

AMS 20th Conference on Air Pollution Meteorology

January 8-11, 2018
Austin, TX

Conference Summary

In 2018 the American Meteorological Society (AMS) Conference on Air Pollution Meteorology was held in Austin TX. The conference hosted scientists and presenters from across the United States and around the world and received a total 105 abstracts, 83 for oral presentations and 22 for poster presentations. Figure 1. illustrates the range of locations from which our speakers and poster presenters traveled to attend the meeting.

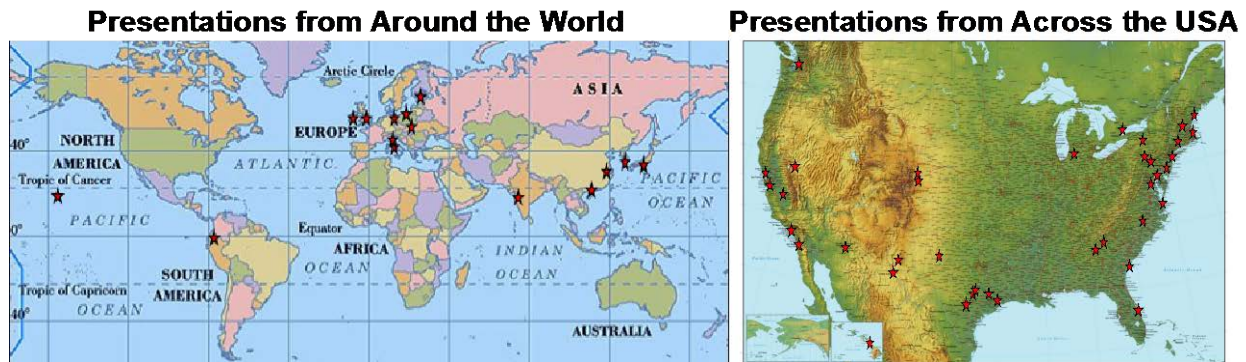


Figure 1. The location of the origin institution of the presenters for the 20th Air Pollution Meteorology Conference in Austin, TX.

The conference included an award ceremony and technical sessions on the following topics:

1. Emerging Air Pollution Meteorology Topics
2. Emergency Response, Defense, and Air Pollution
3. Urban Environment (3 Sessions held jointly with the Board on Urban Environment)
 - a. Urban Flow and Dispersion Modeling
 - b. Urban Air Pollution Monitoring and Modeling
 - c. Presentations on the iSCAPE Initiative in Europe
4. Air Pollution Exposure Variability & Health (Held jointly with the Board on Environment and Health)
5. Source Attribution and Chemical/Meteorological Data Assimilation
6. Modeling Dispersion and Pollution in Complex Terrain Environments
7. Air Pollution Meteorology in Coastal Environments (Held jointly with the Committee on Coastal Environment)
8. Operational Air Quality Predictions and Prediction Systems
9. Observational Studies
10. Atmospheric Chemistry (6 Sessions held jointly with the Committee on Atmospheric Chemistry)
 - a. Use of Satellite Observations for Air Quality
 - b. Atmospheric Bioaerosols

- c. Long Range Air Pollution Transport
- d. Atmospheric Chemistry and Air Pollution Meteorology
- e. Air Quality Topics Involving Ozone
- f. Air Quality Topics Involving Particulates

Figure 1 show a depiction of the organization of the sessions listed above.

