

# EPA Tools and Resources Webinar: Wildland Fire Community Engagement and Data Visualization Tools

*Ana Rappold*

*Mary Clare Hano*

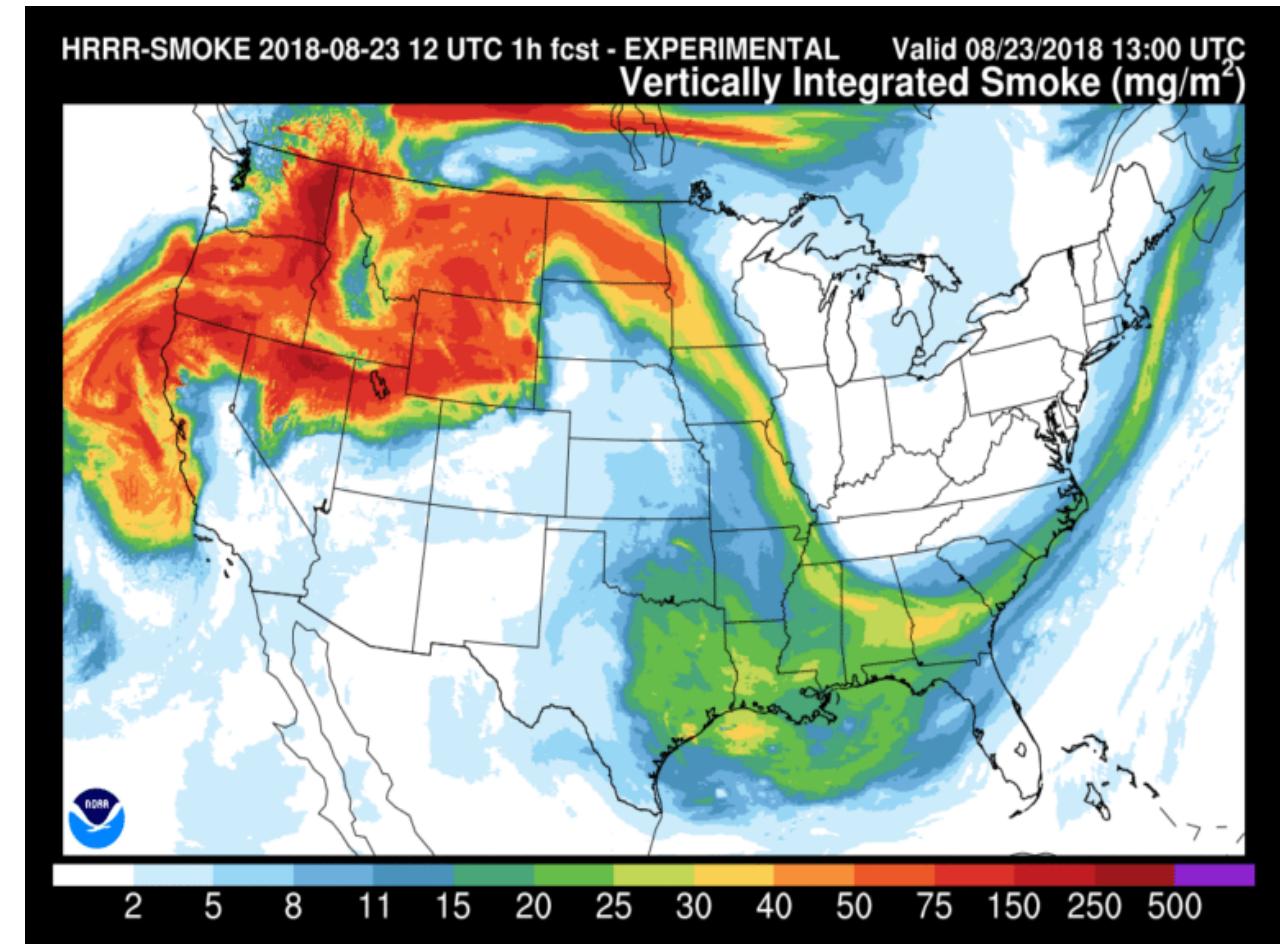
Center for Public Health and Environmental Assessment  
US EPA Office of Research and Development

