

INTERAGENCY WILDLAND FIRE AIR QUALITY RESPONSE PROGRAM



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wildlandfiresmoke.net





2017 & 2018 Smoke and Wildfire

- USDA Forest Service 2017 and 2018 (2019 too) Fire Year Key Messages:
 - “We work closely with our cooperators to manage wildfires and *predict and mitigate smoke impacts on individuals and communities during wildfires.*”
- The Summer of Smoke 2017 has continued in 2018–
 - Regular coverage in NPR, Washington Post, many others media sources
- NY Times – “What to Know Before Buying an Air Purifier to Clear Wildfire Smoke” – Little to No government funding for un
- Focus of Congressional Hearing in Fall 2017 and 2018
- Wildlandfiresmoke.net (IWFAQRP site) – Outlooks 4+ million total views
- State Smoke Blogs (WA, OR, CA, ID) – 1.9 million views 2018 (pre-Camp)
- 2018 Launch – USFS-EPA and state/tribal/local Smoke-Ready Communities and a Smoke-Wise Public cooperative efforts, Many local efforts-OR, WA...

2017 and 2018 Wildfire Smoke Impacted



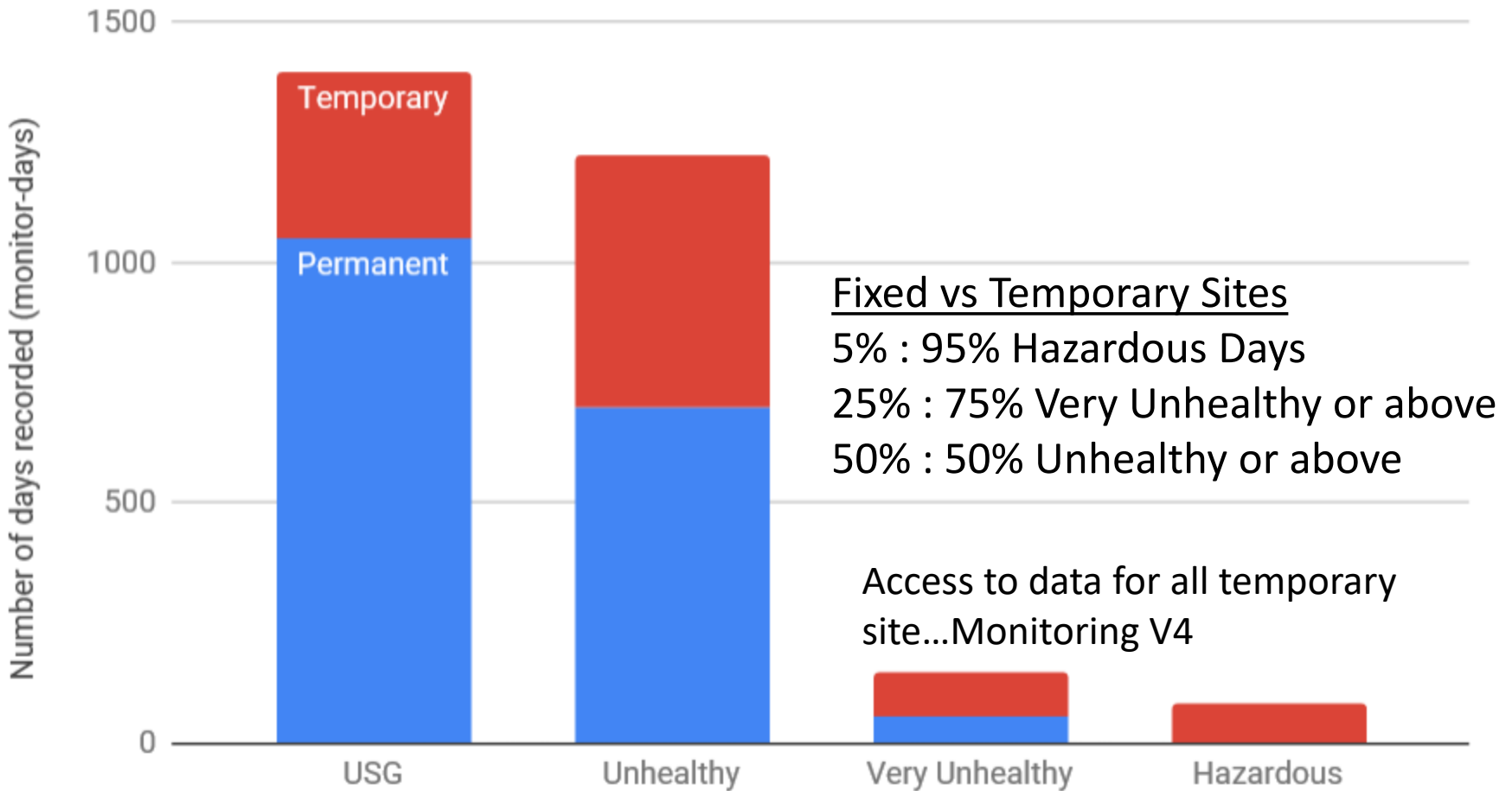
Monitor Days (Larkin, 2018)

- Using Fixed and Temporary Monitors 2017 and 2018
- AQI Level At or Above PM2.5 Unhealthy for Sensitive Groups Levels

State	2017	2018
WA	555	631
OR	647	536
CA	684	2036
NV	9	39
ID	323	192
UT	12	33
AZ	4	8
NM	32	36
CO	18	62
WY	7	6
MT	436	105

- Days in 2018: 3730 USG (NAAQS), 1995 Unhealthy, 105 Hazardous
- 95% of all Hazardous days on Temporary Monitors (200x more likely)

