

DANIEL BON, *PhD*

curriculum vitae

Arvada, Colorado ♦ 626-773-0606 ♦ dbon@carbonmapper.org ♦ [linkedin.com/in/daniel-bon](https://www.linkedin.com/in/daniel-bon)

Environmental Science & Policy Leader

Accomplished, innovative, and energetic program and project management leader with diverse experience in air quality, measurements, science programs and policy. Seasoned in creating strategies that support the role of science in policy decision-making. Proven track record of collaborating across all organization levels, with external stakeholders and industry leaders to gather information, build consensus, and develop key initiatives.

Areas of expertise:

Scientific Research & Instrumentation ♦ Environmental Program Project Management
Air Toxics ♦ Air Quality Measurements & Program Development ♦ Operations and Budgeting
Legislative Implementation ♦ Hiring and Staff Development

EDUCATION

UNIVERSITY OF COLORADO, Boulder, CO

PhD- Analytical/Atmospheric Chemistry, 2011

WESTERN WASHINGTON UNIVERSITY, Bellingham, WA

MASTER OF SCIENCE- Marine & Environmental Sciences, 1999

CARLETON COLLEGE, Northfield, MN

BACHELOR OF ARTS – Chemistry, 1990

RECENT EXPERIENCE

Colorado Department of Public Health and Environment

SUPERVISOR, AIR TOXICS MEASUREMENT AND SPECIAL PROJECTS UNIT (2021-present)

Supervised the development, purchase, staffing and operation of 3 mobile labs, a ground monitoring network for ozone precursors and air toxics, and a network of PID sensors used near oil and gas development. Provided technical expertise to various policy related efforts related to the implementation of two bills passed by the Colorado Legislature (HB21-1189 and HB22-1244). Participated in multimillion dollar budgeting activities. Wrote Requests for Proposal documents to solicit contractor bids for various projects. Supervised 6 direct reports.

AIR MONITORING SPECIAL PROJECT DEVELOPMENT & MANAGEMENT (2018-2021)

- Proposed and received grants of \$1.8M for second CDPHE mobile lab and 2 staff
- Proposed and received grants for \$2.7M 2021Methane and VOC Aerial Survey, managed grant proposals, planning and oversaw survey effort for methane and ethane along the front range of Colorado.
- Advisor to \$2M Satellite Methane Study conducted by Environment & Energy Lab, University of Chicago.
- Spearheaded development and implementation of SPOD technology (2017-2020)

MOBILE LABORATORY LEAD SCIENTIST (2016 – 2022)

Oversaw the building of a gas chromatography-based mobile environmental health lab with a construction budget of \$350K. Conducted daily operations, strategic planning, deployment logistics and public outreach efforts. Secured funding to recruit, hire, supervise and train a key data analysis team member. Collaborate with environmental and technical teams to advance initiatives.

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Colorado Department of Public Health & Environment, continued

AIR QUALITY PLANNER (2013 – 2016)

Work on State Implementation Planning efforts, authored technical analyses and documents, coordinated ground deployments for mobile labs during a major air quality field study with NASA and NCAR.

- Worked on a variety of planning and policy activities including Oil and Gas rulemaking, Rocky Mountain National Park, Regional Haze, others.
- Supported FRAPPE study efforts by giving presentations to a variety of stakeholders, media representatives, attending science meetings, and aided in data collection efforts.
- Collaborated with staff subject matter experts and regional planning groups to build inventories, conduct research, and draft reports in support of policy requirements and rulemaking initiatives.
- Led environmental industry working groups to discuss policy changes related to oil and gas emissions.
- Authored region haze 5 year update plan; presented American Geophysical Union meeting.

PHYSICAL SCIENCE RESEARCHER, Modeling Group (2011 – 2012)

Collaborated with an environmental team from Colorado, Wyoming, and Utah to facilitate a three-state study development. Contributed to emission inventory improvement and supported air quality modeling efforts across 3 states. Attended modeling training and other state, regional, and federal workshops.

