# Curriculum Vitae
# Brian C. McDonald, Ph.D.

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## Education

Ph.D. Civil & Environmental Engineering, ***University of California, Berkeley***, 2014
*Dissertation:* High-Resolution Mapping and Long-Term Trends for Motor Vehicle Emissions
*Committee:* Prof. Robert Harley (advisor), Prof. Allen Goldstein, Prof. Lee Friedman

M.P.P. Goldman School of Public Policy, ***University of California, Berkeley***, 2011
M.S. Civil & Environmental Engineering, ***University of California, Berkeley***, 2011
B.S. Civil & Environmental Engineering, ***Virginia Tech***, 2008
B.A. Economics, ***Virginia Tech***, 2008

## Research Interests

Emissions of air pollutants and greenhouse gases from urban, energy, and transportation systems, atmospheric modeling, and satellite data analysis.

## Research Experience

**Environmental Engineer ZP-4**, ***NOAA Chemical Sciences Laboratory***, March 2022 – present

- Satellite liaison of Atmospheric Emissions and Reactions Observed from Megacities to Marine Areas (AEROMMA), a NASA DC8 aircraft study to address emerging research needs in urban air quality, marine chemistry influences on cloud formation, and interactions at the marine-urban interface.
- PI of NOAA GeoXO Project, "The Value of GeoXO Atmospheric Composition Observations for Emissions Updating and Air Quality Forecasting."
- PI of a NOAA Proving Ground/Risk Reduction (PGRR) Program Project to evaluate Joint Polar Satellite System (JPSS) trace gas and aerosol products, "Evaluations and applications of JPSS Atmospheric Composition Products."
- Co-PI of a Clark County, NV funded project, "Las Vegas Field Measurements of Volatile Chemical Product and Mobile Source Emissions: Ozone Formation and its Sensitivity to $NO_x$ and VOCs."
- Associate Editor of the Journal of Geophysical Research-Atmospheres (JGR-Atmospheres).
- Scientific Steering Committee member and Co-Chair of the Global Emissions Initiative (GEIA).
- Program Leader of the Regional Chemical Modeling Group (February 2023 – present).

**Environmental Engineer ZP-3**, ***NOAA Chemical Sciences Laboratory***, March 2020 – February 2021

- Satellite liaison of Atmospheric Emissions and Reactions Observed from Megacities to Marine Areas (AEROMMA), a NASA DC8 aircraft study to address emerging research needs in urban air quality, marine chemistry influences on cloud formation, and interactions at the marine-urban interface.
- PI of NOAA GeoXO Project, "Demonstrating Nitrogen Dioxide Observations from GEO-XO for Emissions Updating and Air Quality Forecasting."
- Co-PI of a NOAA Proving Ground/Risk Reduction (PGRR) Program Project to evaluate Joint Polar Satellite System (JPSS) trace gas and aerosol products, "Evaluations and applications of JPSS Atmospheric Composition Products."
- Co-PI of a Clark County, NV funded project, "Las Vegas Field Measurements of Volatile Chemical Product and Mobile Source Emissions: Ozone Formation and its Sensitivity to $NO_x$ and VOCs."
- Co-PI of Southwest Urban NOx and VOC Experiment (SUNVEx) to study air quality in Los Angeles and Las Vegas.
- PI of NOAA OAR Project, "COVID-19: Near Real-time Emissions Adjustments for Air Quality Forecasting and Long-Term Impact Analyses."

- Co-PI of COVID Air Quality Study (COVID-AQS) to study impacts on US air quality from the COVID-19 pandemic.
- Co-PI of EPASTAR Project, "Evaluating Chemical Mechanisms with Recent Field Data to Account for the Contributions of Volatile Chemical Product Emissions to Urban Ozone Pollution."
- Associate Editor of the Journal of Geophysical Research-Atmospheres (JGR-Atmospheres).
- Scientific Steering Committee member and Co-Chair of the Global Emissions Initiative (GEIA).

**Research Scientist II**, ***University of Colorado, Boulder***, May 2018-February 2020
Cooperative Institute for Research in Environmental Sciences and Chemical Sciences Division, Earth System Research Laboratory, NOAA

- Received 2019 Presidential Early Career Award for Scientists and Engineers (PECASE) from US Department of Commerce.
- Principal Investigator on awarded NASA Atmospheric Composition Modeling and Analysis Program grant titled, "Detecting Oil and Gas Emissions and Their Trends from Space and Modeling Impacts on Tropospheric Ozone."
- Co-Investigator on NSF-sponsored workshop held in Boulder, CO in January 2019 titled, "Evolutions in Urban Chemistry: Growing Influence of Non-Traditional Emission Sources."
- Helped design and conceptualize a 3-week summertime and 3-week wintertime NOAA field experiment in New York City, the New York Investigation of Consumer Emissions (NY-ICE), to measure volatile organic compound emissions from volatile chemical products (e.g., personal care products, paints, adhesives, etc.).
- Honorable mention for 2018 CO-LABS Governor's Award for "Consumer products' emissions – Pioneering work on growing emissions from consumer products improves scientific understanding of air pollution and benefits environmental regulation and policy".
- Received CIRES Outstanding Performance Award in Science and Engineering for "cutting-edge work to improve scientific understanding of how human activities affect air quality".
- Received CIRES Cash in Your Account Award for "leadership and success in the New York City sampling campaign."
- Co-Investigator on awarded Colorado Energy Research Collaboratory Seed Grant titled, "Linking Volatile Organic Compound Chemistry to Secondary Organic Aerosol Formation from Next-generation Biofuels and Volatile Chemical Products."
- Co-Investigator on awarded CIRES Innovative Research Program proposal titled, "Do people or forests emit more monoterpenes?"

**Research Scientist I**, ***University of Colorado, Boulder***, July 2016-April 2018
Cooperative Institute for Research in Environmental Sciences and Chemical Sciences Division, Earth System Research Laboratory, NOAA

- Established importance of VOC emissions from everyday consumer products, and estimated their potential to contribute to urban air pollution problems in Los Angeles (published in *Science*). In the top 0.1% of research articles tracked by Altmetric (score = 2311 as of 10/20/19). Study covered by 200+ news outlets worldwide, including New York Times, Washington Post, Los Angeles Times, BBC, CNN, Bloomberg News, Voice of America, and the Atlantic. Performed live interview on National Public Radio's *Science Friday* with Ira Flatow.
- Developed new U.S. inventory of transportation emissions of nitrogen oxides ($NO_x$), modeled ground-level ozone, and found large discrepancies in current U.S. EPA estimates of transportation emissions (accepted in *Environmental Science & Technology*).
- Mentored undergraduate student, Alan Gorchov-Negron, who developed a new U.S. inventory of oil and gas emissions of $NO_x$, constrained by NOAA field measurements, and who currently has a manuscript prepared as the lead author (submitted to *Environmental Science & Technology*).
- Participant in Technical discussions on Emissions and Atmospheric Modeling (TEAM) between NOAA, NASA, and EPA on improving regulatory transportation emission inventories and atmospheric models.
- Participant in Global Emissions Initiative (GEIA) working group of international experts, on improving global inventories of volatile organic compound (VOC) emissions. Mentored undergraduate student on data analysis component for working group.
- Co-I/Science PI on two research grant proposals to NASA ROSES solicitations (not awarded).

**CIRES Visiting Postdoctoral Fellow**, ***University of Colorado, Boulder***, September 2014-June 2016
Cooperative Institute for Research in Environmental Sciences and Chemical Sciences Division, Earth System Research Laboratory, NOAA, Dr. Joost de Gouw (advisor)

- Mentored two undergraduate students, one presented poster at the American Geophysical Union (AGU) Fall Meeting 2015 and the other at the American Meteorological Society (AMS) Meeting 2017.

**Graduate Student Researcher**, ***University of California, Berkeley***, 2008-August 2014
Civil & Environmental Engineering, Prof. Robert Harley (advisor)

- Developed high-resolution transportation emission maps, sponsored by CARB and U.S. EPA.
- Explored utility of mobile $CO_2$ platforms to monitor changes in transportation emissions, sponsored by the University of California Multi-Campus Research Program in Sustainable Transportation.
- Analyzed greenhouse gas emissions from goods movement, sponsored by CARB.

**Undergraduate Student Researcher**, ***Virginia Tech***, Spring 2007
Civil & Environmental Engineering, Prof. Marc Edwards (advisor)

- Performed a literature review on the water-energy nexus.
- Estimated potential energy savings in household pipe distribution systems.