2018 Exceedences Recorded by Network



Wildland Fire Air Quality Response Program



Operations directly partnered with research

Air Resource Advisors - Smoke specialists deployed as part of an Incident Management Team

60 ARA's and 35 trainees highly diverse group:

FS, BLM, NPS, FWS, EPA, State Forestry (KS, NC, GA, FL, OR, WA)

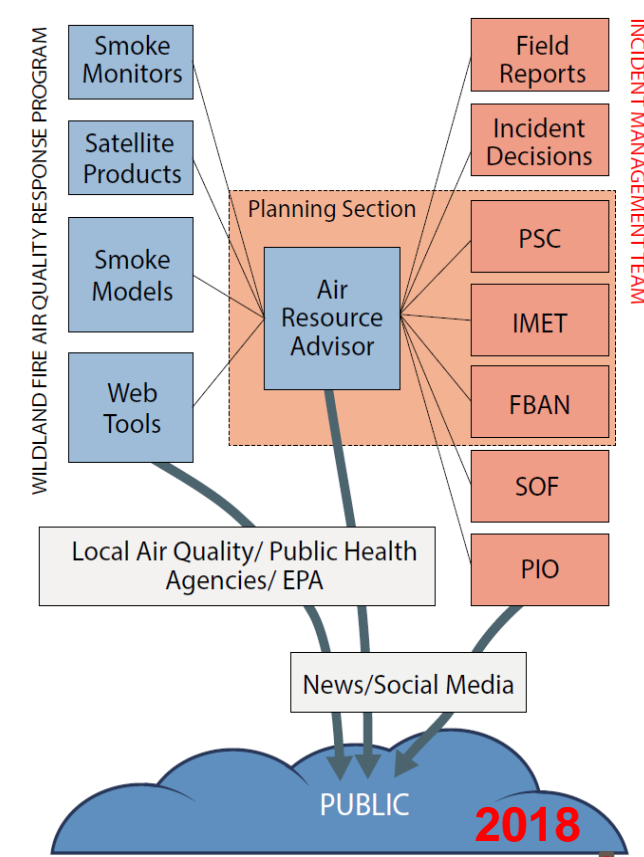
Tribes, NWS, NRCS, CDC, AD-Contract, State/County

Air Regulatory/Health (KS, NC, CO, Placer Cty, Washoe Cty)

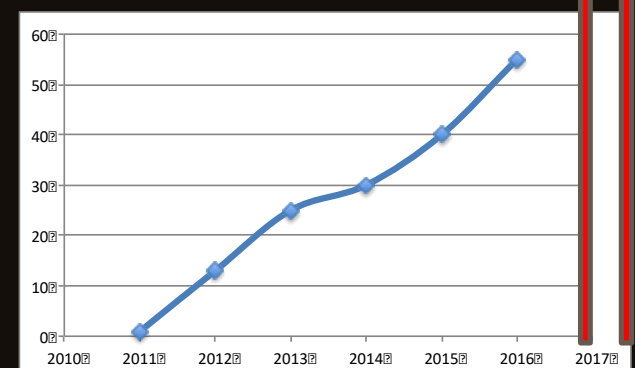
Background: Wildland Fire, Air Quality, Meteorology

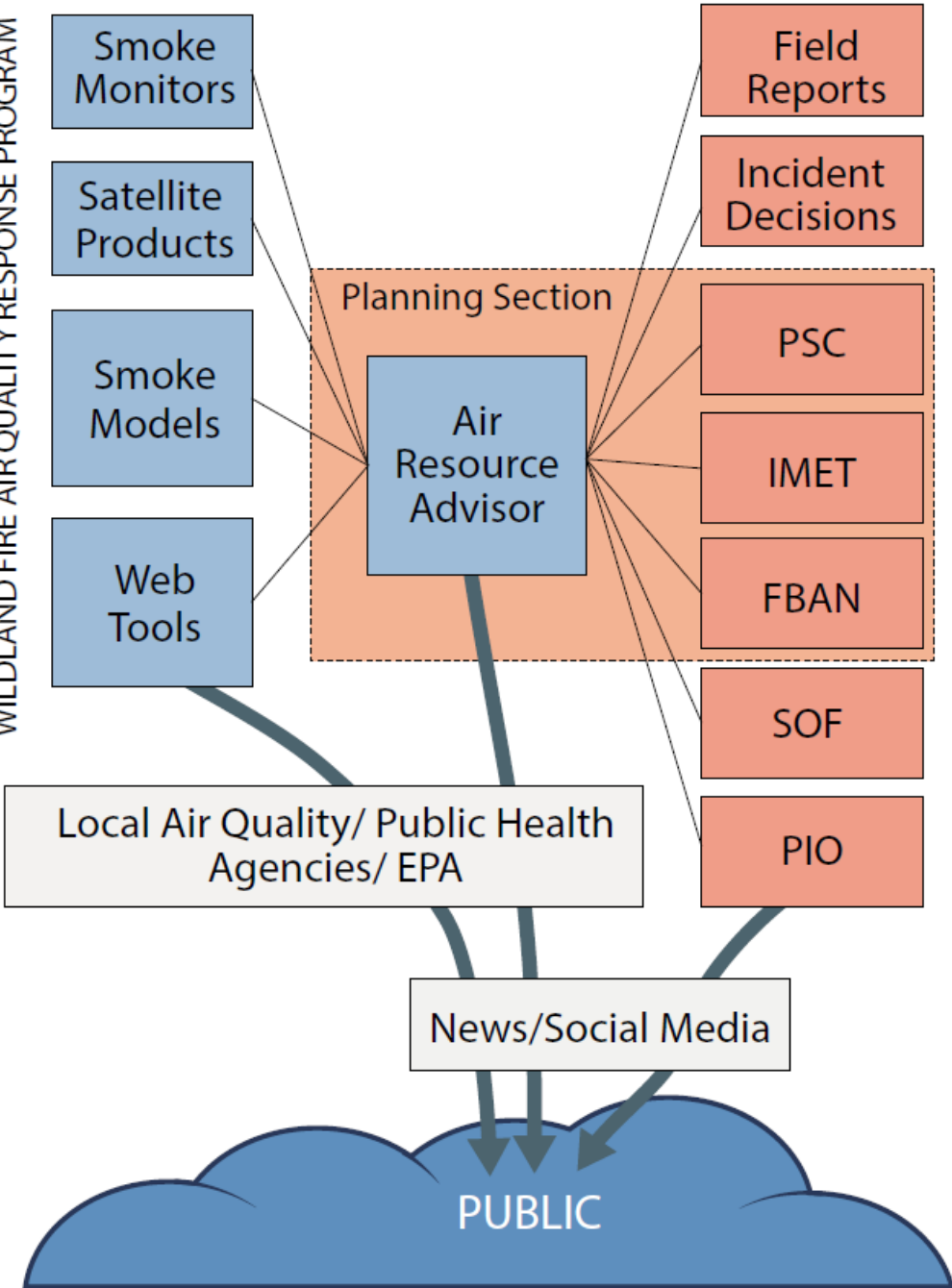
Enables: Reduction of smoke exposure through behavior modification messages (public or personnel) and provide roadway smoke forecasting (when needed)

