



MICHIGAN DEPARTMENT OF  
ENVIRONMENT, GREAT LAKES, AND ENERGY

# Introduction to Low Cost Air Sensors

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# General Information

- Numerous makes and models
- Cost between a couple hundred and several thousand dollars
- Limited in scope of pollutants
- Operate on 110 V or solar panels with batteries
- Report either on SD card or WiFi/direct cellular connection
- Fixed installation or hand-held
  - Typically installed within 8 feet of the ground for fixed installation



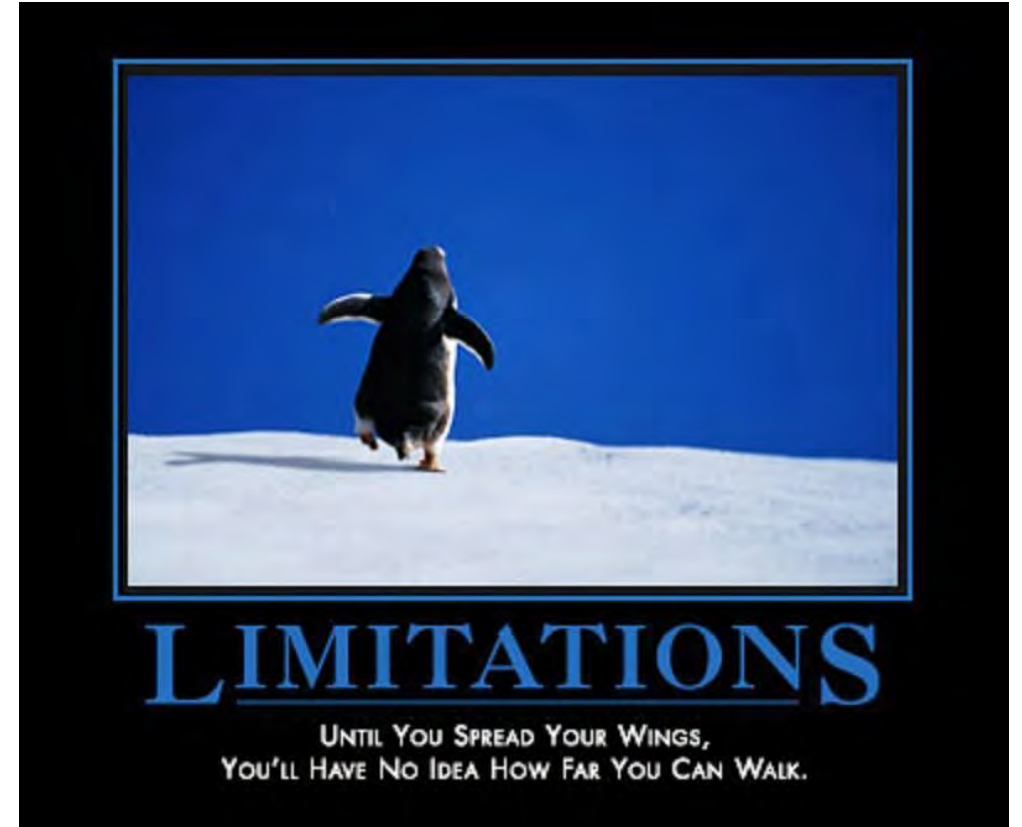
# Advantages of Low Cost Sensors

- Low cost means that more sensors can be deployed for “network”
- Can be placed practically anywhere and moved easily
- Data is real-time (except when simply stored on SD card)
- Low power consumption means cheap to operate
- Minimal maintenance compared to regulatory monitors