**General Scholar**, ***Tsinghua University***, Summer and Fall 2007
Hydraulic Engineering, Prof. Yuefei Huang (advisor)

- Investigated non-point source pollution in storm water runoff in Beijing.

## Awards and Recognitions

NOAA Bronze Medal for Organizational Development, ***NOAA OAR***, 2021
CIRES Administrator's Award, ***University of Colorado, Boulder***, 2020
Silver Sherman Award, ***NOAA OAR***, 2020
Gold Star Award for Outreach and Education, ***NOAA ESRL***, 2020
Presidential Early Career Award for Scientists and Engineers, ***US Department of Commerce***, 2019
Honorable mention, ***CO-LABS Governor's Award***, 2018
CIRES Outstanding Performance Award, ***University of Colorado, Boulder***, 2018
CIRES Cash in Your Account Award, ***University of Colorado, Boulder***, 2018
*Science* paper on volatile chemical products selected for press briefing, ***AAAS Annual Meeting***, 2018
CIRES Visiting Postdoctoral Fellowship, ***University of Colorado, Boulder***, 2014-16
Achievement Rewards for College Scientists Fellowship, ***University of California, Berkeley***, 2008-12
Outstanding Graduate Student Instructor Award, ***University of California, Berkeley***, 2011
Wayne and Claire Horton Honors Scholarship, ***Virginia Tech***, 2007

## Teaching Experience

**Head Graduate Student Instructor**, ***University of California, Berkeley***, Spring 2012 and Spring 2014
Introduction to Computer Programming for Scientists and Engineers (undergraduate level)

- Class size of 400 students. Managed team of 12 graduate student instructors and four graders to run weekly lab and discussion sections, grade homework, write lab assignments. Gave guest lecture on reading and writing files. Ran end of semester robot tournament project.

**Engineering Discipline Cluster Workshop Leader**, ***University of California, Berkeley***, Fall 2013
Fall Teaching Conference for First-Time Graduate Student Instructors

- Led workshop on teaching new graduate student instructors about effective teaching and time management strategies.

**Graduate Student Instructor**, ***University of California, Berkeley***, Fall 2010
Air Quality Engineering (graduate level)

- Led weekly discussion session, held office hours, and developed homework solutions.

## Science Mentorship

*CIRES/NOAA CSL Research Scientists*

17. **Siyuan Wang, *NOAA Chemical Sciences Laboratory***, 2020-present
    - Ph.D. from Hong Kong University of Science & Technology.
    - Evaluation of NOAA's Unified Forecasting System, satellite evaluation, and modeling of wildfires.

16. **Jian He, *NOAA Chemical Sciences Laboratory***, 2020-present
    - Ph.D. from North Carolina State University.
    - Evaluation of NOAA's Unified Forecasting System, satellite evaluation, and modeling of greenhouse gases.

15. **Meng Li, *NOAA Chemical Sciences Laboratory***, 2019-present
    - Ph.D. from Tsinghua University, China.
    - Evaluation of anthropogenic emission inventories with satellite datasets and modeling on air quality.

14. **Rebecca Schwantes, *NOAA Chemical Sciences Laboratory***, 2020-22
    - Ph.D. from California Institute of Technology.
    - Evaluation of NOAA's Unified Forecasting System and chemical mechanism development.

*Postdoctoral Researchers*

13. **Congmeng Lyu, *NOAA Chemical Sciences Laboratory***, 2021-present
    - Ph.D. from Drexel University.
    - Developing and advancing emission processing systems of air pollutants and greenhouse gases.
    - Performing chemical data assimilation of satellite observations to improve wildfire emissions modeling.

12. **Bert Verreyken, *NOAA Chemical Sciences Laboratory***, 2021-present
    - Ph.D. from Belgium Institute for Space Aeronomy (BIRA-IASB) and Ghent University, Belgium.
    - National Research Council Postdoctoral Fellow.
    - Investigating Lagrangian inversions of urban VOC emissions and impacts on air quality.

*CIRES/NOAA CSL Associate Scientists*

11. **Colin Harkins, *University of Colorado, Boulder***, 2022-present
    - M.S. from University of Colorado, Boulder.
    - Developing and advancing emission processing systems of air pollutants and greenhouse gases.

*Graduate Student Researchers*

10. **Chia-Hua Hsu, *University of Colorado, Boulder***, 2021-present
    - Graduate student researcher in Mechanical Engineering.
    - Investigating satellite-based inversions of US $NO_x$ emissions for the NOAA GEO-XO satellite mission.

9. **Katelyn Yu, *University of California, Berkeley***, 2021-present
    - Graduate student researcher in Civil & Environmental Engineering.
    - NSF Graduate Research Fellowship, sponsored by the National Science Foundation.
    - Development of mobile source emissions inventories and urban air quality modeling.

8. **Harold Gammaro, *City College of New York***, 2020-present
    - Graduate student researcher in Mechanical Engineering.
    - NOAA Experiential Research and Training Opportunities (NERTO) intern, sponsored by NOAA Office of Education.
    - Investigating the effects of the urban canopy on air quality models.

7. **Colin Harkins, *University of Colorado, Boulder***, 2019-21
    - Graduate student researcher in Mechanical Engineering.

- Evaluation of US anthropogenic $NO_x$ emissions with satellite data and adjustments during COVID-19.
- Published first author manuscript in *Environmental Research Letters*.

6. **Colby Francoeur, *University of Colorado, Boulder***, 2019-present
   - Graduate student researcher in Mechanical Engineering.
   - Quantifying emissions of oil & gas development using aircraft and satellite data.
   - Published first author manuscript in *Environmental Science & Technology*.

5. **Lucas Algrim, *University of Colorado, Boulder***, 2019
   - Served on Ph.D. Defense Committee, "Fates of Oxygenated Organics in Outdoor and Indoor Environments: Chemical Reactions and Partitioning".

*Undergraduate Student Researchers*

4. **Alan Gorchov-Negron**, ***Brown University***, 2015-18
   - Undergraduate student researcher in Geophysics.
   - SOARS (Significant Opportunities in Atmospheric Research and Science) Scholar, sponsored by the National Center for Atmospheric Research (NCAR) and NOAA Climate Program Office.
   - Developed new emission maps of oil & gas development using GIS.
   - Published first author manuscript in *Environmental Science & Technology*.

3. **Shelby Tisinai, *Principia College***, 2017
   - Undergraduate student researcher in Biology.
   - Performed data analysis for GEIA working group on global VOC emission inventories.
   - Results presented at the 2017 International Emissions Inventory Conference sponsored by EPA.

2. **Justin DuRant, *University of South Carolina***, 2016
   - Undergraduate student researcher in Biological Sciences.
   - Hollings Scholar, sponsored by NOAA Office of Education.
   - Developed a U.S. inventory of transportation emissions for long-term chemistry-climate models.
   - Poster presentation at the 2017 American Meteorological Society Meeting.

1. **Zoe McBride**, ***University of California, Berkeley***, 2013-14
   - Undergraduate student researcher in Civil & Environmental Engineering.
   - QUEST (Qualcomm Undergraduate Experiences in Science & Technology) Scholar, sponsored by the UC-Berkeley College of Engineering.
   - Developed highly-resolved maps of transportation emissions using GIS.
   - Co-author on peer-reviewed journal publication in the Journal of Geophysical Research-Atmospheres.

## **Peer-Reviewed Publications** (*51 peer-reviewed articles, H-index = 23*)

**Blue highlighted manuscripts denote first, corresponding, or science advisee papers.

*Manuscripts in preparation*

57. He, J., **B.C. McDonald**, C. Harkins, K. O'Dell, M. Li, C. Francoeur, R. Schwantes, B. Pierce, G.J. Frost, S. Anenberg (in preparation). COVID-19 Perturbation on US Air Quality and Health Impact Assessment. *Proceedings of the National Academy of Sciences*.

56. Peischl, J., K.C. Aikin, **B.C. McDonald**, C. Harkins, A.M. Middlebrook, A.O. Langford, O.R. Cooper, K.L. Chang, S.S. Brown (in preparation). Quantifying the Impacts of COVID-19 Lockdowns on Air Pollutants in Nine U.S. Cities. *Elementa: Science of Anthropocene*.

