Curriculum Vitae

**Daniel A. Jaffe**

University of Washington Bothell

18115 Campus Way NE

Bothell, WA 98011-8246

Tel: 425-352-5357

Fax: 425-352-5233

Email: djaffe@uw.edu

http://blogs.uw.edu/djaffe

**Education**

Ph.D. Chemistry, June 1987, University of Washington; graduate work in inorganic, analytical and atmospheric chemistry, atmospheric sciences, environmental sciences and policy.

M.S. Chemistry, December 1983, University of Washington

B.S. Chemistry, February 1979, Massachusetts Institute of Technology

**Professional Experience**

Professor and Chair, School of STEM, Physical Sciences Division, University of Washington Bothell, Sept 1997-present. (Chair from 2013-2022).

Professor, Atmospheric Sciences, University of Washington Seattle, Sept 2010-present.

Professor of Chemistry--University of Alaska Fairbanks, Department of Chemistry/Geophysical Institute, Sept. 1987 – Sept.1997

Teaching Assistant/Instructor, University of Washington, September 1982 – March 1987.

Teacher, North Andover High School, North Andover, MA, September 1979 - June 1981.

Editor-In-Chief, Aerosol and Air Quality Research, December 2015-present.

**Research**

The main themes of my research are on global and regional air pollution and long range transport of pollution (especially ozone, nitrogen oxides, CO, aerosols, and mercury). I am also interested in science and environmental education.

**Honors and awards**

Elected to the Washington State Academy of Sciences (July 2021). Selected for National Academy of Sciences panel on "The Significance of International Transport of Air Pollutants" BASC-U-07-01-A, National Academy of Sciences/National Research Council. June 2008. Chapter lead for chapters on ozone and mercury for UNEP-HTAP 2007 report. Named the Fulbright Distinguished Chair in Environmental Sciences at Parthenope University of Naples for 2014. First UW-Bothell Distinguished Research, Scholarship, and Creative Activity Award (DRSCA) given in 2014. Selected as scientific expert/advisor for EPA Clean Air Science Advisory Committee (CASAC) in 2020.

**Synergistic activities:**

* **Lead and contributing author for numerous reviews and assessments on ozone, mercury and smoke impacts on U.S. air quality.**
* **Participant and chapter lead for National Academy of Sciences study on global air pollution.**
* **Development of new analytical methods to measure atmospheric Hg(II) compounds.**
* **Development of new metrics to quantify smoke impacts on air quality in the western U.S.**
* **Development of new methods to quantify ozone impacts from wildfires in the western U.S.**
* **Elected to the Washington State Academy of Sciences in 2021.**

**Key Discoveries and accomplishments**

* **Over 200 scientific papers and reports; h-index of 72 (Google scholar).**
* **Principal investigator on more than 31 projects (total >$9 million) with funding from NSF, EPA, NOAA, NASA, USGS and industry and NGOs.**
* **Lead and contributing author for numerous reviews and assessments on ozone, mercury and smoke impacts on U.S. air quality.**
* **Discovery of transport of Asian air pollution to North America.**
* **Establishment and long-term operation of the Mt. Bachelor Observatory, the only long-term high elevation atmospheric chemistry research site on the west coast of the U.S.**
* **Participant and chapter lead for National Academy of Sciences study on global air pollution.**
* **Development of new analytical methods to measure atmospheric Hg(II) compounds.**
* **Identification of a significant under-estimate of mercury emissions from Asia.**
* **Development of new metrics to quantify smoke impacts on air quality in the western U.S.**
* **Development of new methods to quantify ozone impacts from wildfires in the western U.S.**

