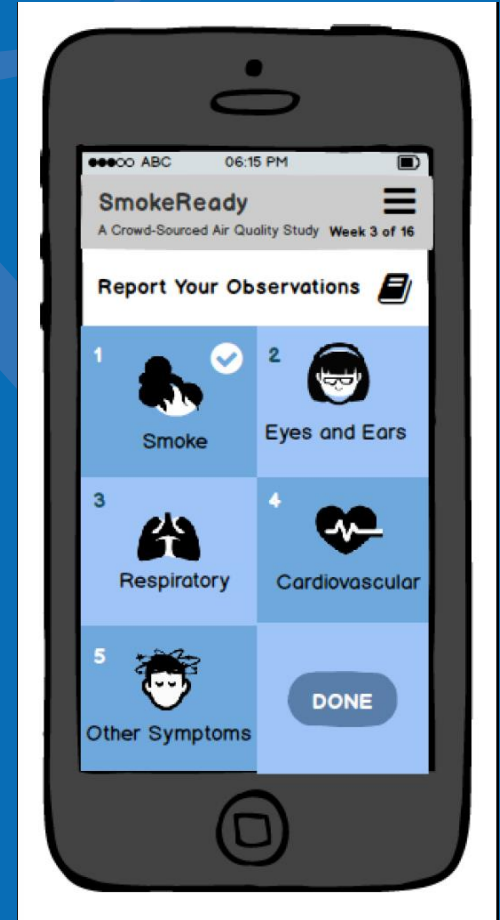
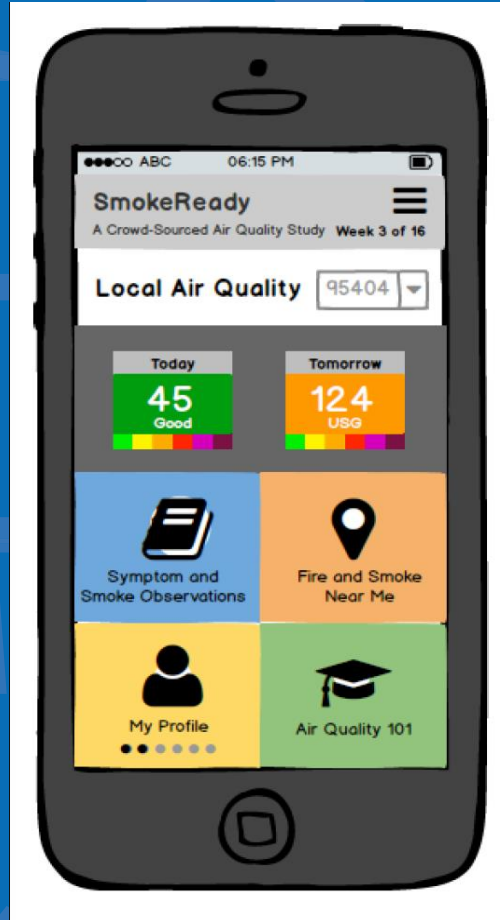
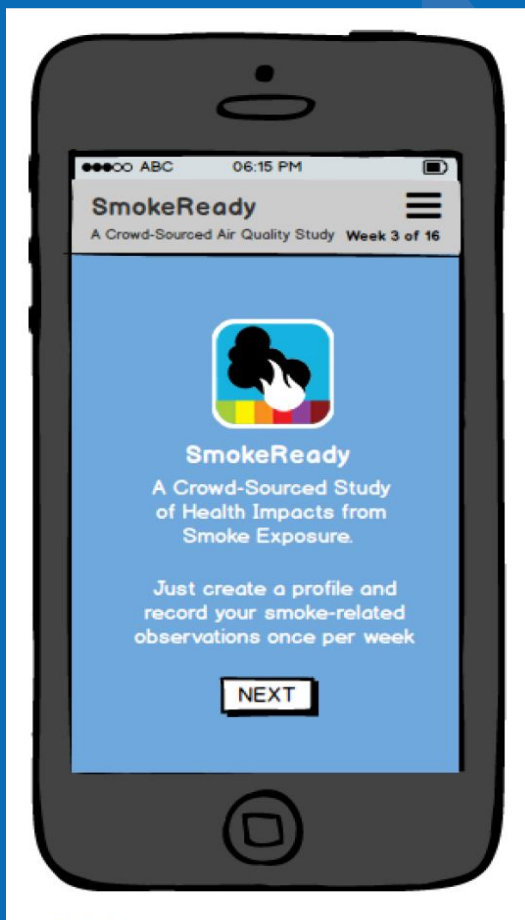


