

# **Finding Common Ground on Climate Change Mitigation and Adaptation**

Arlington, Virginia, USA  
10 - 11 October 2017

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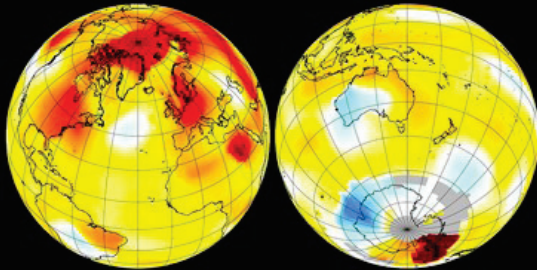
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# FINAL PROGRAM



## Finding Common Ground on Climate Change Mitigation and Adaptation

October 10-11, 2017, Arlington, VA

[www.awma.org/climatechange](http://www.awma.org/climatechange)

**DoubleTree by Hilton Washington DC - Crystal City**

300 Army Navy Drive

Arlington, VA 22202

1-703-416-4100



AIR & WASTE MANAGEMENT  
ASSOCIATION

SINCE 1907

# FINAL PROGRAM

## ABOUT THE CONFERENCE

This international conference on climate change mitigation and adaptation will provide a neutral forum to address emerging policies and technologies for greenhouse gas (GHG) emissions reductions and mitigation along with estimating climate change impacts and adaptation strategies.

The conference is convened as a neutral science-based forum for addressing climate change related issues such as: Methodologies for identifying and estimating climate change risks and impacts; Strategies and technologies for reducing emissions of greenhouse gasses (GHGs) and other climate-changing pollutants; Practices for increasing the resiliency of communities and facilities to the changing climate.

## GENERAL INFORMATION

### REGISTRATION

Register online at [www.awma.org/climatechange](http://www.awma.org/climatechange), or onsite in the Presidential Hallway during the following hours:

Tuesday, Oct. 10	7:00 am - 5:00 pm
Wednesday, Oct. 11	7:30 am - 4:00 pm

### REFUND POLICY

If written notice of cancellation is received on or before September 26, 2017, payment will be refunded, less a \$75 cancellation fee. (Cancellation fees apply regardless of payment method). Substitutions may be made at any time; payment for any difference is due at the time of substitution. This refund policy applies to all occurrences, including weather-related events and other natural disasters. In the unlikely occurrence of event cancellation, the Association is not liable for any expenses incurred by the registrant other than the full refund of registration fee(s) paid.

### PRESENTER'S MEETINGS

Presenters and Session Chairs for each day will meet to review program details. Presenters should bring their most recent presentations on a memory stick/USB to this meeting, as well as a brief biography.

### CONFERENCE PROCEEDINGS

Conference proceedings will be posted on the A&WMA website after the conference. Attendees will be notified via e-mail when the extended abstracts and presentations are available. A login and password will be provided at that time.

### CONFERENCE COMMITTEE

#### General Chair:

C. Flint Webb, Leidos

#### Committee Members:

Michael Conrardy, AECOM  
Chris Frey, North Carolina State University  
Joshua Fu, University of Tennessee  
Sardar Hassan, Office of the Inspector General, Department of Defense  
Michael Hendrix, LSA Associates, Inc.  
Miriam Lev-On, The Levon Group LLC  
George Namie, Phoenix Environmental Systems  
Chris Nelson, 3M  
Clara Poffenberger, Environmental Law and Policy, LLC  
Harish Rao, Rao Consulting Services Inc.  
Abby Young, Bay Area Air Quality Management District

### CONTINUING EDUCATION

**Supported by A&WMA South Atlantic States Section.** Conference attendees may be eligible for continuing education credit. For more information, contact Gloria Henning at 412-904-6031 or [glhenning@awma.org](mailto:glhenning@awma.org).

### SUPPORTING PARTNERS

Thank you to the following organizations for supporting this conference:

American Security Project (ASP)  
American Society of Adaptation Professionals (ASAP)  
Association of Climate Change Officers (ACCO)  
Association of Environmental Professionals (AEP)  
Center for Climate Change Communication (4C)  
Center for Climate and Security (CCS)