55. Warneke, C., R. Schwantes, P. Veres, A. Rollins, S. Baidar, W.A. Brewer, K. Aikin, G. Frost, D. Fahey, L. Judd, B. Lefer, R.B. Pierce, S.Kondragunta, C. Stockwell, D. Gentener, A. Lambe, D.B. Millet, D. Farmer, N.L. Ng, J. Kaiser, C. Young, J. Mak, G. Wolfe, J. Sullivan, K. Mueller, A. Karion, L. Valin, M. Witte, X. Ren, R. Dickerson, P. Decarlo, **B. McDonald**, S. Brown (in preparation). The AEROMMA 2023 experiment

(Atmospheric Emissions and Reactions Observed from Megacities to Marine Areas. *Elementa: Science of Anthropocene*.

*Manuscripts submitted or in revision*

54. Sasidharan, S., Y. He, A. Akherati, Q. Li, W. Li, D. Cocker, **B.C. McDonald**, M.M. Coggon, K.M. Seltzer, H.O.T. Pye, B.N. Murphy, J.R. Pierce, S.H. Jathar (in preparation). Secondary Organic Aerosol Formation from Volatile Chemical Product Emissions: Parameters and Contributions to Anthropogenic Aerosol. *Environmental Science & Technology*.

53. Wang, B., J.A. Geddes, T.J. Adams, E.S. Lind, **B.C. McDonald**, J. He, D. Li, G.G. Pfister (in revision). Implications of Sea Breezes on Air Quality Monitoring in a Coastal Urban Environment: Evidence from High Resolution Modeling of $NO_2$ and $O_3$. *Journal of Geophysical Research-Atmospheres*.

52. von Schneidemesser, E., **B.C. McDonald**, H. Denier van der Gon, M. Crippa, D. Guizzardi, A. Borbon, P. Dominutti, G. Huang, G. Jansens-Maenhout, M. Li, C.F. Ou-Yang, S. Tisinai, J.L. Wang (in revision). Comparing Urban NMVOCs Measurements with Representation in Emission Inventories – A Global Perspective. *Journal of Geophysical Research-Atmospheres.*

*Manuscripts published, in press, or accepted*

51. Rickly, P.S., M.M. Coggon, K.C. Aikin, R.J. Alvarez, S. Baidar, J.B. Gilman, G.I. Gkatzelis, C. Harkins, J. He, A. Lamplugh, A.O. Langford, **B.C. McDonald**, J. Peischl, M.A. Robinson, A.W. Rollins, R.H. Schwantes, C.J. Senff, C. Warneke, S.S. Brown (accepted). Wildfire Influences on Urban Ozone: an Observationally-Constrained Box Modeling Study at a Site in the Colorado Front Range. *Environmental Science & Technology.*

50. Kopacz, M., V. Breeze, S. Kondragunta, G. Frost, S. Anenberg, L. Bruhwiler, S. Davis, A. da Silva, J. de Gouw, R. Duren, L. Flynn, A. Gaudel, M. Geigert, G. Goldman, J. Joiner, **B. McDonald**, L. Ott, V.H. Peuch, S.E. Pusede, I. Stajner, C. Seftor, C. Sweeney, L.C. Valin, J. Wang, J. Whetstone, S. Kalluri (accepted). Global Atmospheric Composition Needs from Future Utraviolet-Visible-Near-Infrared (UV-Vis-NIR) NOAA Satellite Instruments. *Bulletin of the American Meteorological Society*.

49. Womack, C.C., W.S. Chace, S. Wang, M. Baasandorj, D.L. Fibiger, A. Franchin, L. Goldberger, C. Harkins, D.S. Jo, B.H. Lee, J.C. Lin, **B.C. McDonald**, E.E. McDuffie, A.M. Middlebrook, A. Moravek, J.G. Murphy, J.A. Neuman, J.A. Thorton, P.R. Veres, S.S. Brown (accepted). Mid-Latitude Ozone Depletion and Air Quality Impacts from Industrial Halogen Emissions: Aircraft Measurements and Modeling in the Great Salt Lake Basin. *Environmental Science & Technology.*

48. Abdi-Oskouei, M., B. Roozitalab, C.O. Stanier, M. Christiansen, G. Pfister, R.B. Pierce, **B.C. McDonald**, Z. Adelman, M. Janssen, A.F. Dickens, G.R. Carmichael (accepted). The Impact of Volatile Chemical Products, Other VOCs, and $NO_x$ on Peak Ozone in the Lake Michigan Region. *Journal of Geophysical Research-Atmospheres*.

47. Khare, P., J.E. Krechmer, J.E. Machesky, T. Haas-Mitchell, C. Cao, J. Wang, F. Majluf, F. Lopez-Hilfiker, K. Seltzer, H.O.T. Pye, R. Commane, B.C. McDonald, R. Toledo-Crow, J.E. Mak, D.R. Gentner (accepted). Ammonium-adduct Chemical Ionization to Investigate Anthropogenic Oxygenated Gas-Phase Organic Compounds in Urban Air. *Atmospheric Chemistry & Physics*.

46. Dressel, I.M., M.A. Demetillo, L.M. Judd, S.J. Janz, K.P. Fields, K. Sun, A.M. Fiore, **B.C. McDonald**, S.E. Pusede (2022). Daily Satellite Observations of Nitrogen Dioxide Air Pollution Inequality in New York City, New York and Newark, New Jersey: Evaluation and Application. *Environmental Science & Technology*, 56, doi: 10.1021/acs.est.2c02828.

45. Peng, Y., A.P. Mouat, Y. Hu, M. Li, **B.C. McDonald**, J. Kaiser (2022). Source apportionment of volatile organic compounds and evaluation of anthropogenic monoterpene emission estimates using in Atlanta, Georgia. *Atmospheric Environment*, **288**, doi: 10.1016/j.atmosenv.2022.119324.

44. Kim, S.W., **B.C. McDonald**, S. Seo, K.M. Kim, M. Trainer (2022). Understanding the Paths of Surface Ozone Abatement in the Los Angeles Basin. *Journal of Geophysical Research-Atmospheres*, **127**, doi: 10.1029/2021JD035606.

43. Jiang, Z., R. Zhu, K. Miyazaki, **B.C. McDonald**, Z. Klimont, B. Zheng, K.F. Boersma, Q. Zhang, H. Worden, J.R. Worden, D.K. Henze, D.B.A. Jones, H.A.C. Denier van der Gon, H. Eskes (2022). Decadal Variabilities in Tropospheric Nitrogen Oxides over United States, Europe, and China. *Journal of Geophysical Research-Atmospheres*, **127**, doi: 10.1029/2021JD035872.

42. Lopez-Coto, I., X. Ren, A. Karion, K. McKain, C. Sweeney, R.R. Dickerson, **B.C. McDonald**, D.Y. Ahn, R.J. Salawitch, H. He, P.B. Shepson, J.R. Whetstone (2022). Carbon Monoxide Emissions over the Washington, DC and Baltimore Metropolitan Area: Recent Trend and COVID-19 Anomaly Detection. *Environmental Science & Technology*, **56**, doi: 10.1021/acs.est.1c06288.

41. Dix, B., C. Francoeur, M. Li, R. Serrano, P. Levelt, P. Veefkind, **B.C. McDonald**, J.A. de Gouw (2022). Quantifying $NO_x$ Emissions from U.S. Oil and Gas Production Regions using TROPOMI $NO_2$. *ACS Earth & Space Chemistry*, **6**, doi: 10.1021/acsearthspacechem.1c00387.

40. Bishop, G.A., M.J. Haugen, **B.C. McDonald**, A.M. Boies (2022). Utah Wintertime Measurements of Heavy-duty Diesel Vehicle Nitrogen Oxide Emission Factors. *Environmental Science & Technology*, **56**, doi: 10.1021/acs.est.1c06428.

39. Cao, H., D.K. Henze, K. Cady-Pereira, **B.C. McDonald**, C. Harkins, K. Sun, K.B. Bowman, T.M. Fu and O. Nawaz (2021). COVID-19 Lockdowns Afford the First Satellite-Based Confirmation that Vehicles are an Under-Recognized Source of Urban $NH_3$ Pollution. *Environmental Science & Technology Letters*, **9**, doi: 10.1021/acs.estlett.1c00730.

38. Li, M., **B.C. McDonald**, S.A. McKeen, H. Eskes, P. Levelt, C. Francoeur, C. Harkins, J. He, M. Barth, D. K. Henze, M. Trainer, J.A. de Gouw, G.J. Frost (2021). Assessment of Updated Fuel-Based Emissions Inventories over the Contiguous United States using TROPOMI NO2 Retrievals. *Journal of Geophysical Research-Atmospheres*, **126**, doi: 10.1029/2021JD035484.

