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New technology revolutionizing how we understand the air around us

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Air pollution – not on the mind, growing up in New Hampshire

photo: yankeemagazine.com

Atlanta, Georgia and Dalian, China were a wake-up call

Photo credit: Institute for Southern Studies

Photo credit: Asia News Photo

Then, I dove into the deep end

2001-2002

Pearl River Delta area of China

Level of effort: High

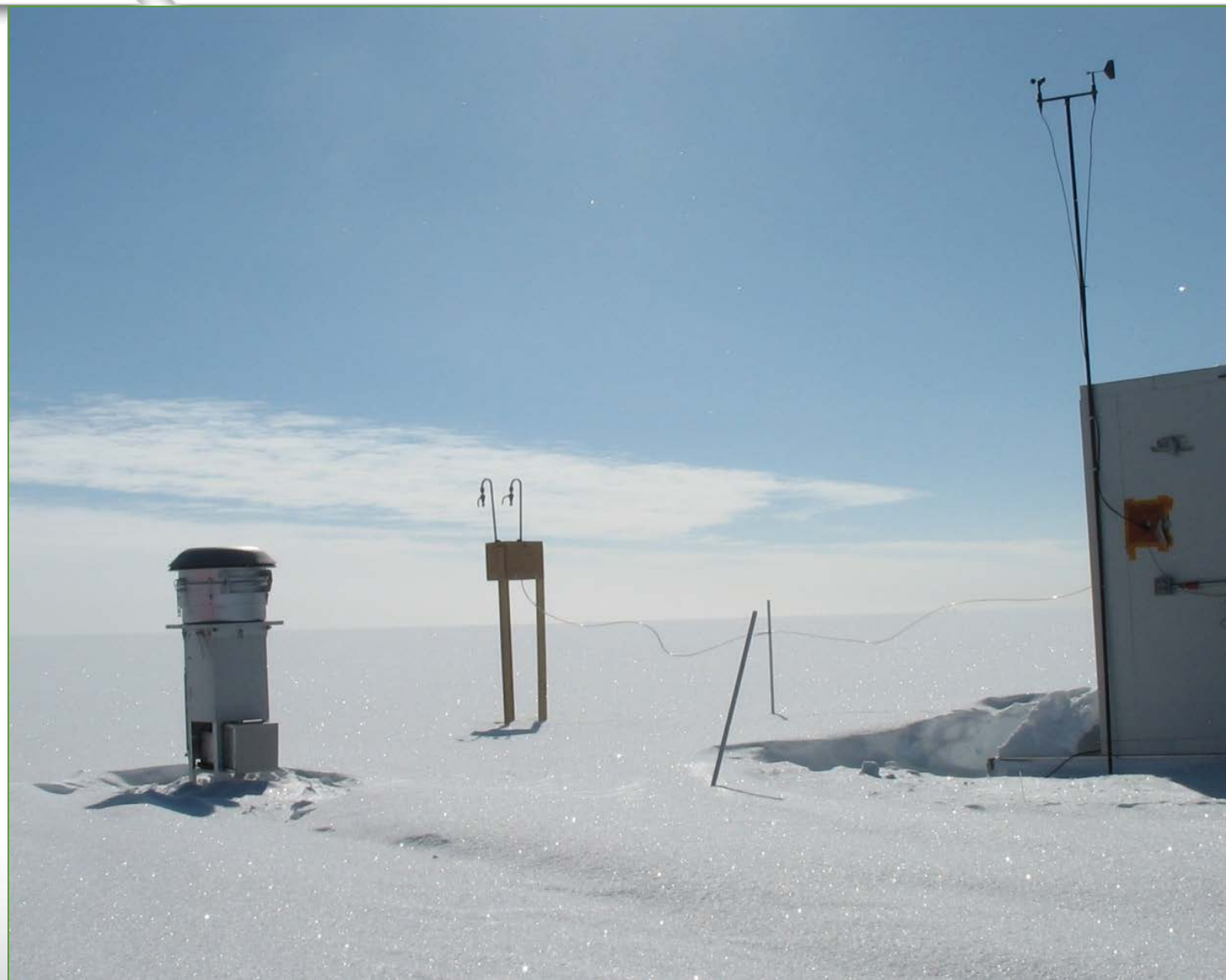
Summit, Greenland

2005-2006