## TECHNICAL PROGRAM - Tuesday, October 10

**7:30 am - 5:00 pm**  
Conference Registration  
Presidential Hallway

**7:30 am - 8:30 am**  
Presenters' Meeting  
Jackson

**7:30 am - 8:30 am**  
Continental Breakfast  
Presidential Hallway

### KEYNOTE SESSION

**Wilson/Harrison**

**8:30 am - 8:45 am**

**Welcome and Introductory Remarks**

*C. Flint Webb, Leidos*  
General Conference Chair

**8:45 am - 10:10 am**

**Keynote Plenary Panel - Climate Policy Update**

**Wilson/Harrison**

Moderator: Clara Poffenberger, Principal, Environmental Law and Policy, LLC

#### Panelists:

- Dan Carol, Senior Advisor on Energy and Infrastructure, California Governor's Office
- Mark Keam, Delegate 35th District VA House of Delegates
- Kate Schisler, Legislative Aide to Congressman Don Beyer Jr., (D-VA 8th District)

**10:10 am - 10:30 am**

**Coffee Break**

Presidential Hallway

**10:30 am - 11:50 am**

**Plenary Panel - Climate Communication**

**Wilson/Harrison**

Moderator: C. Flint Webb, Leidos

#### Panelists:

- Edward Maibach, Director, George Mason University Center for Climate Change Communication 1
- Chris Frey, North Carolina State University 8
- Dan Kreeger, Executive Director, Association for Climate Change Officers 18

**11:50 am - 12:10 pm**

**Plenary Discussion: Institutionalizing Climate Change into Decision Making**

Dan Kreeger, Executive Director, Association for Climate Change Officers

**12:10 pm - 1:10 pm**  
**Lunch**  
Jackson

### ABOUT THE AIR & WASTE MANAGEMENT ASSOCIATION

A&WMA is a nonprofit, nonpartisan professional organization that enhances knowledge and expertise by providing a neutral forum for information exchange, professional development, networking opportunities, public education, and outreach to more than 5,000 environmental professionals in 65 countries. A&WMA also promotes global environmental responsibility and increases the effectiveness of organizations to make critical decisions that benefit society. For more information, please visit [www.awma.org](http://www.awma.org). A&WMA Federal Tax ID #: 25-6048614

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# FINAL PROGRAM

## TECHNICAL PROGRAM - Tuesday, October 10

### Session A1:

#### NATIONAL AND INTERNATIONAL POLICY

(concurrent with session A2)

Madison

**Chair:** Miriam Lev-On, The Levon Group LLC

**1:10 pm - 1:30 pm**

CC05

#### Assessment of Progress in Climate Change Mitigation and Adaptation

Jesse D. Frederick, WZJ Inc., Bakersfield, CA 32

**1:30 pm - 1:50 pm**

CC04

#### What is Measured is Managed: Lessons Learned from the Operation of the Israeli Voluntary Greenhouse Gas Registry Since 2010

Miriam Lev-On, Perry P. Lev-On, The LEVON Group, LLC, Thousand Oaks, CA and Samuel Neaman Institute, Technion, Haifa, Israel; Ofira Ayalon, Department of Natural Resources & Environmental Management, University of Haifa, Israel and Samuel Neaman Institute, Technion, Haifa, Israel 50

**1:50 pm - 2:10 pm**

CC21

#### GHG Policies for International Maritime Activities

Steve O'Malley, Ken Walsh, Leidos Corporation, Atlanta, Georgia & Raleigh, NC 62

**2:10 pm - 2:30 pm**

CC27

#### Greenhouse Gas Emissions in Abu Dhabi Emirate, UAE: Current and Future Status

Hussein I. Hamed, Ruqaya M. Mohamed, Mouza I. Al Zaabi, Environment Agency, Abu Dhabi, UAE 80

**2:30 pm - 2:50 pm**

Open Discussion

### Session A2:

#### LOCAL POLICY

(concurrent with session A1)

Monroe

**Chair:** Michael Hendrix, LSA Associates, Inc.

**1:10 pm - 1:30 pm**

CC35

#### An Update and Comparison on State Level Greenhouse Gas Reporting and Cap and Trade Regulations

Cassandra Drotman, Raymond H. Huff, SCS Engineers, Long Beach, CA; John Henkelman, Patrick S. Sullivan, SCS Engineers, Sacramento, CA 96

**1:30 pm - 1:50 pm**

CC30

#### Spare the Air – Cool the Climate

Henry Hilken, Jack P. Broadbent, Bay Area Air Quality Management District, San Francisco, CA 112

**1:50 pm - 2:10 pm**

CC31

#### Effects of Bay Area Policies and Incentives to Improve Air Quality and Reduce Greenhouse Gas Emissions by Electrifying Transportation

Damian Breen, Karen M. Schkolnick, Kenneth Mak, Bay Area Air Quality Management District, San Francisco, CA 126