May 20, 2020



# Context & Background

- Large-scale wildfires are increasing in the western U.S. (e.g., Dennison et al. 2014; Westerling 2016; Joyce et al. 2014; Littell et al. 2009)
- Smoke from these wildfires is significantly impacting air quality, namely particulate matter (PM) (e.g., Phuleria et al. 2005, Larsen et al. 2018)
- Exposure to PM is associated with range of adverse health outcomes (e.g., U.S. EPA 2019; Rappold et al. 2011; Reid et al. 2016; Black et al. 2017; Delfino et al. 2009; Deflorio-Barker et al. 2019; Sacks et al. 2011)



# *Advancing the engagement on the issue: Wildfire smoke and our health through research*

- 1) Smoke Sense Citizen Science Initiative
- 2) Smoke Ready Communities Project

<https://www.epa.gov/sites/production/files/2019-04/documents/wildland%20fire%20research%20framework%20final-tagged.pdf>

# Smoke Sense Citizen Science Initiative Story

## Objectives

- Understanding the gap between what we know about risk and ways to protect our health and the observed public health outcomes
- Increase engagement issue
- Inform ways to improve effectiveness of health risk messaging and communication strategies

## Methods

- Central component is mobile app; also additional projects that support overall objectives

## Timeline

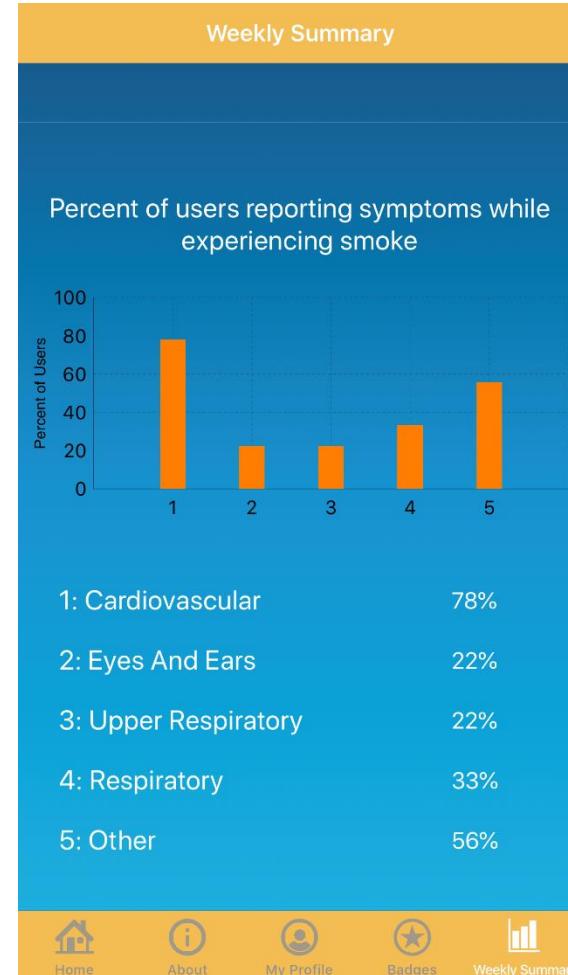
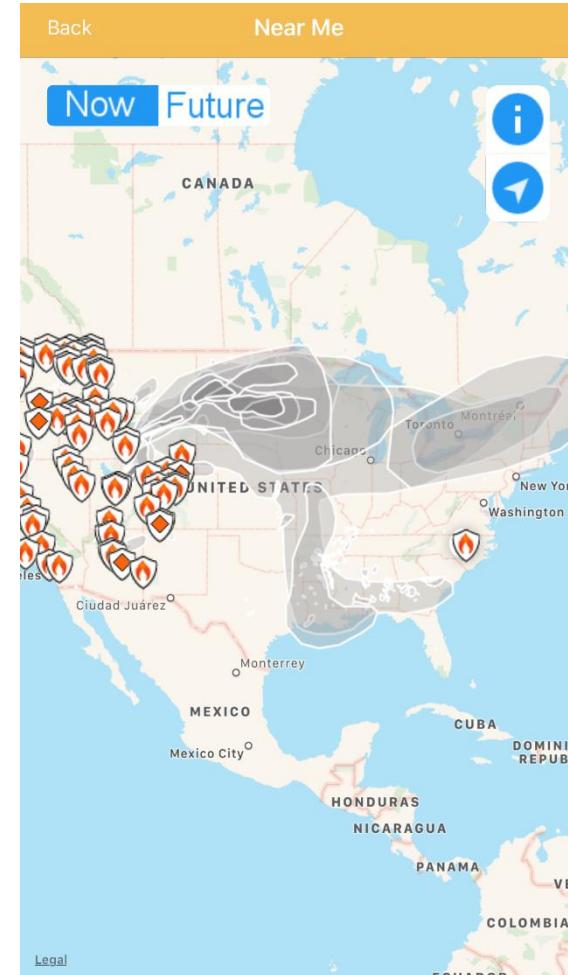
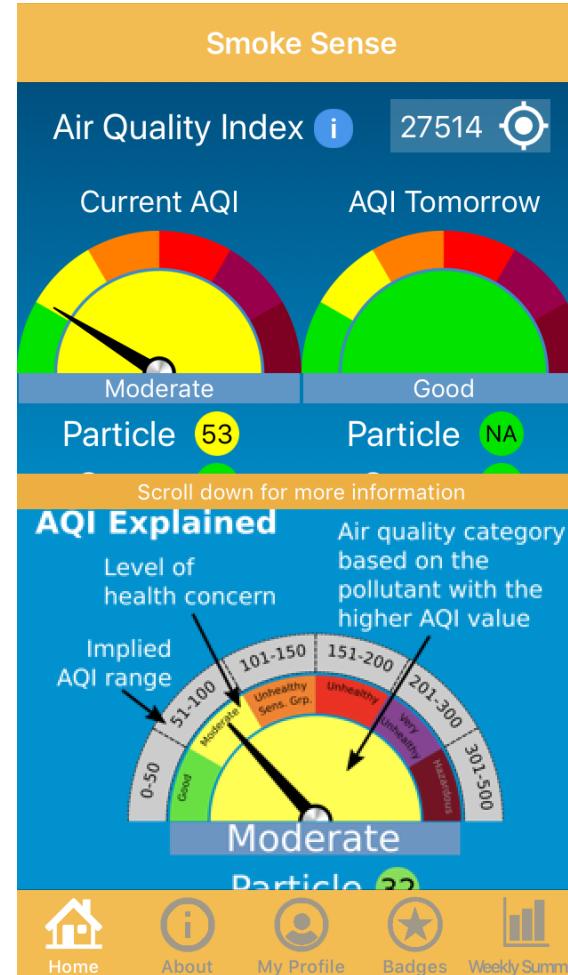


