

DANIEL A. BURGARD, PHD

Department of Chemistry
University of Puget Sound
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I. Education

- August 2006 Doctor of Philosophy, Chemistry
University of Denver, Denver, CO
Thesis: *Remote Sensing of Ammonia, Sulfur Dioxide, and Nitrogen Dioxide Emissions from Cars and Trucks*
- May 1996 Bachelor of Arts, Chemistry
The Colorado College, Colorado Springs, CO

II. Academic Appointments

- 7/16 – present **Chair of Chemistry Department:** University of Puget Sound, Tacoma, WA
- 7/17 – present **Professor of Chemistry:** University of Puget Sound, Tacoma, WA
- 7/11 – 6/17 **Associate Professor of Chemistry:** University of Puget Sound, Tacoma, WA
- 7/13 – present **Affiliate Associate Professor:** University of Washington, Tacoma, WA
Department of Interdisciplinary Arts and Sciences
- 7/08 – 6/11 **Assistant Professor of Chemistry:** University of Puget Sound, Tacoma, WA
- 8/06 – 6/08 **Visiting Assistant Professor:** University of Puget Sound, Tacoma, WA
- 1/06 – 3/06 **Adjunct Faculty:** University of Denver
- 08/97 – 05/02 **Chemistry Teacher:** Regis Jesuit High School, Aurora, CO
- 06/96 – 06/97 **Chemistry Paraprofessional:** The Colorado College, Colorado Springs, CO

III. Courses taught at the University of Puget Sound

Instrumental Analysis	Analytical Chemistry
Environmental Analytical Chemistry	Chemical Analysis and Equilibrium
Art and Science of Color	Environmental Science

IV. Awards

- 2014 Thomas A. Davis Teaching Award: University of Puget Sound
- 2017 Senior Faculty Research Award: University of Puget Sound

V. Funding

- 2015 – 2017 NIH/NIDA *Using Sewers to Understand the Legalized Retail Sales Effects on Marijuana Consumption* (R03DA038806) Principle Investigator \$121,934
- 2016 – 2017 M.J. Murdock Charitable Trust, Partners In Science Program *Investigating the Removal of Emerging Contaminants from a Surface Water Biofiltration System* (Support for a high school teacher for two summers) PI/Mentor \$15,000
- 2015 NSF-MRI *Acquisition of High performance Liquid Chromatography and Mass Spectrometry Instrumentation to Support Research and Training at the University of Puget Sound* (1531435) Co-PI \$347,120.00