Roadmap to the Conference

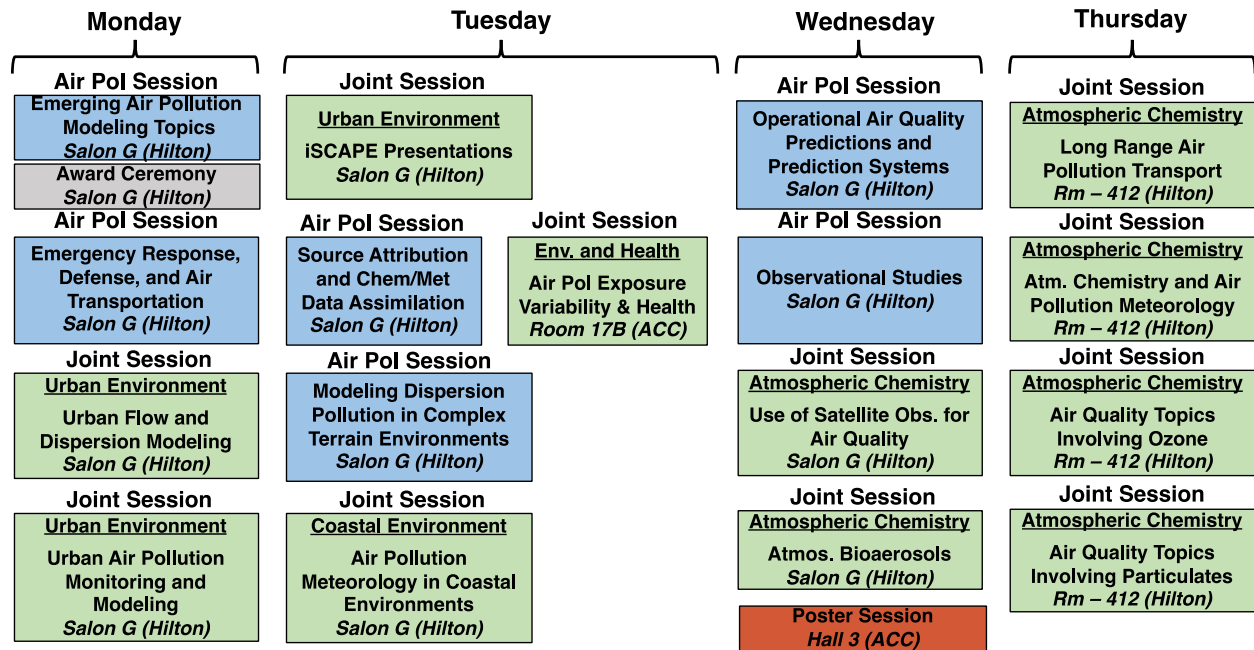


Figure 2. An illustration of the sessions for the 2018 Air Pollution Meteorology Conference.

Some highlights from the conference sessions include presentations of research on urban flow, dispersion, air quality and the micro-climate. Maider Llaguno-Munitxa (Univ. of Princeton, USA) presented an innovative approach to provide weather and air quality data from autonomous sensing kits deployed onto private cars or public transportation to the public using mobile apps that apply augmented reality visualisation techniques. Chenghao Wang (Arizona State Univ., USA) presented a new model for estimating source areas of fluxes and concentrations based on a backward Lagrangian stochastic footprint model. Regarding emerging technologies in atmospheric dispersion and air quality modelling, Paul Bieringer (Aeris LLC, USA) demonstrated the great prospects of conducting computationally demanding large-eddy simulations on GPUs, achieving computational speed-ups that could eventually pave the way for using turbulence-resolving methods for near real-time predictions in cities.

Another focus was put on the improvement of models through measurements. Ron L. Petersen (CPP Inc., USA) presented recent improvements to the building downwash algorithm in the AERMOD dispersion model based on extensive wind-tunnel datasets. Steven Hanna (Hanna Consultants, USA) discussed results from the Jack Rabbit II chlorine release experiment, carried out in a ‘mock urban’ array of about 80 shipping containers in the Utahan desert, which can be

used to assess heavy-gas dispersion models. Isobel J. Simpson (Univ. of California, Irvine, USA) explored aircraft measurements of VOC concentrations above Seoul with the aim to assess emission inventories. Further presentations highlighted the effects of tall buildings on urban flow and dispersion and modelling challenges on local and city scales. Based on wind-tunnel measurements in a scale model of a part of central London, Denise Hertwig (Univ. of Reading, UK) showed that the strong interaction between the tall-building wake and the flow in the canopy layer cannot be described by classic conceptual models of urban flow. If pollutants are released at street level in the vicinity of a tall building, flow divergence and convergence in the canopy layer can lead to a displacement of the effective source location as shown in recent experiments and CFD simulation carried out in the DIPLOS project (www.diplos.org; “Dispersion of localised releases in a street network”).

A special session focused on research from the ongoing Horizon 2020 project iSCAPE “Improving the smart control of air pollution in Europe” (www.iscapeproject.eu) involving several research groups across Europe. K.V. Abhijith (Univ. of Surrey, UK) showed in an experimental case study that roadside pollutant exposure can be notably reduced by the presence of green vegetation barriers. Kirsti Jylhä (Finnish Meteorological Institute) discussed the environmental and socio-economic benefits of green infrastructure in a Finnish city. Based on summer-time measurements in vegetated and non-vegetated street canyons in Bologna, Francesco Barbano (Univ. of Bologna, Italy) demonstrated that the effects of trees on air quality in street canyons depend strongly on the interaction between synoptic meteorological conditions, wind stress at roof-level and canyon geometry. CFD simulations of the Bologna case study presented by Federico Prandini (Univ. of Bologna, Italy) showed that the pollutant ventilation potential is mainly controlled by the street topology. Silvana di Sabatino (Univ. of Bologna, Italy) discussed effects of mechanically and thermally driven street-canyon circulations on local temperatures and showed that the intensity of the UHI can vary as much as 2-3 °C within 1-2 km in Bologna.

A full day and a half of presentations were given on various aspects of air pollution meteorology and atmospheric chemistry. These talks included talks on the use of observations in simulations long range transport. Additionally, there were sessions with talks on topics associated with various subcategories of atmospheric chemistry and air pollution involving bioaerosols, particulates and ozone. Finally, the Committee on Meteorological Aspects of Air Pollution Meteorology (CMAAP) was pleased to honor our distinguished colleague, Dr. Jonathan Pleim, with the 2018 Air Pollution Meteorology Award for his outstanding scientific contributions to the field of air pollution meteorology and atmospheric transport, dispersion, and deposition modeling.