# Why Citizen Science Approach?



- Develops entry points for members of the public to contribute to ***research, engage and access*** data
- ***Mutually beneficial*** – it helps EPA answer questions, and it also serves as a educational/data resource that communities can leverage to address issues related to air quality and health in their communities
- Allows for ***two-way communication*** framework in problem formulation and dissemination of knowledge
- ***Data sharing and fostering change***

# Smoke Sense App: 31K users in all 50 states



# Findings from participant submitted data during the pilot season

Rappold, A. G., et al. (2019). *GeoHealth*.

- Very strong demand for understanding air quality during wildfires
- Spatial and temporal distribution of available air quality data does not meet user's demand
- Participants clearly recognized smoke as an exposure and as a health risk, and health was the reason they participated
- Majority (89%) responded to smoke by taking action to reduce exposure but health status did not determine how we respond to smoke
- Largely we respond to reduce symptoms rather than prevent symptoms
- Current information about air quality and health risk, as provided in the app, does not change individual behavior

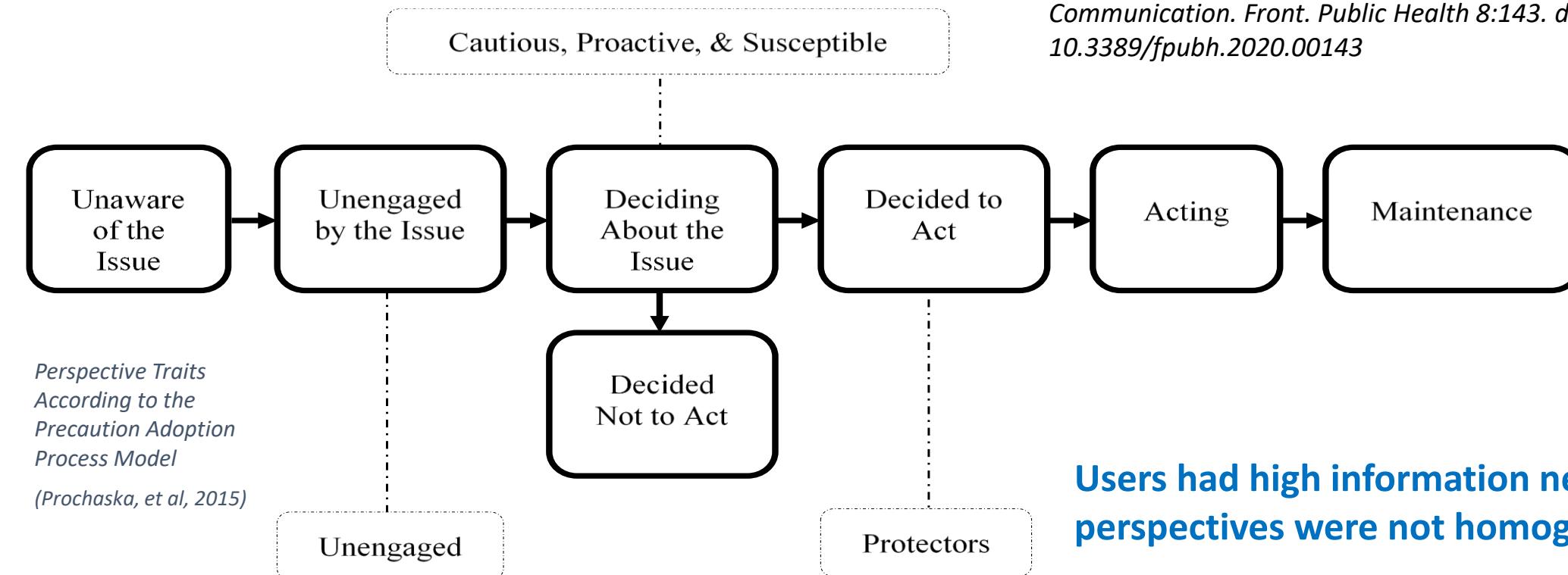
---

Two insights regarding ways to increase the effectiveness of health risk messaging:

- 1) Focus on health factors and outcomes that individuals identify with, in addition to air quality and susceptibility may increase ***personal relevance***
- 2) ***Compelling evidence that behavioral change is beneficial***

# The role of perspectives on the smoke as a health risk in issue engagement

Hano MC, et al. (2020) Knowing Your Audience: A Typology of Smoke Sense Participants to Inform Wildfire Smoke Health Risk Communication. *Front. Public Health* 8:143. doi: 10.3389/fpubh.2020.00143



**Users had high information needs, however their perspectives were not homogeneous.**

**Perspectives influence our engagement with the issue, and health risk messaging may be more successful if flexible and tailored to address those differences.**

# Increasing the Impact of Solutions-Driven Research

- Smoke Sense aims to increase issue engagement across levels (individuals, organizations, academics)
- Interviews shed light on partners' experiences and needs related to our shared goal
- Smoke Sense can complement partners' efforts



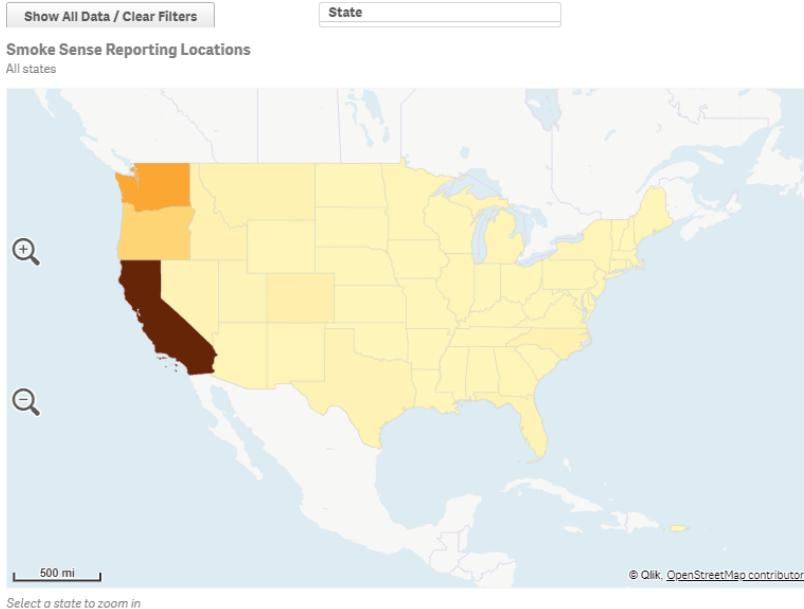
*Hano, MC, et. al. 2019. Scaling Up: Citizen Science Engagement and Impacts Beyond the Individual. Citizen Science: Theory and Practice, 4(1): X, pp. 1–13. DOI: <https://doi.org/10.5334/cstp.244>*