Summit, Greenland

T = -40 ºF

Level of effort: Very, very high



Summit, Greenland

2005-2006

Summit, Greenland

T = -40 ºF

Level of effort: Very, very high

Routine air monitoring meeting regulatory standards – also not easy

Rigorous protocols and methods for regulatory applications

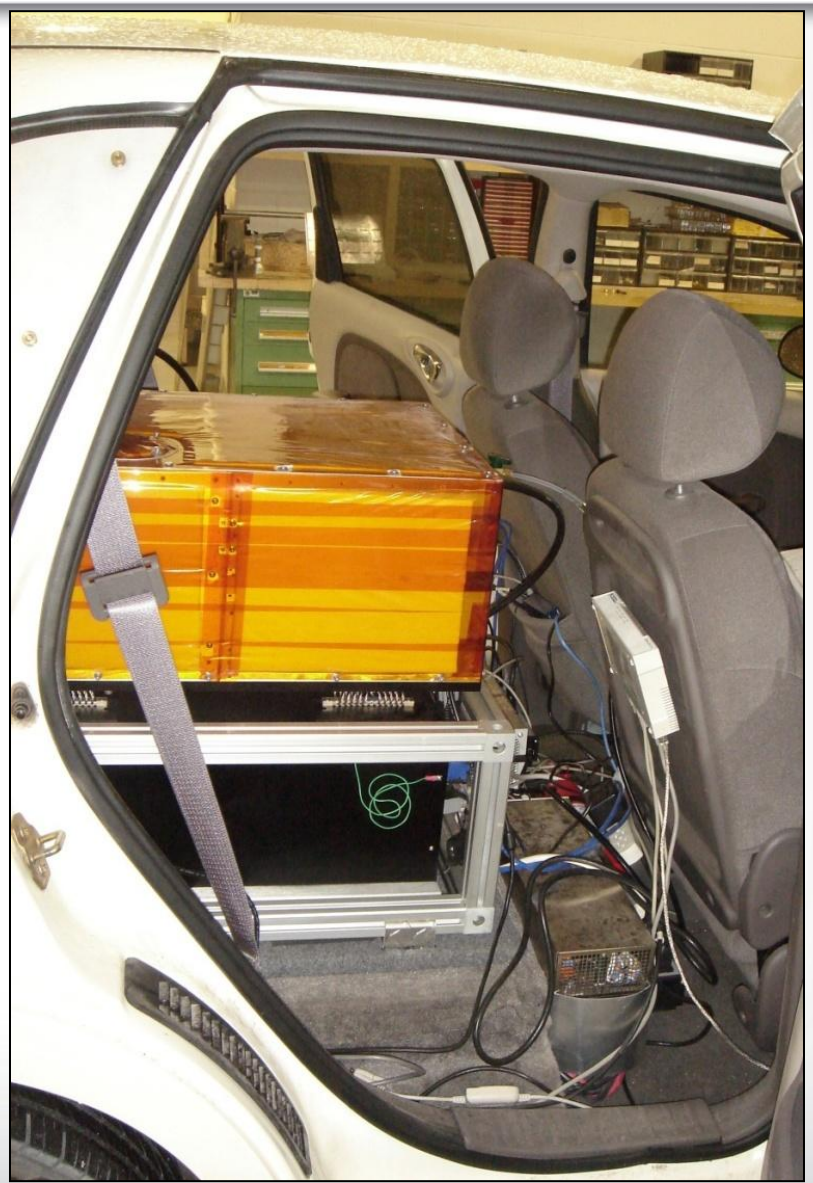
- Expensive instruments (>$10K)
- Specialized training required
- Large physical footprint
- Large power draw

- How can we measure air pollution in more places?
- Can we make it easier?
- Less expensive?
- Approachable?
- How good is “good enough”?