37. Kondragunta, S, Z. Wei, **B.C. McDonald**, D.L. Goldberg, D.Q. Tong (2021). COVID-19 Induced Fingerprints of a New Normal Urban Air Quality in the United States. *Journal of Geophysical Research-Atmospheres*, **126**, doi: 10.1029/2021JD034797.

36. Mo, Z., R. Cui, B. Yuan, H. Cai, **B.C. McDonald**, M. Li, J. Zheng, M. Shao (2021). A mass balance-based emission inventory of non-methane volatile organic compounds (NMVOCs) for solvent use in China. *Atmospheric Chemistry & Physics*, **21**, doi: 10.5194/acp-21-13655-2021.

35. Demetillo, M.A., C. Harkins, **B.C. McDonald**, P.S. Chodrow, K. Sun, S.E. Pusede (2021). Space-based Observational Constraints on NO2 Air Pollution Inequality from Diesel Traffic in Major U.S. cities. *Geophysical Research Letters*, **48**, doi: 10.1029/2021GL094333.

34. Sokhi, R. S., V. Singh, X. Querol, S. Finardi, A.C. Targinos, M.F. Andrade, R. Pavlovic, R.M. Garland, J. Massagué, S. Kong, A. Baklanov, L. Ren, O. Tarasova, G. Carmichael, V.H. Peuch, A. Terrazas-Ahumada, V. Anandi, G. Arbilla, K. Badali, G. Beig, L.C. Belalcazar, A. Bolignano, P. Brimblecombe, A. Casallas, J.P. Charland, J. Choi, E. Chourdakis, I. Coll, M. Collins, J. Cyrys, C.M. da Silva, A.D. Di Giosa, A.D. Leo, C. Ferro, M. Gavidia, A. Gayen, A. Ginzburg, F. Godefroy, Y.A. Gonzalez, M. Guervara-Luna, S.M. Haque, H. Havenga, O.R. Hernandez, D. Herod, U. Horrak, T. Hussein, S. Ibarra, M. Kaasik, R. Khaiwal, J. Kim, A. Kousa, J. Kukkonen, M. Kulmala, J. Kuula, N. La Violette, G. Lanzani, X. Liu, S. MacDougall, P.M. Manseau, G. Marchegiani, **B.C. McDonald**, R.V.P. Meethal, S.V. Mishra, L.T. Molina, D. Mooibroek, S. Mors, N. Moussiopoulos, F. Murena, J.V. Niemi, S. Noe, T. Nogueira, M. Norman, M. Jaimes-Palomera, J.L. Perez-

Camano, T. Petaja, S. Piketh, A. Rathod, K. Reid, A. Retama, P. Camacho Rodriguez, N.Y. Rojas, J.P. Rojas, R.S José, O. Sánchez, R.J. Seguel, S. Sillanpaa, Y. Su, N. Tapper, H. Timonen, D. Toscano, G. Tsegas, G.J.M. Velders, C. Vlachokostas, E. von Schneidemesser, R. Yadav, R. Zalakeviciute, M. Zavala (2021). A Global Observational Analysis to Understand Changes in Air Quality During Exceptionally Low Anthropogenic Emission Conditions. *Environment International*, **157**, doi: 10.1016/j.envint.2021.106818.

33. Nault, B.A., D.S. Jo, **B.C. McDonald**, P. Campuzano-Jost, D.A. Day, W. Hu, J.C. Schroder, J. Allan, D.R. Blake, M.R. Canagaratna, H. Coe, M.M. Coggon, P.F. DeCarlo, G.S. Diskin, R. Dunmore, F. Flocke, A. Fried, J.B. Gilman, G. Gkatzelis, J.F. Hamilton, T.F. Hanisco, P.L. Hayes, D.K. Henze, A. Hodzic, J. Hopkins, M. Hu, L.G. Huey, B.T. Jobson, W.C. Kuster, A. Lewis, M. Li, J. Liao, M. Omar Nawaz, I.B. Pollack, J. Peischl, B. Rappengluck, C.E. Reeves, D. Richter, J.M. Roberts, T.B. Ryerson, M. Shao, J.M. Sommers, J. Walega, C. Warneke, P. Weibring, G.M. Wolfe, D.E. Young, B. Yuan, Q. Zhang, J.A. de Gouw, and J.L. Jimenez (2021). Anthropogenic Secondary Organic Aerosols Contribute Substantially to Air Pollution Mortality. *Atmospheric Chemistry & Physics*, **21**, doi: 10.5194/acp-21-11201-2021.

32. Coggon, M.M., G.I. Gkatzelis, **B.C. McDonald**, J.B. Gilman, R.H. Schwantes, N. Abuhassan, K.C. Aikin, M. Arend, T. Berkoff, T. Campos, G. Gronoff, J. Hurley, G. Isaacman-VanWertz, A.R. Koss, M. Li, S.A. McKeen, F. Moshary, J. Peischl, V. Pospisilova, Y. Wu, M. Trainer, C. Warneke (2021). Volatile chemical product emissions enhance ozone and modulate urban chemistry. *Proceedings of the National Academy of Sciences*, **118**, doi: 10.1073/pnas.2026653118.

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29. Yu, K.A., **B.C. McDonald**, R.A. Harley (2021). Evaluation of Nitrogen Oxide Emission Inventory and Trends for On-Road Gasoline and Diesel Vehicles. *Environmental Science & Technology*, **55**, doi: 10.1021/acs.est.1c00586.

28. Stockwell, C.E., M.M. Coggon, G.I. Gkatzelis, J. Ortega, **B.C. McDonald**, J. Peischl, K. Aikin, J.B. Gilman, M. Trainer, C. Warneke (2021). Volatile organic compound emissions from solvent- and water-borne coatings: compositional differences and tracer compound identifications. *Atmospheric Chemistry & Physics*, **21**, doi: 10.5194/acp-21-6005-2021.

27. Gkatzelis, G.I., J.B. Gilman, S.S. Brown, H. Eskes, A.R. Gomes, A.C. Lange, **B.C. McDonald**, J. Peischl, A. Petzold, C.R. Thompson, A. Kiendler-Scharr (2021). The Global Impacts of COVID-19 Lockdowns on Urban Air Pollution: A Critical Review and Recommendations. *Elementa: Science of Anthropocene*, **9**, doi: 10.1525/elementa.2021.00176.

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24. Qin, M., B.N. Murphy, K.K. Isaacs, **B.C. McDonald**, Q. Lu, S.A. McKeen, L. Koval, A.L. Robinson, C. Efstathiou, C. Allen, H.O.T. Pye (2020). Criteria Pollutant Impacts of Volatile Chemical Products Informed by Near-Field Modeling. *Nature Sustainability*, **4**, doi: 10.1038/s41893-020-00614-1.

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22. Dix, B., J. de Bruin, E. Roosenbrand, T. Vlemmix, C. Francoeur, A. Gorchov-Negron, **B.C. McDonald**, M. Zhizhin, C. Elvidge, J.P. Veefkind, P.F. Levelt, J.A. de Gouw (2020). Nitrogen Oxide Emissions from US Oil and Gas Production: Recent Trends and Source Attribution. *Geophysical Research Letters*, **47**, doi: 10.1029/2019GL085866.

21. Shah, R.U., M.M. Coggon, G.I. Gkatzelis, **B.C. McDonald**, A. Tasoglou, H. Huber, J.B. Gilman, C. Warneke, A.L. Robinson, A.A. Presto (2019). Urban Oxidation Flow Reactor Measurements Reveal Significant Secondary Organic Aerosol Contributions from Volatile Emissions of Emerging Importance. *Environmental Science & Technology*, **54**, doi: https://doi.org/10.1021/acs.est.9b06531.

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17. Jiang, Z., **B.C. McDonald**, H. Worden, J.R. Worden, K. Miyazaki, Z. Qu, D.K. Henze, D.B.A. Jones, A.F. Arrellano, E.V. Fischer, L. Zhu, K.F. Boersma (2018). Unexpected Slowdown of US Pollutant Emission Reduction in the Past Decade. *Proceedings of the National Academy of Sciences*, **115**, doi: 10.1073/pnas.1801191115.