**Peer-Reviewed Publications**

1. Jin, L., Permar, W., Selimovic, V., Ketcherside, D., Yokelson, R. J., Hornbrook, R. S., Apel, E. C., Ku, I.-T., Collett Jr., J. L., Sullivan, A. P., Jaffe, D. A., Pierce, J. R., Fried, A., Coggon, M. M., Gkatzelis, G. I., Warneke, C., Fischer, E. V., and Hu, L.: Constraining emissions of volatile organic compounds from western US wildfires with WE-CAN and FIREX-AQ airborne observations, Atmos. Chem. Phys., 23, 5969–5991, https://doi.org/10.5194/acp-23-5969-2023, 2023.
2. Chang, K.-L., Cooper, O. R., Rodriguez,G., Iraci, L. T., Yates, E. L., Johnson,M. S.,Jaffe, D.A. et al. Diverging ozone trends above western North America: Boundary layer decreases versus free tropospheric increases. *Journal of Geophysical Research: Atmospheres*, *128*, e2022JD038090. <https://doi.org/10.1029/2022JD038090>, 2023.
3. Jaffe, D., Miller, C., Thompson, K., Nelson, M., Finley, B., Ouimette, J., and Andrews, E.: An evaluation of the U.S. EPA’s correction equation for Purple Air Sensor data in smoke, dust and wintertime urban pollution events, Atmos. Meas. Tech. 16, 1311–1322, <https://doi.org/10.5194/amt-16-1311-2023>, 2023.
4. May, N. W., Bernays, N., Farley, R., Zhang, Q., and Jaffe, D. A.: Intensive aerosol properties of boreal and regional biomass burning aerosol at Mt. Bachelor Observatory: larger and black carbon (BC)-dominant particles transported from Siberian wildfires, Atmos. Chem. Phys., 23, 2747–2764, <https://doi.org/10.5194/acp-23-2747-2023>, 2023.
5. Marsavin A., van Gageldonk R., Bernays N., May N.M., Jaffe D.A., and Fry J.L. Optical properties of biomass burning aerosol during the 2021 Oregon fire season: comparison between wild and prescribed fires. Environ. Sci.: Atmos. <http://dx.doi.org/10.1039/D2EA00118G>, 2023.
6. Warneke, C., Schwarz, J. P., Dibb, J., Kalashnikova, O., Frost, G., Al-Saad, J., Jaffe D.A. et al. Fire influence on regional to global environments and air quality (FIREX-AQ). Journal of Geophysical Research: Atmospheres, 128, e2022JD037758. <https://doi.org/10.1029/2022JD037758>, 2023.
7. Ninneman M, Petropavlovskikh I, Effertz P, Chand D, Jaffe D. Investigation of the Parameters Influencing Baseline Ozone in the Western United States: A Statistical Modeling Approach. Atmosphere. 13(11):1883. <https://doi.org/10.3390/atmos13111883>, 2022.
8. Sedlacek A.J. Lewis E.R., Onasch T.B., Zuidema P., Redemann J., Jaffe D, and Kleinman L.I. Using the Black Carbon Particle Mixing State to Characterize the Lifecycle of Biomass Burning Aerosols. Environmental Science & Technology, 56 (20), 14315-14325 DOI: 10.1021/acs.est.2c03851, 2022.
9. Jaffe, D. A., Schnieder, B., and Inouye, D.: Technical note: Use of PM2.5 to CO ratio as an indicator of wildfire smoke in urban areas, Atmos. Chem. Phys., 22, 12695–12704, https://doi.org/10.5194/acp-22-12695-2022, 2022.
10. Jaffe, D. A., Ninneman, M., & Chan, H. C. NOx and O3 trends at U.S. non-attainment areas for 1995–2020: Influence of COVID-19 reductions and wildland fires on policy-relevant concentrations. Journal of Geophysical Research: Atmospheres, 127, e2021JD036385. <https://doi.org/10.1029/2021JD036385>, 2022.
11. Bernays, N., Jaffe, D. A., Petropavlovskikh, I., and Effertz, P.: Comment on “Comparison of ozone measurement methods in biomass burning smoke: an evaluation under field and laboratory conditions” by Long et al., Atmos. Meas. Tech., 15, 3189–3192, https://doi.org/10.5194/amt-15-3189-2022, 2022.
12. Farley R., Bernays N., Jaffe D.A., Ketcherside D., Hu L,. Zhou S., Collier S and Zhang Q. Persistent Influence of Wildfire Emissions in the Western United States and Characteristics of Aged Biomass Burning Organic Aerosols under Clean Air Conditions. Environ. Sci. Technol. 56, 6, 3645–3657, <https://doi.org/10.1021/acs.est.1c07301>, 2022.
13. Lee H-J, Chang L-S, Jaffe DA, Bak J, Liu X, Abad GG, Jo H-Y, Jo Y-J, Lee J-B, Yang G-H, Kim J-M, Kim C-H. Satellite-Based Diagnosis and Numerical Verification of Ozone Formation Regimes over Nine Megacities in East Asia. Remote Sensing. 2022; 14(5):1285. <https://doi.org/10.3390/rs14051285>, 2022.
14. Ninneman M and Jaffe D. The impact of wildfire smoke on ozone production in an urban area: Insights from field observations and photochemical box modeling. Atmos.Envir. 267 118764. <https://doi.org/10.1016/j.atmosenv.2021.118764>, 2021.
15. Ninneman M, Jaffe D. Observed Relationship between Ozone and Temperature for Urban Nonattainment Areas in the United States. Atmosphere. 12(10):1235. <https://doi.org/10.3390/atmos12101235>, 2021.
16. May, N.W., Dixon, C., Jaffe, D.A. Impact of Wildfire Smoke Events on Indoor Air Quality and Evaluation of a Low-cost Filtration Method. Aerosol Air Qual. Res. 21, 210046. <https://doi.org/10.4209/aaqr.210046>, 2021.
17. Lee, H.-J.; Chang, L.-S.; Jaffe, D.A.; Bak, J.; Liu, X.; Abad, G.G.; Jo, H.-Y.; Jo, Y.-J.; Lee, J.-B.; Kim, C.-H. Ozone Continues to Increase in East Asia Despite Decreasing NO2: Causes and Abatements. Remote Sens. 13, 2177. <https://doi.org/10.3390/rs13112177>, 2021.
18. Flynn M.T., Mattson E.J., Jaffe D.A., and Gratz L.E. Spatial patterns in summertime surface ozone in the southern Front Range of the Rocky Mountains, USA. Elementa: Science of the Anthropocene. 9 (1): 00104. <https://doi.org/10.1525/elementa.2020.00104>, 2021.
19. Hu C., Kang P., Jaffe D.A. Li C., Zhang X., Wu K., and Zhou M. Understanding the impact of meteorology on ozone in 334 cities of China. Atmos. Envir., 248, 118221, <https://doi.org/10.1016/j.atmosenv.2021.118221>, 2021.
20. Jaffe D.A., Fiore A.M. and Keating, T.J. Importance of Background O3 for Air Quality Management. EM. November 2020.
21. Altshuler S.L., Zhang Q., Kleinman M.T., Garcia-Menendez, F. Jr., Moore C.T., Hough M.L, Stevenson E.D., Chow J.C., Jaffe D.A. and Watson J.G. Critical Review Discussion: Wildfire and prescribed burning impacts on air quality in the United States, Journal of the Air & Waste Management Association, DOI: [10.1080/10962247.2020.1813217](https://doi.org/10.1080/10962247.2020.1813217), 2020.
22. Kurz A.Y., Blum J.D., Gratz L.E., and Jaffe D.A. Contrasting Controls on the Diel Isotopic Variation of Hg- at Two High Elevation Sites in the Western United States. Environ. Sci. Technol. 54 (17), 10502-10513, doi: 10.1021/acs.est.0c01918, 2020.
23. Zeng, Y., Jaffe, D.A., Qiao, X., Miao, Y. and Tang, Y. Prediction of Potential High PM2.5 Concentrations in Chengdu, China. Aerosol Air Qual. Res., <https://doi.org/10.4209/aaqr.2019.11.0586>, 2020.