At EPA, I got a chance to explore new technologies – faster, more flexible

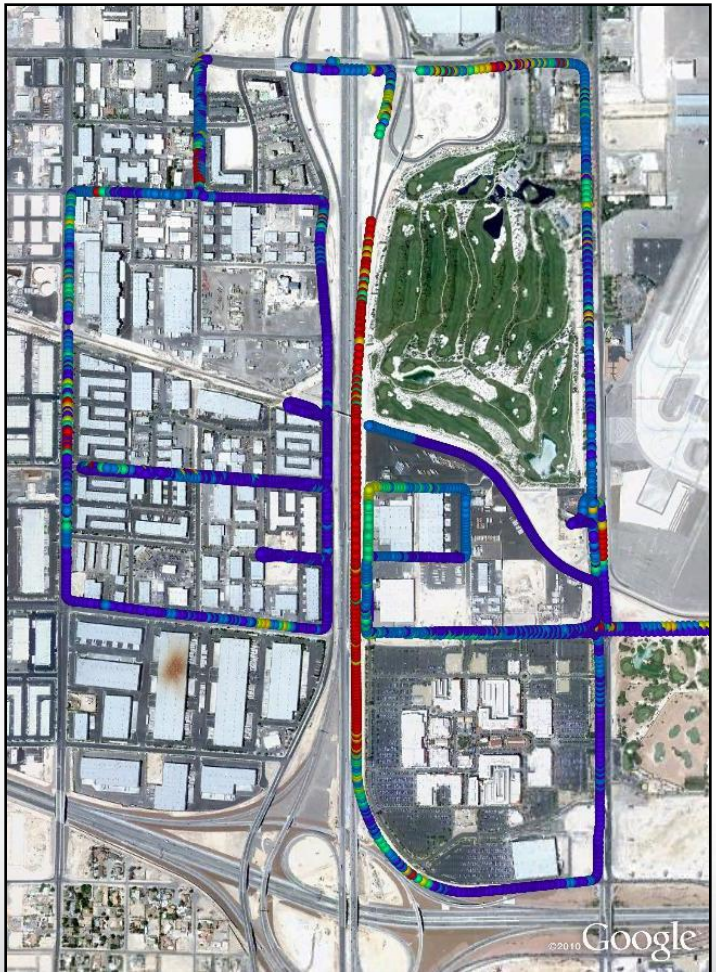
Measuring air pollution every second, while driving…

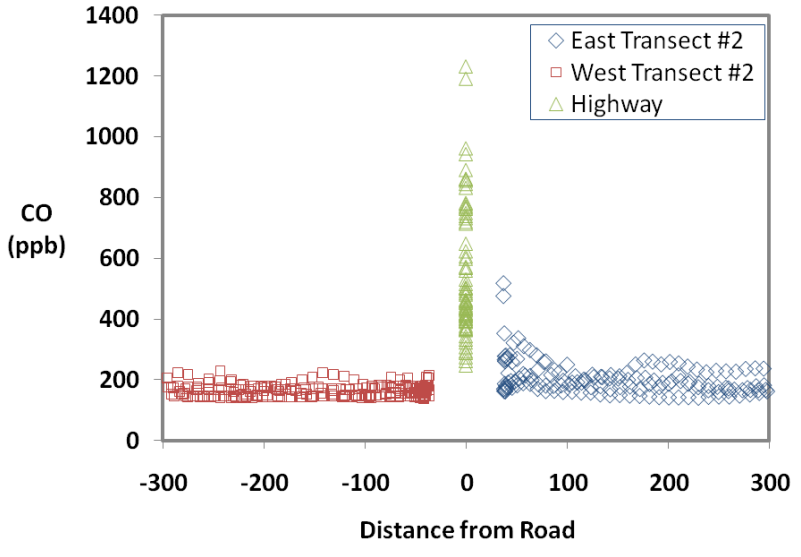
Geospatial measurement of air pollution (GMAP)



Geospatial measurement of air pollution (GMAP)

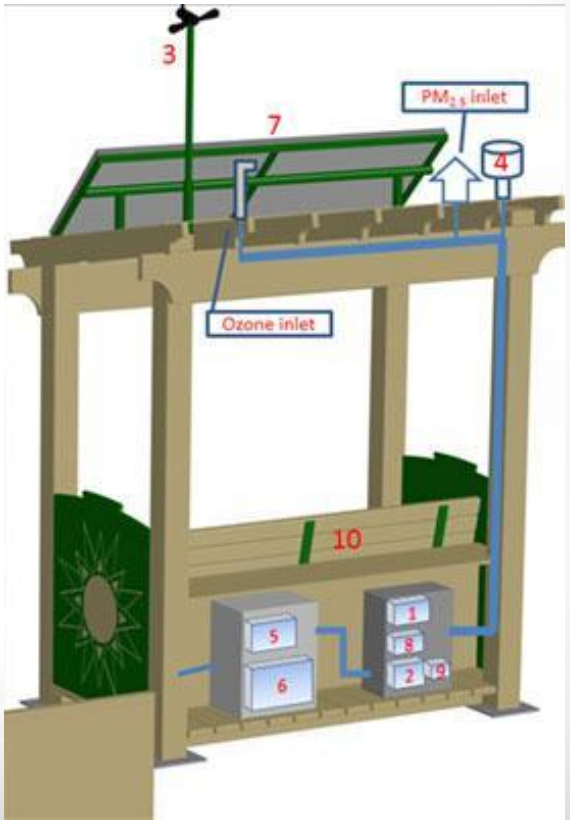
Las Vegas Near-Road Study – 9 AM to noon local time, high wind speeds (>10 m/s), from the NNW





