



CIRES science at #AGU18

WEDNESDAY MORNING PRESENTATIONS

Times and locations as indicated below

A NOAA highlight

The 2018 UNEP/WMO Assessment of Ozone Depletion: An update

NOAA Chemical Sciences Division director David Fahey will discuss the 2018 UNEP/WMO assessment of ozone depletion, highlighting findings released in an executive summary in November; the full report will be available early next year. Among the findings: Actions taken under the international Montreal Protocol agreement have led to decreases in the atmospheric abundance of many ozone-depleting substances and the start of the recovery of stratospheric ozone. Fahey will discuss unexpected emissions of CFC-11, quantification of carbon tetrachloride emissions, and the likely impact of the Kigali Amendment on future global average warming.

David Fahey, NOAA

08:00 - 08:20 • Convention Ctr, 151B • [A31A-01](#)

Evolution of surface emissions in China and impact on changes in air quality

Claire Granier, a researcher with the French Laboratoire d'Aerologie, CIRES and NOAA will discuss recent surface emission inventories in China, how they compare to satellite observations, and the consistency between modeled and observed changes in emissions. Granier will then present how the uncertainties in surface emission inventories can impact air quality forecasting model predictions in China. This work contributes to the Analysis of Emissions Using Observations (AMIGO) activity of the International Global Atmospheric Chemistry (IGAC) project, which aims to use observation-based analysis techniques to better quantify emissions.

Claire Granier, CIRES, NOAA, and Laboratoire d'Aerologie

09:00 - 09:15 • Convention Ctr, 151A • [A31B-05](#)

Using new global compilations of glacier surface elevations and ice speeds to examine glacier and ice cap contributions to sea level (Invited)

In this invited talk, CIRES Fellow Mike Willis (CU Boulder Geological Sciences) will present work to quantify the recent contribution to global sea level rise from mountain glaciers and ice caps, which are retreating and thinning worldwide. Willis combines several global datasets and techniques (high-resolution digital elevation models, satellite ice observations, etc.) and finds a continuum of surface changes: Astonishing and sustained thinning rates along tidewater glaciers in Patagonia, the Russian Arctic, and Alaska, and more subdued thinning rates along land-terminating glaciers elsewhere.

Michael J Willis, CIRES and CU Boulder

10:20 - 10:35 • Convention Ctr, Salon H • [32A-01](#)

Secondary organic aerosol production across worldwide megacities and its impact on mortality

CIRES and CU Boulder's Benjamin Nault's team found organic aerosols account for about 15 percent of global particulate matter deaths each year. They studied secondary organic aerosol (SOA) production in megacities around the world and found that differences in the SOA production efficiency appear to be driven by differences in precursor emissions across cities, and used these results to model globally-realistic organic aerosol for urban areas.

[Benjamin Nault](#), CIRES and CU Boulder

10:20 - 10:35 • Convention Ctr, 144A-C • [A32E-01](#)

Instantaneous glacier loss through catastrophic collapse at Flat Creek glacier: Disentangling the roles of climate, geology and glacier dynamics in Wrangell-St. Elias National Park and Preserve, Alaska

CIRES researcher Mylène Jacquemart and colleagues at the National Park Service launched a 2018 field study to investigate what triggered the catastrophic detachment of Flat Creek Glacier in Alaska's Wrangell-St. Elias National Park. Only two other instances of such catastrophic glacier collapse are known: That of Kolka glacier in the Russian Caucasus in 2002, and that of two Tibetan glaciers in 2016. Jacquemart and her colleagues believe that similar circumstances contributed to the detachments in all three cases, and have determined that Flat Creek Glacier lost a significant portion of its mass in two large ice and rock avalanches that caused enormous debris flows. Jacquemart highlights her team's results identifying what circumstances led to this catastrophic failure, and how it may relate to other, similar events around the globe.