VI. Manuscripts underline denotes University of Puget Sound student co-author

- (1) Breuer, M.A.; **Burgard, D.A.** Bridge-based remote sensing of NO_x emissions from locomotives. *Atmos. Environ.* **2019**, *198*, 77-82.
- (2) van Nuijs, A.; Lai, F.; Been, F.; Andres Costa, M.J.; Barron, L.; Baz Lomba, J.A.; Berset, J.D.; Benaglia, L.; Bijlsma, L.; **Burgard, D.**; Castiglioni, S.; Christophoridis, C.; Covaci, A.; de Voogt, P.; Emke, E.; Fatta-Kassinos, D.; Fick, J.; Hernandez, F.; Gerber, C.; Gonzalez-Marino, I.; Grabic, R.; Gunnar, T.; Kannan, K.; Karolak, S.; Kasprzyk-Hordern, B.; Kokot, Z.; Krizman, I.; Li, A.; Li, X.; Love, A.; Lopez de Alda, M.; Meyer, M.; Oberacher, H.; O'Brien, J.; Quintana, J.B.; Reid, M.; Schneider, S.; Simoes, S.; Thomaidis, N.; Thomas, K.; Yargeau, V.; Ort, C. Multi-year interlaboratory exercises for the analysis of illicit drugs and metabolites in wastewater: development of a quality control system. *Trends Anal. Chem.* **2018**, *103* 34-43. doi.org/10.1016/j.trac.2018.03.009
- (3) Causanilles, A.; Baz-Lomda, J.A.; **Burgard, D.A.**; Emke, E.; Gonzalez-Marino, I.; Krizman-Matasic, I.; Li, A.; Love, A.S.C.; McCall, A.K.; Montes, R.; van Nuijs, A.L.N.; Ort, C.; Quintana, J.B.; Senta, I.; Terzic, S.; Hernandez, F.; de Voogt, P.; Bijlsma, L. Improving wastewater-based epidemiology to estimate cannabis use; focus on the initial aspects of the analytical procedure. *Anal. Chim. Acta.* **2017**, *988* 27-33 doi.org/10.1016/j.aca.2017.08.011
- (4) Williams, J; Banta-Green, C; **Burgard, D.** The need for better marijuana sales data. *Addiction.* **2017**, *112*(12), 2179-2180. doi: 10.1111/add.14037.
- (5) Bishop, G.A.; Stedman, D.H.; **Burgard, D.A.**; Atkinson, O. High-mileage Light-duty Fleet Vehicle Emissions: Their Potentially Overlooked Importance. *Environ Sci Technol.* **2016**, *50* (10), 5405-5411.
- (6) **Burgard, D.A.**; Bria, R.M. Bridge-based sensing of NO_x and SO₂ emissions from ocean-going ships. *Atmos. Environ.* **2016**, *136* 54-60. doi:10.1016/j.atmosenv.2016.04.014
- (7) Moore, D.; **Burgard, D. A.**; Larson, R.; Ferm, M. Psychostimulant Use Among College Students During Periods of High and Low Stress: An Interdisciplinary Approach Utilizing Both Self-Report and Unobtrusive Chemical Sample Data. *Addictive Behaviors*, **2014**, *39*(5) 987-993
- (8) **Burgard, D.A.**; Banta-Green, C.; Field, J.A. Working Upstream: How far can you go with sewage-based drug epidemiology? *Environ. Sci. Technol.* **2014**, *48* (3) 1362-1368.
- (9) **Burgard, D.A.**; Fuller, R.; Becker, B.; Ferrell, R.; Dinglasan-Panlilio, M.J. Potential Trends in Attention Deficit Hyperactivity Disorder (ADHD) Drug Use on a College Campus: Wastewater Analysis of Amphetamine and Ritalinic Acid. *Sci Total Environ* **2013**, *450-451*, 242-249.
- (10) **Burgard, D.A.**; Bria, C.R.M.; Berenbeim, J.A. Remote Sensing of Emissions from In-Use Small Engine Marine Vessels. *Environ. Sci. Technol.* **2011**, *45*, 2894-2901.
- (11) **Burgard, D.A.**; Provinsal, M. On-Road, In-Use Gaseous Emissions Measurements by Remote Sensing of School Buses Equipped with Diesel Oxidation Catalysts and Diesel Particulate Filters. *J. Air Waste Manage. Assoc.*, **2009**, *59*, 1468-1473.
- (12) **Burgard, D.A.**; Bishop, G.A.; Stedman, D.H.; Gessner, V. H.; Daeschlein, C. Remote Sensing of in Use Heavy Duty Diesel Vehicles. *Environ. Sci. Technol.*, **2006**, *40*, 6938-6942.
- (13) **Burgard, D.A.**; Bishop, G.A.; Stedman, D.H. Remote Sensing of Ammonia and Sulfur Dioxide from On-Road Light Duty Vehicles. *Environ. Sci. Technol.*, **2006**, *40*, 7018-7022.