24. Hopke P. K. and Jaffe D.A. Letter to the Editor: Ending the Use of Obsolete Data Analysis Methods. Aerosol and Air Quality Research, 20: 688–689, doi: 10.4209/aaqr.2020.01.0001. 2020.
25. Jaffe D.A., O’Neill S.M., Larkin N.K., Holder A.L, Peterson D.L., Halofsky J.E. and Rappold A.G. Wildfire and prescribed burning impacts on air quality in the United States, J. Air and Waste Mgt. Assn., DOI: [10.1080/10962247.2020.1749731](https://doi-org.offcampus.lib.washington.edu/10.1080/10962247.2020.1749731), 2020.
26. Chandra, P.B. McClure. C.M., Mulligan,J. and Jaffe D.A., Analysis of ambient VOCs using thermal desorption gas chromatography to identify smoke influence in urban areas. Atmosphere 11(3), 276; <https://doi.org/10.3390/atmos11030276>, 2020.
27. Casazza M., Lega M., Jannelli E., Minutillo M., Jaffe D., Severino V. and Ulgiati S. 3D monitoring and modelling of air quality for sustainable urban port planning: Review and perspectives. J. Cleaner Production 231, 1342-1352, <https://doi.org/10.1016/j.jclepro.2019.05.257>, 2019.
28. Buysse C.E. Kaulfus A. Nair U. and Jaffe D.A. Relationships between particulate matter, ozone, and nitrogen oxides during urban smoke events in the western US. Environ. Sci. Technol., DOI: 10.1021/acs.est.9b05241, 2019.
29. Laing J.R., Jaffe D.A. and Sedlacek A.J.III. Comparison of Filter-based Absorption Measurements of Biomass Burning Aerosol and Background Aerosol at the Mt. Bachelor Observatory. Aer. Air Qual. Res, DOI: 10.4209/aaqr.2019.06.0298, 2019.
30. Laing J.R. and Jaffe D.A. [Wildfires Are Causing Extreme PM Concentrations in the Western United States](http://pubs.awma.org/flip/EM-June-2019/jaffe.pdf). EM- The Magazine for Environmental Managers , A&WMA , June 2019
31. Zhou, S., Collier, S., Jaffe, D. A., and Zhang, Q.: Free tropospheric aerosols at the Mt. Bachelor Observatory: more oxidized and higher sulfate content compared to boundary layer aerosols, Atmos. Chem. Phys., 19, 1571-1585, https://doi.org/10.5194/acp-19-1571-2019, 2019.
32. Chatterjee, A., Devara, P.C., Balasubramanian, R. and Jaffe, D.A. (2019). Aerosol Climate Change Connection (AC3) Special Issue: An Overview. Aerosol Air Qual. Res. 19: 1-4. https://doi.org/10.4209/aaqr.2018.11.0435.
33. Guo, J. J., Fiore, A. M., Murray, L. T., Jaffe, D. A., Schnell, J. L., Moore, C. T., and Milly, G. P.: Average versus high surface ozone levels over the continental USA: model bias, background influences, and interannual variability, Atmos. Chem. Phys., 18, 12123-12140, https://doi.org/10.5194/acp-18-12123-2018, 2018.
34. Jaffe DA, Cooper OR, Fiore AM, Henderson BH, Tonneson GS, Russell AG, Henze DK, Langford AO, Lin M and Moore T. Scientific assessment of background ozone over the U.S.: Implications for air quality management. Elem Sci Anth. 2018;6(1):56. doi:<http://doi.org/10.1525/elementa.309>, 2018.
35. McClure C.D. and Jaffe D.A. US particulate matter air quality improves except in wildfire-prone areas. Proc.Natl.Acad.Sci., DOI: 10.1073/pnas.1804353115, 2018.
36. McClure C.D. and Jaffe D.A. Investigation of High Ozone Events due to Wildfire Smoke in an Urban Area.  Atmos. Envir. <https://doi.org/10.1016/j.atmosenv.2018.09.021>, 2018.
37. Schuerger, A.C., Smith, D.J., Griffin, D.W. et al. Science questions and knowledge gaps to study microbial transport and survival in Asian and African dust plumes reaching North America. Aerobiologia (2018) 34: 425. <https://doi.org/10.1007/s10453-018-9541-7>.
38. Fiore, A. M., Fischer, E. V., Milly, G. P., Pandey Deolal, S., Wild, O., Jaffe, D. A., et al. Peroxy acetyl nitrate (PAN) measurements at northern midlatitude mountain sites in April: a constraint on continental source–receptor relationships, Atmos. Chem. Phys., 18, 15345-15361, https://doi.org/10.5194/acp-18-15345-2018, 2018.
39. Carlton A.G. Synthesis of the Southeast Atmosphere Studies: Investigating Fundamental Atmospheric Chemistry Questions. Bull. Amer. Met. Soc., <https://doi.org/10.1175/BAMS-D-16-0048.1>, March 2018.
40. Gaudel A, Cooper OR, Ancellet G, Barret B, Boynard A, Burrows JP, et al. Tropospheric Ozone Assessment Report: Present-day distribution and trends of tropospheric ozone relevant to climate and global atmospheric chemistry model evaluation. Elem Sci Anth 6, DOI: <http://doi.org/10.1525/elementa.291>, 2018.
41. Zhang L., Jaffe D.A., Gao X., and McClure C.D. A quantification method for peroxyacetyl nitrate (PAN) using gas chromatography (GC) with a non-radioactive pulsed discharge detector (PDD). Atmospheric Environment 179, 23–30, <https://doi.org/10.1016/j.atmosenv.2018.02.008>. 2018.
42. Gong X., Hong S. Jaffe D.A. Ozone in China: Spatial distribution and leading meteorological factors controlling O3 in 16 Chinese cities. Aer. Air Qual. Res, DOI: [10.4209/aaqr.2017.10.0368](https://doi.org/10.4209/aaqr.2017.10.0368), 2018.
43. Baylon, P., Jaffe, D. A., Hall, S. R., Ullmann, K., Alvarado, M. J., & Lefer, B. L.  Impact of biomass burning plumes on photolysis rates and ozone formation at the Mount Bachelor Observatory. Journal of Geophysical Research: Atmospheres,  123. <https://doi.org/10.1002/2017JD027341>, 2018.
44. [Kaulfus, A.S., Nair, U., **Jaffe, D.A.,** Christopher, S.A., and Goodrick, S.. Biomass burning smoke climatology of the United States: Implications for particulate matter air quality, Environmental Science & Technology 50, 11731-11741, doi: 10.1021/acs.est.7b03292, 2017.](https://drive.google.com/a/uw.edu/file/d/0B1RuuILdAjVzTlpfSEE3dXRCR0E/view?usp=sharing)
45. Gong X., Kaulfus A., Nair U. and Jaffe D.A. Quantifying O3 impacts in urban areas due to wildfires using a Generalized Additive Model. Envir. Sci. Tech. DOI: 10.1021/acs.est.7b03130, 2017.
46. Baylon P., Jaffe D.A. de Gouw J. and Warneke C., Influence of Long-Range Transport of Siberian Biomass Burning at the Mt. Bachelor Observatory During the Spring of 2015. Aer. Air Qual. Res. DOI: [10.4209/aaqr.2017.06.0213](https://doi.org/10.4209/aaqr.2017.06.0213), 2017.
47. [Gao H. and Jaffe D.A., Comparison of ultraviolet absorbance and NO-chemiluminescence for ozone measurement in wildfire plumes at the Mount Bachelor Observatory.](https://drive.google.com/a/uw.edu/file/d/0Bxu55FndR2IQQ04tN1hiaGJWM3c/view?usp=sharing)Atmospheric Environment 166, 224–233, doi: 10.1016/j.atmosenv.2017.07.007, 2017.
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**Book Chapters, Technical Reports, National Assessments and Other Publications**

