WILDLAND FIRE AIR QUALITY RESPONSE EFFORTS AND TOOLS IN THE UNITED STATES

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Partners in this effort:
USFS, NPS, NOAA NWS, EPA,
State and local agencies
Smoke and Fire

- Wildfires single biggest source of high-level air quality impacts (in U.S.)
- Single wildfires and multiple regional wildfires are known to cause significant impacts to millions
  - Health, Safety, Economics, Disruption of Life, Children/School/Athletics impacts
  - Long durations of high levels of pollutants
  - Can contribute to fatal traffic accidents
- Public impacts of smoke: 1 in 3 households has someone with respiratory issues, E.g. children with asthma, COPD, emphysema
- Wildland fires contributing to more than 32% of US fine particulate matter (PM2.5) based on the EPA’s 2011 National Emission Inventory (40% with new emission factors)
2017 Smoke and Fire

- USDA Forest Service 2017 Fire and Aviation Management Program Talking Points:
  - “We work closely with our cooperators to manage wildfires and predict and mitigate smoke impacts on individuals and communities during wildfires.”

- Regulatory Impacts to States and EPA:
  - MT – 296 exceedances, 173 exceedance days to do EER
  - ID – 146 exceedances, 44 exceedance days to do EER
  - WA – 417 measurement days at Unhealthy for Sensitive Groups (AQI) with 137 PM2.5, 14 PM10 and 31 ozone exceedances, 1 EER to do
  - OR – 431 measurement days at Unhealthy for Sensitive Groups (AQI)
  - NV – 3 ozone and 1 PM2.5 exceedances

- The Summer of Smoke – NPR, Washington Post, NY Times – “What to Know Before Buying an Air Purifier to Clear Wildfire Smoke”

- Focus of Congressional Hearing in Fall 2017
Wildland Fire Air Quality Response Program

- Interagency response (2011-Present)
- Operationally addressing wildfire smoke
  - Public health
  - Transportation safety
  - Fire personnel exposure
- Four components:
  - Modeling
  - Monitoring
  - Messaging / Communication
    - Air Resource Advisors (ARA)
    - Active Coordinated Response
- Integration / coordination
  - EPA, NOAA, NASA, States, and beyond
Modeling

- USFS PNW R&D AirFire Team - BlueSky smoke modeling framework
- 20+ daily regional runs to supplement national products
- NWS 1.3-km domains provides vast improved model performance
- New 1.8-km domains - OR, AZ, NM and now 3-km CONUS
- On-incident support for high resolution and customization for best performance
BlueSky Production Run Domains

- GFS, NAM 3km, 12km
- PNW 4-km
- PNW 1.33-km
- CANSAC 2-km
- CANSAC 6-km
- UofA 1.8-km
- Alaska 12-km
Monitoring

- Cache of 30 non-regulatory PM2.5 monitors
- USFS covered 20 and 10 donated by EPA and FWS
- Ordered through supply on incidents by an Air Resource Advisor and housed at Rocky Mt. National Cache
- Rapid deployment to affected and under-served communities
- Real-time telemetry
- Data available to all interested parties
- Development of monitoring data analytical tools useful for wildfire smoke by USFS PNW AirFire Team for temporary and fixed stations
  - [https://monitoring.airfire.org/monitoring/v3](https://monitoring.airfire.org/monitoring/v3)
- USFS MTDC, PNW and ARA’s to test new devices for program use
September 6, 2017 Monitoring of PM2.5, Hourly updated display at:
https://monitoring.airfire.org.monitoring/v3/#/?date=LATEST&productType=plotTable&userProfile=simple
Air Resource Advisors
Smoke specialists deployed as part of an Incident Management Team (THSP in ICS)

Roughly 48 ARA’s and 24 trainees

Highly diverse group: FS, BLM, NPS, FWS, EPA, State Forestry, Tribes, NRCS...must be qualified and able to be in ROSS/interagency fire dispatch system

Backgrounds: Wildland Fire, Air Quality, meteorology

Training: 2013-2017, 2018 planned

Enables: Reduction of exposure through behavior modification (public or personnel)

• Allows incident information to be made available for modeling, etc...to develop smoke outlooks and other documents for communications

• Works with state/tribal/local air quality regulatory agencies and public health departments, impacted communities
Communications

- Create Smoke Outlooks and Impact Summaries
  - WFAQRP Programmatic Goal: Reduce exposure through behavior modification
- Work closely with public health agencies
- Sync communications across impacted areas, and incident commands
- Provide critical additional information:
  - Monitor data
  - Fire activity and burnout operations
  - Fire behavior predictions
  - Meteorology
  - Incident command decisions
  - PIO info and posting on net, Inciweb, blogs, social media
- Coordinate with partners on traffic smoke impact response efforts
2017 WFAQRP Efforts

- Over 100 ARA deployments
- More than 1100 Smoke Outlooks issued
- Covering most of the western United States in 2017
- Outlook coordination with EPA’s AQI and Nowcast
- Many state regulatory agencies very engaged in 2017
- Much greater health department engagement
- Challenges in message consistency (1 hr impacts vs Nowcast)
- See wildandfiresmoke.net
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