Student Platform Paper & Poster Award Winners

Below we acknowledge the winners of this year’s student platform paper and poster awards presented during A&WMA’s 105th Annual Conference & Exhibition held in San Antonio, TX, in June.

Doctoral Platform Paper Award
First Place: Andrew J. Nelson

Title: Investigation of Bioaerosol Removal from a Gas Stream and Inactivation Using Acoustically Enhanced Impaction
Authors: Andrew J. Nelson,1 Martin A. Page,1 Brian Zadler,2 Mark J. Rood,3 and Mark D. Ginsberg1
Affiliations: 1U.S. Army Corps of Engineers, Engineer Research and Development Center – Construction Engineering Research Laboratory, Champaign, IL; 2Applied Research Associates Inc., CO; 3University of Illinois, Urbana, IL

Description: A new method was developed and tested to measure particle removal efficiency of aerosolized Bacillus cereus (BC) spores at 1 LPM by an acoustically enhanced impaction device in a biological safety level-2 facility. Removal efficiency was measured to be 99.38% ± 0.16 % of 0.85 – 1.4 μm diameter of aerosolized BC spores. Additionally, a method to measure viability of immobilized spores after exposure to high sound pressure levels (>140 dB) was developed, and it was determined that prolonged exposure (13 days) to a high intensity sound field at indoor ambient temperature and pressure will not affect spore viability.

Second Place: Wangki Yuen
Title: Open Burning and Open Detonation PM10 Mass Emission Factor Measurements with Optical Remote Sensing
Authors: Wangki Yuen,1 David L. Johnsen,1 Sotiria Koloutsou-Vakakis,1 Mark J. Rood,1 Byung J. Kim,2 and Michael R. Kemme2
Affiliations: 1University of Illinois, Urbana, IL; 2U.S. Army Corps of Engineers, Engineer Research and Development Center – Construction Engineering Research Laboratory, Champaign, IL

Description: Results from a field campaign to quantify PM10 EFs from OB/OD in outdoor ambient air were presented. An optical remote sensing technique was used for determining PM10 EFs from OB of M1 propellant and OD of 2,4,6-trinitrotoluene (TNT). The results suggest that previous enclosed environment measurements likely underestimated the PM10 EFs for OD of TNT.

Honorable Mention: Lin Shou
Title: Development of a Novel Porous Membrane Denuder
Authors: Lin Shou,1 Alex Theodore,1 Chang-Yu Wu,1 Yu-Mei Hsu,2 and Brian Birky3
Affiliations: 1University of Florida, 2Wood Buffalo...
Environment Association, Alberta, Canada; Florida Industrial and Phosphate Research Institute, Bartow, FL

Description: Conventional denuders made of glass or metal are too heavy and bulky to be used in a personal sampling system. In this study, a portable Porous Membrane Denuder (PMD) was developed for personal sampling, which utilizes the porosity of membrane material, and a configuration of multiple parallel flow channels to compact the size, decrease the weight, and increase gas collection efficiency.

Master's Platform Paper Award
First place: James E. Bonany

Title: Heat Budget for the Sainte-Sophie Anaerobic Bioreactor Landfill, Quebec, Canada
Authors: James E. Bonany, Paul J. Van Geel, H. Burak Gunay, and O. Burkan Isgor
Affiliation: Carleton University, Ottawa, Ontario, Canada

Description: Results from a three-year effort to instrument a cell of the Ste. Sophie bioreactor landfill located north of Montreal, Canada were presented. Two vertical profiles of six instrument bundles record the moisture content, temperature, settlement, total load, percent oxygen, moisture content, mounding of leachate, and electrical conductivity. Preliminary modeling of the heat transfer throughout the waste confirmed that the waste is an efficient insulator, having a low thermal conductivity and high latent heat of fusion.

Second Place: Christopher Blazo
Title: China: The Fastest Growing Economy and the Associated Air Quality Challenges
Authors: Christopher Blazo, Bhaskar Kura, and Natasha Halageri
Affiliation: University of New Orleans, LA

Description: The objective of the study was to assess the air quality in China and compare the pollutant concentrations with the National Ambient Air Quality Standard (NAAQS) used in the United States. The air quality of major cities such as Beijing, Shanghai, Changzhi, Shaoxing, Shenzhen, and Xiamen were discussed with respect to PM$_2.5$, SO$_2$, and NO$_2$.