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2. Jaffe D. Evaluation of Ozone Patterns and Trends in 8 Major Metropolitan Areas in the U.S. Final project report for CRC Project A-124, Coordinating Research Council, Alpharetta, GA, March 2021. Available at: <http://crcao.org/wp-content/uploads/2021/04/CRC-Project-A-124-Final-Report_Mar2021.pdf>
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**Funded Projects (with D. Jaffe as the Principal Investigator)**

Impact of smoke on ozone, aerosols and oxidant chemistry in urban and rural areas in the U.S. Funded by the National Oceanic and Atmospheric Administration. September 1 2022-August 31, 2025. Three year project with a total budget $457,005.

Impacts of Freeways, Cooking and Wildfires on Indoor Air Quality in a variety of WA households: Towards Actionable Solutions UWB SRCP Seed grant program, June 1, 2022-June 1, 2023, $25,000.

The Salt Lake regional Smoke, Ozone and Aerosol Study (SAMOZA). Funded by the Utah Dept of Air Quality, (UW, USU and UMt collaboration with D.Jaffe as lead PI), June 1, 2022-August 31, 2023, $360,580. UW portion of budget is $136,699.

Collaborative Research: Aerosols, Nitrogen Oxides, and Ozone at the Mt. Bachelor Observatory. Funded by the NSF, Sept.1, 2018-Aug. 31, 2023, $ $873,270.

NOAA Support for Mt Bachelor Flask Sampling. Nov. 1, 2017-Jan. 31, 2023. Funded by NOAA, Global Monitoring Division, $24,969.

Measurements of oxygenated volatile organic compounds (OVOCs) as tracers of biomass burning. Funded by the University of Texas at Austin (pass thru funding from State of Texas), Feb. 25,2020-Sept. 30, 2021, $120,000.

Wildfire Impacts on O3 and Particulate Matter in Urban Areas of the Western US. Funded by the National Oceanic and Atmospheric Administration (NOAA), July 1, 2017-June 30, 2021, four year award total of $616,024.

NOAA Support for Mt Bachelor Flask Sampling. Jan. 1, 2016-Sept 30, 2017. Funded by NOAA, Global Monitoring Division, $23,000.

Influence of Free Tropospheric Ozone and Particulate Matter on Surface Air Quality in the Western U.S. Funded by the NSF, March 15, 2015-Feb. 28, 2018, three year award of $822,406.

Do coal and diesel trains make for unhealthy air? May 2013-no end date. Funded by gifts to the UW from Experiment.com (crowd-funding), the Sierra Club and Friends of the Columbia Gorge. Total award of $75,000.

Ultrafine Particle study in Jefferson and Clallam Counties (J. Thornton Co-PI). July 1, 2013-June 30, 2015. Funded by the Olympic Region Clean Air Agency. Total award of $451,000.

NOAA Support for Mt Bachelor Flask Sampling. Feb. 1, 2013-Sept 30, 2015. Funded by NOAA, Global Monitoring Division, $30,000.

Collaborative Research: Mercury in the Atmosphere Over the Eastern United States (L. Jaeglé, Co-PI). Funded by the NSF, Oct 2012-Sept. 2015, total award of $984,559.

Measurements of Total Hg (THg) at the Birmingham SEARCH site and cross-calibrations of a Tekran system with an HgBr2 source. Funded by Atmospheric Research Associates, March 1,2013- February 28, 2014, total award of $62,998.

Influence of Free Tropospheric Ozone and PM on Surface Air Quality across the West Coast of the United States. Funded by the NSF, May 2011-2014, three year award of $822,406.

Collaborative Research: Reno Atmospheric Mercury Inter-comparison Experiment, Funded by the NSF. April 2011-Oct. 2012, total award of $205,133.

Identifying Oxidized Mercury in the Atmosphere using Mass Spectrometry, Funded by Electric Power Research Institute, January 2011-April 2012, Total budget of $113,000.

Import of Asian Mercury to the U.S. as Observed at the Mt. Bachelor Observatory. Funded by the Electric Power Research Institute, December 2006- Dec 2012, $450,966.

Western Airborne Mercury Observations (WAMO), Funded by the National Science Foundation, October 2008 – September 2011. Total budget $320,786.

Understanding the Influence of Global Air Pollution on US Air Quality through Observations at the Mt. Bachelor Observatory (MBO). Funded by the National Science Foundation. Sept. 2007-August 2011. Total budget $592,358.

Workshop on Reducing the Uncertainty in Measurements of Atmospheric Mercury (RUMA) Funded by the National Science Foundation, October 2008 – October 2009, $32,809.

Development of Speciated Mercury Measurement Capabilities for use on Future NASA Aircraft Missions. Funded by the National Aeronautics and Space Administration, July 2007-June 2008, $237,860.

Western Airborne Contaminants Assessment Project (WACAP). Cooperative agreement with U.S. National Park Service to participate in the WACAP project as the lead atmospheric scientist. Sept. 2002-Oct. 2007, $264,797.

Influence of Global Sources on Free Tropospheric O3 and Aerosols in the Western U.S. August 2004-July 2007, Three year award of $609,233 funded by the National Science Foundation.

Inflow, Chemistry and Deposition of Mercury to the West Coast of the U.S. Funded by the U.S. EPA (EPA-STAR program). February 2003- August 2006. Award total of $756,774.

Cheeka Peak as a Baseline ITAP Observatory. Funded by the Olympic Region Clean Air Agency, Sept. 2004-June 2006, $118,535.

Photochemical Ozone Budget of the Eastern North Pacific Atmosphere-II (PHOBEA-II). National Science Foundation/Atmospheric Chemistry, 3 year award total $508,000. April 2001-2004.

Trans-Pacific Transport of Ozone, Carbon monoxide and Particulates. National Oceanic and Atmospheric Administration, Co-PI: Dr. Lyatt Jaeglé, 2 year award total $204,964., Sept 2001-Sept 2003.

Transport of Mercury and Other Metals to the West Coast of the U.S. U.S. Environmental Protection Agency. Two year total $298,251. August 1, 2000-August 2002.

Photochemical Ozone Budget of the Eastern North Pacific Atmosphere (PHOBEA). National Science Foundation/Atmospheric Chemistry, 4 year total, $475,000. ATM-9529604 and ATM-9896270 (transferred to UW), June 1996-June 2000.

Identification of Sources and Long Term Trends for Pollutants in the Arctic. (through UW-JISAO), NOAA Cooperative Institute for Arctic Research (CIFAR). Two year total $127,667. May 1998-2000.

Benzene and Carbon Monoxide as Air Pollutants in Fairbanks, Alaska. Partners in Science: with Janet Ricker (West Valley High School). Research Corp, 2 year total, $14,000. June 1997-June 1999.

Identification of Sources and Long Term Trends for Pollutants in the Arctic using Clustered Trajectory Analysis. NOAA, Cooperative Institute for Arctic Research (CIFAR). One year total, $60,000. May 1997-May 1998.

Atmospheric Transport Pathways to Alaska from Potential Radionuclide Sites in the Former Soviet Union, Sept. 1995-December 1996, $40,000. PI: Dr. Dan Jaffe, Co-PI: Dr. Robert Andres (UAF-INE), Funded by the State of Alaska.