- (14) **Burgard, D.A.**; Bishop, G.A.; Stadtmuller, R.S.; Dalton, T.R.; Stedman, D.H. Spectroscopy Applied to Mobile Source Emissions. *Appl. Spectrosc.*, **2006**, *60*, 135A-148A.
- (15) Bishop, G.A.; **Burgard, D.A.**; Dalton, T.R.; Stedman, D.H.; Ray, J.D. Winter Motor Vehicle Emissions in Yellowstone National Park. *Environ. Sci. Technol.*, **2006**, *40*, 2505-2510.
- (16) **Burgard, D.A.**; Dalton, T.R.; Bishop, G.A.; Starkey, J.R.; Stedman, D.H. A Nitrogen Dioxide, Sulfur Dioxide, and Ammonia Detector for Remote Sensing of Vehicle Emissions. *Rev. Sci. Instrum.*, **2006**, *77*, 014101/1-014101/5.
- (17) **Burgard, D.A.**; Abraham, J.; Allen, A.; Craft, J.; Foley, W.; Robinson, J.; Wells, B.; Xu, C.; Stedman, D.H. Chemiluminescent Reactions of Nickel, Iron, and Cobalt Carbonyls with Ozone. *Appl. Spectrosc.*, **2006**, *60*, 99-102.
- (18) **Burgard, D.A.** An Introduction to the General Chemistry Laboratory that Makes a Lasting Impression Concerning Laboratory Safety. *Chem. Educator*, **2005**, *10*, 427-429.

VII. Conference Presentations denotes Puget Sound student co-author

- (1) Rushing, R.; **Burgard, D.A.** “Estimating Changes from Legalization of Cannabis through Wastewater-Based Epidemiology” poster presented at the 255th ACS National Meeting, New Orleans, LA March 18-22, 2018.
- (2) **Burgard, D.A.**; Rushing, R.; Clarke, J.; LaRock, A.; Sadetsky, J.; Westerman, D.; Carpenter, R.; Fryhle, H.; Pellman, M.; Williams, J.; Banta-Green, C. Using Sewers as a Tool to Understand Legalized Retail Sales Effects on Cannabis Consumption in Washington State, USA., Testing the Waters 2017, 3rd International Conference on Wastewater-Based Drug Epidemiology, Lisbon, Portugal, 26-27 October, 2017.
- (3) **Burgard, D.A.**; Clarke, J.; Rushing, R. “Revised Cannabis Correction Factor for Back-Calculation: A broader picture” Poster presented at Testing the Waters 2017, 3rd International Conference on Wastewater-Based Drug Epidemiology, Lisbon, Portugal, 26-27 October, 2017.
- (4) LaRock, A.; Sadetsky, J.; Westerman, D.; **Burgard, D.A.** “Quantification of 11-nor-9-carboxy-tetrahydrocannabinol in wastewater from Washington State to estimate consumption patterns of cannabis use” poster presented at the 253rd ACS National Meeting, San Francisco, CA April 2-6, 2017.
- (5) Sadetsky, J.; LaRock, A.; Carpenter, R.; **Burgard, D.A.** “Quantification of THC-COOH to estimate cannabis consumption trends via wastewater based drug epidemiology” poster presented at the 253rd ACS National Meeting, San Francisco, CA April 2-6, 2017.
- (6) Westerman, D.; Carpenter, R.; **Burgard, D.A.** “Quantification of THC-COOH in wastewater: A tool to assess cannabis consumption in WA State” poster presented at the 251st ACS National Meeting, San Diego, CA March 13-17, 2016.
- (7) Carpenter, R.; Westerman, D.; **Burgard, D.A.** “Quantifying THC-COOH as a tracer of cannabis use in wastewater from a residential treatment plant using LC-MS/MS” poster presented at the 251st ACS National Meeting, San Diego, CA March 13-17, 2016.