# SmokeReady – A Crowdsourced Study Of Health Impacts from Smoke Exposure



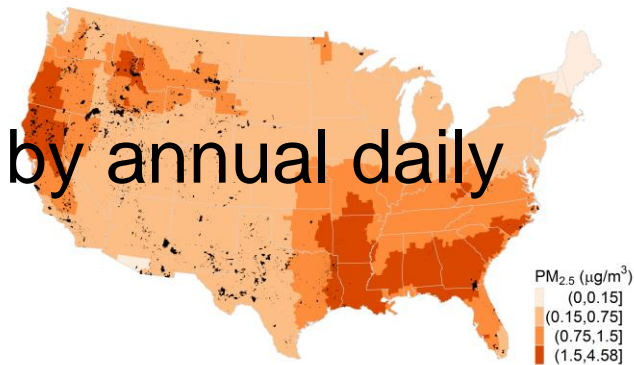
## Why Do We Need to Communicate Smoke Impacts on Health?

- Incidence and severity of large fires are increasing around the globe.
- As emissions from other sources of PM decrease, relative contributions of fire-PM will increase.
- Many communities are affected periodic and transient exposures to smoke from fires.
- Are there effective public health risk communication strategies that can address air quality during smoke events?

# 2011 National Emission Inventory Estimates:

	NH3	CO	NOx	PM10	PM2.5	SO2	VOCs	BC (EC)
Fires - Agricultural Field Burning	3,469	965,662	43,173	142,641	95,728	16,402	75,542	15,500
Fires - Prescribed Fires	162,420	10,091,996	168,204	1,063,159	903,062	83,255	2,320,330	102,000
Fires - Wildfires	203,252	12,701,426	184,802	1,325,991	1,125,176	95,837	2,891,271	119,000
Fuel Comb - Residential - Wood	19,740	2,524,960	34,547	382,509	382,283	8,972	443,966	22,000
2011 NEI v2 total emissions (all sectors but biogenics and soil emissions)	4,257,000	75,202,000	16,189,000	20,835,000	6,175,000	6,857,000	18,301,000	555,750
Percentage of Total Emissions due to Ag, Wild and Prescribed Fires	9%	35%	3%	14%	41%	3%	31%	47%

Population size at risk summarized by annual daily average fire-PM<sub>2.5</sub> (given in millions).



PM <sub>2.5</sub> (µg/m <sup>3</sup> )	Adult Asthma	Pediatric Asthma	COPD	Hyper- tensive	Diabetes	Obesity	Poverty	Under 18	65 and Over	Total Population
(0,0.15]	0.2	0.1	0.1	0.6	0.2	0.5	0.4	0.6	0.4	2.8
(0.15,0.75]	12.7	3.8	6.6	40.0	11.3	34.4	23.6	43.5	23.7	182.2
(0.75,1.5]	5.9	1.9	3.8	20.8	6.4	19.0	13.2	22.2	11.9	91.1
(1.5,4.58]	2.0	0.7	1.3	7.4	2.4	7.0	5.3	7.4	4.0	30.5
	20.8	6.4	11.8	68.8	20.3	60.9	42.5	73.7	40.0	306.7

ORD: communicating and translating research is essential  
to protect public health

## New Research Task

ACE PEP4.3: Integrating public health messaging with environmental models and understanding their effectiveness to reduce burden in population

SHC.62 Community Public Health & Well-Being;  
SHC 2.62.5 Public Health Conditions  
SHC 2.62.4 Environmental Drivers and Community Public  
Health and Well Being.

# *Research Approach Focused on Smoke and Health*

**SmokeReady** Crowdsourced Study: – smartphone app for public health risk communication during smoke episodes.

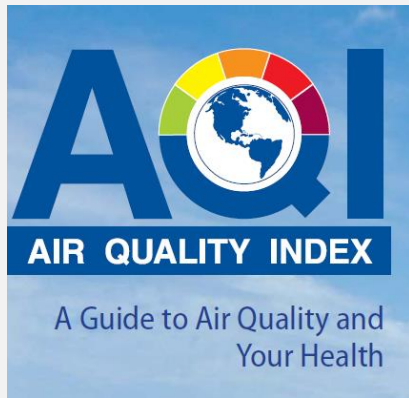
## Objective:

- 1) Determine the magnitude of the health burden in population at large;
- 2) Examine health risk communication strategies that influence individuals' behaviors and reduce public health burden during smoke episodes;
- 3) Quantify economic value of avoiding these outcomes;