A Study of the High Latitude Nitrogen Oxide Reservoir, NSF Division of Atmospheric Sciences/ Atmospheric Chemistry, ATM-9215127, 3 year total $373,800., Sept. 1992-June 1996

Impact of East Asian Emissions on CO and O3 Concentrations in the North Pacific Atmosphere. NOAA Climate and Global Change Program, NA36GPO253, 3 year total $180,000., May 1993-May 1996.

Ground-Based Measurements of Nitrogen Oxides as Part of the Pacific Exploratory Mission-West (PEM-West) Program. NSF, ATM-9022004, 2 years grant June 1991-June 1993, 2 year total $99,000.

Tropospheric Nitrogen Oxide Chemistry in Central, Alaska. NSF Division of Atmospheric Sciences/ Atmospheric Chemistry, ATM-8814518, Oct. 1988- March 1992. 3 year total $299,202.

**Funded projects (with D. Jaffe as Co-PI)**

Ozone Vertical Profile Measurements at Fairbanks, Alaska in Support of the Polaris Campaigns. NASA, 7 month total $58,250, April 1, 1997-October 30, 1997. Principal Investigator: Samuel J. Oltmans; Co-Investigators: Daniel Jaffe, Bryan Johnson.

Soviet Arctic Haze: A study of Pollution in Northern Russia, Earthwatch, $30,000 (approximate total) + volunteer labor, co-PI with Alexander Baklanov, Kola Science Center, Russia, March 1990-September 1993.

Gaseous Emissions of Redoubt Volcano. USGS/Alaska Volcano Observatory. 1 year grant, May 1990-May 1991, $34,143. (This is a multiple PI effort, the funds listed are for the portion on gas and snow chemistry for which D. Jaffe was the sole PI).

**Graduate students advised (Major Professor)**

Claire Buysse, M.S. 2019, Atmospheric Sciences-UWS

Crystal McClure, PhD 2018, Atmospheric Sciences-UWS

Pao Baylon, PhD 2018, Atmospheric Sciences-UWS

Nicole Wigder (Briggs), PhD 2014, Atmospheric Sciences-UWS

Emily Fischer, PhD 2010, Atmospheric Sciences-UWS

David Reidmiller, PhD, 2010, Atmospheric Sciences-UWS

Phil Swartzendruber PhD, 2009, Atmospheric Sciences-UWS

Heather Price, PhD, 2004, Chemistry-UWS

Bob Kotchenruther, PhD, 2000, Chemistry-UWS

Alexander Mahura, M.S. 1998, Environmental Chemistry-UAF

Harry Beine, PhD 1996, Atmospheric Chemistry-UAF

Zhiyong Zhang, M.S. 1996, Environmental Chemistry-UAF

Lizhen Zhang, M.S. 1995, Environmental Chemistry-UAF

Jennifer Kelley, M.S. 1993, Environmental Chemistry-UAF

Bianca Cerundolo, M.S. 1993, Environmental Chemistry-UAF

Richard Honrath, PhD 1991, Atmospheric Chemistry-UAF

Matt Zukowski, M.S. 1988, Geochemistry-UAF

**In-Progress: None.**

**Invited Presentations**

Fires and Air Quality. NW Weather workshop. Seattle, WA, July 2018.

Background O3. What is it? Why does it matter? SCORES workshop. Riverside, CA, June 2018.

The Mt. Bachelor Observatory. “Sampling the free troposphere since 2004”. NSF Atmospheric Chemistry symposium. Boulder, CO, June 2018.

Scientific assessment of background ozone over the U.S.: Implications for air quality management. National Academy of Sciences-Board of Atmos. Science, Wash. D.C. May 2018.

Where there’s smoke, there’s PM and O3, sometimes! Univ. of Montana, Feb. 2018.

Scientific assessment of background ozone over the U.S.: Implications for air quality management. WESTAR workshop. Denver, CO. Nov. 2017.

Background O­3 Scientific Assessment Workshop. Lead Presentation. Denver, CO, April 2017.

Use of NOAA Hazard Mapping System Fire and Smoke Product (HMS-FSP) to understand fire impacts on PM and O3.. NASA HQAST workshop. Seattle, WA, Feb. 2017.

Impacts of Heat, Wind and Fire on 2015 Ozone in the West: A year of extremes! EPA workshop. Denver CO, Nov. 2016.

Impacts of Fire and Temperature on Ozone in 2015 in the West: A year of extremes. MIT, Cambridge, MA, Aug. 2016.

Merging of the streams: Integration of Modeling and Observations to Understand Background Ozone. EPRI EnviroVision. Wash. DC, May 2016.

Identification of Ozone Sources in the Western US. WESTAR/EPA meeting, Phoenix, AZ. Feb. 2016.

O3, PM and Black carbon in wildfire plumes and impact on urban air quality, Univ. of Nevada-Reno, Jan. 2016.

The Air We Breathe: Three Decades of Research on Global Air Pollution. Wilson Center, Washington D.C., Nov. 2015.

Richard Honrath Memorial Lecture: An Overview of Air Quality Issues in the Western U.S. Michigan Tech University, Oct. 2015.

Diesel PM and Coal Dust from Trains. Asian Aerosol Assn. Taipei, Sept 2015.

The Air We Breathe: 18 Years of Atmospheric Research at UW Bothell. 1st Distinguished Research, Scholarship and Creative Activities Award. UWB-Bothell, April 2015.

Importance of Boundary Conditions (BC) and Use of a Statistical Model to Help Interpret O3 in W. US. Transboundary Ozone Pollution Conference. Tenaya Lodge, Yosemite, CA, March 2015.

Is Crowd-funding Right for Me? AGU Fall meeting, Session PA13C, San Francisco, Dec. 2014.

Aircraft Observations of Mercury over the US: The NOMADSS Experiment. AGU Fall meeting, Session B52B, San Francisco, Dec. 2014.

Observations of O3, PM and Hg in the Pacific Northwest, USA: Using Science to Understand and Fight Global Pollution. Invited presentation at National Research Council (CNR)- Bologna, Italy, May 2014.

Observations of O3, PM and Hg in the Pacific Northwest, USA: Using Science to Understand and Fight Global Pollution. Invited presentation at Weizmann Institute, Rehovot Israel, May 2014.

Results from the NOMADSS/SAS Mercury experiment. Invited presentation at EPRI Mercury Workshop, Pensacola, FL, January 2014.

Mercury in the Environment: What do we know? What do we need to know? Invited presentation to EPA Region X Tribal Summit, Spokane, WA, October 2013.

New methods to understand mercury in the atmosphere:  Results from MBO, WAMO RAMIX and NOMADSS Campaigns. Invited presentation at Tsinghua University, Beijing China, Sept. 2013.