- Modeling (BlueSky daily fire/smoke runs)
- Monitoring (National cache of 38+ PM2.5 units)
- Messaging - Daily Smoke Outlook AQI/Nowcast-with peak and low impact timing information
- Coordination w/ state/tribal/local air quality regulatory agencies, public health dept. and impacted communities



2017
ARA Deployments by Year





PSC = Planning Section Chief
 IMET = Incident Meteorologist
 FBAN = Fire Behavior Analyst
 SOF = Safety Officer
 PIO = Public Information Officer
 Others: Liaison Officer, Medical Unit Leader, Incident Commander and Agency Administrator

Deployed to wildfire as land managers know more of what the fire will do in terms of: fire size, growth rate, intensity, fuels, consumption, emissions, weather, duration,...and impacts typically highest near the wildfire





Modeling of PM2.5 - Research, Development, Application



<https://tools.airfire.org/websky/v1#status>

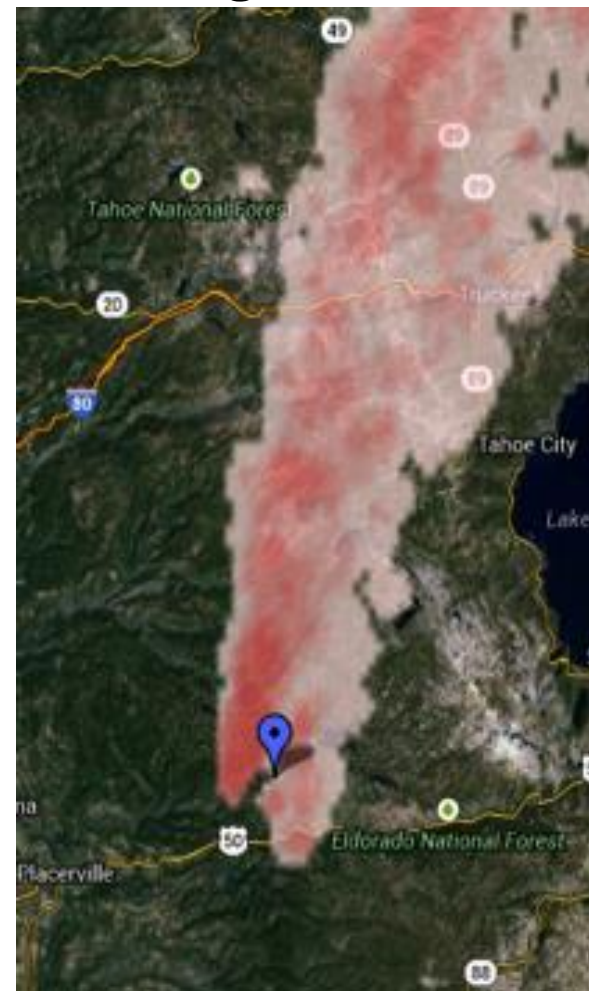
USFS PNW R&D AirFire Team -BlueSky smoke modeling framework

- 20+ daily regional runs to supplement national products
- Canadian wildfire emissions added mid-season 2017
- New 1.8-km domains- OR, AZ, NM and now NWS 3-km CONUS
- 2018 CMAQ runs added
- Use of NWS 1.3km grid from NOAA (6/15-9/15)
- On-incident support for high resolution and customization for best performance