Then, we tried for sustainable, autonomous, and smaller

Village Green Project

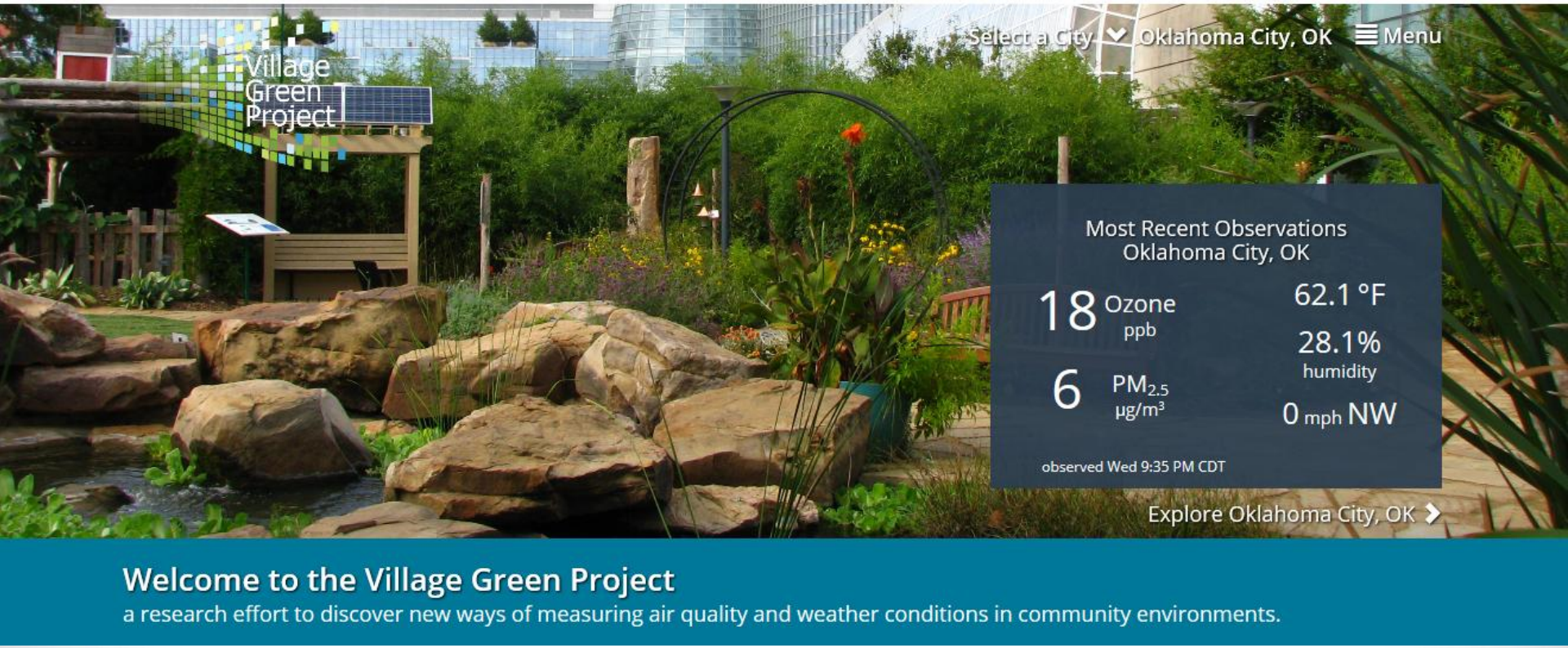


A community-friendly design

Durham, NC

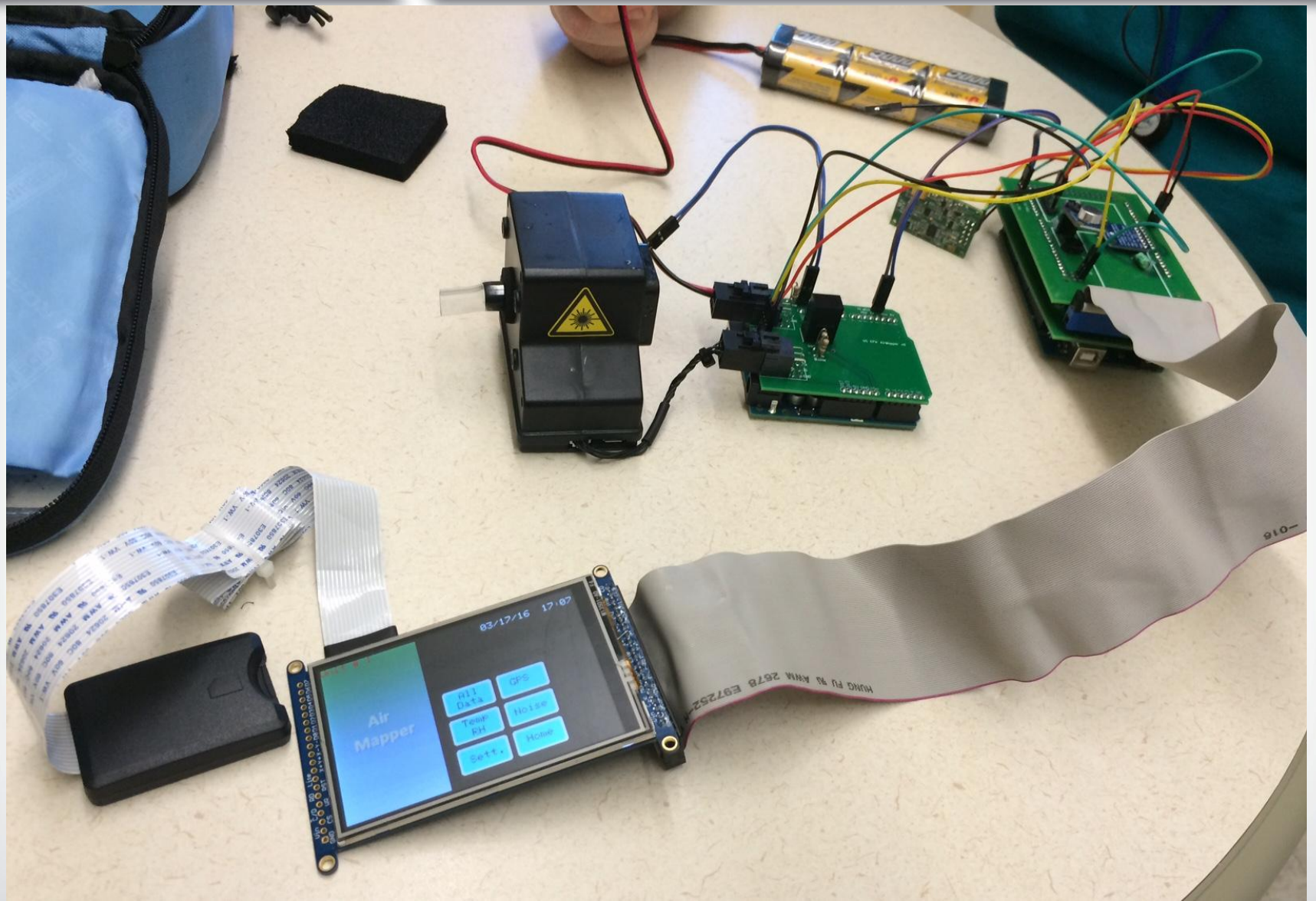
Oklahoma City, OK

With data shown every minute



www.airnow.gov/villagegreen

The next frontier…miniature sensors, big data, citizen science



The next frontier…miniature sensors, big data, citizen science

Thank you!

Research contributors:

China: Mike Bergin, Jianzhen Yu, Lynn Salmon, Yuanhang Zhang

Summit: Gene Smith, Mike Bergin, Summit Camp staff

Village Green Project: Ron Williams, Esteban Herrera, Bobby Sharpe, John White, Brad Johns, Phil Dickerson, Kristen Benedict, Lewis Weinstock, Ron Evans, Ann Brown, Melissa Anley-Mills, Kelly Witter, Bill Mitchell

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