**2:10 pm - 2:30 pm**

CC43

#### Outcomes of Recent Public Renewable Energy Policies in the City of Gainesville, FL

Christopher Cuevas, Fazil T. Najafi, University of Florida, Gainesville, FL 131

**2:30 pm - 2:50 pm**

CC47

#### Community Energy Planning and Implementation – Making it Happen in Arlington, VA

Richard Dooley - Arlington Initiative to Rethink Energy (AIRE) 143

**2:50 pm - 3:10 pm**  
**Refreshment Break**  
**Presidential Hallway**

## TECHNICAL PROGRAM - Tuesday, October 10

### Session B1:

#### MITIGATION PATHWAYS

(concurrent with session B2)

Madison

**Chair:** Miriam Lev-On, The Levon Group LLC

**Co-Chair:** Michael Hendrix, LSA Associates, Inc.

#### 3:10 pm - 3:30 pm

CC19

##### Impacts of Future Electricity Generation on Greenhouse Gases and Air Quality in the Rocky Mountain Region

*Rene Nsanzineza, Jana Milford, University of Colorado, Boulder, CO; Mathew O'Connell, Gregory Brinkman, Strategic Energy Analysis Center, Golden, CO* 158

#### 3:30 pm - 3:50 pm

CC46

##### Prediction of GHGs Reduction Scenario Analysis of in Korea Using of the LEAP Model

*Jindo Chung, Haemin An, Taewoo Kim, Jongwoo Kim, Naining Liu, Department of Environment Engineering, Hoseo University, Asan, Korea* 172

#### 3:50 pm - 4:10 pm

CC36

##### Emerging Technology Solutions Microgrid Technology within Hospital Campuses

*Michael Hendrix, Nichole Dubois, LSA Associates, Riverside, CA* 193

#### 4:10 pm - 4:30 pm

CC18

##### The Electricity Generation Carbon Footprint in the State of Kuwait

*Ashraf A. Ramadan, Osamah Al-Sayegh, Environmental Pollution and Climate Program, Environment and Life Sciences Research Center, Kuwait* 208

#### 4:30 pm - 4:50 pm

CC29

##### The Clean and Secure Grid – Siting and Economic Analysis Considerations for a New Underground Electricity Superhighway in the Contiguous United States

*Rachel E. Levine, Climate Institute, Washington, DC; Alexander MacDonald, Spire Global, Boulder, CO; David Bunch, University of California – Davis, Davis, CA* 227

### Session B2:

#### CORPORATE POLICY

(concurrent with session B1)

Monroe

**Chair:** Harish Rao, Rao Consulting Services, Inc.

#### 3:10 pm - 3:30 pm

CC14

##### A Review of Regulatory and Industry Greenhouse Gas Reporting Cooperation

*John Henkelman, Patrick S. Sullivan, SCS Engineers, Sacramento, CA; Raymond H. Huff, Cassandra Drotman, SCS Engineers, Long Beach, CA* 240

#### 3:30 pm - 3:50 pm

CC45

##### Connecting Climate Risk to Financial Performance for Infrastructure Investments

*David Espinoza, Jeremy Morris, Geosyntec CAT Advisory, Washington DC* 256

#### 3:50 pm - 4:10 pm

CC15

##### Measuring the Impact of Organizational Efforts on Community Sustainability and Resilience

*Sarah Dobie, Jennifer Schneider, Collaboratory for Resiliency and Recovery, Rochester Institute of Technology, Rochester, NY* 273

#### 4:10 pm - 4:30 pm

CC50

##### Private Sector Advances on Key Climate Risks and Opportunities—But More are Still Needed

*Emily Wasley, The Cadmus Group, Inc., San Francisco, CA* 286

#### 4:30 pm - 4:50 pm

Open Discussion

5:30 pm

#### Networking Event

Hosted by the American Society of  
Adaptation Professionals (ASAP)

Alba Osteria

425 I Street NW  
Washington, DC 20001

# FINAL PROGRAM

## TECHNICAL PROGRAM - Wednesday, October 11

**7:30 am - 4:00 pm**  
Conference Registration  
Presidential Hallway

**7:30 am - 8:30 am**  
Presenters' Meeting  
Jackson

**7:30 am - 8:30 am**  
Continental Breakfast  
Presidential Hallway

**8:30 am - 9:00 am**  
Keynote Address  
Wilson/Harrison

**Climate Change: The Imperative to Increase Global Resilience**  
*Vice Admiral Dennis V. McGinn, United States Navy (Retired), The Center for Climate and Security*