King Fire 2014



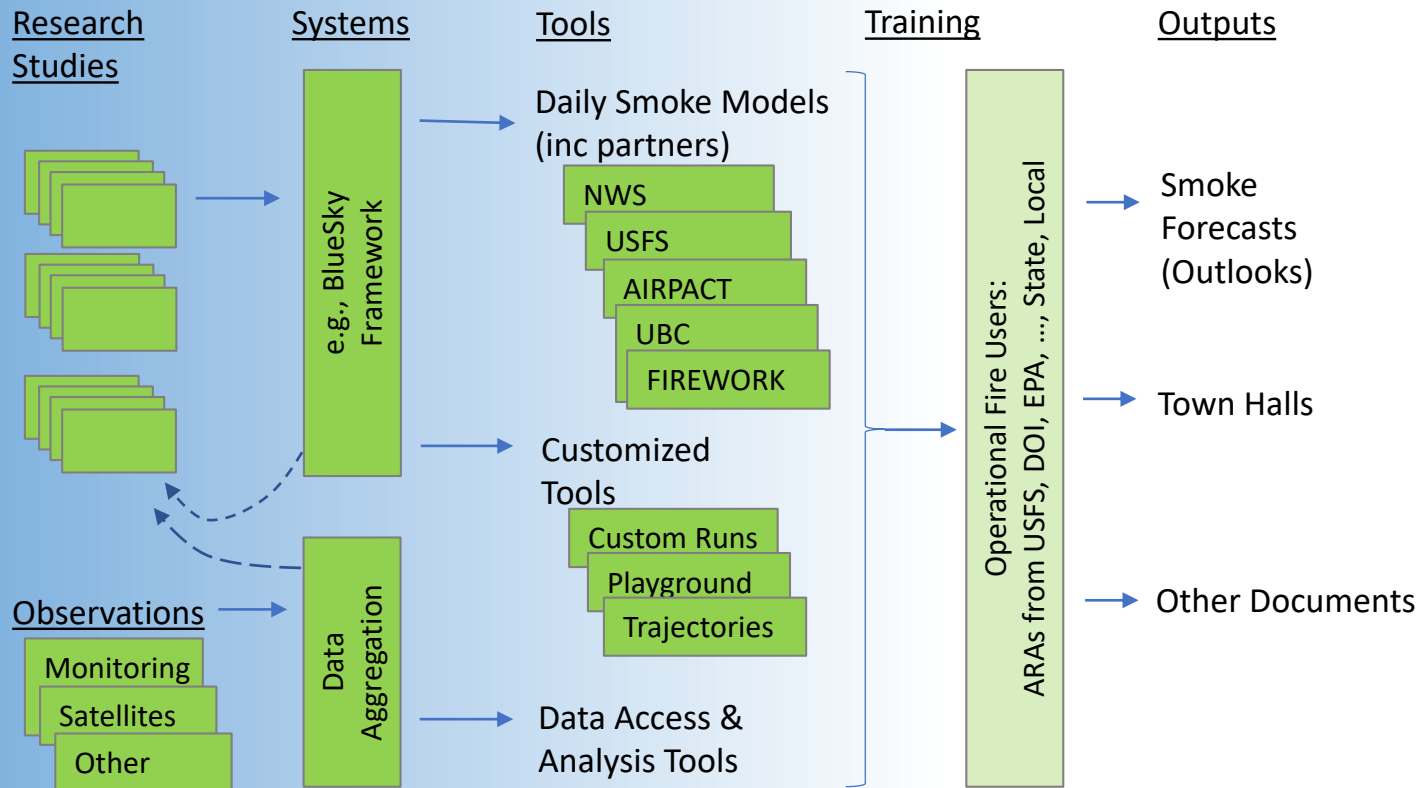
Earth Observatory 9/17/2014



BlueSky Daily Run



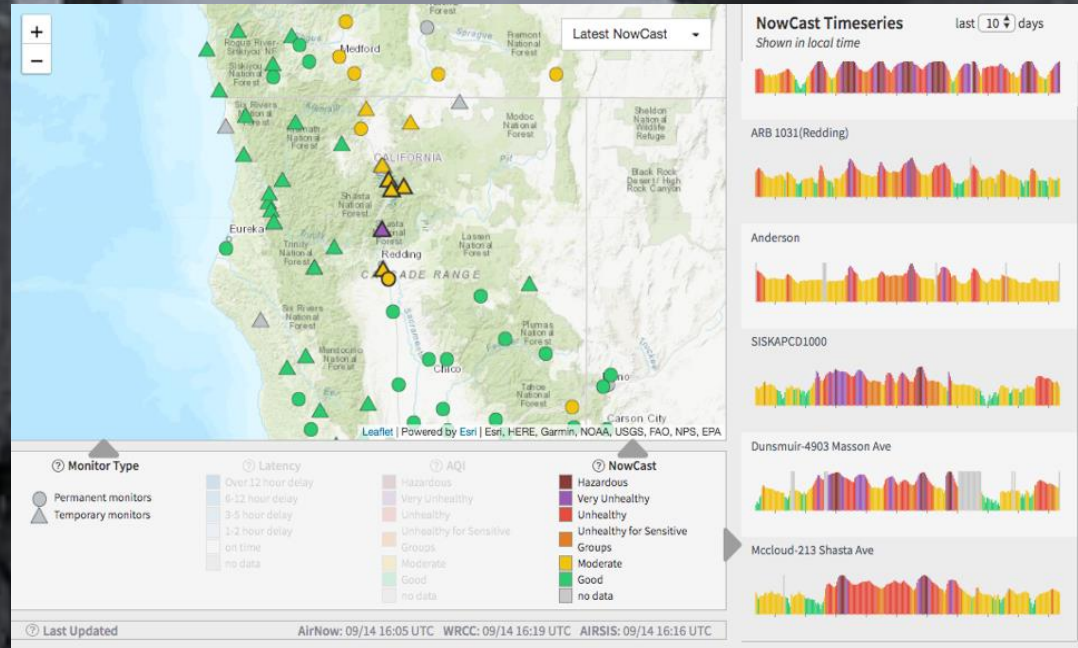
USFS AirFire and Partners' work within the Interagency Wildland Fire Air Quality Response Program