# Take Aways for Complementing Smoke Sense Partner Data Needs

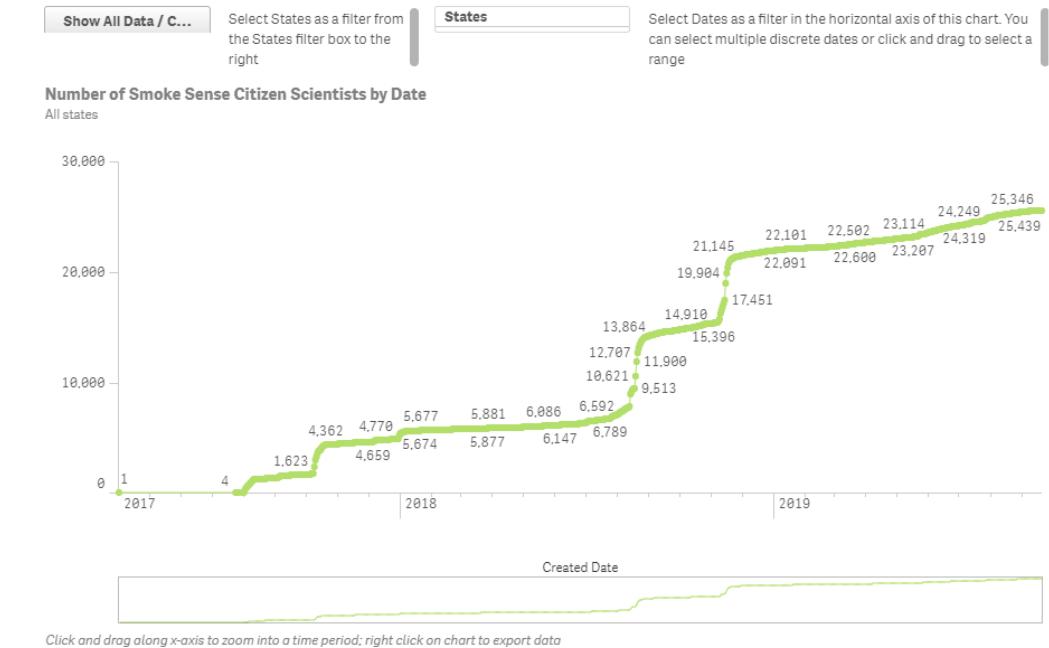


- Access to geographically bound data
- Data are a tool for insights on situational awareness and future response
- Both raw data and interpretation of those data are important

# Example: Data Visualization Lab



Where Smoke Sense participants are reporting from: 31K in all 50 states



When are participants joining? Large wildfires result in big increases in the number of participants