Doctoral Student Poster Award
First place: Evan Couzo

Title: Houston's Unusually Large Ozone Increases: Using Ambient Formaldehyde Concentrations and Wind Fields in the Search for a Cause
Authors: Evan Couzo, Harvey Jeffries, and William Vizuete
Affiliation: The University of North Carolina, Chapel Hill

Description: Some of Houston's highest measured ozone peaks are characterized by non-typical ozone changes, or NTOCs, that appear at a few monitors and span narrow geographic areas. Analysis of ozone, formaldehyde, and local wind measurements indicates that NTOCs originate near the industrial ship channel in eastern Houston. This paper demonstrated that formaldehyde levels, a strong indicator of VOC oxidation, are significantly greater immediately following a NTOC. This suggests that the increases in ozone are due at least in part to heightened chemical production above usual levels.

Second place: Masoud Jahandar Lashaki
Title: Irreversible Adsorption of Organic Vapors onto Beaded Activated Carbon: Effect of Adsorption and Regeneration Temperature
Authors: Masoud Jahandar Lashaki and Mohammadreza Fayaz
Affiliation: University of Alberta, Edmonton, Canada

Description: The influence of adsorption and regeneration temperature on the irreversible adsorption of organic compounds emitted from automobile painting operations was investigated. The adsorption of an organic vapor mixture onto microporous beaded activated carbon (BAC) and the regeneration of the saturated BAC were completed. Based on results, adsorption process should be accomplished at lowest possible temperature to minimize adsorbate-adsorbate and adsorbate-adsorbent interactions.

Third place: Yevgen Nazarenko
Title: Novel Experimental Approach to Determine the Effects of Nanoaerosol-Bioaerosol Interaction and the Associated Toxic Effects
Authors: Yevgen Nazarenko and Gediminas Mainelis
Affiliation: Rutgers University, New Brunswick, NJ

Student Corner is a new quarterly column written for (and by) student members sponsored by A&WMA's Publication Committee. Have an idea for a topic or want to author a column? E-mail: studentcorner@awma.org.
Description: The toxic effects of nanoparticles on the air-suspended microorganisms in the airborne phase were investigated. Nano- and bio-aerosols of controlled concentrations are generated separately and then brought into contact in the gas phase in a reaction chamber for different interaction times. Preliminary results of the toxicological investigations showed both low and high general toxicity of different nanoparticles with airborne silver nanoparticles being the most toxic to the test airborne microorganisms.

Master's Student Poster Award
First place: Dipsikha Sarmah

Title: Evaluation of Different GIS-based Spatial Interpolation Schemes using Indoor Radon Data for Ohio
Authors: Dipsikha Sarmah and Dr. Ashok Kumar
Affiliation: University of Toledo, OH

Description: This study tested numerous techniques to identify the best method for interpolating radon concentration for all the missing zip codes in the state. Statistical performance measures such as coefficient of correlation (r), slope of the regression line (m), ratio of the intercept of the regression line to the average observed concentrations (b/C0), normalized mean square error (NMSE), fractional bias (FB), and fractional variance (FV) were used to compare the performance of the different interpolation techniques. This approach provides a complete picture of radon distribution in the state.

Second place: Sagar A. Chitre
Title: Bench Scale Quantification of Water Vapor Adsorption Capacity of Biologically Active Soil and Wood Chips
Authors: Sagar A Chitre, Sergio Santos, Dr. David Ramirez, and Dr. Kim Jones
Affiliation: Texas A&M University, Kingsville

Description: Results of water vapor adsorption capacity of biologically active soil and wood chips were presented. Biologically active cover (biocover) materials are proposed to mitigate the fugitive methane emissions from landfill sites by oxidizing methane to carbon dioxide. Organically rich soil and wood chips are used as the biocover materials in this study. Bench-scale column tests were conducted to determine the water adsorption capacity of organic rich soil and wood chips obtained from the McCommas Bluff landfill site in Dallas, TX.

Third place: Andrew J. Keebaugh
Title: Cardiovascular Toxicity of Semi-Volatile Constituents of Airborne Particulate Matter in an Atherosclerotic Mouse Model
Authors: Andrew J. Keebaugh,1 Loyda Mendez,1 Payam Pakbin,2 Zhi Ning,2 Glenn Gookin,1 Constantinos Sioutas,2 and Michael Kleinman1
Affiliations: 1University of California, Irvine; 2University of Southern California

Description: Previous studies have shown a possible association between increasing distance from ultrafine particulate matter (PM) emission sources and decreased PM toxicity. The aim of this study was to assess the difference in cardiovascular toxicity between semi-volatile organic compounds (SVOC) and refractory non-volatile constituents of ultrafine PM. Apolipoprotein E knockout (Apoe-/-) mice, which are prone to develop atherosclerosis, were exposed to ultrafine concentrated ambient particles (CAPs), or to either its semi-volatile components or to non-volatile CAPs. Greater heart rate variability changes from baseline were observed in mice exposed to unmodified CAPs and SVOC components. Removal of SVOCs present in ultrafine CAPs resulted in a reduction of both plaque formation and lipid accumulation in the aorta. The results indicate that SVOCs are important contributors to the cardiovascular toxicity attributed to ultrafine PM.