[Mylène Fabienne Jacquemart](#), CIRES and CU Boulder

10:50 - 11:05 • Convention Ctr, Salon H • [C32A-03B](#)

A NOAA
highlight

The urban methane paradox: Results from the 2018 East Coast Outflow experiment

NOAA's Colm Sweeney will present greenhouse gas data from a mission that measured the springtime outflow of airborne chemicals from major Northeastern U.S. cities (Baltimore, Boston, New York, Philadelphia, Providence, and Washington, D.C.) The 2018 East Coast Outflow experiment was an intensive airborne campaign to measure CO₂, CH₄, C₂H₆, O₃ and CO using both airborne and ground measurement techniques. Initial data suggest that methane leakage from the urban distribution network is a large source of CH₄, and one that is largely ignored by methane inventories.

[Colm Sweeney](#), NOAA

11:05 - 11:20 • Convention Ctr, 151A • [A32B-04](#)

A University
of Colorado
Boulder
highlight

Earthquake interactions in the Raton Basin, Colorado and New Mexico, USA

CU Boulder's Megan Brown presents efforts to explain the marked seismicity rate increase in the Raton Basin on the Colorado and New Mexico border, which has been linked to wastewater injection within the Basin. Studies have shown a possible additional mechanism for the induced seismicity is earthquake interactions. Brown and her team explored the role of earthquake interactions by harnessing the Coulomb static stress transfer models to investigate the spatiotemporal progression of earthquake interactions.

[Megan Brown](#), University of Colorado

11:05 - 11:20 • Marriott Marquis, Independence E • [S32A-04](#)

Wednesday morning poster sessions appear on the following page

WEDNESDAY MORNING POSTERS 08:00 - 12:20

Convention Ctr. Poster Hall A-C.

Boundary layer entrainment of transported ozone layers observed with lidar during the CABOTS and FAST-LVOS studies, [A31I-2971](#)

CIRES and NOAA's Christoph Senff discusses the efforts of two recent air quality campaigns in the southwestern United States to study the impact of transported ozone, stratospheric intrusions, and fire emissions on ground-level ozone concentrations. This work is improving our understanding of how different sources of ozone, both anthropogenic and natural, impact ground-level air quality, and it explores the role of boundary layer dynamics in transporting elevated ozone layers to the surface.

[Christoph Senff](#), CIRES and NOAA

Inspiring youth to learn about local impacts of climate change through filmmaking—a transformative experience, [ED31C-1074](#)

CIRES' Education & Outreach director Anne Gold presents the National Science Foundation-funded Lens on Climate Change program, which guides students in an informal setting to explore climate change impacts locally through filmmaking. Research data show that engagement through filmmaking is a transformative experience with participants showing significant increases in awareness of, concern about and knowledge of the topics when compared to a control group.

[Anne Gold](#), CIRES and CU Boulder

Detecting extratropical and tropical cyclone regions of interest (ROI) in satellite data using deep learning, [H31H-1992](#)

CIRES and NOAA's Christina Bonfanti presents efforts to identify regions of interest for cyclones by harnessing the power of machine learning to comb through the deluge of available satellite data. Her team built a machine tool to go through satellite data in a fast and accurate way looking for extreme weather patterns like hurricanes. The machine has to be trained from previous examples, so the group first built a program that uses their set of rule to find cyclones from weather models. Then, the machine takes these answers and teaches itself how to find cyclones in satellite data without using any rules made by humans. This happens many different times until the machine confidently can locate most of the regions of interest. Once the program is taught what to look for, it can then very quickly identify these regions in satellite images in the future that do not have labels.

[Christina Bonfanti](#), CIRES and NOAA

A University
of Colorado
Boulder
highlight

Circumpolar deep water intrusions drive phytoplankton blooms in the Amundsen Sea, [OS31H-1901](#)

In the Amundsen Sea, increased light exposure from reduced ice extent and thus greater uptake of dissolved iron by phytoplankton may influence the timing and scale of bloom events, which has significant implications for ocean chemistry. In this poster, CIRES' Michelle MacLennan presents her team's efforts to indicate phytoplankton bloom events by linking dissolved iron measurements and satellite measurements of chlorophyll, and comparing the timing of those blooms to circumpolar deep water forcing events.