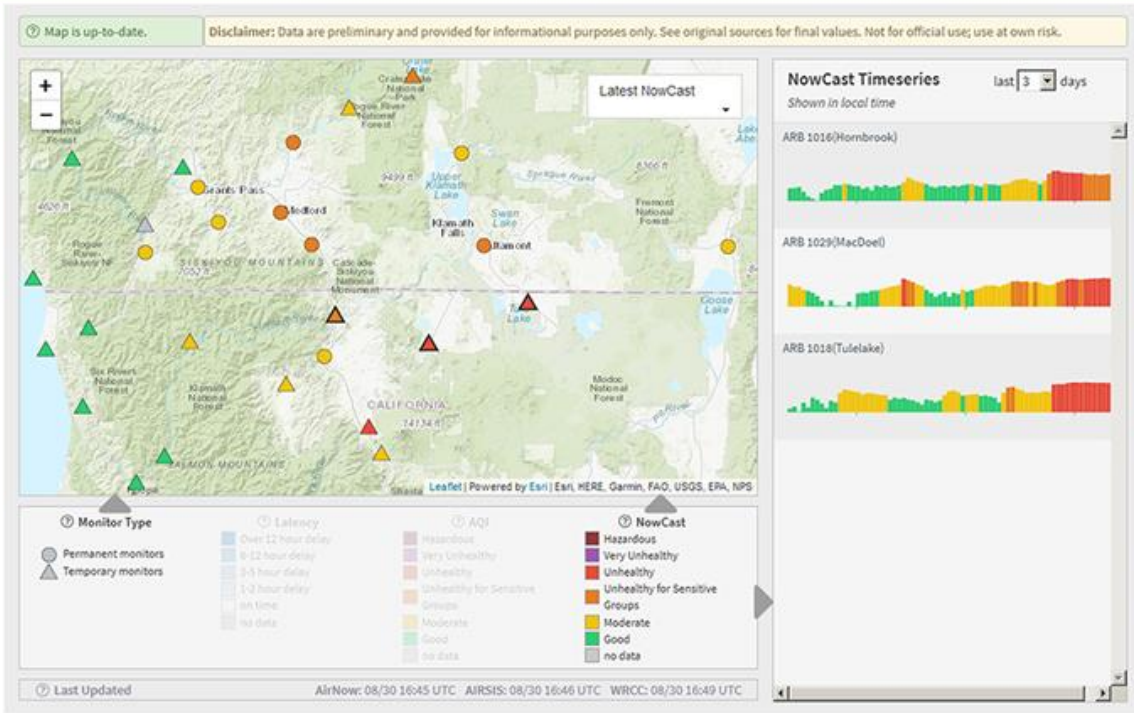




Monitoring

- 38 monitors in USFS national cache deployed to most impacted communities
- Monitor deployments affect underserved communities directly
- Web tool (USFS AirFire) aggregates and displays data across all sources
- Used by impacted communities
- Used by smoke forecasters
- In 2018 adopted by State of California when other sites crashed under heavy smoke

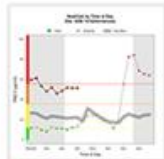
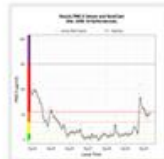
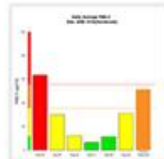




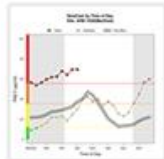
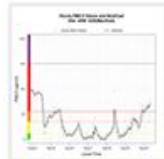
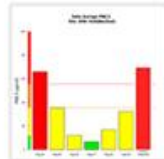
Selected Monitors: 3 monitors from 1 timezones.

[Data Report](#) [CSV File](#) [AQI-NowCast](#)

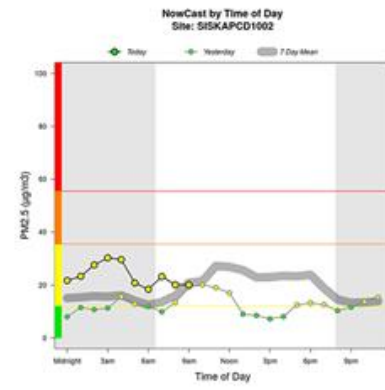
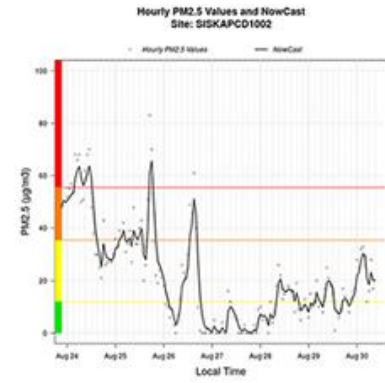
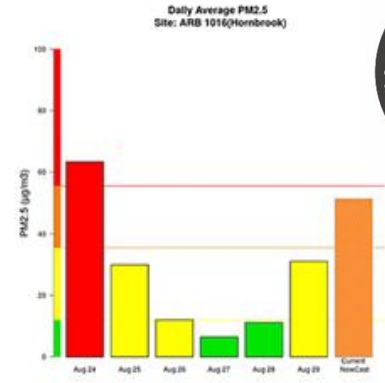
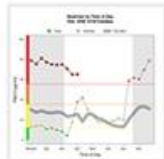
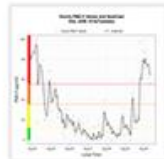
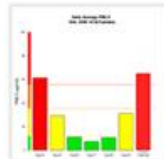
ARB 1016(Hornbrook)
Monitor ID: lon_122.569_lat_41.904_arb2.1016
Source: AIRSIS
Latest NowCast PM_{2.5}: 51.4 µg/m³
Last Updated 2018-08-30 15:00:00 UTC
Timezone: America/Los_Angeles
QA/QC: [Report](#)
[Show in Simple Interface](#)