# What are people in our community experiencing?

Show All Data / Clear Filters

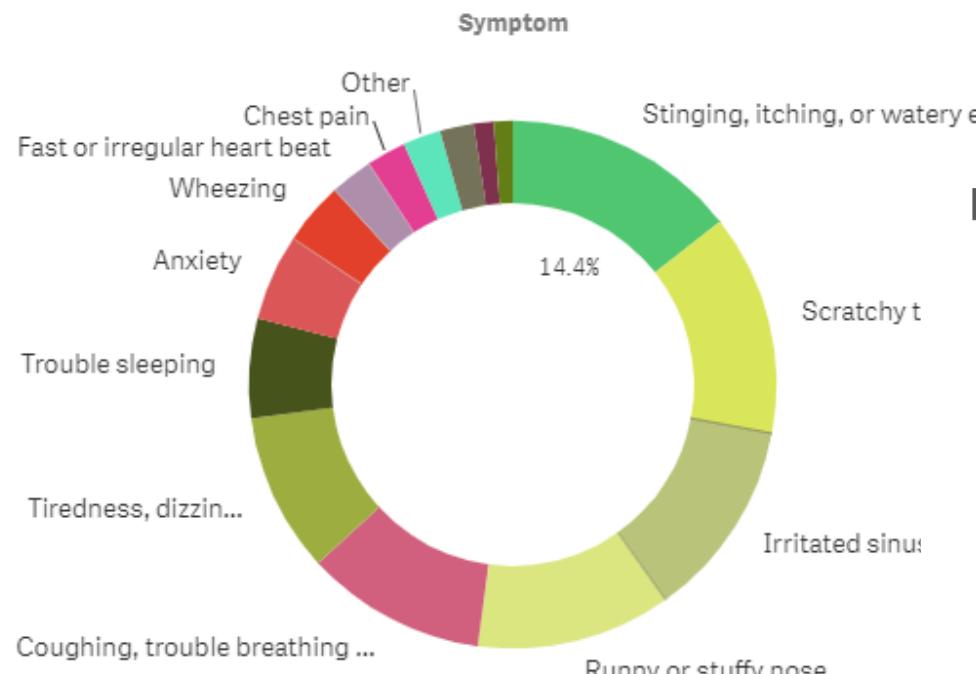
This sheet contains three charts based on the Health Symptoms Survey.

Show Help...

[Smoke this week](#)   [Actions](#)   [Smoke this month](#)

**Yes, I experienced smoke this week: Symptoms Reported**

All states / All weeks



Right click on chart to export data

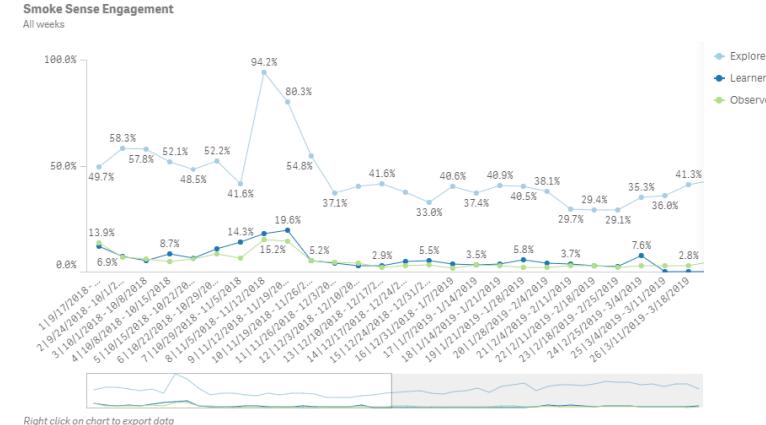
For some explanation of the filtering of this chart please click the Show Help notes.

**What type of information are participants most interested in? Air Quality, Health, Participation**

No selections applied

Show All Data / Clear Filters

Badges Earned 24,366



Right click on chart to export data

# Example Cases of Smoke Sense Community of Practice

- Developing standards-based K-12 curriculum leveraging Smoke Sense in the classroom
- Spanish Translation
- Continuing to develop research collaboration
  - Washington State University
  - University of Southern California
  - Stanford University
  - California Department of Public Health
  - California Air Resources Board
  - Commission for Environmental Cooperation extension to Mexico and Canada