[Michelle MacLennan](#), CU Boulder

WEDNESDAY AFTERNOON PRESENTATIONS

Times and locations as indicated below

Securing the Third Pole: Glaciers, snowpacks, and water vulnerability in High Asia

Known as the "Third Pole," the mountain ranges of High Asia are the snow and ice headwaters of Asia's most important rivers, and changes in the mountains' glaciers and snow reservoirs have cascading impacts on the region's economic and human security. This event will feature a panel of USAID-funded researchers, CHARIS (Contribution to High Asia Runoff from Ice and

This study is one of several from the Contribution to High Asia Runoff from Ice and Snow (CHARIS) project that will be presented and discussed with various audiences during AGU18.

Snow) project scientists (including NSIDC's [Richard Armstrong](#)), water program managers, and policymakers who will discuss the implications of changing snow and ice resources for water security in High Asia.

14:30 to 16:30 • 6th floor, [Woodrow Wilson Center](#) (Ronald Reagan Building, One Woodrow Wilson Plaza, 1300 Pennsylvania Ave.)

NOAA Booth Talk: High-latitude unmanned aircraft operations: An introduction to recent and upcoming field campaigns

CIRES' [Gijs de Boer](#), of CIRES and NOAA's Physical Sciences Division, presents.

15:45 • Convention Ctr, Exhibit Hall, Booth #1415

WEDNESDAY AFTERNOON POSTERS 13:40 - 18:00

Convention Ctr. Poster Hall A-C.

Wildfire. This is one of a few AGU abstracts featuring NOAA' and NASA's FIREX-AQ campaign (Fire Influence on Regional and Global Environments and Air Quality), a five-year effort to study North American wildfires and their impacts on air quality, health and climate.

Biomass burning emissions determined during the fire influence on regional and global environments 2016 Firelab experiment, [A33K-3311](#)

In this poster, CIRES' Carsten Warneke presents major findings of the FIREX FireLab 2016 experiment in Missoula, Montana, which has helped set the stage for next summer's field work by helping researchers understand the importance of temperature and other fire conditions (smoldering, flaming) on emissions. FireLab data are also helping them understand exactly what to look for in the air next summer, including organic aerosol and black carbon, nitrogen-containing compounds and chemical products that form downwind as smoke ages.

[Carsten Warneke](#), CIRES and NOAA

Settlement of sea level rise zones in the United States: Using Zillow data to investigate historical development patterns, [IN33B-0861](#)

Using Zillow housing data from pre-1900 to 2015, and a NOAA sea level rise zone map, we explore when and where people have settled in coastal areas across the United States. In general, we see the spread of coastal settlements along southern and western U.S. coasts in the first half of the 20th Century, and more recent development bringing greater density in coastal areas is increasing risk of flood damage. Understanding past trends and trajectories may help inform policies and public perception of risk in coastal areas.

[Anna Elizabeth Braswell](#), Earth Lab, CIRES and CU Boulder

Evaluating the perils and promises of academic climate advocacy, [PA33C-1189](#)

CIRES and CU Boulder's David Oonk investigates how academic scientists perceive and define appropriate advocacy. He asks the question: Do scientists think that advocacy tarnishes the reputation of the research, and in what cases is advocacy effective and appropriate? Oonk, along with CIRES fellow and director of CIRES' Center for Science and Technology Policy Research director Max Boykoff examined differences between academic communities that either engaged in, or avoided, advocacy through exploratory surveys of U.S.-based researchers. They found a scientist's area of study, age, gender, and political affiliation impacted how they felt about advocacy.

[David Oonk](#), CIRES and CU Boulder