University of Colorado, Boulder & NOAA Chemical Sciences Division

GRADUATE RESEARCH ASSISTANT (2005-2011)

Conducted field and laboratory research in Atmospheric Chemistry in the group of Dr. Joost DeGouw. Successfully operated mass spectrometry and gas chromatography instruments in a variety of remote field environments including on board ships. Responsible for the data products from collection to publication.

Western Washington University, Bellingham, WA

GRADUATE RESEARCH ASSISTANT (1995-1999)

Conducted research into the remote sensing of coral reefs. Collected underwater spectroscopic measurements in the Florida Keys and assessed their usefulness in detecting climate-induced changes in coral reef environments.

RESEARCH & FIELD CAMPAIGNS

HEALTH EFFECTS INSTITUTE (HEI) (2021-present)

Collaborator, data collection, for Oil and Gas Health Effects study effort coordinated by Jeff Collett, Colorado State University. <https://www.healtheffects.org/>

COORDINATOR, COLORADO COMBINED CAMPAIGN (C3) (2020-present)

Coordinated funding and grant awards for aerial field campaign focused on methane emissions, basin-wide mass balance of methane and VOCs, emissions modeling. Oversaw logistics for group of researchers for CSU, CU, UMD, Carbon Mapper, and Scientific Aviation.

OIL AND GAS HEALTH INFORMATION AND RESPONSE (OGHIR) PROGRAM (2016-present)

Founding member of interdepartmental program between CDPHE's Air Pollution Control Division and Toxicology and Environmental Epidemiology Office, which responds to health complaints related to oil and gas development in Colorado. Created in response to the Governor's oil and gas task force.

<https://cdphe.colorado.gov/health/oil-and-gas-and-your-health>

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RESEARCH & FIELD CAMPAIGNS, continued

Front Range Air Pollution and Photochemistry Experiment (FRAPPE) (2014)

Coordinated ground operations for mobile and ground sites for FRAPPE and Discover AQ Colorado field campaigns including 3 mobile labs and 6 ground sites. Served on selection committee to award \$2M in research funding, coordinated science meetings and reviewed research and publications.

https://www.eol.ucar.edu/field_projects/frappe

CDPHE Innovation Grant Program

School Idling Study, Recipient (2019-2021)

Cannabis Growhouse Study, Technical Advisor (2018-2020)

Graduate Student Atmospheric Field Work (2005-2010)

CalNex (2010), **FLAME III** (2009) **BearPex** (2007), **TexAQS** (2006), **MILAGRO** (2006), collected ground and ship-based measurements using GC-FID and PTR-MS instruments.

Instrumental Analysis & Techniques

PTR-MS, GC-MS, GC-FID, Cavity Ring Down Spectroscopy, DOAS, meteorology, among others. Familiar with regulatory monitoring equipment for ozone, NO_x, and PM. Proficient in Igor Pro, Excel and other data processing software.

TEACHING

Pacific Collegiate School, Santa Cruz, CA

HIGH SCHOOL SCIENCE TEACHER (1999-2004)

Delivered instruction in a startup college preparatory charter school setting. Designed and delivered a comprehensive science curriculum and built a school laboratory building with a budget of less than \$200K.

- Played a role in enabling Pacific Collegiate to achieve a reputation as one of the most successful charter schools in the United States.

GRADUATE TEACHING ASSISTANT, UNIVERSITY OF COLORADO, BOULDER (2004-2005)

Responsible for teaching laboratory courses for Chemistry for Engineers and Environmental Chemistry courses at the University of Colorado, Boulder. Participated in curriculum development, graded papers and supervised examinations.

SCIENCE INSTRUCTOR, GUIDED DISCOVERIES, INC. (1991-1996)

Organized and taught hands-on classes in Marine, Physical, Earth and Environmental Sciences. Coordinated programs for groups of up to 250. Taught SCUBA and Underwater Photography.