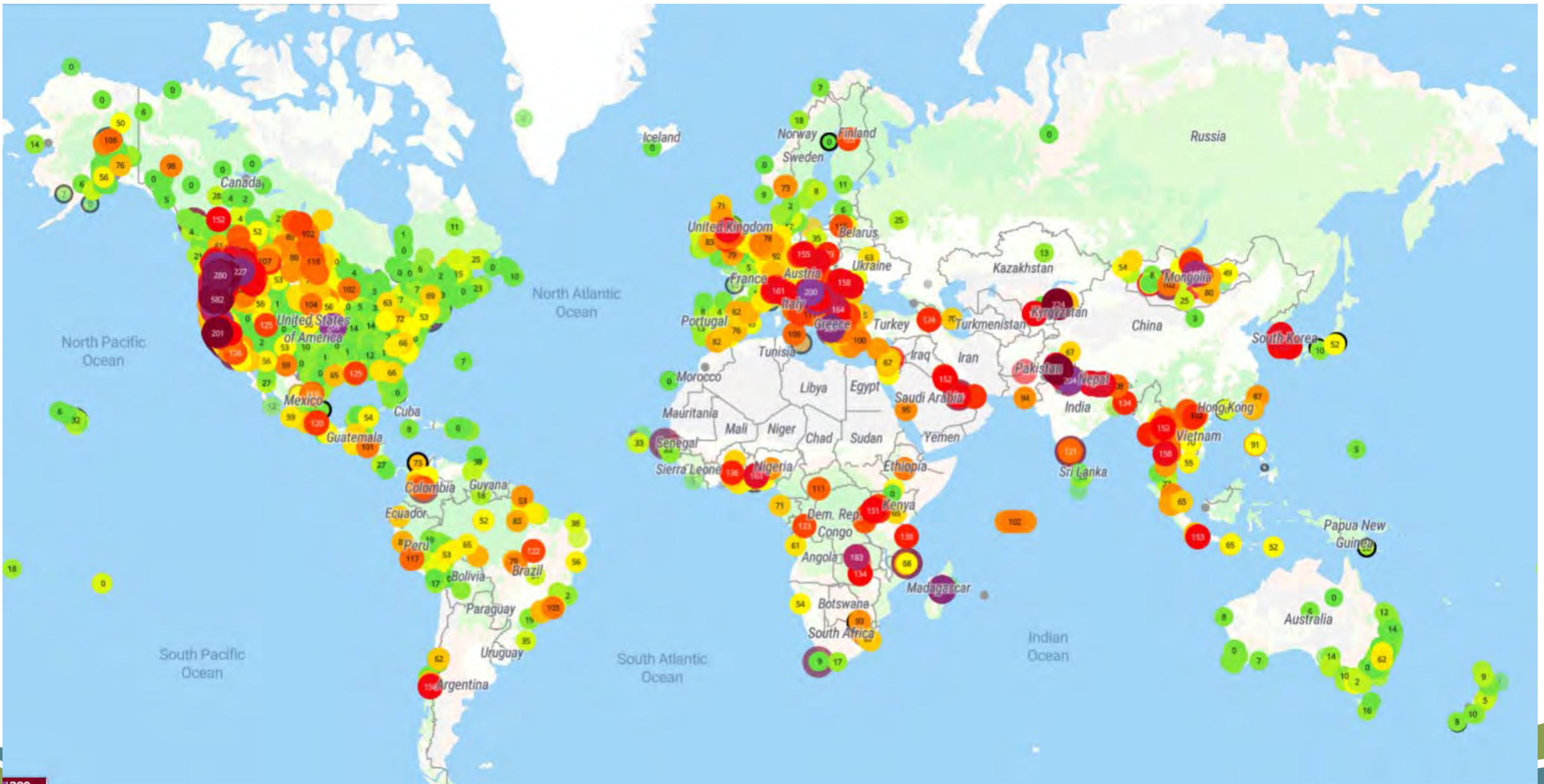


# Limitations of Low Cost Sensors

- Can not be used for regulatory compliance
- Data must be subjected to correction factors
- Real time data stream subject to WiFi/cellular interruptions
- SD card data only available when you pick it up