Using science to fight global pollution: Two tales from the Pacific NW. Invited presentation at Gordon Research Conference, Mt. Snow VT, July 2013.
The challenge of tropospheric ozone in the W. US. Invited presentation at Gordon Research Conference, Colorado State Univ., Fort Collins CO, February 2013.

Ozone, mercury and fires, oh my! Recent discoveries from the Mt. Bachelor Observatory. Invited presentation at National Institute of Environmental Studies, Tsukuba Japan, Nov 2013.

Ozone, mercury and fires, oh my! Recent discoveries from the Mt. Bachelor Observatory. Invited presentation at NOAA, Boulder CO, Nov 2012.

Ozone production from wildfires in the West: Quantifying the impact in urban areas, Invited presentation at EPA Workshop on Exceptional Events, Sacramento CA, March 2013.

New measurement technology and new insights into the oxidation of atmospheric Hg0. National Research Council (CNR)-Rende Italy, July 2012.Made in China: Global sources of local pollution. Invited presentation at National Research Council (CNR), Rome, July 2012.

Global Transport of Aerosols, Ozone and Mercury: Implications for Climate, Air quality and Environmental Chemistry, Invited presentation to EPA Georgia Basin/Puget Sound workshop, Seattle, WA, Nov. 2011.

Searching for the sources of O3 and Hg in the global atmosphere. Invited talk at University of British Columbia, Nov. 2011.

Uncertainty in Environmental Analysis. Invited presentation to Harvard Atmospheric Chemistry Group, October 2011.

Global Transport of O3, Aerosols and Hg. Invited presentation to Chinese Meteorological Agency, Beijing, Sept 2011.

New approaches for understanding atmospheric Hg. Invited talk at International Conf on Mercury as a Global Pollutant. Halifax NS, July 2011.

Policy relevant background and exceptional events: Identification of UTLS, Asian and fire influence on O3 in AQ data. Invited talk at PNW Airquest meeting, Pullman WA, June 2011.

Transport of radionuclides from the Japanese nuclear accident: mass hysteria or serious concern? Pacific Northwest Weather Workshop, May 2011.

Let the data speak! What do observations say about PRB in the western U.S.? Invited presentation at API workshop on Policy Relevant Ozone, Austin TX, April 2011.

Relationship between surface and free tropospheric ozone. Invited presentation to the Nevada Dept. of Environmental Protection, Carson City, NV, Jan. 2011.

Role of the free troposphere on surface air quality, Invited talk at annual Amer. Met. Society meeting, Seattle, WA, Jan. 2011.

Global Transport of O3, Aerosols and Hg: Implications for Climate, Air quality and Environmental Chemistry. Invited talk to Pacific Northwest National Laboratory (PNNL), Richland, WA, Nov. 2010.

Contributions to the European GMOS project from the University of Washington (USA). Invited presentation to GMOS steering board, Nov. 2010, Rome, Italy.

Key Uncertainties in the Global Mercury Cycle. Keynote talk at Taiwan Aerosol Association for Research, September 2010.

RGM: What happens when good analytical chemists breathe toxic vapors. Invited talk at Goldschmitt conference, Knoxville Tenn, June 2010.

Adventures in mercury. Invited to talk to Puget Sound Toxics workshop, UWT June 2010.

Impact of the free troposphere on the proposed new ozone standard, UW Atmospheric Sciences colloquium, May 2010.

Global sources of local pollution, Presentation to the Board on Atmospheric Sciences, National Academy of Sciences, Nov. 2009.

Made in China- Global Influences on Local Air Quality. Invited talk to the UW Board of Regents, March 2009.

Testimony before the US-China Economic and Security Review Commission, Washington D.C. August 2008.

Global Transport of Mercury, Ozone and PM: Policy Relevant Results. International Joint Commission, Anchorage, AK, Sept 2008.

Long-Range Transport of Pollutants: Does it Matter for U.S. Air Quality? UN ECE Hemispheric Transport of Air Pollutants (HTAP) working group. Washington D.C., June 2008.

## Free tropospheric observations at the Mt. Bachelor Observatory in Oregon and the PICO-NARE observatory in the Azores. Presentation at the Swiss Federal Institute for Materials Science and Technology (EMPA), April 2008.

## Influence of Long-Range Transport and Oxidation on the Global and Regions Cycles of Mercury. UNEP/HTAP/LRTAP Joint International Conference on Intercontinental Transport of Atmospheric Mercury and Persistent Organic Pollutants, Rome, Italy, April 2008.

Influence of Long-Range Transport and Oxidation on the Global Cycle of Mercury in the Atmosphere. Great Basin Mercury Working Group (EPA regions, 8,9,10). Reno, NV, January 2008.

Influence of Long-Range Transport and Oxidation on the Global Cycle of Mercury in the Atmosphere. Air Quality VI. Washington D.C., Sept. 2007.

An overview of free tropospheric observations of background air quality at the Mt. Bachelor Observatory in Oregon. Presentation at the annual NOAA-ESRL meeting, Boulder Colo, April 2007.

Who’s polluting the Columbia River Gorge. Presentation to the Gorge Commissions. March 2007.

Long-Range Transport of Pollutants: Does it Matter for U.S. Air Quality? UN ECE Hemispheric Transport of Air Pollutants (HTAP) working group. Geneva, Switzerland, January 2007.

Transport and Cycling of Asian Mercury in the Pacific Atmosphere. Invited presentation. Western Pacific Geophysics Meeting. Beijing, China, July 2006.

Free Troposphere Sampling at the Mt. Bachelor Observatory, Invited presentation given at Harvard University (Atmospheric Modeling Research Group), June 2006.

Long-Range Transport of Pollutants: Does it Matter for US Air Quality. Annual Meeting of the Health Effects Institute, San Francisco, April 2006.

Global Influences on Mercury and Local Air Quality. Annual Meeting of the Electric Power Research Institute (EPRI), San Jose, March 2006.

Carmen San Diego and the Case of the Increasing Regional (and Global?) Ozone, Michigan Technological University, Houghton, MI, February 2006.

Free Troposphere Sampling at the Mt. Bachelor Observatory, Invited presentation at the Task Force on Hemispheric Transport of Air Pollution Workshop, Washington, DC, January 2006.

Long-Range Transport of Mercury to the United States, Presented at the EPA Region 10, Air Toxics Summit, Portland, OR, October 2005.

Fate and transport of atmospheric mercury in Asia. Presented at the First International Symposium by the China, Korea and Japan Meteorological Societies, “Atmospheric Sciences in East Asia,” Tokyo, Japan, May 2005.

“Made in China” Global Influences on Local Air Quality, University of Wyoming, Laramie, March 2005.