TEACHING ASSISTANT, CARLETON COLLEGE (1987-1990 & 1994)

Served as a college-level teaching assistant for a field biology/marine biology program and for a variety of undergraduate chemistry courses.

AWARDS, VOLUNTEER & PROFESSIONAL DEVELOPMENT

Co-chair WESTAR Technical Committee, 2019-2021

RIHEL Advanced Leadership Training Program, 2020

Native Plant Master, CSU Extension, 2022

Supervisory Certificate Program, State of Colorado, 2018

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AWARDS, VOLUNTEER & PROFESSIONAL DEVELOPMENT, continued

ECOS State Air Innovation Award, 2017
CDPHE Employee STAR Award, 2014 & 2017
EPA Graduate STAR Fellowship Recipient, 2008-2011
International Wildlife Photographer of the Year, Finalist, 1998

SELECTED INVITED SPEAKING ENGAGEMENTS

University of Colorado Chemistry Seminar, 2022
Carleton College Chemistry Seminar, 2020
NCAR Atmospheric Chemistry Seminar, 2019
Hendrix College, Undergraduate Research Seminar 2017-2021
NOAA Research Update, Rocky Mountain NP Agriculture Subcommittee, January 2015
FRAPPE Study update, Colorado Air Quality Control Commission, Sept. 2014
Methane Inventory Update, Colorado Air Quality Control Commission, Sept. 2013
CIRES Graduate Student Association, University of Colorado, Dec. 2008.
Chemical Ionization Mass Spectrometry Group Meeting, NOAA Chem. Sci. Division, Oct. 2008.
Analytical Chemistry Seminar, University of Colorado, March, 2007 & November, 2005.

PROFESSIONAL PUBLICATIONS

FIRST AUTHOR

- Bon, D., de Gouw, J. A., Warneke, C., et al. Measurements of Volatile Organic Compounds at a Suburban Ground Site (T1) in Mexico City during the MILAGRO 2006 Campaign: Measurement Comparison, Emission Ratios, and Source Attribution, *Atmos. Chem. Phys. Discuss.* 10, 23229–23286, 2010.
- Bon, D., de Gouw, JA, Gilman, J., Kuster, W., Lerner, B., Williams, E., Frost, G., Tucker, S., Evaluation of the Industrial Point Source Emission Inventory for the Houston Ship Channel Area Using Ship-Based, High Time Resolution Measurements of Volatile Organic Compounds. Published as part of my Dissertation, manuscript prepared as part of dissertation.
- Bon, D. Measurement of Atmospheric Volatile Organic Compounds from Urban, Industrial and Biogenic Sources by Proton-Transfer Ion Trap Mass Spectrometry. PhD Dissertation, CU Scholar website: http://scholar.colorado.edu/cgi/viewcontent.cgi?article=1035&context=chem_gradetds
- Regional Haze State Implementation Plan Colorado Regional Haze Plan 5-Year Progress Report. 2015. https://www.colorado.gov/pacific/sites/default/files/AP_RegionalHaze5-yrReport-AppendixE.pdf

CONTRIBUTING AUTHOR, PEER REVIEWED

- Mead, G.J., Waxman, E.M., et al., Open-path dual-comb spectroscopy of methane and VOC emissions from an unconventional oil well development in Northern Colorado, 2023. <https://doi.org/10.3389/fchem.2023.1202255>
- Flocke, F., Pfister, G., et al., Air Quality in the Northern Colorado Front Range Metro Area: The Front Range Air Pollution and Photochemistry Experiment (FRAPPÉ), 2019. <https://doi.org/10.1029/2019JD031197>
- Kille, N., Chiu, R., et al., Separation of Methane Emissions From Agricultural and Natural Gas Sources in the Colorado Front Range, 2019. <https://doi.org/10.1029/2019GL082132>

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CONTRIBUTING AUTHOR, PEER REVIEWED, continued

