartos, Yuri Beregovski, Mayer Rud, James P. McGuire, Andre Wong, Didier Keymeulen, Peter Sullivan, Elliott Liggett, Michael Bernas. CARBO - The Carbon Observatory Instrument Suite – the next generation of Earth observing instruments for global monitoring of carbon gases. *Proceedings Volume 10785, Sensors, Systems, and Next-Generation Satellites XXII*: 107850U (2018). *SPIE Remote Sensing*, 2018, Berlin, Germany. <https://doi.org/10.1117/12.2513286>
- Jeong, Su-Jong, A. Anthony Bloom, David Schimel, Colm Sweeney, Nicholas C. Parazoo, David Medvigy, Gabriela Schaepman-Strub, Chunmiao Zheng, Christopher R. Schwalm, Deborah N. Huntzinger, Anna M. Michalak, **Charles E. Miller**, 2018. Accelerating rates of Arctic carbon cycling revealed by long-term atmospheric CO₂ measurements, *Science Advances*, Vol. 4, no. 7, eaao1167 (2018). DOI:10.1126/sciadv.aao1167
- Parazoo, Nicholas; Arneth, Almut; Pugh, Thomas; Smith, Benjamin; Steiner, Nick; Luus, Kristina; Commane, Róisín; Benmergui, Joshua; Liu, Junjie; Rodenbeck, Christian; Kawa, Stephan; Euskirchen, Eugenie; Zona, Donatella; Arndt, Kyle; **Miller, Charles**. Spring photosynthetic onset and net CO₂ uptake in northern terrestrial ecosystems triggered by landscape thawing, *Global Change Biology* (2018). <https://doi.org/10.1111/gcb.14283>
- Carranza, V., Rafiq, T., Frausto-Vicencio, I., Hopkins, F. M., Verhulst, K. R., Rao, P., Duren, R. M., and **Miller, C. E.**: Vista-LA: Mapping methane-emitting infrastructure in the Los Angeles megacity, *Earth Syst. Sci. Data*, **10**, 653-676, <https://doi.org/10.5194/essd-10-653-2018>, 2018.
- Fisher, J. B., D. J. Hayes, C. R. Schwalm, D. N. Huntzinger, E. Stofferahn, K. Schaefer, Y. Luo, S. D. Wullschleger, S. J. Goetz, **C. E. Miller**, P. Griffith, S. Chadburn, A. Chatterjee, P. Ciais, T. A. Douglas, H. Genet, A. Ito, C. S. R. Neigh, B. Poulter, B. M. Rogers, O. Sonnentag, H. Tian, W. Wang, Y. Xue, Z.-L. Yang, and N. Zeng (2018), Missing pieces to modeling the Arctic-Boreal puzzle, *Environ. Res. Lett.*, **13**(2), 020202. <https://doi.org/10.1088/1748-9326/aa9d9a>. (ABOVE Special Collection)
- Parazoo, N. C., Koven, C. D., Lawrence, D. M., Romanovsky, V., and **Miller, C. E.**: Detecting the permafrost carbon feedback: talik formation and increased cold-season respiration as precursors to sink-to-source transitions, *The Cryosphere*, **12**, 123-144, <https://www.the-cryosphere.net/12/123/2018/>, 2018.
- Hartery, S., Commane, R., Lindaas, J., Sweeney, C., Henderson, J., Mountain, M., Steiner, N., McDonald, K., Dinardo, S. J., **Miller, C. E.**, Wofsy, S. C., and Chang, R. Y.-W.: Estimating regional-scale methane flux and budgets using CARVE aircraft measurements over Alaska, *Atmos. Chem. Phys.*, **18**, 185-202, <https://www.atmos-chem-phys.net/18/185/2018/>, 2018.

- Schwandner, F.M., Gunson, M.R., **Miller, C.E.**, Carn, S.A., Eldering, A., Krings, T., Verhulst, K.R., Schimel, D.S., Nguyen, H.M., Crisp, D. and O'Dell, C.W., 2017. Spaceborne detection of localized carbon dioxide sources. *Science*, **358**, p.eaam5782. [DOI:10.1126/science.aam5782](https://doi.org/10.1126/science.aam5782)
- Verhulst, K. R., Karion, A., Kim, J., Salameh, P. K., Keeling, R. F., Newman, S., Miller, J., Sloop, C., Ponggetti, T., Rao, P., Wong, C., Hopkins, F. M., Yadav, V., Weiss, R. F., Duren, R. M., and **Miller, C. E.**: Carbon dioxide and methane measurements from the Los Angeles Megacity Carbon Project – Part 1: calibration, urban enhancements, and uncertainty estimates, *Atmos. Chem. Phys.*, **17**, 8313-8341, <https://doi.org/10.5194/acp-17-8313-2017>, 2017.
- Rao, P., K.R. Gurney, R. Patarasuk, Y. Song, **C.E. Miller**, R.M. Duren, A. Eldering, Spatio-temporal variations in on-road vehicle fossil fuel CO₂ emissions in Los Angeles Megacity, *AIMS Geosciences* **3**, 239-267 (2017). doi:[10.3934/geosci.2017.2.239](https://doi.org/10.3934/geosci.2017.2.239)
- Veraverbeke, Sander, Brendan M. Rogers, Mike L. Goulden, Randi R. Jandt, **Charles E. Miller**, Elizabeth B. Wiggins, James T. Randerson, Lightning as a major driver of recent extreme fire years in North American boreal forests, *Nature Climate Change* (2017). doi:[10.1038/nclimate3329](https://doi.org/10.1038/nclimate3329). Advance online publication: 26 June 2017. NCLIMATE3329
- McGuire, A.D., B.P. Kelly, L. Sheffield Guy, H.V. Wiggins, L. Bruhwiler, J. Frederick, H. Huntington, R. Jackson, R. Macdonald, **C. Miller**, D. Olefeldt, E.A.G. Schuur, and M.R. Turetsky. 2017. Final Report: International Workshop to Reconcile Methane Budgets in the Northern Permafrost Region. Arctic Research Consortium of the United States (ARCUS), Fairbanks, Alaska. 14 pages. Available through the International Arctic Research Center (IARC) Data Archive at <http://climate.iarc.uaf.edu/geonetwork/srv/en/main.home?uuid=e436b77a-b0db-44c1-bd18-260c5b076b43>.
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