**9:00 am - 10:30 am**  
**Plenary Panel – National Security and Climate Change**  
**Moderator:** Sardar Hassan, Office of the Inspector General, Department of Defense  
**Panelists:** 294

- Vice Admiral Dennis V. McGinn, United States Navy (Retired), The Center for Climate and Security
- Rear Admiral Ann Phillips (Retired), Member of the Advisory Board, The Center For Climate and Security
- Brigadier General Stephen Cheney, United States Marine Corps (Retired), CEO, American Security Project
- Dr. Wade Smith, APM Institute

**10:30 am - 10:50 am**  
Coffee Break  
Presidential Hallway

**Session C1:**  
**METHANE EMISSIONS**  
(concurrent with session C2)  
**Madison**

**Chair:** Miriam Lev-On, The Levon Group LLC

**10:50 am - 11:10 am**  
CC17  
**U.S. EPA Greenhouse Gas Data for Petroleum and Natural Gas Systems**  
*Melissa Weitz, Mark de Figueiredo, Adam Eisele, U.S. EPA, Washington DC* 306

**11:10 am - 11:30 am**  
CC07  
**Towards Robust Methane Emissions for Petroleum and Natural Gas Systems in the National Greenhouse Gas Emissions Inventory**  
*Karin Ritter, American Petroleum Institute, Washington DC; Miriam Lev-On, The LEVON Group, LLC, Thousand Oaks, CA; Terri Lauderdale, AECOM, Austin, TX* 320

**Session C2:**  
**ATMOSPHERIC PROCESSES**  
(concurrent with session C1)  
**Monroe**

**Chair:** C. Flint Webb, Leidos  
**Vice Chair:** Joshua Fu, University of Tennessee

**10:50 am - 11:10 am**  
CC44  
**The Berkeley Atmospheric CO2 Observation Network: Greenhouse Gas Monitoring at the Scale of Regulatory Action**  
*Alexis A. Shusterman, Ronald C. Cohen, University of California, Berkeley, CA; Alexander J. Turner, Harvard University, Cambridge, MA* 335

**11:10 am - 11:30 am**  
CCC42  
**Regional and Seasonal Variations in Ambient CO2 Concentrations as Indicators of Natural and Anthropogenic Events**  
*Quamrul Huda, Bob Myrick, Environmental Monitoring and Science Division, Alberta Environment and Parks, Edmonton, Alberta, Canada; Arturo Sanchez-Azofeifa, Earth and Atmospheric Sciences Department,* 352



## TECHNICAL PROGRAM - Wednesday, October 11

### Session C1:

#### METHANE EMISSIONS, CON'T.

(concurrent with session C2)

Madison

11:30 am - 11:50 pm

CC48

#### Using a Life Cycle Perspective to Reach Common Ground on Methane Emissions from the Natural Gas Supply Chain

James Littlefield and Timothy J. Skone, National Energy Technology Laboratory (NETL), Department of Energy, Pittsburgh, PA

369

11:50 am - 12:10 pm

CC49

#### Estimating Methane Emissions for the U.S. Oil and Gas Supply Chain with a Synthesis of Component-, Site-, and Basin-level Data

David Lyon, Ramon Alvarez, Daniel Zavala-Araiza, and Steve Hamburg; Environmental Defense Fund, Austin, TX

375

12:10 pm - 12:30 pm

### Session C2:

#### ATMOSPHERIC PROCESSES, CON'T

(concurrent with session C1)

Monroe

11:30 am - 11:50 am

CC28

#### Aircraft Greenhouse Gas Emissions

C. Flint Webb, Leidos, Reston, VA; Erik Tucker, Leidos, Falls Church, VA

384

11:50 am - 12:10 pm

CC24

#### The Global Distribution of Nitrogen Deposition in a Changing Climate

Joshua S. Fu, Jian Sun, University of Tennessee, Knoxville, TN

398

12:10 pm - 12:30 pm

CC38

#### Reconciliation of Competing Climate Science and Policy Paradigms

Patrick J. Michaels, Center for the Study of Science, Cato Institute, Washington DC

415

12:30 pm - 1:30 pm **Lunch** Jackson

### Session D1:

#### ADAPTATION AND RESILIENCY

(concurrent with session D2)

Madison

**Chair:** Sardar Hassan, Office of the Inspector General, Department of Defense

1:30 pm - 1:50 pm

CC11

#### Climate Change Adaptation: Emerging International Standards and Best Practices

Elizabeth T. Delaney, First Environment, Inc., Boonton, NJ

437

1:50 pm - 2:10 pm

CC34

#### Climate Risk and Resilience Assessment in Due Diligence

Sue Kembell-Cook, Lisa Grice, Ramboll Environ US Corporation, Novato, CA; Stella Whittaker, Ramboll Environ US Corporation, North Sydney, AUS; Shari Beth Libicki, Ramboll Environ US Corporation, San Francisco, CA