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15. de Gouw, J.A., J.B. Gilman, S.W. Kim, S.L. Alvarez, S. Dusanter, M. Graus, S.M. Griffith, G. Isaacman-VanWertz, W.C. Kuster, B.L. Lefer, B.M. Lerner, **B.C. McDonald**, B. Rappenglueck, J.M. Roberts, P.S. Stevens, J. Stutz, R. Thalman, P.R. Veres, R. Volkamer, C. Warneke, R.A. Washenfelder, C.J. Young (2018). Chemistry of Volatile Organic Compounds in the Los Angeles Basin: Formation of Oxygenated Compounds and Determination of Emission Ratios. *Journal of Geophysical Research-Atmospheres*, **123**, doi: 10.1002/2017JD027976.

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12. de Gouw, J.A., J.B. Gilman, S.W. Kim, B.M. Lerner, G. Isaacman-VanWertz, **B.C. McDonald**, C. Warneke, W.C. Kuster, B.L. Lefer, S.M. Griffith, S. Dusanter, P.S. Stevens, J. Stutz (2017). Chemistry of Volatile Organic Compounds in the Los Angeles Basin: Nighttime Removal of Alkenes and Determination of Emission Ratios. *Journal of Geophysical Research-Atmospheres*, **122**, doi: 10.1002/2017JD027459.

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10. Hassler, B., **B.C. McDonald**, G.J. Frost, A. Borbon, D. Carslaw, K. Civerolo, C. Granier, P.S. Monks, S. Monks, D.D. Parrish, I.B. Pollack, K.H. Rosenlof, E. von Schneidemesser, T.B. Ryerson, M. Trainer (2016). Analysis of Long-Term Observations of $NO_x$ and CO in Megacities and Application to Constraining Emissions Inventories. *Geophysical Research Letters*, **43**, doi: 10.1002/2016GL069894.

9. Kim S.W., **B.C. McDonald**, S., Baidar, S.S. Brown, B. Dube, R.A. Ferrare, G.J. Frost, R.A. Harley, J.S. Holloway, H.J. Lee, S.A. McKeen, J.A., Neuman, J.B. Nowak, H. Oetjen, I. Ortega, I.B. Pollack, J.M. Roberts, T.B. Ryerson, J. Scarino, C.J. Senff, R. Thalman, M. Trainer, R. Volkamer, N. Wagner, R.A. Washenfelder, E. Waxman, C.J. Young (2016). Modeling the Weekly Cycle of $NO_x$ and CO Emissions and their Impacts on O3 in the Los Angeles-South Coast Air Basin during the CalNex 2010 Field Campaign. *Journal of Geophysical Research-Atmospheres*, **121**, doi: 10.1002/2015JD024292.

8. Bastien, L.A.J., **B.C. McDonald**, N.J. Brown, R.A. Harley (2015). High-Resolution Mapping of Sources Contributing to Urban Air Pollution Using Adjoint Sensitivity Analysis: Benzene and Diesel Black Carbon. *Environmental Science & Technology*, **49**, doi: 10.1021/acs.est.5b00686.

7. **McDonald, B.C.**, A.H. Goldstein, R.A. Harley (2015). Long-Term Trends in California Mobile Source Emissions and Ambient Concentrations of Black Carbon and Organic Aerosol. *Environmental Science & Technology*, **49**, doi: 10.1021/es505912b.

6. Maness, H.L, M.E. Thurlow, **B.C. McDonald**, R.A. Harley (2015). Estimates of $CO_2$ Traffic Emissions from Mobile Concentration Measurements. *Journal of Geophysical Research-Atmospheres*, **120**, doi: 10.1002/2014JD022876.

5. **McDonald, B.C.**, Z.C. McBride, E.W. Martin, R.A. Harley (2014). High-Resolution Mapping of Motor Vehicle Carbon Dioxide Emissions. *Journal of Geophysical Research-Atmospheres*, **119**, doi: 10.1002/2013JD021219.

4. Joe, D.K, H.L. Zhang, S.P. DeNero, H.H. Lee, S.H. Chen, **B.C. McDonald**, R.A. Harley, M.J. Kleeman (2014). Implementation of a High-Resolution Source-Oriented WRF/Chem Model at the Port of Oakland. *Atmospheric Environment*, **82**, doi: 10.1016/j.atmosenv.2013.09.055.

3. **McDonald, B.C.**, D.R. Gentner, A.H. Goldstein, R.A. Harley (2013). Long-Term Trends in Motor Vehicle Emissions in U.S. Urban Areas. *Environmental Science & Technology*, **47**, doi: 10.1021/es401034z.

2. **McDonald, B.C.**, T.R. Dallmann, E.W. Martin, R.A. Harley (2012). Long-Term Trends in Nitrogen Oxide Emissions from Motor Vehicles at National, State, and Air Basin Scales. *Journal of Geophysical Research-Atmospheres*, **117**, D00V18, doi: 10.1029/2012JD018304.

1. Griffin, K., G. Leventis, G., **B. McDonald** (2010). Implementing a Public Goods Charge for Water. *Current, Public Policy Journal of the Cornell Institute for Public Affairs*, **14**.

## Technical & Scientific Reports

7. Frost, G. J., M. Kopacz, S. Kondragunta, R. Ahmadov, J. Al-Saadi, A. Andrew, C. Barnet, V. Breeze, J. Christopoulos, O. Cooper, A. Crawford, L. Flynn, A. Gaudel, C. Martin, **B. McDonald**, J. McQueen, F. Paulot, M. Pavolonis, I. Petropavlovskikh, R.B. Pierce, K.H. Rosenlof, R. Saylor, T. Schmit, I. Stajner, D. Stanitski, J. Szykman (2020). A Value Assessment of an Atmospheric Composition Capability on the NOAA Next-Generation Geostationary and Extended Orbits (GEO-XO) Missions (NOAA Technical Report OAR CPO-8). Prepared for NOAA GEO-XO Program. doi: 10.25923/1s4s-t405.

6. **McDonald, B.C.** and R.A. Harley (2013). EMFAC Model Evaluation. Prepared for CARB.

5. **McDonald, B.C.** and R.A. Harley (2012). Analysis of Greenhouse Gas Emissions from the Goods Movement Sector in California – Year 2 Report. Prepared for CARB.

4. **McDonald, B.C.** (2011). Reducing Exposure to Toxic Air Contaminants and Fine Particulates. Prepared for Community Environmental Advisory Commission (City of Berkeley) and Bay Area Air Quality Management District.

3. Leventis, G. and **B. McDonald** (2011). Alternative Approaches to Set an Environmental Enhancement Surcharge. Prepared for San Francisco Public Utilities Commission.

2. Griffin, K., G. Leventis, and **B. McDonald** (2010). Implementing a Public Goods Charge for Water. Prepared for California Public Utilities Commission.

1. **McDonald, B.C.** and R.A. Harley (2010). Analysis of Greenhouse Gas Emissions from the Goods Movement Sector in California – Year 1 Report. Prepared for CARB.

## Research Grant Proposal Writing

*Proposals in preparation*
none

*Proposals submitted and pending*
none

*Proposals awarded*
9. PI: **B.C. McDonald**, co-Is: D. Henze, A. Mizzi (2022). The Value of GeoXO Atmospheric Composition Observations for Emissions Updating and Air Quality Forecasting. *NOAA GeoXO Value Assessment*. Performance period: 6/1/2022 to 5/31/2023. Total award: $160k.

8. PI: **B.C. McDonald**, co-Is: D. Henze, A. Mizzi (2021). Demonstrating Nitrogen Dioxide Observations from GEO-XO for Emissions Updating and Air Quality Forecasting. *NOAA GeoXO Value Assessment*. Performance period: 6/1/2021 to 5/31/2022. Total award: $130k.

7. PI: Frost, G.J., co-Is: **B.C. McDonald**, J. He, S. Wang, A. Gaudel, collaborators: S. McKeen, C. Brock, S. Kondragunta, L. Flynn, K. Pryor, K. Yang, C. Nowlan, G. Gonzalez Abad, X. Ren, R. Dickerson (2020). Evaluations and applications of JPSS atmospheric composition products. *NOAA Proving Ground/Risk Reduction Program (PGRR)*. Performance period: 6/1/2021 to 5/31/24. Total award: $560k.

6. PI: Brown, S., co-PIs: C. Warneke, M.M. Coggon, G.G. Gkatzelis, **B.C. McDonald** (2020). Las Vegas Field Measurements of Volatile Chemical Product and Mobile Source Emissions: Ozone Formation and its

Sensitivity to $NO_x$ and VOCs. *Clark County, NV, RFP 605440-19*. Performance period: 4/1/2020 to 5/31/21. Total award: $520k.

