

Community Tools For Change

Community Prevention and Mitigation Strategies

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Today's Presentation

- How Air Pollution is regulated in California
- Current Air Monitoring and Messaging Strategies in Wildland Fire
- Air Resource Advisor program
- Fire/Fire suppression history and how we got where we are today
- Wildfire versus Prescribed Fire smoke impacts
 - Our ability to regulate them
- Policy Implications and changing policy to best protect public health
- Where do we go from here?

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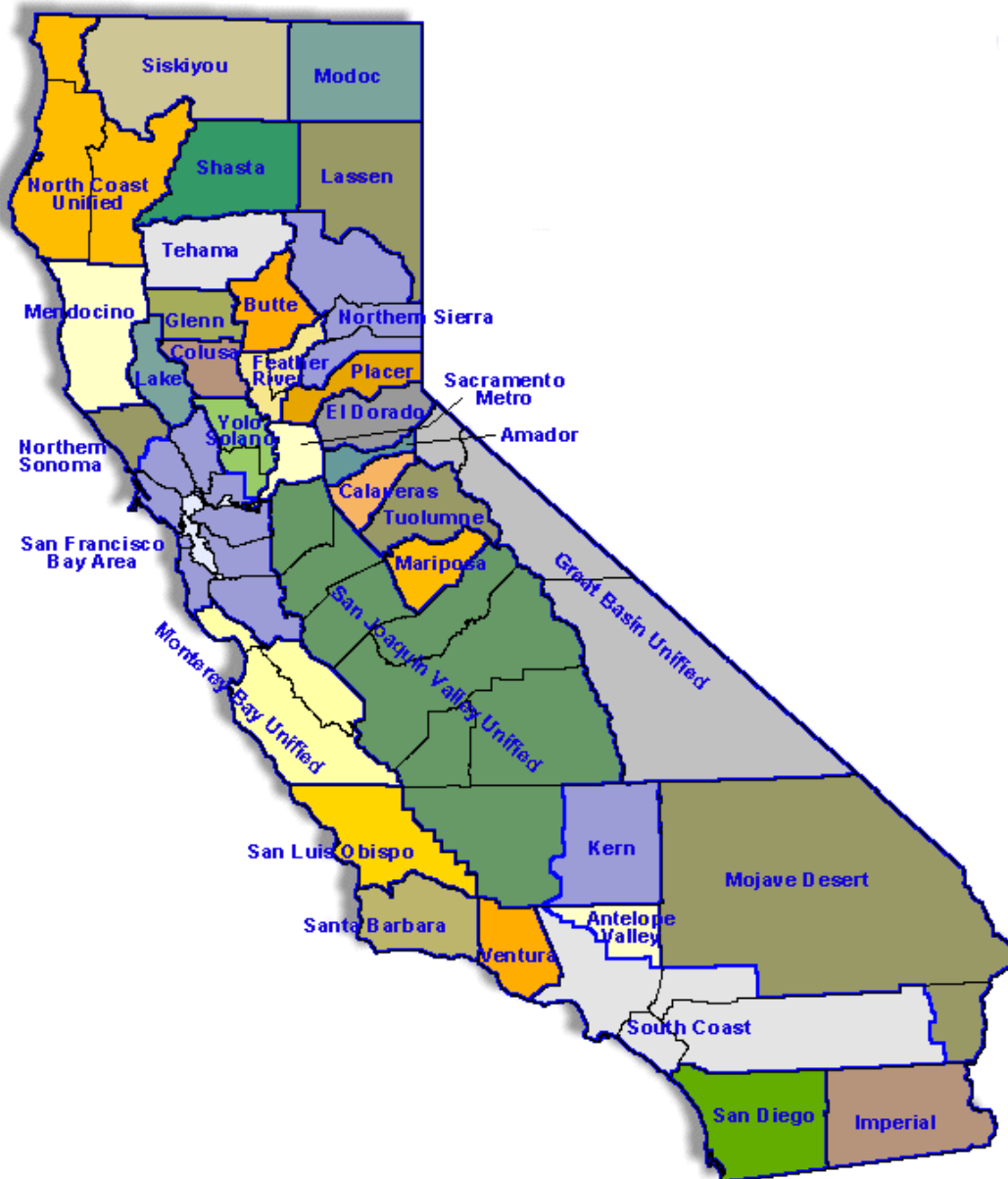


How Air Pollution is regulated in California

- California Air Resources Board (ARB)
 - Mobile sources – Automobiles, Trucks, Locomotives, Shipping
 - Consumer Products – Paints, etc.
- Local Air Pollution Control Districts (APCDs)
 - Stationary sources – biomass plants, cement plants, large boilers and generators, gasoline stations, refrigeration equipment, etc.
 - Agricultural and non-agricultural Burning
 - Including wildland fire both prescribed and suppression fires
 - Other local sources – dust, etc.