- McMullin, T.S., Bamber, A.M., Bon, D, et al. Exposures and Health Risks from Volatile Organic Compounds in Communities Located near Oil and Gas Exploration and Production Activities in Colorado (U.S.A.) *Int. J. Environ. Res. Public Health* 2018, 15(7), 1500; <https://doi.org/10.3390/ijerph15071500>
- Townsend-Small, A. et al, Using stable isotopes of hydrogen to quantify biogenic and thermogenic atmospheric methane sources: A case study from the Colorado Front Range, *Geophysical Research Letters* Volume 43, Issue 21, 16 November 2016, Pages 11,462–11,471
- Status Report to the Colorado State Legislature, Oil and Gas Health Information and Response Program <https://www.colorado.gov/pacific/cdphe/categories/services-and-information/environment/oil-and-gas/oil-and-gas-and-your-health>
- Riedel, T.P., Wolfe, G.M., et al., An MCM modeling study of nitryl chloride (ClNO₂) impacts on oxidation, ozone production and nitrogen oxide partitioning in polluted continental outflow, *Atmos. Chem. Phys.*, 14, 3789–3800, 2014. <https://doi.org/10.5194/acp-14-3789-2014>
- Ortega, A.M., Day, D.A. Day, et al. 1,Secondary organic aerosol formation and primary organic aerosol oxidation from biomass-burning smoke in a flow reactor during FLAME-3 *Atmos. Chem. Phys.*, 13, 11551–11571, 2013 <http://www.atmos-chem-phys.net/13/11551/2013/>
doi:10.5194/acp-13-11551-2013
- Wagner, N.L., et al. The sea breeze/land breeze circulation in Los Angeles and its influence on nitryl chloride production in this region 10.1002/jgrd.50490, *JGR Atmospheres* Volume 118, Issue 12, 27 June 2013 Pages 6750–6763
- Gaston, C.J., Quinn, P.K., et al., The impact of shipping, agricultural, and urban emissions on single particle chemistry observed aboard the R/V *Atlantis* during CalNex *Journal of Geophysical Research* 118, 10 5003–5017, 2013. <https://doi.org/10.1002/jgrd.50427>
- Riedel, T.P., Bertram, T.H., et al. , Nitryl Chloride and Molecular Chlorine in the Coastal Marine Boundary Layer *Environ. Sci. Technol.*, 2012, 46 (19), pp 10463–10470
- Angevine, W.M., Brioude, J., et al., Pollutant transport among California regions *JGR Atmospheres* Volume 117, Issue D21 16 November 2012 <https://doi.org/10.1002/jgrd.50490>
- Sommariva, R., Bates, T.S., Bon, D. *et al.* Modelled and measured concentrations of peroxy radicals and nitrate radical in the U.S. Gulf Coast region during TexAQS 2006. *J Atmos Chem* 68, 331–362 (2011). <https://doi.org/10.1007/s10874-012-9224-7>
- Sommariva, R., Brown, S. S., et. al.: Ozone production in remote oceanic and industrial areas derived from ship based measurements of peroxy radicals during texaqs 2006, *Atmos. Chem. Phys.*, 11, 2471–2485, 10.5194/acp-11-2471-2011, 2011.
- Washenfelder, R.A. et. al, The glyoxal budget and its contribution to organic aerosol for Los Angeles, California, during CalNex 2010 *JGR Atmospheres* 28 October 2011 DOI: 10.1029/2011JD016314
- Apel, E. C., Emmons, L. K., et al. Chemical evolution of volatile organic compounds in the outflow of the Mexico city metropolitan area, *Atmospheric Chemistry And Physics*, 10, 2353–2375, 2010.
- Bouvier-Brown, N.C., Goldstein, A.H., et al. Methyl chavicol: characterization of its biogenic emission rate, abundance, and oxidation products in the atmosphere *Atmos. Chem. Phys.*, 9, 2061–2074, 2009 <http://www.atmos-chem-phys.net/9/2061/2009/> doi:10.5194/acp-9-2061-2009
- de Gouw, J. A., Welsh-Bon, D., et al.: Emission and chemistry of organic carbon in the gas and aerosol phase at a sub-urban site near Mexico City in March 2006 during the Milagro study, *Atmos. Chem. Phys.*, 9, 3425–3442, 2009.

