3rd International Smoke Symposium (ISS3) - Raleigh Workshops

The workshops will take place on Monday, April 20, the day preceding the 3rd International Smoke Symposium (ISS3).

The purpose of the workshops is to provide a forum for researchers and practitioners in wildland fire, smoke management, public health, and air quality management to discuss and exchange interests on defined topics. We view these workshops as an opportunity for knowledge and technology transfer.

Registration for the workshops is $20 for half day and $40 for full day.

Workshop Schedule - Raleigh				
	Room 1	Room 2	Room 3	Room 4
8:30 - 12:30	Smoke and Health Research: The Years Ahead	Community Innovation: Learning from Leaders to Protect Health from Smoke	Smoke Modeling from Forest to Plume: Integrated Modeling Workshop for Smoke Management	Incorporating Smoke Impacts into Air Quality Forecasting
1:30 - 5:30		Federal Partners Meeting	New Generation Satellite Products for Operational Fire and Smoke Applications	Wildfire Detection and Dispatch – Case Studies and Enabling Technologies

Full Day 8:30-5:30

Smoke and Health Research: The Years Ahead

Instructors: Sarah Henderson, Senior Scientist, BC Centre for Disease Control
Wayne Cascio, US Environmental Protection Agency
Fay Johnston, University of Tasmania
Ana Rappold, US Environmental Protection Agency
Bonne Ford, Colorado State University
Ian Gilmour, US Environmental Protection Agency

The objective of this workshop is to develop a consensus on the most pressing research gaps related to wildfire smoke, exposure assessment, and health effects. During the morning session, each of the instructors will give a 20-minute presentation on where they feel the science needs to go over the next 5-10 years. This is NOT a review of work that has already been done but brainstorming around the questions we most urgently need to answer in the years ahead. All of the instructors have been working in the field of wildfire smoke and health for several years and have published multiple peer-reviewed papers on the topic, which gives them important insight into the past, present, and future research areas. During the afternoon session, the instructors and participants will decide on 2-4 research topics based on the morning presentations and will break into collaborative groups to workshop study designs and protocols for upcoming funding opportunities. This workshop will allow new investigators in wildfire smoke and health to work with established investigators, thereby growing research capacity and opportunities for funding success.

Morning 8:30-12:30

Community Innovation: Learning from Leaders to Protect Health from Smoke

Presenters: Invited experts from smoke affected communities

Facilitators:
Christina Baghdikian, EPA's Office of Research and Development
Mary Clare Hano, Social Scientist, EPA's Office of Research and Development
Ana Rappold, Statistician, EPA's Office of Research and Development
Susan Lyon Stone, Senior Environmental Health Scientist, EPA's Office of Air Quality Planning and Standards
Sara Terry, Senior Policy Advisor, EPA's Office of Air Quality Planning and Standards

Are you a leader charged to increase preparedness and response to smoke in your community? We'd like to hear from you!

Wildfire smoke is impacting communities across the country in a more intense, more frequent pattern. When a community faces significant smoke intrusion, the individuals responsible for coordinating wildfire smoke response often have various other full-time environmental public health roles in their community. This workshop is designed around "lightning talks" from practitioners on-the-ground who will share with attendees what they are doing to deal with wildfire smoke, what they have learned, and what needs still exist. The workshop will: increase awareness of available resources for communities to prepare for wildfire smoke; offer an opportunity to provide facilitated input on knowledge and resource gaps that communities need; and outline EPA plans to enhance the Smoke Ready Community framework and research the effectiveness of that framework to build community capacity.

Morning 8:30-12:30
Smoke Modeling from Forest to Plume: Integrated Modeling Workshop for Smoke Management
Instructors:
Susan Prichard, University of Washington,
Susan O'Neill, USDA Forest Service
Roger Ottmar, USDA Forest Service,
Jim Cronan, USDA Forest Service,
Janice Peterson, USDA Forest Service,
Anne Andreu, University of Washington,
Paige Eagle University of Washington,
Marlin Martinez, University of Washington

Smoke emissions from prescribed fires and wildfires are dependent on a number of variables including area burned, pre-burn fuel loading and arrangement, fuel consumption, fire behavior and plume dynamics. Dispersion and concentrations of the smoke from prescribed burns depends on the rate of emissions and heat release, weather and terrain. Each of these variables in predicted emissions is associated with uncertainty, and of these, estimating fuel consumed within burned areas has the potential for particularly high error propagation in estimated emissions. In addition to errors in quantifying or estimating total fuel consumption, determining the amount and type of fuel consumed in flaming, smoldering and long-term smoldering is critical for predicting downwind smoke impacts such as nighttime inversions and intrusions into communities. Finally, the selection of meteorological domain is critical in dispersing smoke downwind, as well as how emissions are input into the meteorological system via plume rise and vertical allocation underneath plume rise.