ARB 1029(MacDoel)
Monitor ID: lon_122.044_lat_41.784_arb2.1029
Source: AIRSIS
Latest NowCast PM_{2.5}: 69.3 µg/m³
Last Updated 2018-08-30 15:00:00 UTC
Timezone: America/Los_Angeles
QA/QC: [Report](#)
[Show in Simple Interface](#)



ARB 1018(Tulelake)
Monitor ID: lon_121.479_lat_41.856_arb2.1018
Source: AIRSIS
Latest NowCast PM_{2.5}: 65 µg/m³
Last Updated 2018-08-30 15:00:00 UTC
Timezone: America/Los_Angeles
QA/QC: [Report](#)
[Show in Simple Interface](#)



Communications

- **Create Smoke Outlooks and Impact Summaries**

- **IWFAQRP Programmatic Goal: Reduce exposure through behavior modification**

- Work closely with state/tribal/local air regulatory agencies and public health agencies (Daily Calls)

- Sync communications across impacted areas, and IMTs

- Provide critical additional information:

- Monitor data
- Fire activity and burnout operations
- Fire behavior predictions
- Meteorology

- Fire smoke information covered at public meetings, PIO traplines and posting on net, Inciweb, state smoke blogs, social media, EPA, State air agencies

- **Stay indoors a key message (AC? heat? clean?)**

- Coordinate with partners on smoke impacts

- Posting on Wildlandfiresmoke.net (IWFAQRP site) – Outlooks, daily modeled fire smoke, monitor data



Smoke Outlook for 6/14 - 6/15
SW Colorado 416 and Burro Fires
 Issued at: 2018-06-14 14:35 UTC



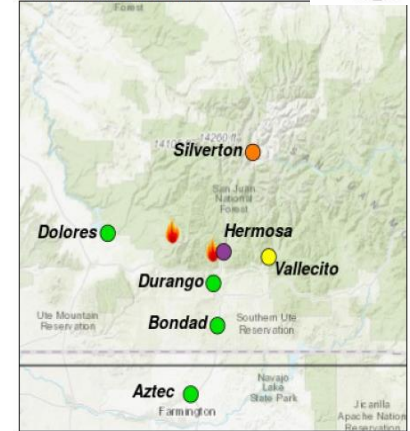
Outlook for SW Colorado

Fire
 416 Fire is at about 32,000 acres, 15% containment. Burro Fire is about 3,000 acres at 0% containment. Predicted thunderstorms may bring strong outflow winds and increase the potential for extreme fire behavior.

Smoke
 Durango and Bondad should get a reprieve from smoke today. Hermosa will see smoke impacts at varying levels throughout today. Silverton and Lake City will see greater smoke impacts today and tomorrow. Vallecito may see smoke drifting in late this afternoon as well tomorrow morning. Dolores and Aztec should not see much smoke impacts today.

One way to reduce smoke exposure
 Consider using a HEPA air filtration unit to help keep a room in your home less smoky. For more information see: <https://www.missoulaclimate.org/hepa-air-filtration.html>

Daily AQI Forecast for Jun 14, 2018



Station	Yesterday	Wed	Forecast	Thu	Fri
	hourly	6/13		Comment for Today -- Thu, Jun 14	6/14
Bondad			Generally clear today, smoke returning tomorrow morning before clearing around noon.		
Dolores			Generally clear today		
Hermosa			Heavy smoke drift mid-afternoon, some clearing tonight, returning at heavy levels early tomorrow morning, persisting to noon.		
Durango			Generally clear today with heavy smoke returning early tomorrow morning before clearing late morning.		
Silverton			Smoke drifting in late this morning, persisting overnight with heaviest concentrations after midnight and clearing late tomorrow morning.		
Vallecito			Smoke drifting in late this afternoon, clearing tonight. Smoke returning tomorrow morning, clearing before noon.		
Aztec			Generally clear today		

Issued 2018-06-14 14:35 UTC by Andrea Holland, Julie Hunter (t)

Air Quality Index (AQI)	Actions to Protect Yourself
Good	None
Moderate	Unusually sensitive individuals should consider limiting prolonged or heavy exertion.
USG	People within Sensitive Groups* should reduce prolonged or heavy outdoor exertion.
Unhealthy	People within Sensitive Groups* should avoid all physical outdoor activity.
Very Unhealthy	Everyone should avoid prolonged or heavy exertion.
Hazardous	Everyone should avoid any outdoor activity.

Disclaimer: Forecasts may be wrong; use at own risk. Use caution as conditions can change quickly. See your health professional as needed. Smoke sensitive groups should take appropriate precautions.