California Air Districts



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Air District Work During a Wildfire Smoke Incident

- Request air monitoring support from ARB through County OES
- Develop joint health advisories with County/Local/State Health Departments
- Provide and disseminate information on smoke and air quality
- Provide technical air quality data to organizations, event leaders, schools, and individuals to help make informative decisions
- Work with the media
- Coordinate with other agencies and groups (OES, Health, lead agencies, State of California, IMT teams and more)



Monitoring & Messaging Strategies

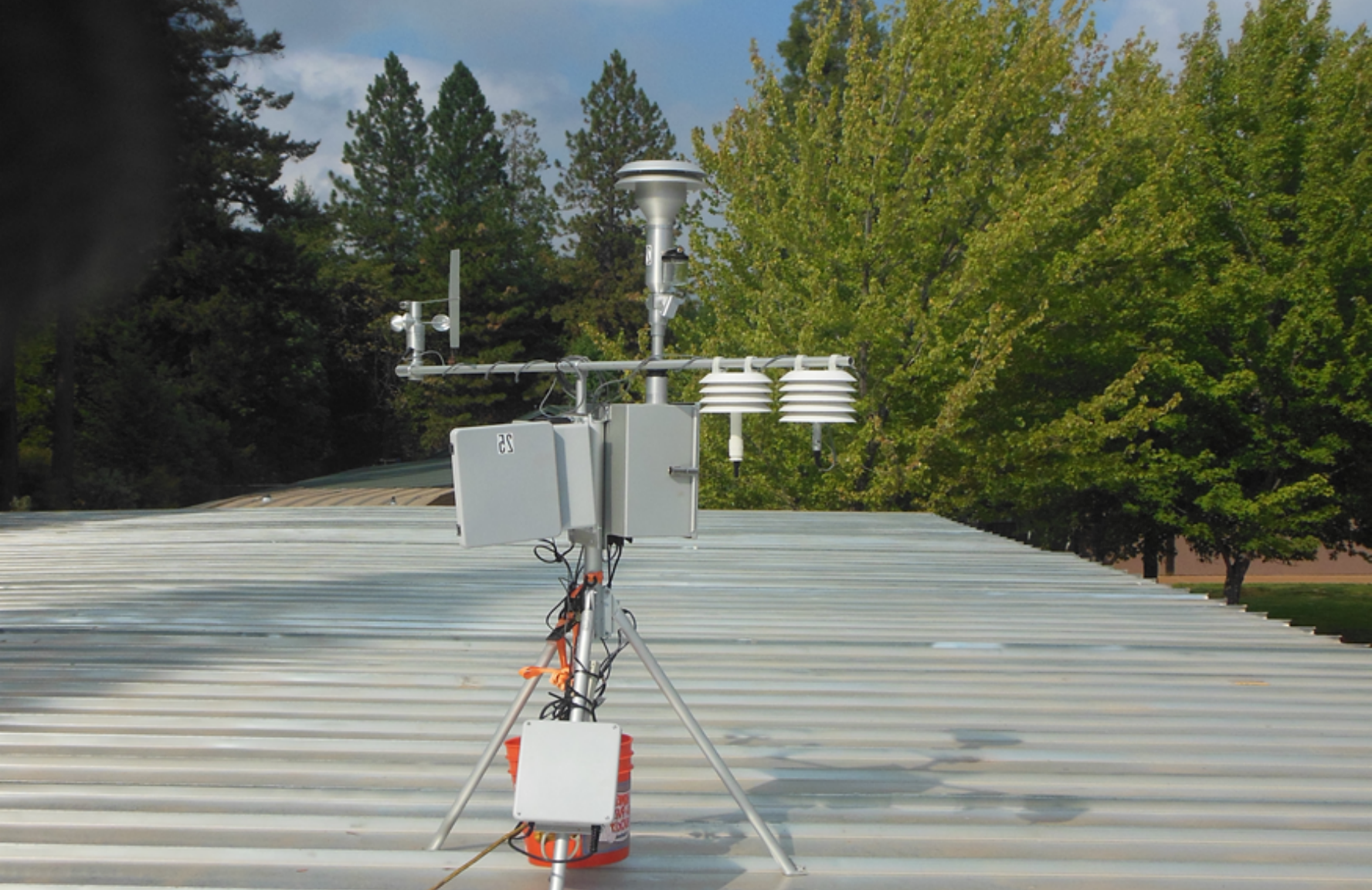
Monitoring

- 1300 call
- E-BAM monitors placed in populated areas expected to be impacted by smoke
- Adding 10 Purple Air sensors this year.

Messaging

- Messaging on our website AQI page and on social media
- California smoke blog
- ARA 1 pager





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MODERATE

FORESTA

NO DATA

WAWONA

UNHEALTHY
with several hourly readings in
the VERY UNHEALTHY range

YOSEMITE WEST

UNHEALTHY
with several hourly
readings in the VERY
UNHEALTHY range

BOOTJACK

MODERATE

YOSEMITE VALLEY

MODERATE
with several hourly readings
in the unhealthy for sensitive
groups range