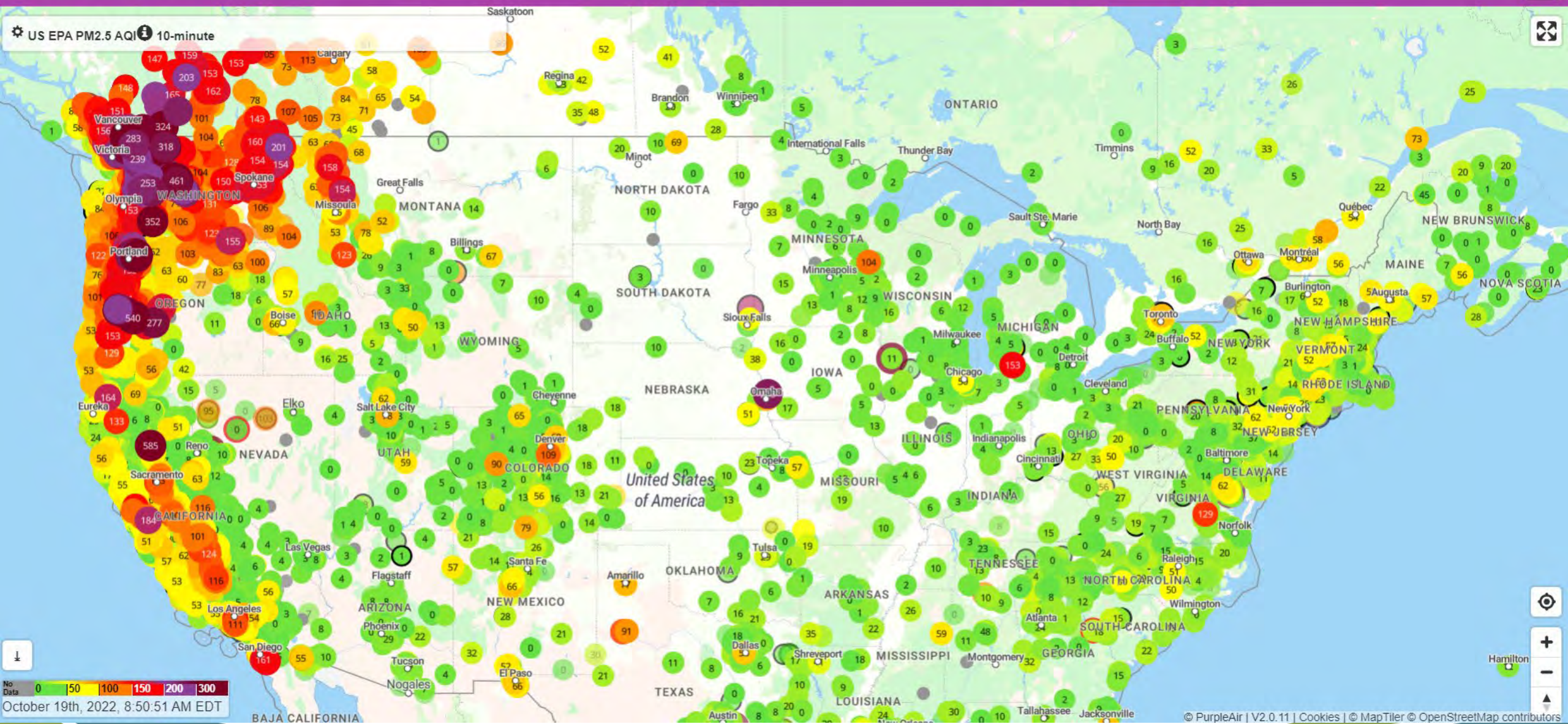






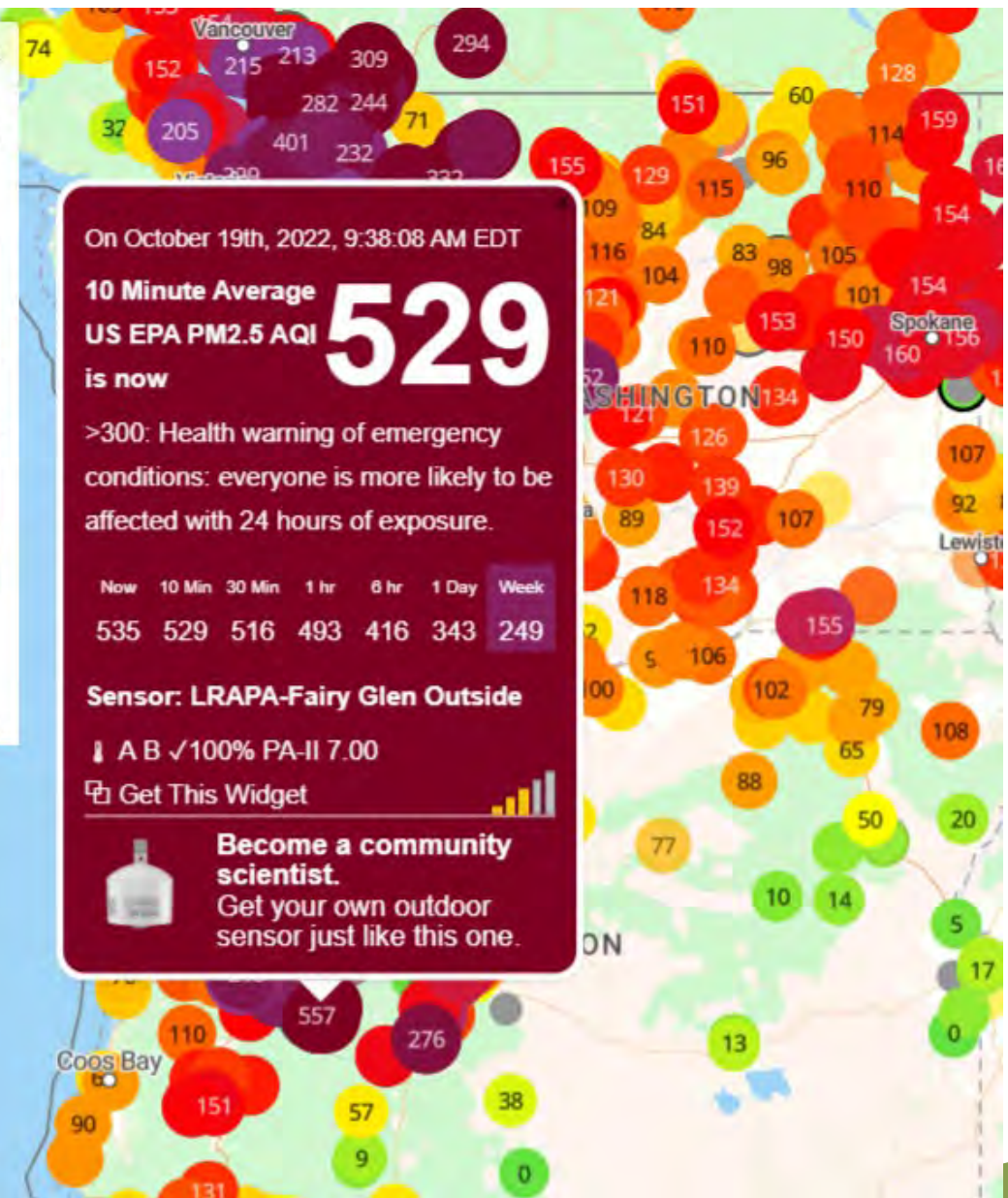
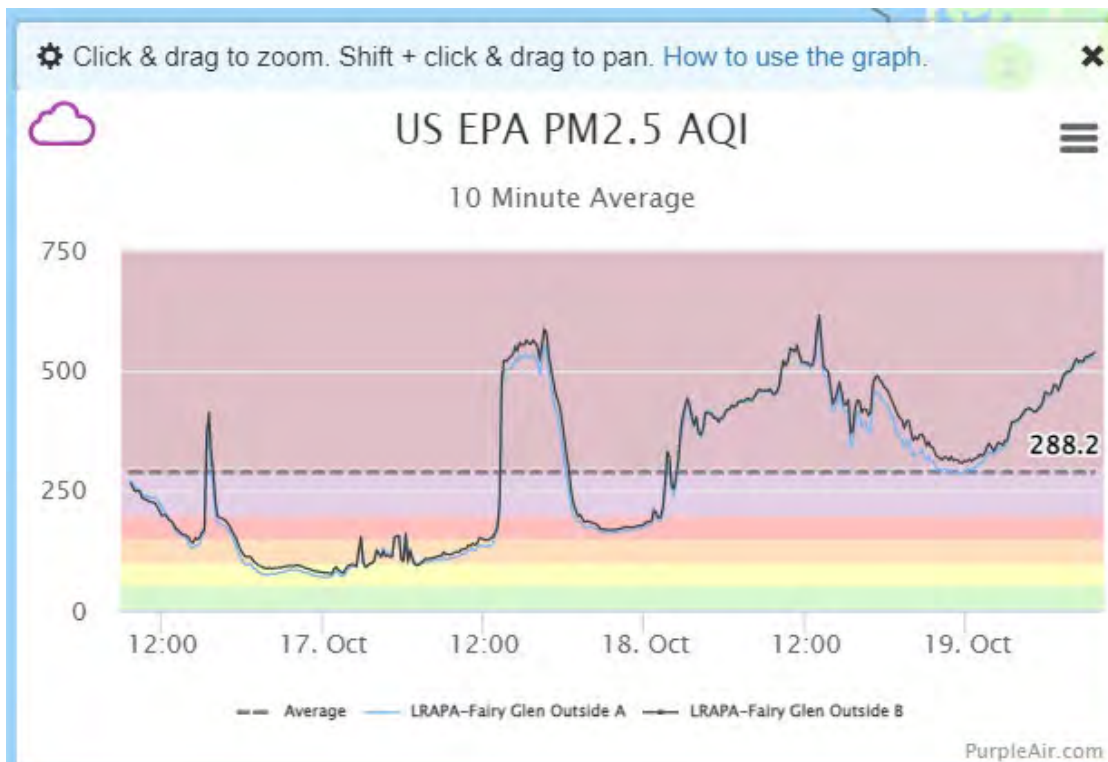
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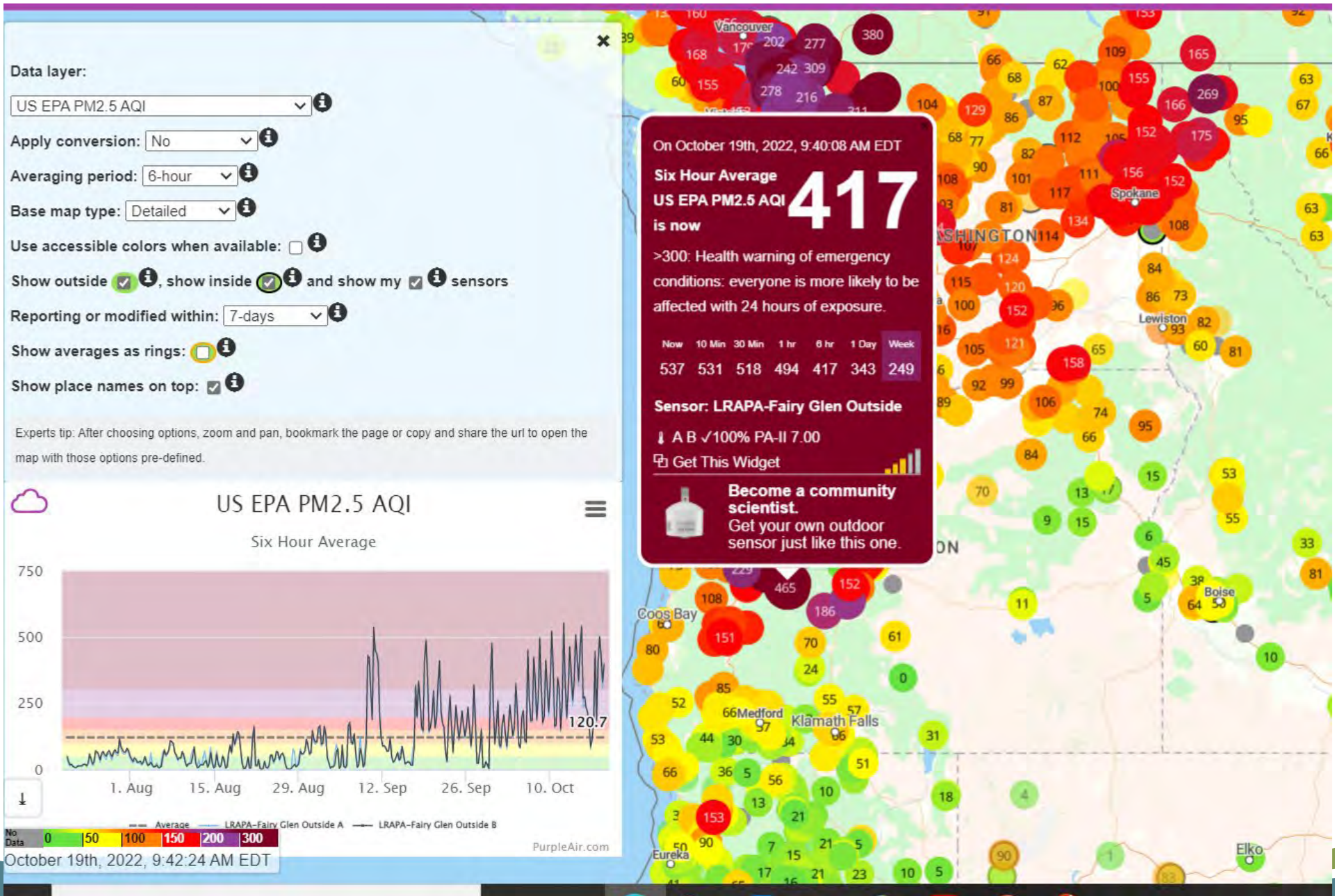