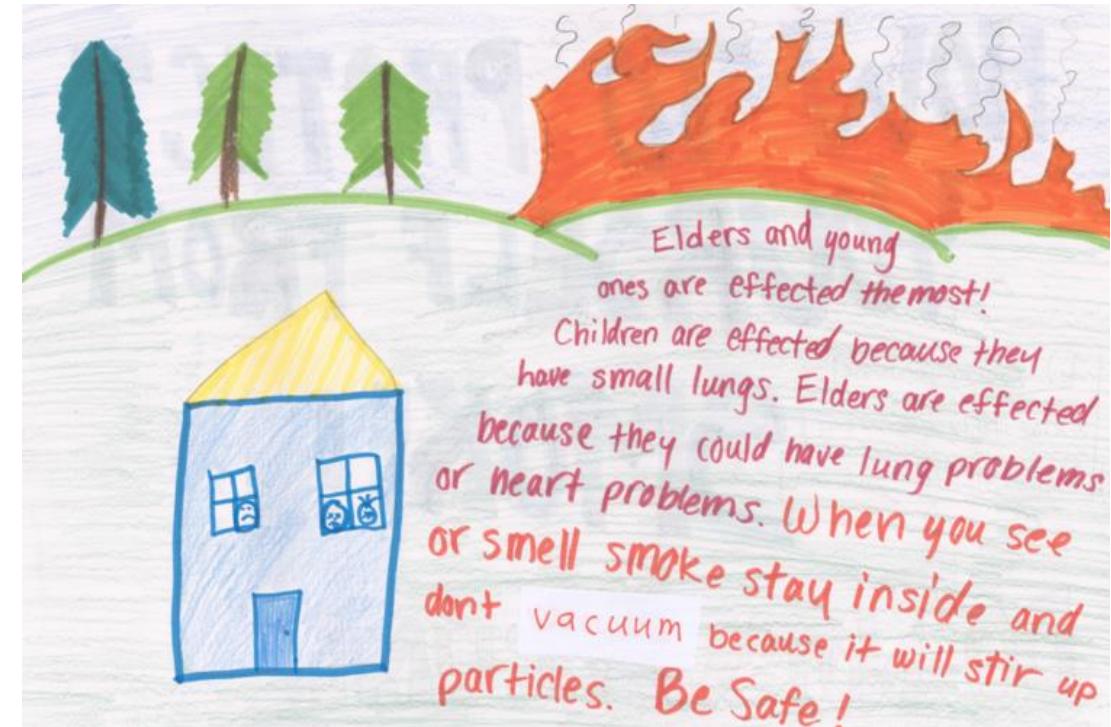


# Smoke Ready Communities

- Translational approach to leverage community experiences in developing a set of resources that can be used by a wide range of communities for responding to wildland fire smoke intrusion
- Multi-agency effort: partnering with US Forest Service, and coordinating with CDC, state and local agencies
- Includes a range of resources related to wildland fire smoke intrusion and processes for effectively preparing and responding to this emergent issue
- Intended primary audience: local, state & tribal organizations that focus on wildland fire, public health, environmental quality and air quality

# Locally-led Smoke Readiness Initiatives

- Air Quality Program – Confederated Tribes of the Colville Reservation
  - [www.cct-enr.com/smoke/](http://www.cct-enr.com/smoke/)
  - Functions with the Office of Environmental Trust and includes a special focus on wildfire smoke and individual behavioral responses to the issue
  - Utilizes Air Now, Smoke Sense, Air Quality Index (AQI) and a range of other resources
- Smokewise Program – Ashland, Oregon
  - [www.ashland.or.us/SectionIndex.asp?SectionID=534](http://www.ashland.or.us/SectionIndex.asp?SectionID=534)
  - Developed and led by the City of Ashland, Oregon and integrates local government, public health and the business community
  - Utilizes Air Now, Smoke Sense, AQI and a range of other resources



# Smoke Ready Communities Content Areas Overview

1. Identifying vulnerable populations
2. Setting up info delivery methods
3. Distributing communication/education materials to public
4. Creating cleaner air spaces
5. Choosing/deploying air quality monitors
6. Setting decision points for action



# Smoke Ready Communities: Process Framework

1. ***Convene*** a multiorganizational, multisector smoke team
2. ***Create*** a community-specific plan
3. ***Activate*** the plan when needed
4. ***Monitor*** plan implementation
5. ***Celebrate*** annual efforts
6. ***Reflect & Revise*** on what aspects of the plan worked well and may need adjustments
7. ***Repeat*** annually as part of overall community preparedness

# Smoke Ready Communities Research

- To what extent are the tools and resources useful for working toward progress in the core areas?
- How do Smoke Ready Communities resources influence community capacity and resilience?



# Smoke Ready Communities Research Next Steps and Goals



- Summer 2020
  - Make available this collection of tools and resources via an online webpage
- Fall 2020 – Summer 2022
  - Carry out community-engaged research activities

# Contacts

## Ana Rappold

Center for Public Health and Environmental Assessment  
EPA Office of Research and Development

[rappold.ana@epa.gov](mailto:rappold.ana@epa.gov)

## Mary Clare Hano

Center for Public Health and Environmental Assessment  
EPA Office of Research and Development

[hano.maryclare@epa.gov](mailto:hano.maryclare@epa.gov)

[smokesense@epa.gov](mailto:smokesense@epa.gov)