EI Portal

MODERATE
with several hourly
readings in the
unhealthy for
sensitive groups

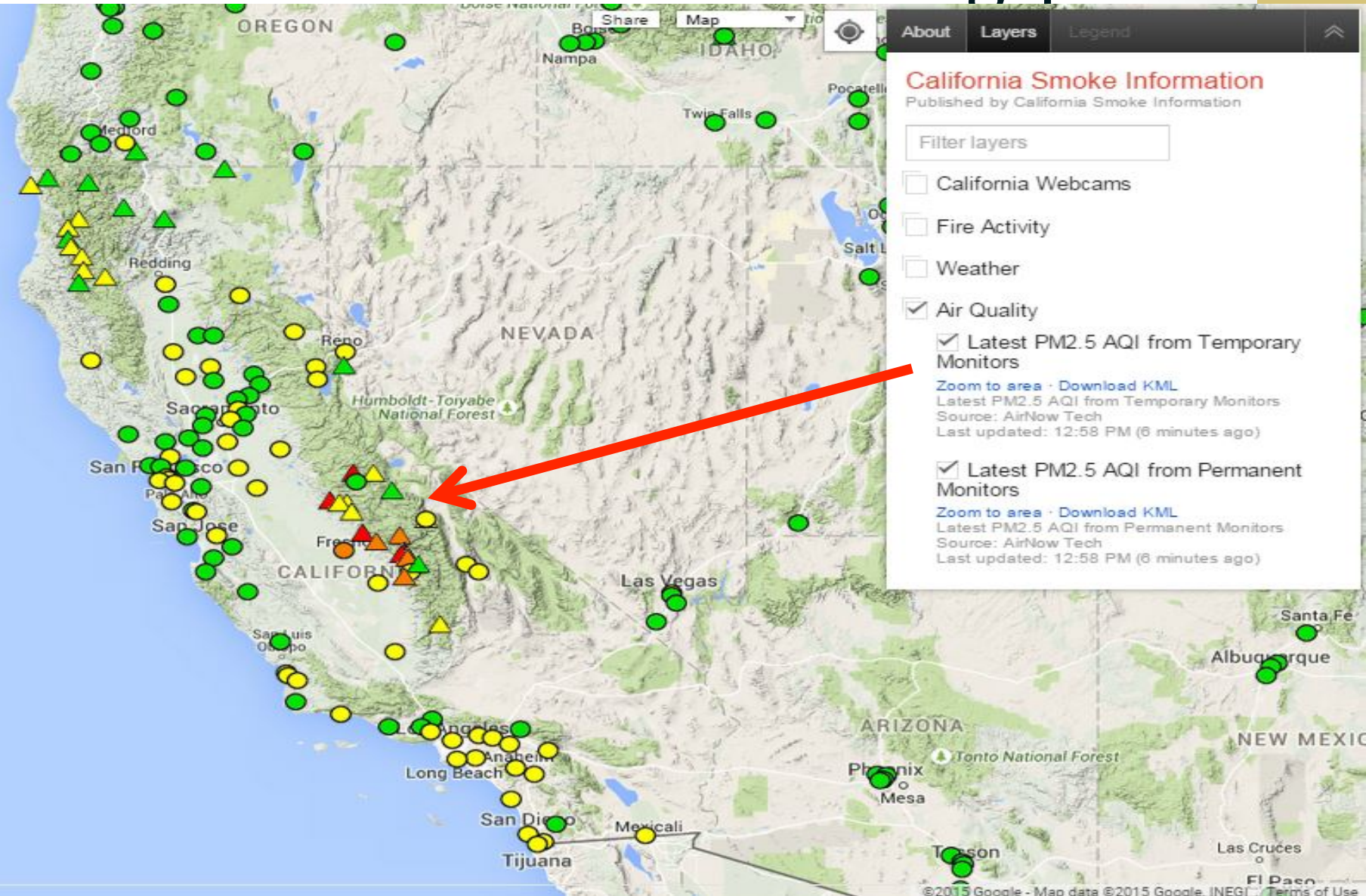


Air Quality Index Levels of Health Concern	Recommended Actions
Good	None needed
Moderate	Reduce unnecessary outdoor activity. Avoid strenuous exercise outdoors.
Unhealthy for Sensitive Groups	Sensitive groups should remain indoors as much as possible until air pollution improves (often better in afternoon).
Unhealthy	Everyone should remain indoors as much as possible until air pollution improves (often better in afternoon).
Very Unhealthy	Consider leaving the area. If not possible, remain indoors. Only go outdoors when air quality conditions improve.
Hazardous	Consider leaving the area. If not possible, remain indoors. Only go outdoors when air quality conditions improve.



California Smoke Info Blog

www.californiasmokeinfo.blogspot.com



Air Resource Advisor (ARA)

- Technical specialists trained in meteorology, atmospheric dispersion, smoke and fire modeling, air quality, and the air quality effects of smoke
- Assigned to the Incident Management Team
- Work closely with the National Weather Service, Health Departments, and Air Pollution Control Districts
- Help craft messaging on smoke and air quality
- Available as a single resource through the Resource Ordering and Status System



ARA 1 Pager

Smoke Forecast Outlook issued September 07, 2017 at 10:49 AM EDT

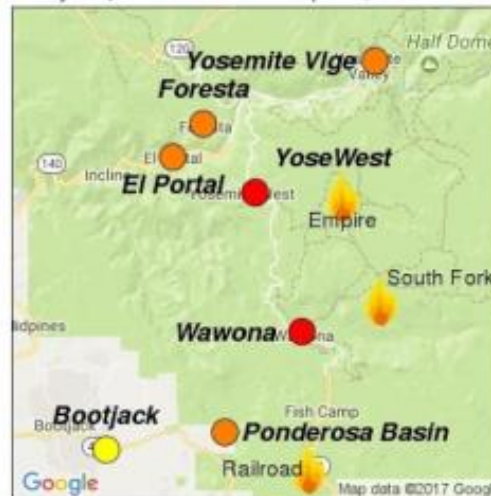
Outlook for Yosemite NP

Smoke: Dispersion will continue to improve today. However, southerly/southwesterly winds are still bringing smoke directly into Yosemite Valley, Wawona, Yosemite West, and Foresta from the Railroad Fire, and to a lesser extent from the Empire and South Fork fires. There should be a more westerly component to the transport winds, so the more western sites (e.g., Bootjack and Mariposa) down canyon and in the foothills will likely clear out even more.

Fire: Growth and emissions from South Fork and Empire Fires remain low to moderate. There was reduced activity on the Railroad fire yesterday, but still enough to push smoke into Yosemite all day. Fire activity today is expected to remain low to moderate on the Railroad Fire today too, which should allow for better clearing of smoke out of Yosemite than yesterday.

Other: Dense smoke for short periods can aggravate symptoms for sensitive persons without changing 24-hr AQI levels. Note: AQ forecasts below reflect only particulate matter - not ozone.