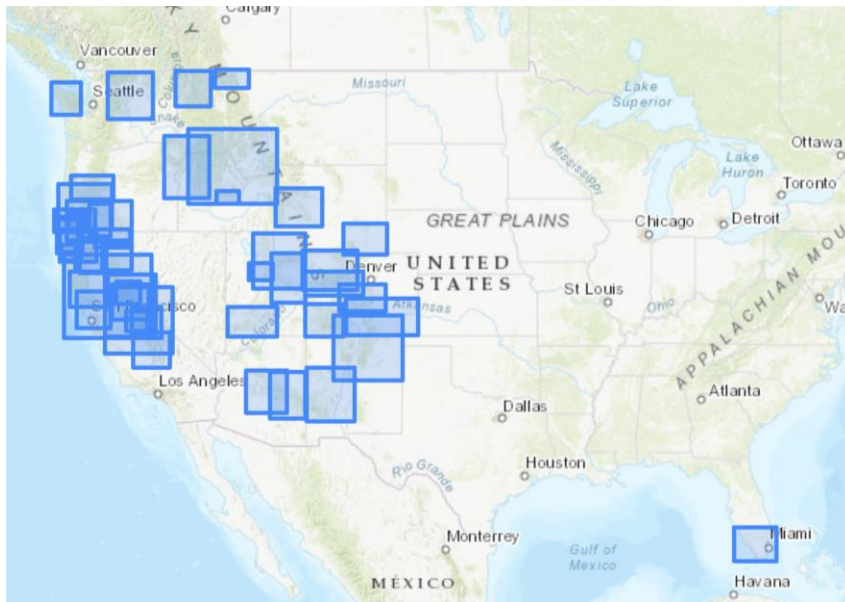


Issued by USFS Wildland Fire Air Quality Response Program -- www.wildlandfiresmoke.net
 SW Colorado Updates -- tools.airfire.org/production-outlooks/SWColorado
 Smoke and Health Info -- www.airnow.gov/index.cfm?action=smoke.index

○ **An application used by all Air Resource Advisors on WILDFIRES developed by USFS PNW Research Station AirFire Team**

2018 Smoke Outlooks

- ~1000 Smoke Outlooks Issued
- Done in collaboration with local agencies



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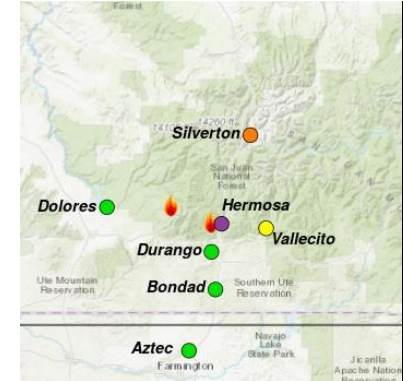
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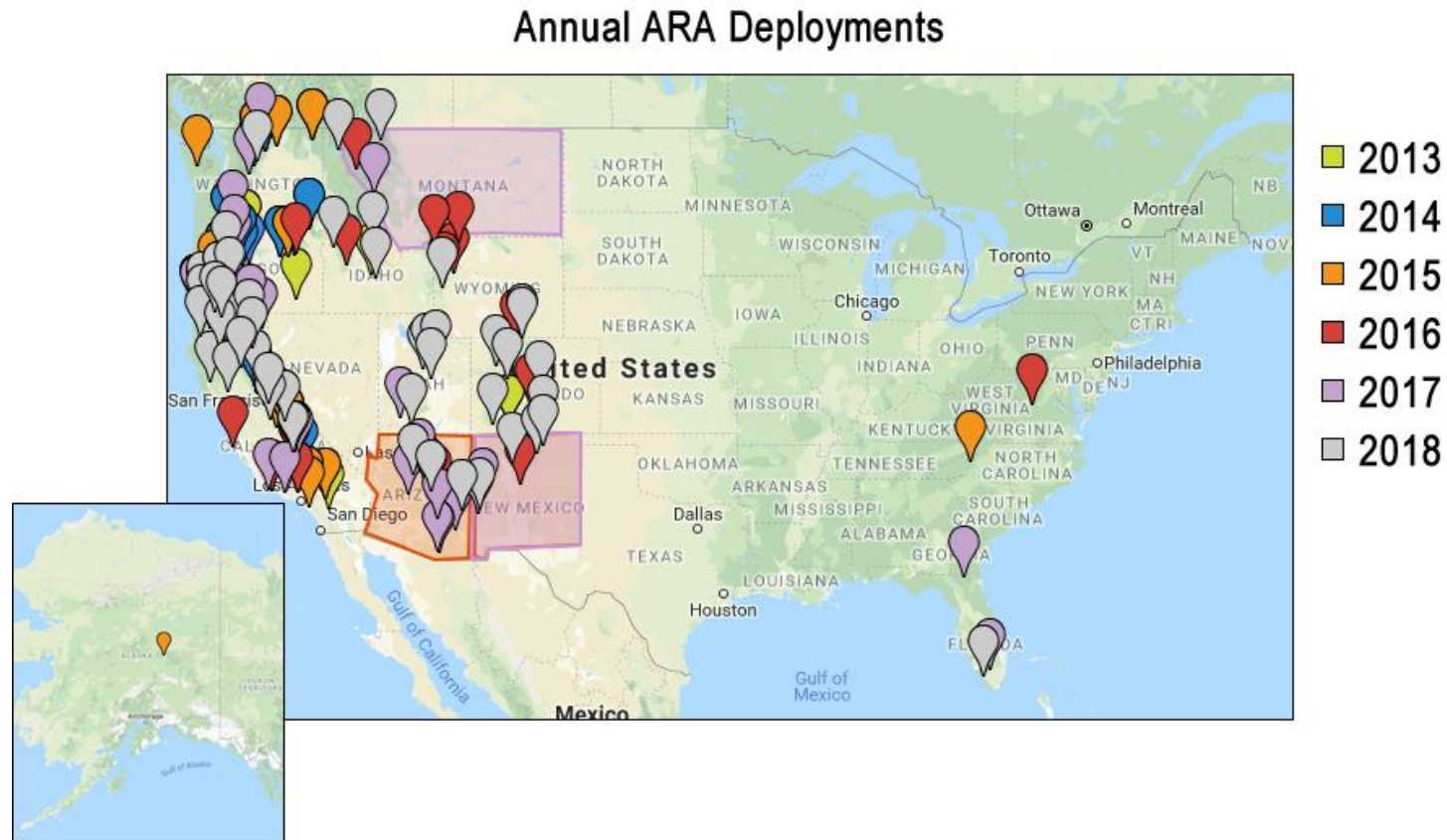
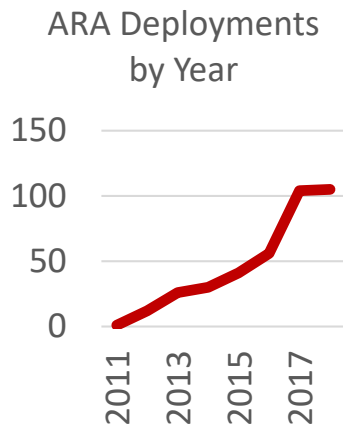
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Issued by USFS Wildland Fire Air Quality Response Program -- www.wildlandfiresmoke.net
 SW Colorado Updates -- tools.airfire.org/production-outlooks/SWColorado
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Air Resource Advisor Deployments over Time