- (8) **Burgard, D.A.**; Westerman, D.; Carpenter, R.; Fryhle, H.; Pellman, M.; Banta-Green, C. “Using Sewers as a Tool to Understand Legalized Retail Sales Effects on Marijuana Consumption: A test case using two treatment plants” Poster presented at Testing the Waters 2015, 2nd International Conference on Wastewater-based drug epidemiology, Congressi Stefano Franscini, Monte Verita, Ascona, Switzerland, 11-15 October, 2015.
- (9) Fryhle, H.; Pellman, M.; **Burgard, D.A.** “Method development towards quantifying marijuana consumption using sewage-based drug epidemiology: Preliminary results for Treatment Plant #1” poster presented at the 2015 Summer Meeting of the Pacific Northwest Regional Section of AOAC International. Tacoma, WA, June, 2015. ***Won 2nd place in poster contest***
- (10) **Burgard, D.A.**; Fryhle, H.; Pellman, M. “Using 5-hydroxyindoleacetic acid as an anthropogenic population biomarker in wastewater treatment plant influent” presented at the 249th ACS National Meeting, Denver, CO, March 22-26, 2015
- (11) Fryhle, H.; Pellman, M.; **Burgard, D.A.** “Method development towards quantifying marijuana consumption using sewage-based drug epidemiology: Preliminary results for Treatment Plant #1” poster presented at the 249th ACS National Meeting, Denver, CO, March 22-26, 2015.
- (12) Pellman, M.; Fryhle, H.; **Burgard, D.A.** “Method development towards quantifying marijuana consumption using sewage-based drug epidemiology: Preliminary results for Treatment Plant #2” poster presented at the 249th ACS National Meeting, Denver, CO, March 22-26, 2015.
- (13) Atkinson, O.; **Burgard, D.A.** “Analysis of on-road emissions of high-mileage airport shuttle vehicles and Prius taxis” presented at the 24rd CRC On-Road Vehicle Emissions Workshop. San Diego, CA, March 31-April 2, 2014.
- (14) Ginsberg, K.; **Burgard, D.A.** “Method development for wastewater epidemiology” poster presented at the 247th ACS National Meeting, Dallas, TX, March 16-20, 2014.
- (15) Ginsberg, K.; **Burgard, D.A.** “Method development for wastewater epidemiology” poster presented at the 2013 Murdock College Science Research Program Conference. Portland, OR, Nov., 2013. ***Won 1st place in Environmental Science/Geology division***
- (16) Ferrell, R.; **Burgard, D.A.** “Determination of stimulant use by commercial truck drivers: Wastewater analysis by LC-MS/MS” poster presented at the 2013 Summer Meeting of the Pacific Northwest Regional Section of AOAC International. Tacoma, WA, June, 2013. ***Won 1st place in poster contest***
- (17) **Burgard, D.A.**; Fuller, R.; Becker, B.; Ferrell, R.; Dinglasan-Panlilio, M.J. “Trends in attention deficit hyperactivity disorder (ADHD) drug use on a college campus as evidenced through wastewater analysis” presented at the 245th ACS National Meeting, New Orleans, LA, April 7-11, 2013.
- (18) Ferrell, R.; **Burgard, D.A.** “Determination of stimulant use by commercial truck drivers: Wastewater analysis by LC-MS/MS” poster presented at the 245th ACS National Meeting, New Orleans, LA, April 7-11, 2013.