Daily AQI Forecast for Sep 07, 2017



Station	Yesterday hourly	Wed 9/06	Forecast Comment for Today -- Thu, Sep 07	Thu 9/07	Fri 9/08
Yosemite Village			Variable smoke all day; evening clearing		
Yosemite West			Variable smoke all day; evening clearing		
Wawona			Variable smoke all day; evening clearing		
Foresta			Variable smoke all day; evening clearing		
Tuolumne Meadows			Variable smoke afternoon/evening smoke; morning clearing		
Ponderosa Basin			Variable smoke all day; evening clearing		
El Portal			Variable smoke all day; evening clearing		
Bootjack			Morning smoke, improved afternoon clearing		

Issued Sep 07, 2017 by Leland Tarnay, Air Resource Advisor

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

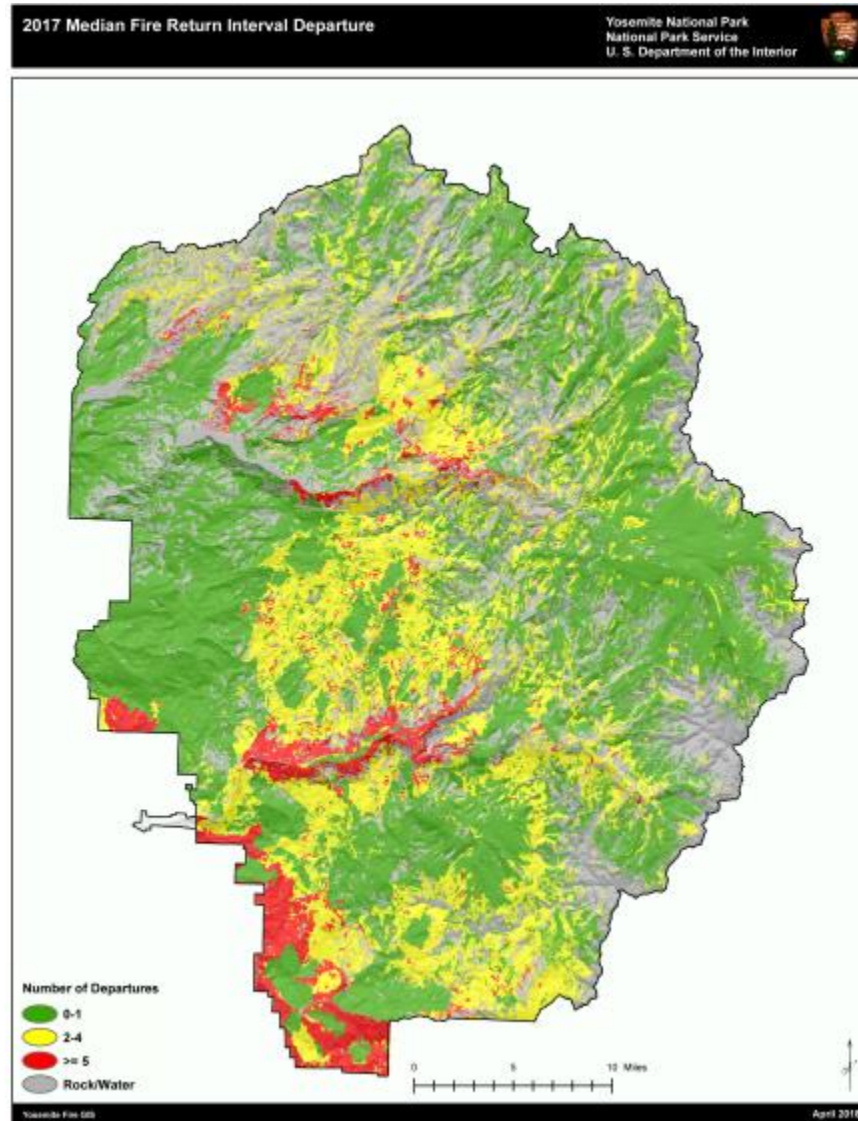
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Fire and Fire suppression history and how we got where we are today



Wildfire vs. Prescribed Fire smoke impacts and our ability to regulate them

- Prescribed fires are heavily regulated by APCD
 - Planned ignitions
 - Wildfires managed for resource benefit
 - Associated fees assessed by APCD for acres burned
- Wildfires under suppression strategies are not regulated
 - No fees assessed