5. PI: Coggon, M.M., co-PIs: G.G. Gkatzelis, **B.C. McDonald**, M. Li (2019). Evaluating Chemical Mechanisms with Recent Field Data to Account for the Contributions of Volatile Chemical Product Emissions to Urban Ozone Pollution. *EPA Science to Achieve Results (STAR) Research Program*. Performance period: 6/1/2020 to 5/31/2023. Total award: $400k.

4. PI: **McDonald, B.C.**, co-Is: J.A. de Gouw, G. Frost, collaborators: P. Levelt, R. Ahmadov, J. Gilman (2018). Detecting Oil and Gas Emissions and Their Trends from Space and Modeling Impacts on Tropospheric Ozone. *NASA Research Opportunities in Space and Earth Sciences (ROSES), A.19 Atmospheric Composition: Aura Science Team and Atmospheric Composition Modeling and Analysis Program*. Performance period: 5/1/2019 to 4/30/2022. Total award: $640k.

3. PI: de Gouw, J.A., co-PI: **B. McDonald** (2018). Evolutions in Urban Chemistry: Growing Influence of Non-Traditional Emission Sources. *NSF Atmospheric Chemistry Workshop Grant*. Performance period: 10/1/2018 to 9/30/2019. Total award: $24k.

2. PI: Jathar, S., co-PIs: R. McCormick M. Thornton, **B. McDonald** (2018). Linking Volatile Organic Compound Chemistry to Secondary Organic Aerosol Formation from Next-generation Biofuels and Volatile Chemical Products. *Colorado Energy Research Collaboratory Seed Grant*. Performance period: 8/1/2018 to 6/30/2019. Total award: $45k.

1. PI: Coggon, M.M., co-PIs: J.B. Gilman, **B. McDonald**, C. Warneke (2018). Do People or Forests Emit more Monoterpenes? Detection of Monoterpene Emissions from Volatile Chemical Products in Urban Areas. *CIRES Innovative Research Program Grant*. Performance period: 5/29/2018 to 11/30/2019. Total award: $24k.

## Invited Seminars & Lectures

26. ***University of California-Irvine*** (2021). Tracking Petroleum Use from Fossil Fuels to Chemical Products. *Department of Earth System Science*, Irvine, CA.

25. ***GreenHome Institute*** (2021). Chemical Product Emissions Emerging as Urban VOCs: How Indoor Air Affects Outdoor Pollution. *Continuing Education Webinar Series*, remote.

24. ***Telluride Science Research Center*** (2021). Tracking Petroleum Use from Fossil Fuels to Chemical Products. *Urban Mapping Meeting*, Telluride, CO.

23. ***University of California-Berkeley*** (2020). Impacts on Urban Chemistry from the COVID-19 Pandemic. *Berkeley Atmospheric Sciences Center Seminar Series*, Berkeley, CA.

22. ***National Oceanic & Atmospheric Administration – NOAA Central Library*** (2019). Quantifying Upstream and Downstream Emissions from Oil and Natural Gas. *Brown Bag Lunch Seminar Series*, Silver Spring, MD.

21. ***Harvard University*** (2019). Quantifying Upstream and Downstream Emissions from Oil and Natural Gas. *Atmospheric & Environmental Chemistry Seminar Series*, Cambridge, MA.

20. ***Gordon Conference*** (2019). A Human Forest in New York City and Implications on Urban Air Quality. *Atmospheric Chemistry*, Newry, ME.

19. ***California Air Resources Board*** (2019). Chemical Product Emissions Emerging as Important Urban Source of Volatile Organic Compounds. *CARB Research Seminars*, Sacramento, CA.

18. ***University of California-Davis*** (2019). Chemical Product Emissions Emerging as Important Urban Source of Volatile Organic Compounds. *Department of Environmental Engineering Seminar*, Davis, CA.

17. ***Carnegie Mellon University*** (2019). Chemical Product Emissions Emerging as Important Urban Source of Volatile Organic Compounds. *Donora Lecture in Center for Atmospheric Particle Studies*, Pittsburgh, PA.

16. ***University of Colorado-Boulder*** (2019). Chemical Product Emissions Emerging as Important Urban Source of Volatile Organic Compounds. *Department of Environmental Engineering Seminar*, Boulder, CO.

15. ***Yonsei University*** (2018). Chemical Product Emissions Emerging as Important Urban Source of Volatile Organic Compounds. *Department of Atmospheric Sciences Seminar*, Seoul, South Korea.

14. ***US Environmental Protection Agency - Region 5*** (2018). Chemical Product Emissions Emerging as Important Urban Source of Volatile Organic Compounds. *Air and Radiation Division Group Meeting*, Chicago, IL.

13. ***National Oceanic & Atmospheric Administration – National Centers for Environmental Information*** (2018). Those Scented Products You Love? NOAA Research Finds They Can Cause Air Pollution. *OneNOAA Seminar Series*, Silver Spring, MD.

12. ***US Environmental Protection Agency - Office of Research and Development*** (2018). Chemical Product Emissions Emerging as Important Urban Source of Volatile Organic Compounds. *NERL/A-E Seminar Series*, Research Triangle Park, NC.

11. ***US Environmental Protection Agency - Office of Transportation and Air Quality*** (2018). Reconciling Mobile Source Emissions with Air Quality Measurements. *Assessment and Standards Division Seminar*, Ann Arbor, MI.

10. ***University of Michigan*** (2018). Chemical Product Emissions Emerging as Important Urban Source of Volatile Organic Compounds. *CLaSP Special Seminar*, Ann Arbor, MI.

9. ***City College of New York*** (2018). Chemical Product Emissions Emerging as Important Urban Source of Volatile Organic Compounds. *NOAA-CREST Seminar*, New York, NY.

8. ***California Institute of Technology*** (2018). Chemical Product Emissions Emerging as Important Urban Source of Volatile Organic Compounds. *Department of Environmental Science and Engineering Seminar*, Pasadena, CA.

7. ***Institute for Advanced Sustainability Studies*** (2017). Reconciling Ambient Measurements of Ozone and Aerosol Precursors with Urban Emission Sources. *Air Quality Seminar*, Potsdam, Germany.

6. ***National Center for Atmospheric Research*** (2016). An Overview of Mobile Source Emissions and their Impacts on Air Quality and Climate. *Advanced Study Program Summer Colloquium*, Boulder, CO.

5. ***National Institute of Standards & Technology*** (2016). Reconciling Urban Emissions with Atmospheric Observations. *Greenhouse Gas and Climate Science Measurements Seminar*, Gaithersburg, MD.

4. ***National Oceanic & Atmospheric Administration – Earth System Research Laboratory*** (2016). Improving Anthropogenic Emission Inventories using Atmospheric Observations. *NOAA Chemical Sciences Division Seminar Series*, Boulder, CO.

3. ***National Aeronautics & Space Administration – Jet Propulsion Laboratory*** (2015). Los Angeles Air Quality: Past, Present, and Future. *Megacities Carbon Project Group Meeting*, Pasadena, CA.

2. ***University of Colorado, Boulder*** (2015). Long-Term Trends in Mobile Source Emissions and Urban Air Quality. *Colloquium on Air Quality Research*, Boulder, CO.

1. ***Colorado State University*** (2014). High-Resolution Mapping and Long-Term Trends of Motor Vehicle Emissions. *Department of Atmospheric Science Seminar*, Fort Collins, CO.

## Conference & Workshop Presentations

** = undergraduate or graduate student advisee

65. **B.C. McDonald** (2022). Quantifying methane and ozone precursor emissions from oil and gas production regions, *EPA Model Applications Team Meeting*, remote (oral).

64. **B.C. McDonald** (2022). Quantifying and modeling the urban VOC budget, *Telluride: New Insights into Gas Phase Atmospheric Chemistry*, Telluride, CO (oral).

63. **B.C. McDonald** (2022). Identifying urban tracers for VOC source apportionment analysis, *Urban Methane Workshop*, Washington, DC (oral).

62. **B.C. McDonald** (2022). Rapid response case study: COVID-19 on air quality, *NOAA UV-Vis-NIR Workshop*, remote (oral).

61. **B.C. McDonald** (2022). Overview of SUNVEx modeling efforts and very preliminary results, *Los Angeles Megacities Carbon Project Meeting*, Pasadena, CA (oral).

60. **B.C. McDonald** (2022). AEROMMA-STAQS 2023 field campaigns, *Atmospheric Composition – Virtual Constellation #18 Meeting*, remote (oral).