In this workshop, we will offer training on a suite of applications addressing these topics, giving participants a hands-on experience with each. 1) The Fuel and Fire Tools (FFT) application to model fuel characterization, consumption, emissions and fire behavior of wildland fuels. 2) The BlueSky Playground to estimate smoke production and dispersion. 3) We will also introduce the new Smoke Emissions Repository Application (SERA), a central repository of wildland fire emissions factors and discuss implications of how the latest emissions factors for criteria air pollutants such as PM2.5 may impact smoke management decisions. 4) Finally, participants will get hands-on training with the monitoring data webtool that gives single click access to measured near-surface particulate matter data (e.g. PM2.5) from permanent monitors and temporary monitors deployed specifically for prescribed fires and wildfires.

Morning 8:30-12:30
Incorporating Smoke Impacts into Air Quality Forecasting
Instructors: Patrick Zahn, Lead Air Quality Forecaster, Sonoma Technology, Inc
Marcus Hylton, Air Quality Forecaster, Sonoma Technology, Inc
Jeff Beamish, Air Quality Forecaster, Sonoma Technology, Inc
ShihMing Huang, Air Quality Scientist, Sonoma Technology, Inc

Air quality impacts from wildfires, prescribed burns, and agricultural burns have become an increasing concern for air quality forecasters, and smoke impacts present a particular challenge when trying to deliver accurate, timely forecasts. In this workshop, meteorologists and air quality forecasters from Sonoma Technology discuss practical approaches to incorporating smoke impacts into daily ozone and PM2.5 forecasts. We share tools and techniques to predict smoke-enhanced air pollution, including trajectory analyses, satellite imagery, and air quality forecasting models. We also present case study examples of smoke impacts from local fires, as well as long-range smoke transport leading to exceptional air quality events. In particular, we discuss localized burning in the Imperial Valley in southern California, prescribed burn impacts in the Flint Hills region of Kansas, smoke impacts on ozone in Louisiana, impacts from recent fires in northern California, and long-range smoke transport into Ohio. Additionally, we discuss challenges in communicating smoke impacts to air quality agencies and the public, using examples from residential wood burning and prescribed burn decision support systems.

Afternoon 1:30-5:30
New Generation Satellite Products for Operational Fire and Smoke Applications
Instructors: Amy K. Huff, Senior Research Scientist, IMSG at NOAA/NESDIS/STAR
Shobha Kondragunta, NOAA/NESDIS/STAR

In this half-day workshop, participants will learn how to utilize the new generation of geostationary and polar-orbiting satellite products to forecast, monitor, and track the impacts of wildland fires and smoke. The polar-orbiting satellites SNPP, NOAA-20, and S5P and the geostationary satellites GOES-16 and GOES-17 are providing revolutionary observations of fires, aerosols, and trace gases with unprecedented resolution and accuracy. Through case study examples, participants will become familiar with the relevant satellite products for fires and smoke, including color imagery, aerosol optical depth (AOD), aerosol detection, fire characterization, carbon monoxide (CO), and nitrogen dioxide (NO_2). Topics will include the status and specifications of the available products, accessing near real-time imagery from

NOAA's AerosolWatch and JSTAR Mapper websites, and interpreting data and imagery with a focus on air quality and visibility.

Afternoon 1:30-5:30
Wildfire Detection and Dispatch – Case Studies and Enabling Technologies
Instructor: Gavin Hough, Developer and Founder – EnviroVision Solutions Inc.

By using remote access to operational detection centres, several case studies demonstrating detection examples and key design concepts will be explained. Machine learning, and other vision system concepts will be detailed in such a way as to provide improved spatial and situational awareness. The user experience for operators and dispatch managers will be shared and user feedback outlined.

The impact of multispectral imaging on detection range and sensitivity will be shown using test fires and extensive vegetation fire data. Workflow for system operator and monitoring fires from ignition to several days after the wildfire being extinguished to check for holdover fires will be shown.

Integrating early detection with rapid response will be showcased for active wildfires using web-based dispatch, mobile applications and specific workstations for wide area geo-referenced surveillance systems.

Afternoon: 1:30 - 5:30 pm
Federal Partners Meeting (no charge)

This meeting of Federal government departments and agencies is designed to enhance collaboration around wildland fire smoke related activities.
Bringing together perspectives from the health, technology, emergency response, and preparedness disciplines, the meeting will focus on several aspects of the wildland fire smoke challenge.

Specific topics for discussion will include: how can Federal partners best collaborate and contribute to community smoke preparedness; how to improve communications before, during and after smoke events; and how to coordinate efforts around improving the understanding of health impacts associated with wildland fires.

The agenda is being designed to share information among participating organizations and identify key next steps to improving multi-agency smoke-related efforts. Federal registrants will receive meeting details and preparation materials after they register. For more information contact Sara Terry at terry.sara@epa.gov.