Prescribed fire — two varieties

- Planned ignitions with specific boundaries and fire-related prescriptions
 - Front country near higher values at risk
 - Each has a specific fire plan that includes a smoke management plan with trigger points and contingency plans where actions have to be taken to reduce smoke impacts if they become a problem
 - Permits are issued and specific conditions of approval are added to each permit. Failure to comply with permit conditions of approval can result in a Notice of Violation and fines of up to \$10,000 per day
- Naturally ignited (lightning) fires that are being managed for resource benefit
 - High country/wilderness with few values at risk. Usually takes several days to become a significant defined fire with a smoke column
 - Smoke management plan has less info but still requires a permit
 - Some LMAs play nice and Some do not



Prescribed Fire Regulation

- Permit Conditions for Prescribed fire include:
 - 72 and 24 Hour Notification of Burn to Mariposa APCD.
 - Notification to local residents via posting burning sign along highway for burn units close to major roadways.
- A test burn is conducted to determine if conditions meet the approved smoke management plan
- Daily burn authorization obtained prior to ignition
 - Predicted transport winds in the direction of an identified smoke sensitive area (SSA) are grounds for denial of daily authorization to burn
 - Any burn that does not have a favorable condition reported for the following 10 days may receive denial to ignite
- All necessary precautions shall be taken to prevent populated areas and SMP listed smoke sensitive areas (SSA's) from being impacted by smoke.
- The approved smoke management plan shall be followed at all times
- Measures to reduce smoke are implemented when monitoring shows an AQI of Unhealthy for Sensitive Groups or as directed by APCD
- Any complaints filed with the Forest shall be forwarded to the APCD