Measurements of mercury in the US and Okinawa Japan. Presented to US EPA-Taiwan bilateral meeting on environmental cooperation. San Francisco, December 2004.

Use of tracer ratios to identify Asian industrial, biomass burning and strat. influences on the west coast of the US. Atmospheric Chemistry seminar, Harvard University, November, 2004.

Influence of Asian emissions on mercury and ozone in the U.S.. Presented to US EPA-ICAP meeting, Durham NC, October 2004.

Transport and Chemical Processing of Mercury During Long-range Transport in the Pacific. Invited presented to USGS-EPA Mercury Roundtable. September 2004.

Atmospheric chemistry/biogeochemistry linkages between Asia, North America and the North Pacific. Presented at Beijing workshop on Collaborative US-China programs in Arctic and Marine Sciences. Organized by NOAA. Beijing, July 2004.

Quantifying the contribution from long- range transport to a regional smog episode during the summer of 2003. Frontier Research Institute for Global Change, Tokyo, Japan. March 2004.

Trans-Pacific Transport of Pollution: Impact on Urban Air Quality in the U.S. Presented at AAAS annual meeting, Seattle, WA. February 2004.

Influence of global sources on mercury in the Pacific Northwest. EPA-Region X Air Toxics Summit. Seattle, December 2003.

Long-range transport of pollutants from Asia to the US: Does it matter for US air quality? Invited presentation at USGS, St Petersburg, Florida, September 2003.

Long-range transport of pollutants from Asia to the US: Does it matter for US air quality? Invited presentation at University of Miami, September 2003.

Implications of long-range transport on atmospheric deposition to the Pacific Northwest. Invited presentation at EPA deposition workshop. Portland, July 2003.

Long-range transport of pollutants from Asia to the US: Does it matter for US air quality? Invited presentation to US EPA Office of Air Quality Planning and Standards, RTP, North Carolina. May 2003.

Long-range transport of pollutants from Asia to the US: Does it matter for US air quality? Invited presentation to Atmospheric modeling group, Harvard University. May 2003.

Influence of Long-Range Transport on Air Quality in Western North America. Presentation to Environment Canada-MSC, Toronto, Canada, January 2003.

Influence of Long-Range Transport on Air Quality in the Western U.S. Invited presentation at Society for Environmental Toxicology and Chemistry (SETAC), Salt Lake City, November 2002.

What Controls Ozone in the Northeast Pacific? Invited presentation at Telluride Summer Research Institute, Workshop on Atmospheric Chemistry. Telluride, CO. August 5-9, 2002.

What can atmospheric scientists do for WACAP. Invited presentation to National Park Service planning meeting on the Western Air Contaminants Assessment Program. Corvallis, OR. June 2002.

Influence of Long-Range Transport on Air Quality in the Western U.S. Presentation at Oregon State University, Corvallis, June 2002.

Presentation on Transboundary Air Pollution in the Pacific to the International Air Quality Advisory Board of the International Joint Commission. E.P.A. Region X, Seattle, January 2002.

Presentation on Long range atmospheric transport of pollutants across the Pacific: An overview of current knowledge. Presented at the North Pacific Marine Science Organization (PISCES) annual meeting. Victoria, Canada, October 2001.

Presentation at Pacific Northwest National Laboratory. Observations of Ozone, CO, NOx, PAN, NMHCs, and Aerosols in the Northeastern Pacific Atmosphere During Spring. September 2000.

Presentation on Long Range Transport of Asian Air Pollution to North America. Conference on Trans-Pacific Transport of Atmospheric Pollutants. Seattle. July 2000.

Presentation at IGAC planning meeting on “Intercontinental Transport and Chemistry”. Tokyo, Japan, March 2000 (also in Boulder CO July 2001 and Nov. 2001).

Presentation at Ecological Society of America (ESA) workshop on Atmospheric deposition to the Pacific Coast. Invited talk on tools for assessing long range transport of pollutants, UCLA, February 2000.

Presentation at international workshop in Nagoya, Japan on Transport of Asian air pollution to the U.S. and results from the 1999 PHOBEA observations". November 1999.

Presentation at University of British Columbia on Transport of Asian air pollution to North America, October 1999

Presentation at Portland State University on Transport of Asian air pollution and results from 1999 PHOBEA observations, November 1999.

Presentation at Washington State University-Vancouver on Transport of Asian air pollution and results from 1999 PHOBEA observations, November 1999.

Presentation at workshop on Ozone and vegetation impacts. "Transport of Asian air pollution to North America. University of Tokyo, Nov. 1998.

Presentation at Washington State University on “Transport of Asian pollutants to the U.S. West Coast,” Feb. 1998.

Presentation at workshop on Ozone in the Asia Pacific region. University of Tokyo, Nov 1996.

Presentation to Lawrence Livermore National Laboratory on Potential Sources of Radionuclides in Alaska from Sources in the Former Soviet Union. Livermore, CA. Oct 1996.

Presentation at the US-Japan Workshop on Arctic Research. Fairbanks, Alaska, February 1996.

Presentation to joint Office of Naval Research on Acidification in the Arctic-U.S. EPA workshop on Arctic Contaminants. Fairbanks Alaska, August 1996.

Presentation to Japanese scientists on Asian pollutants in the Pacific. University of Tokyo- January 1996

Invited participant on NASA team to evaluate the Hong Kong air monitoring station. Hong Kong, October 1995.

NASA Nitrogen Oxide Evaluation panel. Menlo Park, CA, December 1993.

NATO Advance Research Workshop on “The Tropospheric Chemistry of Ozone in the Polar Regions.” Halifax, Nova Scotia, August 1992.

Workshop on Tropospheric Ozone in the Polar Regions, Halifax N.S., August 1992.

NSF Working Group Participant to develop a research plan for an arctic photochemistry experiment (TAPESTRIES). Washington, D.C., May 1992,

Earthwatch Principal Investigators' Meeting. Invited to present an overview of our Earthwatch sponsored research on air pollution in the Kola Peninsula, Russia, Boston, MA, March 1992 and March 1991.

Alaska Clean Seas workshop on “In-Situ Burning.” Invited to give luncheon address on putting the air pollution aspects of in-situ burning (the burning of oil after an oil spill) into a global perspective. Anchorage, AK, November 1991.

Symposium on the Tropospheric Chemistry of the Antarctic Region. Invited Participant. June 1991, Boulder, CO.

NASA PEM-West Science Team Meeting. As a participant in the International Global Atmospheric Chemistry Program's experiment (PEM-West), I was an invited attendee at this meeting. PEM-West is an international experiment to document the transport of air pollutants from the Asian continent to remote Pacific atmosphere. Herndon, VA, April 1991.

Invited presentation to Corvallis, OR, office of the EPA on arctic air pollution, January 1991.