- (19) Breuer, M.; **Burgard, D.A.** “Remote Sensing Measurements of In-Use Locomotive NO_x Emissions” presented at the 23rd CRC On-Road Vehicle Emissions Workshop. San Diego, CA, April 8-10, 2013.
- (20) Breuer, M.; **Burgard, D.A.** “On-Road Measurements of Transit Bus Emissions” presented at the 2012 Air & Waste Management Association Pacific Northwest International Section Conference. Portland, OR, Nov 3-6, 2012. ***Won 2nd Place for student presenters***
- (21) Larson, R.; Ferm, M.; Moore, D.; **Burgard, D.** “Psychostimulant use among college students during periods of high and low stress: An interdisciplinary approach utilizing both self-report and unobtrusive chemical sample data” poster presented at the 93rd Proceedings of the AAAS Pacific Division. Boise, ID, June 24-27, 2012. ***Won 2nd place in student poster competition***
- (22) Breuer, M.; **Burgard, D.A.** “On-Road Measurements of Transit Bus Emissions” presented at the 22nd CRC On-Road Vehicle Emissions Workshop. San Diego, CA, March 26-28, 2012.
- (23) **Burgard, D.A.**; Horsley, D. “Effects of New Heavy-Duty Diesel Truck Standards on Gaseous Emissions Measured On-Road Via Remote Sensing” presented at the 2011 ACS Northwest Regional Meeting. Portland, OR June 26-29, 2011.
- (24) Horsley, D.; **Burgard, D.A.** “On-road Measurement of the Effects of New Heavy-Duty Diesel Truck Emission Standards” poster presented at the 241st ACS National Meeting. Anaheim, CA, March 27-31, 2011.
- (25) Bria, C.; **Burgard, D.A.** “Remote Sensing Measurements of Gaseous Emissions from Ocean-Going Vessels: Lions Gate Bridge in Vancouver, BC” poster presented at the 2010 Summer Meeting of the Pacific Northwest Regional Section of AOAC International. Tacoma, WA, June, 2010. ***Won 1st place in poster contest***
- (26) Bria, C.; **Burgard, D.A.** “Remote Sensing Measurements of Gaseous Emissions from Ocean-Going Vessels: Lions Gate Bridge in Vancouver, BC” poster presented at the 20th CRC On-Road Vehicle Emissions Workshop. San Diego, CA, March 22-24, 2010.
- (27) Bria, C.; **Burgard, D.A.** “Remote Sensing Measurements of Gaseous Emissions From Marine Vessels” presented at the 2009 Air & Waste Management Association Pacific Northwest International Section Conference. Cle Elum (Suncadia Resort), WA Nov 3-6, 2009.
- (28) **Burgard, D.A.**; Bria, C. “Remote Sensing Measurements of Gaseous Emissions from Ocean-Going Vessels: Lions Gate Bridge in Vancouver, BC” presented at the 2009 Air & Waste Management Association Pacific Northwest International Section Conference. Cle Elum (Suncadia Resort), WA Nov 3-6, 2009.
- (29) **Burgard, D.A.**; Berenbeim J. “Remote Sensing Measurements of Gaseous Emissions From Marine Vessels” presented at the 2009 ACS Northwest Regional Meeting. Tacoma, WA June 28-July 1, 2009.
- (30) **Burgard, D.A.**; Provinsal, M. “On-Road, in-Use Gaseous Emission Measurements by Remote Sensing of School Buses Equipped with Diesel Oxidation Catalysts and Diesel Particulate Filters” presented at the 2009 ACS Northwest Regional Meeting. Tacoma, WA June 28-July 1, 2009.