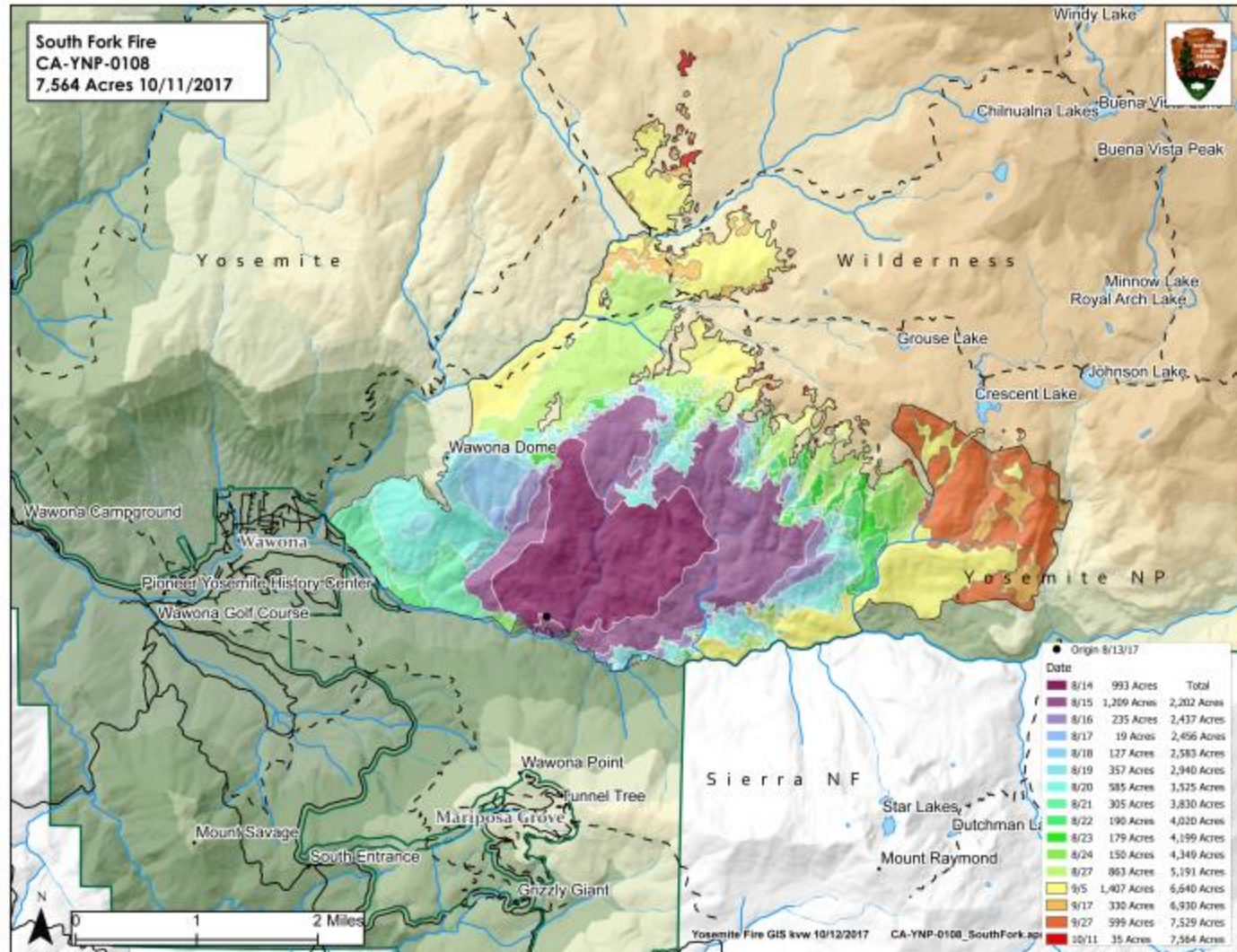


Regulation of Suppression Fires

- During a suppression fire our job changes from Regulator to Informing the Community of the risks based on monitoring that we set up.
- Bottom line – in regards to air quality, prescribed fires are markedly more regulated than fires managed for suppression
- According to Fire Officials Air Quality is not a reason to evacuate communities. We disagree to a certain degree.



South Fork fire Example of “VALUES AT RISK” determining firefighter response



Policy Implications and how we are changing policy to best protect public health

100+ years of fire suppression policies
plus

10+ years of Drought
plus

Bark Beetle caused die off of Hundreds of Millions of trees

Equals

Record setting Stand converting catastrophic wildfires



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Current system

- Discourages prescription fire through monetary disincentive
 - Accumulation of fuels increases possibility of catastrophic fire
- Allows for monitoring and messaging of public health impacts of wildland fire smoke, but does not provide for mitigation of these impacts
- Assesses fees based on acres burned rather than health impact caused



Health Effects of Wildland Fire Smoke



- Eye Irritation
- Reduced Lung Function/
Respiratory Tract
Irritation
- Increased Hospital Visits
and Hospitalizations
- Increased Risk of Out of
Hospital Cardiac Arrest
- Morbidity
 - Impact at high particulate
matter levels (PM_{10} above
 $210\mu g/m^3$)

Liu, JC et al, Environmental Research;136(2015)120–132

Wettstein, ZS et al, J Am Heart Assoc. 2018;7:e007492. DOI: 10.1161/JAHA.117.007492

Schweizer D, Cisneros R, Journal of Environmental Management 144 (2014): 265-278



Prescribed burns different than other wildland fires?

- Similar sized fires produce similar PM2.5 output
 - If done within prescription impact limited to the area immediately around the fire (up to 80 km)
 - Lion Fire showed that nearest communities could experience levels that were Unhealthy for Sensitive Groups or higher