457

### Session D2:

#### COST BENEFITS

(concurrent with session D1)

Monroe

**Chair:** C. Flint Webb, Leidos

**Vice Chair:** Michael Conrardy, AECOM

1:30 pm - 1:50 pm

CC10

#### Estimating Environmental Co-benefits of U.S. GHG Reduction Pathways Using the GCAM-USA Integrated Assessment Model

Yang Ou, Wenjing Shi, Christopher G. Nolte, Daniel H. Loughlin, U.S. EPA, Research Triangle Park, NC; Steven J. Smith, Pacific Northwest National Laboratory, College Park, MD; J. Jason West, University of North Carolina at Chapel Hill, NC

473

1:50 pm - 2:10 pm

CC41

#### Co-benefits of Global and Domestic Greenhouse Gas Emissions for Air Quality and Human Health

J. Jason West, Yuqiang Zhang, Raquel A. Silva, Jared H. Bowden, Zachariah Adelman, University of North Carolina, Chapel Hill, NC; Steven J. Smith, Pacific Northwest National Laboratory, College Park, MD; Vaishali Naik, UCAR/NOAA Geophysical Fluid Dynamics Laboratory, Princeton, NJ; Ying Li, Dennis Gilfillan, East Tennessee State University, Johnson City, TN; Meredith M. Fry, U.S. EPA, Arlington, VA; Susan C. Anenberg, Environmental Health Analytics, Washington, DC; Larry Horowitz, NOAA Geophysical Fluid Dynamics Lab, Princeton, NJ; Jean Francois Lamarque, National Center for Atmospheric Research, Boulder, CO

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# FINAL PROGRAM

## TECHNICAL PROGRAM - Wednesday, October 11

### Session D1:

#### ADAPTATION AND RESILIENCY, CON'T,

(concurrent with session D2)

Madison

2:10 pm - 2:30 pm

CC13

#### Assessment of Coastal Community Waste Management Vulnerabilities to Sea Level Rise and Storm Surge

Marissa S. Liang, U.S. EPA, Cincinnati, OH; Susan H. Julius, U.S. EPA, Arlington, VA; P. Ozge Kaplan, U.S. EPA, Durham, NC; Susan A. Thorneloe, U.S. EPA, Durham, NC; Keith A. Weitz, U.S. EPA, Research Triangle Park, NC 504

### Session D2:

#### COST BENEFITS, CON'T

(concurrent with session D1)

Monroe

2:10 pm - 2:30 pm

CC12

#### Green Bonds: Innovative Financing for Climate Change Mitigation and Adaptation Projects

Phillip J. Ludvigsen, First Environment, Inc., Boonton, NJ 521

2:30 pm - 2:50 pm  
Refreshment Break

Presidential Hallway

2:50 pm - 4:10 pm

#### PLENARY PANEL - CLIMATE ACTION

Wilson/Harrison

**Moderator:** C. Flint Webb, Leidos

#### Panelists:

- Beth Gibbons, Managing Director, American Society of Adaptation Professionals and Senior Program Officer, Insitute for Sustainable Communities 539
- Ashley Lawson, Senior Solutions Fellow, Center for Climate and Energy Solutions 546
- Daniel Richter, Legislative and Science Director, Citizens' Climate Lobby 551
- Davin Hutchins, Volunteer Leader, The Climate Reality Project

4:10 pm - 4:30 pm

#### Closing Remarks

C. Flint Webb, Leidos  
General Conference Chair

#### Carbon Offsets

If you would like to offset the Carbon footprint for this conference, go to

[www.carbonfund.org](http://www.carbonfund.org) to make a donation.

7:00 pm

#### Baltimore-Washington Chapter Meeting (All attendees invited)

Sine Irish Pub and Restaurant, 1301 South Joyce Street, Arlington, VA  
Meet at the DoubleTree, Crystal City at 6:30 pm to walk to the restaurant.

#### "International Perspectives on Climate Change Regulations"

Dr. Ashraf Ramadan, Environmental Pollution and Climate Program, Environment and Life Sciences, Research Center, Kuwait

Cash bar with appetizers provided. Please contact Tiffany Dillow at [tdillow@zephyrenv.com](mailto:tdillow@zephyrenv.com) if you are planning to attend.