Invited presentation to NOAA GMCC lab in Boulder, CO, on the results of our Barrow measurement campaigns. January 1991,

Invited presentation on Arctic Pollution; International Symposium on Environmental Problems of the North. Murmansk, USSR- February 1990

**Other Professional Activities**

External examiner for doctoral dissertation by Cheung Vincent, Hong Kong Polytechnic University (Hong Kong Sept 2001).

Board member, Seattle’s Urban Environmental Institute March 2001-current.

Co-chair of IGAC-Atmospheric Chemistry Education subcommittee (with J. Boonjawat) to develop courses in atmospheric chemistry in developing regions of the world. Presentations to IGAC Steering committee in Seattle (August 1998), Shonan Village, Japan (May 1999), Bangkok (Jan. 2001).

Member Steering Committee for International Global Atmospheric Chemistry (IGAC) projects on Asia-Pacific (APARE) and Polar regions (PASC). 1995

National Academy of Sciences, Young Investigation Program on Arctic Ecology, US-Russian exchange Program, 1993-1994.

Chosen to attend the National Center for Atmospheric Research's 1986 Summer Colloquium; Boulder, CO. One of 30 international graduate and post-doctoral students selected to meet with NCAR's scientific staff to discuss current topics in atmospheric chemistry. July 1986.

Sabbatical leave during AY 1993-1994 at the University of Oslo working with Dr. Ivar Isaksen on global chemical pollutant modeling.

Formerly certified secondary science teacher, Massachusetts and Washington

Member of the American Chemical Society

Member of the American Geophysical Union

Several Lectures at the University of Oslo and the Norwegian Institute for
Air Research during my sabbatical. 1993

Reviewer for the Journals: Atmospheric Environment, Journal of Geophysical Research; Geophysical Research Letters; Environmental Science and Technology; Journal of Atmospheric Chemistry; Environmental Pollution; and Science of the Total Environment.

Proposal and panel reviewer for the National Science Foundation, NASA and NOAA.

**University Service**

**University of Washington**

Chair Physical Sciences Division, UWB-School of STEM. (2013-current)

UW Provost Search Committee, AY 2011-2012.

UW Senate Committee on Planning and Budget (SCPB), Sept 2008-August 2011

UWB, General Faculty Organization, Executive Committee. Sept. 2007-Sept. 2010.

UWB, General Faculty Organization, Executive Committee Vice-chair/Chair (Sept.2007-Sept. 2009).

UWB Chancellor Search Committee, AY 06-07.

Developed and coordinated approval for UWB's first science degree (B.S. in Environmental Science) February 1998-June 2000.

Developed and chaired UWB Science Advisory Board (1998-2000).

Coordinator for Science, Technology and the Environment option within Interdisciplinary Arts and Sciences, September 1997-June 2000.

Extensive curriculum development for science at UWB (12 new courses developed), September 1998-current.

Development of outreach program for community colleges to recruit science students to UWB, January 1998-current.

Chair of Biology/Ecology search committee, October 1997-February 1998.

Advisor on science labs for new UWB campus, September 1997-current.

Advisor for integration of wetlands studies into UWB curriculum, September 1997-current.

Development of budget request for new UWB science labs, February 1998.

Coordinate of usage for science labs with Cascadia Community College

**University of Alaska-Fairbanks**

Chairman, College of Natural Sciences Curriculum Council, University of Alaska Fairbanks, Sept. 1992-June 1993. Member of committee Sept. 1991-Sept. 1992.

UAF Chairman of the "Billion Pound Diet", campus-wide educational program on energy conservation, AY 1990-1991.

UAF member representative to the University Corporation for Atmospheric Research (UCAR), October 1991, 1992.

Department of Chemistry Search committees: 1991 (2), 1993, 1995.

Advisor to the University “Climbing Wall Committee”

Faculty advisor to the Student Conservancy (1992-1997).

Faculty Advisor to the Student Environmental Club, 1991-1993.

Faculty Advisor for the Student Chapter of the Northern Alaska Environmental Center, 1990-1992.

Faculty Advisor for the Student “Science Outreach” program, 1992.

Department of Chemistry graduate committee (1987-1997).

UAF representative to the University Corporation for Atmospheric Research annual members meeting: 1989, 1992.

UAF representative for negotiations with the Alaska Department of Environmental Conservation on creation of the joint UA-ADEC cooperative agreement, November 1994.

Member of UAF task force on Arctic Pollution issues.

Lead for development of an Atmospheric Chemistry PhD, 1992.

**Public Service**

Public presentations on diesel and coal dust from trains, City of Seattle, Community Wise Bellingham, Shoreline CC, Highline CC.

Numerous outreach events for STEM in Washington and Bend OR.

Volunteer with Temple Beth Am homeless shelter program (2011-present).

Numerous discussions with EPA officials on the implications of long range transport of Asian air pollution to the U.S. 1998-2000.

Volunteer Board member for the Northern Alaska Environmental Center from September 1995-June 1997. Board President from January 1996-June 1997.

Session Chair, Relationship between CO, O­3 and nitrogen oxides, American Geophysical Union Fall Meeting, December 1996.

Lecturer for the second IGAC/WMO/NSF Short course on Atmospheric Chemistry November 4-15, 1996 Salvador, Brazil.

Teacher/Team Leader, First IGAC/WMO/NSF Short course on Instrumentation in Atmospheric Chemistry, Buenos Aires, Argentina, October 30-November 10, 1995.

Session Chair, High Latitude Tropospheric Chemistry, American Geophysical Union Fall Meeting, December 1995.

Member of the U.S. delegation to the Arctic Monitoring and Assessment Program.

Consultation with the Alaska Dept. of Environmental Conservation (ADEC) in Juneau in Nov. 1994 on activities of the Arctic Monitoring and Assessment Program.

International Global Atmospheric Chemistry Program-Committee member for Polar (PASC) and Asia/Pacific (APARE) programs.

U.S. Delegate to the Arctic monitoring and Assessment Task Force, Dec. 1991 (TromsØ) December 1992 (Toronto), Oct. 1993 (Reykjavik), March 1994 (TromsØ), Nov. 1994 (Wash. D.C.).

Facilitator, Non-Radionuclide Contamination Technical Session, the Interagency Arctic Research Policy Committee Workshop on Arctic Contamination. Anchorage, Alaska, May 1993.

Session Chair, Arctic Atmospheric Chemistry Session, Arctic Science Conference, Anchorage, Alaska, Oct. 1990.

Numerous presentations to state and local agencies on urban air quality, ozone depletion, arctic air pollution, and etc.

Numerous presentations to Fairbanks public schools on various environmental chemistry issues including ozone depletion, acid rain, climate change, local air quality, etc.