- More broadly, smaller, controlled prescription fires are less likely to lead to long transport of particulate matter than larger suppression fires
 - Schweizer argues there is less impact over time to the public's health with prescribed fire than there is with suppression fires
 - We are pushing our burden onto the next generation





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More prescribed burning?

- Both state and federal land management agencies recognize the need to burn more acres
- Governor's recent Executive Order supports this
- Can this be done while protecting the public's health?

Reducing Barriers for Prescribed Fire

8. The California Air Resources Board with assistance from local air districts and the Department of Forestry and Fire Protection shall increase the opportunities for prescribed fire projects through coordinating staff and equipment availability, accelerate prescribed fire projects that are permit-ready, identify weather conditions suitable for prescribed fire, and institute a real-time air quality and smoke monitoring program for prescribed and wildland fires.

9. The Department of Forestry and Fire Protection and the California Air Resources Board shall develop a publicly available online clearinghouse for permitting of prescribed fire projects on all non-federal lands, which shall include an automated system for prescribed fire project permit submission and approval.



Mitigation as the next step?

- Mariposa has started the conversation with land management agencies, academia, and California ARB
- How do we increase the acreage of prescribed fires while mitigating the impact of smoke on the public's health?
 - Change fee structure to address cost of mitigation
 - Move away from cost per acre and towards modeling that predicts the population at risk
 - Mitigation includes clean rooms, clean shelters, and evacuation as needed to decrease the impacts on the public
 - Base assessed fees on predicted impacts on public health and the cost of mitigation



You can build an Inexpensive Room Filter



Discussion and Questions

- How do we get from here to there?