Undergraduate Student Poster Award
First place: Zachariah J. Berkson

Title: EPR Study of Charge Transfer within Novel TiO2 Photocatalysts for the Reduction of CO2 to Fuels
Authors: Zachariah J. Berkson and Dr. Jean M. Andino
Affiliation: Arizona State University

Description: Electron paramagnetic resonance (EPR), a powerful tool for the study of charge transfer, has been utilized to observe the separation of charge carriers within novel titanium dioxide (TiO2) photocatalysts. A commercial mixed-phase TiO2 photocatalyst was heat treated to promote the formation of oxygen vacancies. This study found...
that treatment increased concentrations of trapped charge carriers by approximately 10 times on UV-vis illumination.

Second place: Matthew Boyle
Title: Air Quality of Marcellus Shale Drilling
Authors: Benjamin Lockwood and Matthew Boyle
Affiliation: Wilkes University, Wilkes-Barre, PA

Description: The goal of this project is to test the air quality near Marcellus shale drilling sites to determine if, and to what extent, drilling operation emissions are affecting the ambient air quality in the region. Monitoring of certain air pollutants such as nitrogen oxides, diesel particulate matter, and ozone started in Summer 2011 and is ongoing. Previous studies have indicated that the drilling operations have the potential to create smog issues during summer in the drilling region. An attempt is being made to expand on this study and to further evaluate the air quality in Northern Pennsylvania.

Third place: Hsiao-Hsin Tsai
Title: Study on the Windblown Dust Emission Characteristics at the Coast of a River in Taiwan and the Assessment of Dust Emission Prevention Strategies
Authors: Hsiao-Hsin Tsai, Chang-Tang Chang, Angus Shiue, Tse-Shao Lin, and Li-Yen Wu
Affiliation: National I-Lan University, Taipei, Taiwan

Description: The typhoon season in Taiwan Yilan Country results in deposits of sand and silt, thereby increasing particulate emissions. The study identified locations where these deposits occurred frequently in the Lan-Yang middle and lower river. The study also analyzed the components of dust and the suspended particulate downwind of the river, and studied the suppression performance of control measures. The study found that the most efficient method for dust elimination was through pipeline laying and watering; the most expensive method was straw laying, while the cheapest method was the use of Pennisetum alopecuroides.

2012 Scholarship Award Recipients

A&WMA takes great pride in supporting the future environmental leaders of our world. For more than a decade, the Association has awarded scholarships to the most promising environmental students on the basis of academic record, plan of study, career goals, recommendations, and extracurricular activities without consideration of sex, race, national origin, financial need, age, or physical disability. Full-time graduate students who are pursuing courses of study and research leading to careers in air quality, waste management, environmental management/policy/law, and sustainability are eligible to apply. This year, A&WMA is pleased to recognize the following nine students chosen by the Scholarship Awards Committee.

In recognition of excellence in air quality research and study:
- Teresa Sosa, Milton Feldstein Memorial Scholarship
- Xiaofei Wang, Dave Benferado Scholarship
- Andrew Keebaugh
- Kurt Westerlund

In recognition of excellence in waste management research and study:
- Stephanie Bolyard, Richard I. Stessel Memorial Scholarship
- Cristina Small, Jacqueline Shields Memorial Scholarship
- Shahed Manzur

In recognition of excellence in environmental management/policy research and study:
- Shahan Khurshid

In recognition of excellence in sustainable development research and study:
- Christopher Gino

Scholarship Donations

A&WMA gratefully acknowledges all of the contributions made to the Scholarship Endowment Trust Fund from April 1, 2011, through March 31, 2012, with special appreciation to the following contributors of US$100 or more.

Margaret Feldstein ........................................ $10,000
Bechtel Group .................................................. $9,500
Jason Booms ................................................... $500
John Higuchi .................................................... $200
Mark J. Rood ................................................... $200
Tim C. Keener .................................................. $120
W.L. Hagar ...................................................... $100
Robert Kelly .................................................... $100

If you are interested in making a donation to the A&WMA Scholarship Endowment Trust Fund, please contact Stephanie Glyptis at sglyptis@awma.org. Contributions are tax deductible.