- (31) Berenbeim, J.; **Burgard, D.A.** “Remote Sensing Measurements of Gaseous Emissions from Marine Vessels” presented at the 2009 ACS Puget Sound Section Undergraduate Research Symposium. Tacoma, WA, May 2, 2009.
- (32) Guyer, K.; **Burgard, D.A.** “Solid Phase Microextraction Used to Quantitate BPA Leaching from Plastic Bottles” poster presented at the 2009 ACS Puget Sound Section Undergraduate Research Symposium. Tacoma, WA, May 2, 2009.
- (33) Berenbeim, J.; **Burgard, D.A.** “Remote Sensing Measurements of Gaseous Emissions from Marine Vessels” poster presented at the 19th CRC On-Road Vehicle Emissions Workshop. San Diego, CA, March 23-25, 2009.
- (34) Virginia, J.; **Burgard, D.A.** “Analysis of Red Dye in Unburned and Combusted Diesel Fuel” poster presented at the 235th ACS National Meeting. New Orleans, LA, April 6-10, 2008.
- (35) Provinsal, M.; **Burgard, D.A.** “Examining Gaseous Emissions from School Buses in Washington State” presented at the 18th CRC On-Road Vehicle Emissions Workshop. San Diego, March 31-April 2, 2008.
- (36) **Burgard, D.A.** “Car, Truck, and Snowmobile Emissions as Measured by Remote Sensing”, presented at the Summer Meeting of the Pacific Northwest Regional Section of AOAC International. Tacoma, WA, June 22-23, 2007.
- (37) **Burgard, D.A.**; Gessner, V. H.; Daeschlein, C.; Bishop, G.A.; Stedman, D.H. “NO, NO₂ and SO₂ RSD Measurements from In-Use HDDV”, presented at the 16th CRC On-Road Vehicle Emissions Workshop. San Diego, March 28-30, 2006.
- (38) **Burgard, D.A.**; Bishop, G.A.; Dalton, T. R.; Stedman, D.H. “Ammonia and Sulfur Dioxide Measurements from Light Duty Vehicles in Denver, CO and Tulsa, OK ”, presented at the 16th CRC On-Road Vehicle Emissions Workshop. San Diego, March 28-30, 2006.
- (39) **Burgard, D.A.**; Starkey, J.R.; Bishop, G.A.; Stedman, D.H. “Vehicle Remote Sensing of Sulfur Dioxide and Ammonia”, poster presented at 15th CRC On-Road Vehicle Emissions Workshop. San Diego, April 4-6, 2005.
- (40) **Burgard, D.A.**; Bishop, G.A.; Stedman, D.H. “Vehicle Remote Sensing of Sulfur Dioxide”, poster presented at 14th CRC On-Road Vehicle Emissions Workshop. San Diego, March 29-31 2004.
- (41) Stedman, D.H.; Bishop, G.A.; Williams, M.J.; Williams, C.P.; **Burgard, D.A.**; Agee, L.D. “A New, On-Road, Continuously Operating, Emissions Remote Sensor”, Air and Waste Management Association Meeting. San Diego, June 23-25 2003.
- (42) **Burgard, D.A.**; Weaver, G.C. “The E-2020 Program: Learning How to Involve Students in Scientific Inquiry”, 16th Biennial Conference on Chemical Education. Ann Arbor, July 30-August 2 2000.

VIII. Reports

- (1) **Burgard, D.A.;** Bisceglia, K.; Banta-Green, C. Wastewater Testing as a Pipeline to Public Health Data. In *The Potential of Wastewater Testing for Public Health and Safety*. Keshaviah, A., Ed.; Mathematica Policy Research: Washington, DC, 2017.
- (2) Bishop, G.A.; **Burgard, D.A.;** Dalton, T.R.; Stedman, D.H. *In-Use Emission Measurements of Snowmobile and Snowcoaches in Yellowstone National Park*, Final Report prepared for the National Park Service, January 2006
- (3) Bishop, G.A.; **Burgard, D.A.;** Stedman, D.H. *On-Road Remote Sensing of Automobile Emissions in the Chicago Area: Year 6, September 2004*, Final Report prepared for CRC, May, 2006.
- (4) Bishop, G.A.; **Burgard, D.A.;** Stedman, D.H. *On-Road Remote Sensing of Automobile Emissions in the Phoenix Area: Year 5, November 2004*, Final Report prepared for CRC, May, 2006.
- (5) Bishop, G.A.; **Burgard, D.A.;** Stedman, D.H. *On-Road Remote Sensing of Automobile Emissions in the La Brea Area: Year 3, October 2003*, Final Report prepared for CRC, May, 2004.
- (6) Bishop, G.A.; **Burgard, D.A.;** Williams, M.J.; Stedman, D.H. *On-Road Remote Sensing of Automobile Emissions in the Phoenix Area: Year 4, November 2002*, Final Report prepared for CRC, November, 2003.
- (7) Bishop, G.A.; Williams, M.J.; **Burgard, D.A.;** Stedman, D.H. *On-Road Remote Sensing of Automobile Emissions in the Chicago Area: Year 5, September 2002*, Final Report prepared for CRC, September, 2003.
- (8) **Burgard, D.A.;** Bishop, G.A.; Stedman, D.H. *On-Road Remote Sensing of Automobile Emissions in the Denver Area: Year 4, January 2003*, Final Report prepared for CRC, July, 2003.

IX. Professional Organizations

2003 – Present American Chemical Society
2009 – Present Air & Waste Management Association
 -Board of Directors, Pacific Northwest International Section, 2015-2017.
 -Board of Directors, Puget Sound Chapter, 2010-2013.