March 2019 Authorized by US Congress

S.47 - John D. Dingell, Jr. Conservation, Management, and Recreation Act



SEC. 1114. WILDFIRE TECHNOLOGY MODERNIZATION.

(a) PURPOSE.

—The purpose of this section is to promote the use of the best available technology to enhance the effective and cost-efficient response to wildfires—

- (1) to meet applicable protection objectives; and
- (2) to increase the safety of—
 - (A) firefighters; and
 - (B) the public.

(f) SMOKE PROJECTIONS FROM ACTIVE WILDLAND FIRES.

—The Secretaries shall establish a program, to be known as the “Interagency Wildland Fire Air Quality Response Program”, under which the Secretary concerned

- (1) to the maximum extent practicable, shall assign 1 or more air resource advisors to a type 1 incident management team managing a Federal wildland fire; and
- (2) may assign 1 or more air resource advisors to a type 2 incident management team managing a wildland fire.



Advisory Meeting for Proposing an Emergency Regulation to Protect Workers from Wildfire Smoke

General Industry Safety Orders
Chapter 4, subchapter 7, new section

May 8, 2019 10:00 am - 3:00 pm	Harris State Building 1515 Clay St., 2nd Floor, Room 1 Oakland, CA
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In response to the Occupational Safety and Health Standards Board's [decision](#) on March 21, 2019 to GRANT in part Petition No. 573, the Division of Occupational Safety and Health (Cal/OSHA) will convene an advisory meeting seeking input on the development of an emergency rulemaking proposal addressing worker exposure to wildfire smoke. Cal/OSHA plans to hold this advisory committee meeting on May 8th, 2019 in Oakland.

Persons interested in receiving announcements and updates pertaining to the advisory meeting, and persons interested in providing information and scientific data on employee exposure to wildfire smoke, control measures, feasibility, or costs may contact Deputy Chief of Health [Eric Berg](#) at (510) 286-7010 or Senior Safety Engineer [Amalia Neidhardt](#) at (916) 263-1944.

Meeting Documents

- [Post-meeting Comments](#)
- [Pre-meeting Comments](#)
- [Agenda](#)
- [Draft Regulatory Text including both Appendices - 5/21/2019](#)
- [Draft Regulatory Text for Discussion - 5/8/2019](#)



Background Documents

- [Petition 573](#)
- [Gavin Newsom, Governor of California, Executive Order N-05-19](#)
- [About the Emergency Rulemaking Process](#)
- [Flow Chart on Emergency Rulemaking](#)

Cal/OSHA

Quick Links

- ▶ [File a workplace safety complaint](#)
- ▶ [Obtain a free consultation](#)
- ▶ [Important Cal/OSHA updates](#)
- ▶ [Public records requests](#)

Cal/OSHA Branches & Units

Branches

- ▶ [Enforcement](#)
- ▶ [Consultation Services](#)

Units

- ▶ [Amusement, Ride and Tramway](#)
- ▶ [Asbestos and Carcinogen](#)
- ▶ [Census of Fatal Occupational Injuries](#)
- ▶ [Communications Program](#)
- ▶ [Crane](#)
- ▶ [Elevator](#)
- ▶ [Heat and Agriculture Coordination Program](#)
- ▶ [High Hazard](#)
- ▶ [Labor Enforcement Task Force](#)
- ▶ [Legal and BOI](#)
- ▶ [Mining and Tunneling](#)
- ▶ [Pressure Vessel](#)

Challenges and Opportunities



- Varying messages regarding:
 - N-95 Masks
 - Box Fans and Filters
 - Multiple Agencies issuing air quality alerts, messaging or advice
 - Air Quality Index and Nowcast indices and other thresholds
 - Cross-boundary forecasting and messaging (adjacent states to cross-country – fine scale vs long-range synoptic scales)
 - **Messaging about indoor air quality during a wildfire smoke impact – not always the clean spot! Role for air quality sensors?**
- Accuracy of models and data – publicly accessed
- Carbon Monoxide in communities adjacent to the fire and other pollutants (Ozone)
- Wildland Urban Interface wildfire (human materials) emission factors and messages
- Interagency sharing of all temporary monitoring data
- Air Quality Sensors, data integration and messages...many measure high for wildfire smoke –key role in indoor air measurement especially vulnerable community

April 20-24, 2020 – **International Smoke Symposium 3** hosted by NWCG Smoke Committee & International Association of Wildland Fire in Raleigh, North Carolina with satellite site at UC Davis.