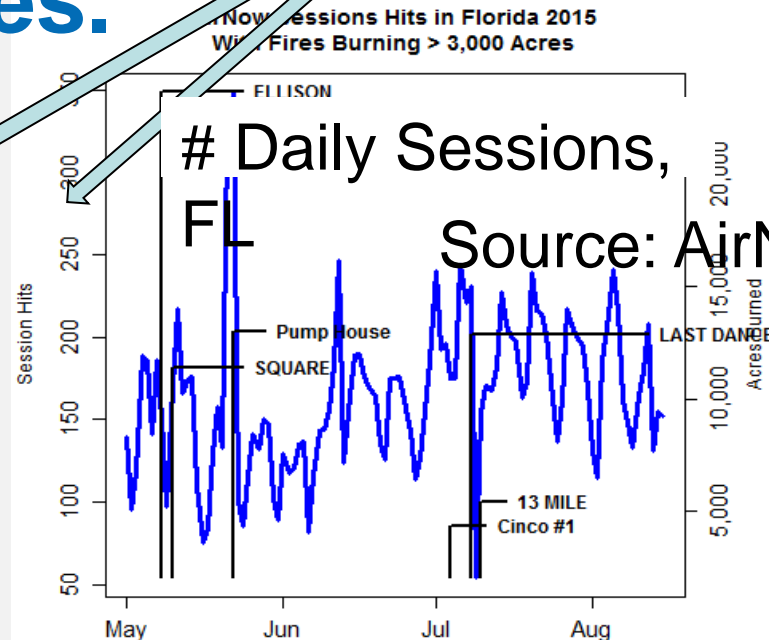
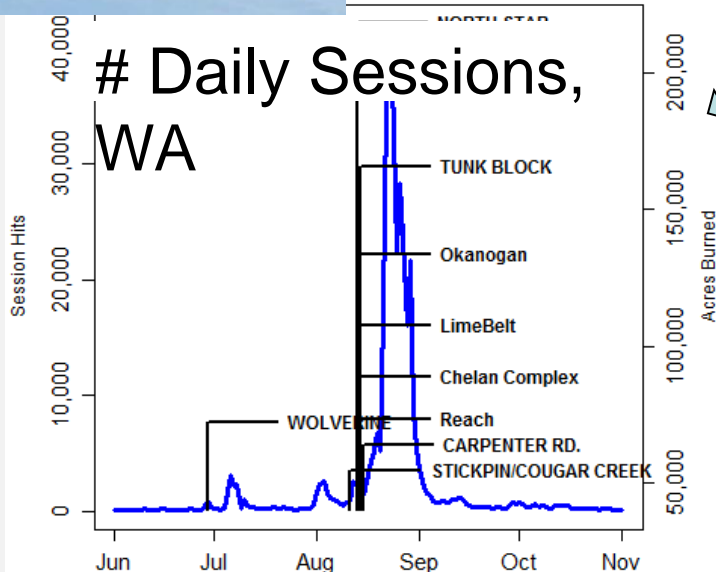
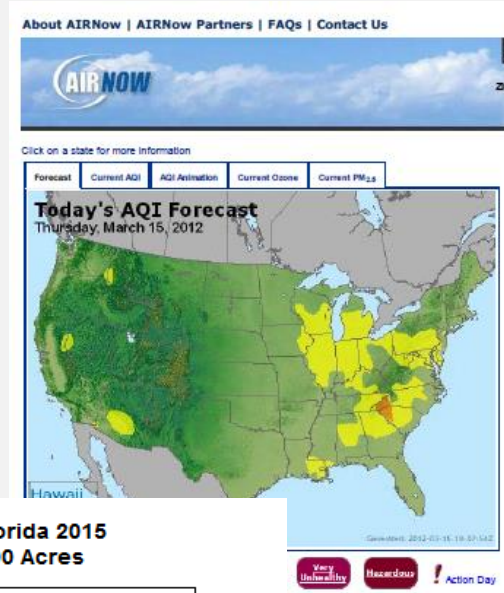
Launch at the beginning of 2017 fire season.



# Why AirNow? – Because people use it!



**Top 3 across  
all EPA  
websites.**



Source: AirNow

But it doesn't tell us about the likelihood of the impact, how long it will last, and how will it impact me!

# *SmokeReady:*


## *A crowd-sourced study of fire-smoke health impacts*

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### Objective:

- 1) Determine the magnitude of the health burden in population at large;
- 2) Examine health risk communication strategies that influence individuals' behaviors and reduce public health burden during smoke episodes;
- 3) Quantify economic value on avoiding these outcomes;

### Secondary objectives :

- Understand whether messaging strategies are equally accessible to all segments of the population and reaching the most vulnerable/at-risk segments of the population?
  - Are health messages clear and understandable to a wide audience?
  - Determine the utility of health messaging strategies to decrease health burden.
  - Identify strategies that promote & incentivize preventive health behaviors.
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# Features of SmokeReady