59. **B.C. McDonald** (2021). Developing near real-time emissions over the US during the COVID-19 pandemic, *American Geophysical Union Fall Meeting*, New Orleans, LA (oral).

58. **B.C. McDonald** (2021). Understanding the paths of surface ozone abatement in the Los Angeles basin, *American Geophysical Union Fall Meeting*, New Orleans, LA (oral).

57. **B.C. McDonald** (2021). Developing near real-time emissions over the US during the COVID-19 pandemic, *10$^{th}$ International Workshop on Air Quality Forecasting*, remote (oral).

56. **B.C. McDonald** (2021). Global Emissions Initiative: VOC Emissions Poster Summary, *International Global Atmospheric Chemistry Conference*, remote (oral).

55. **B.C. McDonald**, et al. (2021). Comprehensive airborne sampling to characterize GEO satellite observations and data products, *GEO-XO Atmospheric Composition Town Hall*, remote (oral).

54. **B.C. McDonald**, et al. (2020). Potential NOAA applications of TEMPO satellite observations. *TEMPO Early Adopters Meeting*, remote (oral).

53. Guevara, M., **B.C. McDonald**, T. Doumbia (2020). Quantifying COVID-19 transportation emission reductions: European, US, and global perspectives. *IGAC/AMIGO Workshop*, remote (oral).

52. **B.C. McDonald**, et al. (2020). COVID-Air Quality Study: U.S. Urban Air Quality during the COVID-19 Outbreak and Future Implications. *NASA Interagency COVID-AQ Meeting*, remote (oral).

51. **B.C. McDonald**, et al. (2020). Quantifying Mobile Source Nitrogen Oxides Emissions during the COVID-19 Pandemic. *Global Monitoring Annual Conference*, remote (oral).

50. **B.C. McDonald**, et al. (2020). COVID-19: Near Real-time Emissions Adjustments for Air Quality Forecasting and Long-Term Impact Analyses. *NOAA & Copernicus CAMS COVID-19 Workshop*, remote (oral).

49. Francoeur, C.**, **B.C. McDonald**, et al. (2020). Evaluating a Bottom-Up Inventory of Oil and Natural Gas with OMI and TROPOMI Satellite Retrievals. *American Meteorological Society Meeting*, Boston, MA (oral).

48. **McDonald, B.C.**, et al. (2020). Modeling Impacts of Energy and Non-Energy Related Sources on Urban Air Quality. *American Meteorological Society Meeting*, Boston, MA (oral).

47. **McDonald, B.C.**, et al. (2019). Evaluating a Bottom-Up Inventory of Oil and Natural Gas with OMI and TROPOMI Satellite Retrievals. *American Geophysical Union Fall Meeting*, San Francisco, CA (oral).

46. **McDonald, B.C.**, et al. (2019). Modeling Impacts on Secondary Organic Aerosol Formation from Volatile Chemical Products. *International Aerosol Modeling Algorithms Conference*, Davis, CA (oral).

45. **McDonald, B.C.**, et al. (2019). Quantifying Urban Emissions Influencing Wintertime Ammonium Nitrate Formation. *AQUARIUS Workshop*, Salt Lake City, UT (oral).

44. **McDonald, B.C.**, et al. (2019). New York City Air Quality in 2018 and Future Plans. *GOTHAMM Workshop*, Stony Brook, NY (oral).

43. **McDonald, B.C.**, et al. (2019). WRF-Chem Modeling of Summertime Ozone during the Long Island Sound Tropospheric Ozone Study. *Meteorology and Climate – Modeling for Air Quality Conference*, Davis, CA (oral).

42. **McDonald, B.C.**, et al. (2019). Evaluation of US Anthropogenic Emissions. *Copernicus Atmosphere Monitoring Service (CAMS) 81 Project Meeting*, Barcelona, Spain (oral).

41. **McDonald, B.C.**, et al. (2019). Updating a Fuel-Based Inventory of Vehicle Emissions for Chemical Transport Modeling during LISTOS 2018. *TEMPO Satellite Science Team Meeting*, Madison, WI (oral).

40. **McDonald, B.C.**, et al. (2019). Modeling Air Quality in the Weather Research and Forecasting with Chemistry Model for LISTOS 2018. *Long Island Sound Tropospheric Ozone Study Workshop*, Albany, NY (oral).

39. **McDonald, B.C.**, et al. (2019). Evaluating a Bottom-Up Inventory of Anthropogenic VOC Emissions with Field Measurements in New York City. *Long Island Sound Tropospheric Ozone Study Workshop*, Albany, NY (oral).

38. **McDonald, B.C.**, et al. (2019). Updating a Fuel-Based Inventory of Vehicle Emissions for Chemical Transport Modeling during LISTOS 2018. *Long Island Sound Tropospheric Ozone Study Workshop*, Albany, NY (oral).

37. **McDonald, B.C.**, et al. (2019). Detecting Human Emissions of Volatile Chemical Products in Urban Atmospheres. *NYSERDA Energy-Related Air Quality & Health Effects Workshop*, Albany, NY (oral).

36. **McDonald, B.C.**, et al. (2019). Evolutions in Urban Chemistry: Growing Influence of Non-Traditional Emission Sources. *Evolutions in Urban Chemistry Workshop*, Boulder, CO (oral).

35. **McDonald, B.C.**, et al. (2018). Evaluating a Bottom-Up Inventory of Volatile Chemical Products and Mobile Source Emissions with Field Measurements in New York City. *American Geophysical Union Fall Meeting*, Washington, DC (oral).

34. **McDonald, B.C.**, et al. (2018). Quantifying Non-Traditional Sources of SOA Precursors in US Cities. *EPASTAR – PM in a Changing World Meeting*, Research Triangle Park, NC (oral).

33. **McDonald, B.C.**, et al. (2018). Detecting Human Emissions of Volatile Chemical Products in Urban Atmospheres. *2018 Workshop for Development of Korean Air Quality Forecasting System*, Busan, South Korea (oral).

32. **McDonald, B.C.**, et al. (2018). Detecting Human Emissions of Volatile Chemical Products in Urban Atmospheres. *International Global Atmospheric Chemistry Conference*, Takamatsu, Japan (oral).

31. **McDonald, B.C.**, et al. (2018). Reconciling Ozone Precursor Emissions with Atmospheric Measurements in the South Coast Air Basin. *Coordinating Research Council Southern California Ozone Research Symposium*, Riverside, CA (oral).

30. **McDonald, B.C.**, et al. (2018). Chemical Product Emissions Emerging as Important Urban Source of Volatile Organic Compounds. *Air Quality Research Seminars & Discussion*, Washington, DC (oral).

29. **McDonald, B.C.**, et al. (2018). Volatile Chemical Products Emerging as Largest Petrochemical Source of Urban Organic Emissions. *Health Effects Institute Annual Conference*, Chicago, IL (poster).

28. **McDonald, B.C.**, et al. (2017). Volatile Chemical Products Emerging as Largest Petrochemical Source of Urban Organic Emissions. *International Aerosol Modeling Algorithms Conference*, Davis, CA (oral).

27. **McDonald, B.C.**, et al. (2017). Reconciling Transportation Emissions of Nitrogen Oxides with Earth Observations and Models. *Northeast States for Coordinated Air Use Management (NESCAUM) Monitoring Meeting*, Norrie Point Environmental Center, NY (oral).

26. **McDonald, B.C.**, et al. (2017). Volatile Chemical Products Emerging as Largest Petrochemical Source of Urban Organic Emissions. *Health & Air Quality Applied Sciences Team (HAQAST) 3 Public Meeting*, Lamont-Doherty Earth Observatory, NY (oral).

25. **McDonald, B.C.**, et al. (2017). Modeling Ozone in the Eastern U.S. using a Fuel-Based Mobile Source Emissions Inventory. *Community Modeling and Analysis System (CMAS) Conference*, Chapel Hill, NC (oral).

24. **McDonald, B.C.**, et al. (2017). Volatile Chemical Products Emerging as Largest Petrochemical Source of Urban Organic Emissions. *18th Global Emissions Initiative (GEIA) Conference*, Hamburg, Germany (oral).

23. **McDonald, B.C.**, et al. (2017). Modeling Ozone in the Eastern U.S. using a Fuel-Based Mobile Source Emissions Inventory. *EPA International Emissions Inventory Conference*, Baltimore, MD (oral).