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CONTRIBUTING AUTHOR, PEER REVIEWED, continued

Fast, J., Aiken, A., et. al.: Evaluating simulated primary anthropogenic and biomass burning organic aerosols during milagro: Implications for assessing treatments of secondary organic aerosols, *Atmos. Chem. Phys.*, 9, 6191-6215, 2009.

Veres, P., Roberts, J. M., et al. Development of negative-ion proton-transfer chemical-ionization mass spectrometry (ni-pt-cims) for the measurement of gas-phase organic acids in the atmosphere, *International Journal of Mass Spectrometry*, 274, 48-55, 10.1016/j.ijms.2008.04.032, 2008.

SELECTED POSTER PRESENTATIONS

Mobil Lab Monitoring of Volatile Organic Compounds (VOCs) near an active suburban Oil and Natural Gas drilling site in Erie, CO. Poster presentation, American Geophysical Union Conference, December 2018. Primary Author.

An energizing new program to address public health concerns of oil and gas development in Colorado, Poster presentation, McMullin et. al, 2017, Health Effects Institute Conference, 2017. Contributing author.

Colorado State Emissions Inventory Trends 2000-2011 and relevance to the FRAPPE/Discover-AQ Studies American Geophysical Union Fall Conference December 2015. Primary author.

<https://agu.confex.com/agu/fm15/preliminaryview.cgi/Paper80244.html>

Evaluation of the Industrial Point Source Emission Inventory for the Houston Ship Channel Area Using Ship-Based, High Time Resolution Measurements of Volatile Organic Compounds. American Geophysical Union Fall Conference, December, 2010. Primary author.

Proton-Transfer Reaction Ion Trap Mass Spectrometry (PIT-MS): Instrumental Improvements and Applications in Atmospheric Field Measurement. American Association of Mass Spectrometry Conference, Denver, May, 2008. Primary author.

VOC Emission Ratios and Source Apportionment at a Suburban Ground Site (T1) in Mexico City during the MILAGRO 2006 Campaign AGU Dec. 2007. Primary author.

Online VOC measurements using Proton Transfer Reaction Ion Trap Mass Spectrometry on the Ronald Brown during TexAQS 2006 and TexAQS Campaign Rapid Science Synthesis Meeting, May 2007. Primary author.

Ponderosa Pine Forest Volatiles: Comparison of PTR-MS and PIT-MS Measurements. AGU Dec. 2005. Also presented at iLeaps conference, Boulder, CO. February 2006. Primary author.

PROFESSIONAL ORGANIZATIONS

American Geophysical Union (AGU)
American Chemical Society (ACS)
American Association for the Advancement of Science (AAAS)
Air and Waste Management Associations (AWMA)

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Scientific Field Campaigns:

- 2014 **FRAPPE** (*Front Range Air Pollution and Photochemistry Experiment*) and 2014 NASA Discover-AQ Study. Served on proposal funding panel, helped coordinate ground measurements and mobile lab operations during these studies.
- 2010 **CalNEX** (*Research at the Nexus of Air Quality and Climate Change*) Ship-based measurement of urban outflow on the California coast from the R/V Atlantis.
- 2009 **FLAME III** (*Fire Lab at Missoula Experiment*). U.S. Department of Agriculture (*USDA*) Fire Sciences Laboratory (*FSL*), Missoula, MT: Fire chamber studies of VOC dilutions and aging.
- 2007 **BEARPEX** (Biosphere Effects on Aerosols and Photochemistry Experiment) Blodgett Forest Research Station, CA. Interactions between biogenic emissions and urban pollution.
- 2006 **TexAQS** (Texas Air Quality Study) Houston, TX. Ship based measurement of industrial VOC emissions.
- 2006 **MILAGRO** (the Megacity Initiative: Local and Global Research Observations). Mexico City. VOC emissions, source-apportionment and processing in a Megacity.