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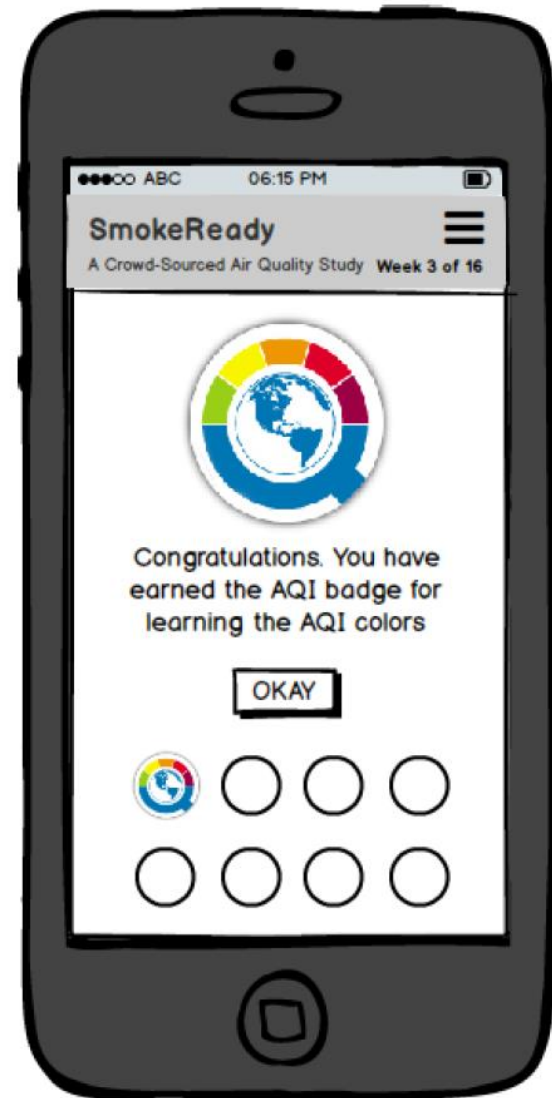
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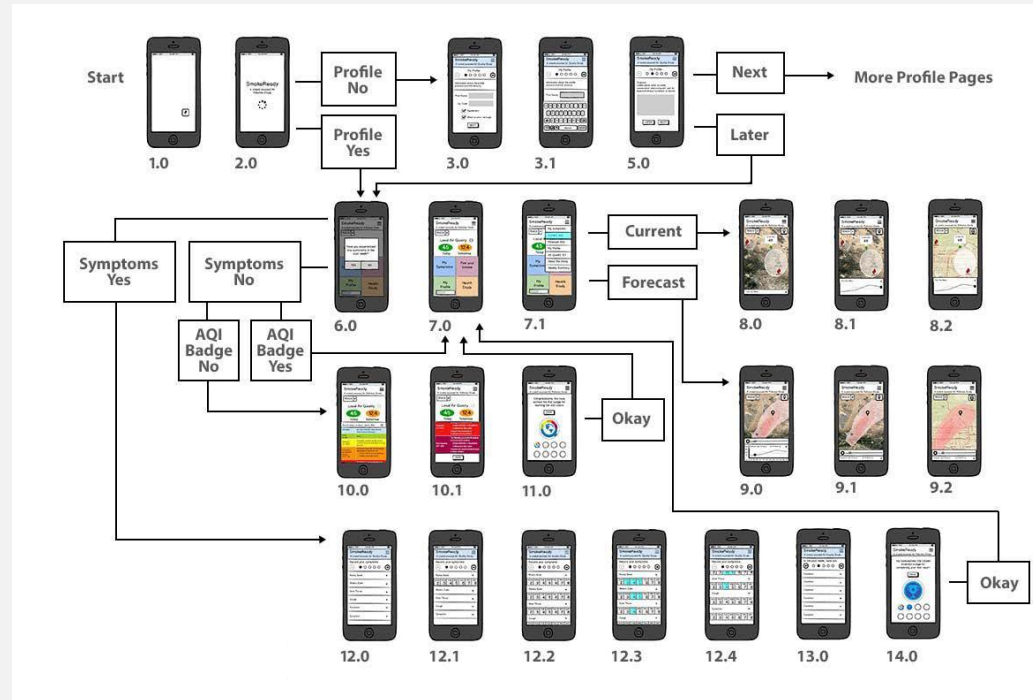
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compliance behavior.



Using gamification strategies to promote desired behaviors and learn about health risk attitudes and behaviors.

Special acknowledgment to

Jamie Foehl  
Center for Advanced Hindsight  
Duke University



# *Breakout groups: “Identifying Research and Development Opportunities”*

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Example discussion points for breakout group:

- Community outreach opportunities.
- Study design. Are we asking the right questions.
- What is important in your community?
- Behavioral incentives.
- Identify additional resources/info/data to users.
- Discuss the opportunity for phase II of the project - identify communities where health behaviors can be tested more extensively.