22. **McDonald, B.C.**, et al. (2017). Volatile Chemical Products Emerging as Largest Fossil-Source of Organics over U.S. Cities. *EPA International Emissions Inventory Conference*, Baltimore, MD (oral).

21. **McDonald, B.C.**, et al. (2017). Developing a Fuel-Based Inventory of Oil and Natural Gas Emissions. *EPA International Emissions Inventory Conference*, Baltimore, MD (oral).

20. **McDonald, B.C.**, et al. (2017). Assessing Current Gaps in Transportation Emissions and Modeling their Effects on Air Quality. *New York City Metro Energy and Air Quality Data Gaps Workshop*, New York City, NY (oral).

19. **McDonald, B.C.**, et al. (2017). Developing Fuel-Based Inventories of Mobile Source and Oil & Gas Emissions for Colorado. *Front Range Air Pollution and Photochemistry Experiment (FRAPPÉ) Science Team Meeting*, Boulder, CO (oral).

18. **McDonald, B.C.**, et al. (2017). Development of a Fuel-Based National Transportation Inventory for Air Quality Forecasting. *NASA Health & Air Quality Applied Sciences Team (HAQAST) 2 Public Meeting*, Seattle, WA (oral).

17. DuRant, J.**, **B.C. McDonald**, et al. (2017). Developing a U.S. Transportation Emissions Inventory for Long-Term Chemistry-Climate Models. *American Meteorological Society Annual Meeting*, Seattle, WA (poster).

16. **McDonald, B.C.**, et al. (2016). Quantifying Volatile Organic Compound Emissions from Solvents and their Impacts on Urban Air Quality. *American Geophysical Union Fall Meeting*, San Francisco, CA (invited talk).

15. **McDonald, B.C.**, et al. (2016). Using Observations to Constrain Volatile Organic Compound Emissions for Urban Air Quality Modeling. *Faraday Discussion: Chemistry in the Urban Atmosphere*, London, UK (poster).

14. **McDonald, B.C.**, et al. (2015). Modeling Ozone in the Eastern United States Using a Fuel-Based Mobile Source Emissions Inventory. *American Geophysical Union Fall Meeting*, San Francisco, CA (oral).

13. Gorchov-Negron, A.**, **B.C. McDonald**, et al. (2015). A Spatially Resolved Fuel-Based Inventory of U.S. Oil and Natural Gas Emissions. *American Geophysical Union Fall Meeting*, San Francisco, CA (poster).

12. **McDonald, B.C.**, et al. (2015). Long-Term Air Quality Modeling of the Los Angeles Basin. *17th Global Emissions Initiative (GEIA) Conference*, Beijing, China (oral).

11. **McDonald, B.C.**, et al. (2015). A Spatially Resolved Fuel-Based Inventory of Utah and Colorado Oil and Natural Gas Emissions. *Spring 2015 Measurements in Oil and Gas Production Regions Data Workshop*, Boulder, CO (oral).

10. **McDonald, B.C.**, A.H. Goldstein, R.A. Harley (2015). Long-Term Trends in California Mobile Source Emissions and Ambient Concentrations of Black Carbon and Organic Aerosol. *11th International Conference on Carbonaceous Particles in the Atmosphere*, Lawrence Berkeley National Laboratory, Berkeley, CA (oral).

9. **McDonald, B.C.**, et al. (2015). Long-Term Trends in Mobile Source Emissions and Urban Air Quality. *Southeast Modeling Workshop*, Princeton, NJ (oral).

8. **McDonald, B.C.**, S.W. Kim, S.A. McKeen, G.J. Frost, M. Trainer (2015). Long-Term Trends in Mobile Source Emissions and Urban Air Quality. *U.S. EPA 21st International Emission Inventory Conference*, San Diego, CA (oral).

7. **McDonald, B.C.**, et al. (2014). Reconciling Long-Term Trends in Air Quality with Bottom-Up Emission Inventories for Los Angeles. *American Geophysical Union Fall Meeting*, San Francisco, CA (oral).

6. **McDonald, B.C.** and R.A. Harley (2014). Evolution of Motor Vehicle Emissions over Multi-Decadal Time Scales. *16th Global Emissions Initiative (GEIA) Conference*, Boulder, CA (oral).

5. **McDonald, B.C.**, T.W. Kirchstetter, A.H. Goldstein, R.A. Harley (2013). Trends in Motor Vehicle Emissions in Relation to Ambient Concentrations of Particulate Black and Organic Carbon. *American Geophysical Union Fall Meeting*, San Francisco, CA (oral).

4. **McDonald, B.C.** and R.A. Harley (2012). High Resolution Mapping of Gaseous Pollutants from On-road Vehicles in Four Major US Metropolitan Areas. *American Geophysical Union Fall Meeting*, San Francisco, CA (oral).

3. **McDonald, B.C.** and R.A. Harley (2012). Long-Term Trends in Motor Vehicle Emissions of Gaseous Pollutants in the USA, 1990-2010. *International Global Atmospheric Chemistry Conference*, Beijing, China (oral).

2. **McDonald, B.C.**, E.W. Martin, R.A. Harley (2012). Spatial and Temporal Patterns of Truck Traffic in California: Analysis and Evaluation of Statewide Weigh-in-Motion and Census Station Truck Count Data. *Transportation Research Board 91st Annual Meeting*, Washington, DC (poster).

1. **McDonald, B.C.** and R.A. Harley (2011). Spatial and Temporal Patterns of On-road Diesel Truck Emissions in California. *American Geophysical Union Fall Meeting*, San Francisco, CA (oral).

## Public Outreach & Lectures

3. ***NOAA Earth System Research Laboratory*** (2019). Surprising Air Pollutants. Hendrix College Student Visit, Boulder, CO.

2. ***NOAA Earth System Research Laboratory*** (2019). Surprising Air Pollutants. Boulder High School AP Environmental Science Student Visit, Boulder, CO.

1. ***Gunbarrel Brewing Company*** (2018). Deodorant, Cleaning Products, & the Virtue of Smelling Bad. *Science on Tap Seminar Series*, Boulder, CO.

## Professional Development & Service

Global Emissions Initiative (GEIA) Co-Chair, 2022-present
Global Emissions Initiative (GEIA) Scientific Steering Committee, 2020 - present
Associate Editor of Journal of Geophysical Research-Atmospheres, 2020 – present
USGEO Satellite Needs Working Group Atmospheric Composition Panel, 2021
Summer Institute for Preparing Future Faculty, UC Berkeley, 2013
Faculty Search in Smart Cities-Student Subcommittee, UC Berkeley, 2013
Engineer in Training Certificate, 2008

Reviewer for: *Nature (1), Nature Geoscience (1)*, *Nature Communications (1)*, *Proceedings of the National Academy of Sciences (2)*, *Environmental Science & Technology, Journal of Geophysical Research-Atmospheres, Atmospheric Chemistry & Physics*, *Journal of Hazardous Materials*, *Elementa: Science of the Anthropocene*.

Reviewer of proposals for: *NASA ROSES (2), NASA RRNES, NSF, UKRI NERC (United Kingdom), NSF (Switzerland), DFG (Germany)*.

Conference or session organizer for:
4. American Geophysical Union Fall Meeting 2021, New Orleans, LA (online).
3. American Geophysical Union Fall Meeting 2020, San Francisco, CA (online).
2. Atmospheric Chemical Mechanisms Conference 2020, Davis, CA (online).
1. American Association for Aerosol Research 2020 (online).

## Public Service

**Commissioner**, appointed by Mayor Tom Bates, 2010-13 (Chair: 2011-13)
Community Environmental Advisory Commission, City of Berkeley

- Co-sponsor on following reports to City Council: Joint Report on Diesel Spill at University of California Stanley Hall (2012), Comply with Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act (CEQA) Guidelines (2011).
- Torkelson, A. and **B. McDonald** (10/26/2012). "Protect the infrastructure in the city from further damage." *The Daily Californian (UC Berkeley's Newspaper)*, op-ed in support of General Obligation Bond for Streets and Related Watershed Improvements (City of Berkeley Ballot Measure M).

## Professional Experience

**Policy Consultant**, San Francisco Public Utilities Commission, 2010-11

- Designed an environmental enhancement surcharge to incentivize and fund water conservation projects.

**Policy Consultant**, California Public Utilities Commission, 2010

- Designed a statewide public goods charge to fund projects that reduce energy consumption and greenhouse gas emissions in water supply and distribution.

**Intern**, Camp, Dresser, and McKee, 2004-06, 2008

- Ran hydraulic, hydrology, and water forecasting models.