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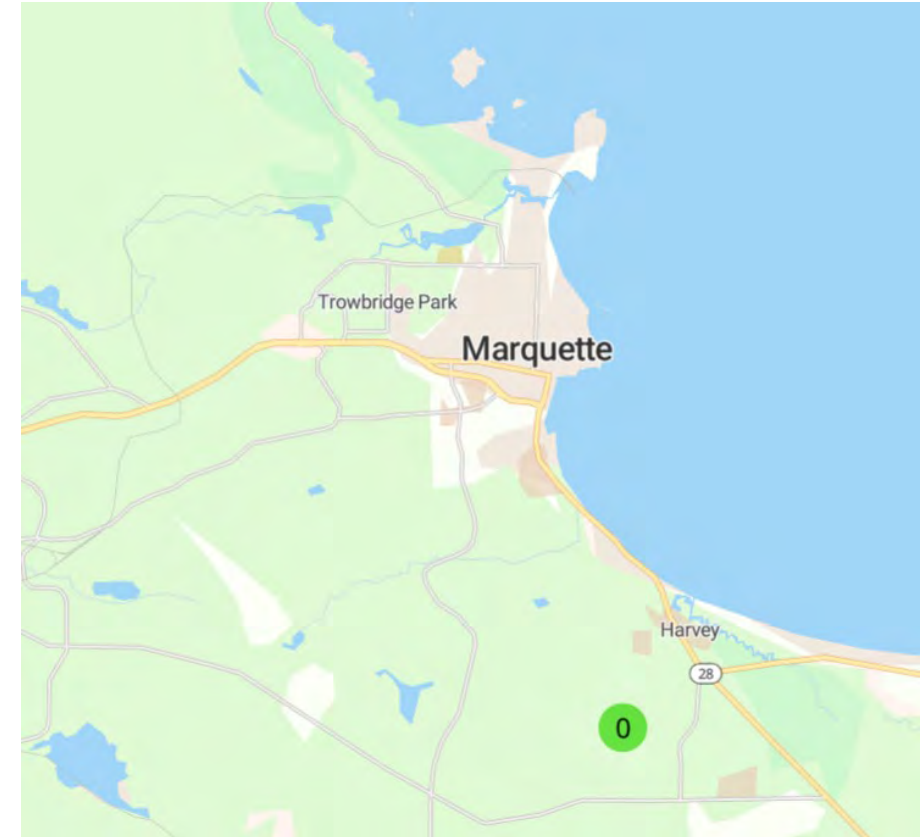
# Collaborative efforts

- Co-location of Low Cost Sensors at regulatory sites
- Sensor Collaborative – Ecology Center working with community groups to create network



# AQD's Use of Low Cost Sensors

- Primarily support role for now
- Considering placement at district offices for publicity and our own use
- Other ways they could be used
  - Short-term evaluation to address community concerns
  - Explore areas for possible placement of regulatory monitors
  - Geographical coverage to fill data gaps (maybe State Parks in the Upper Peninsula)





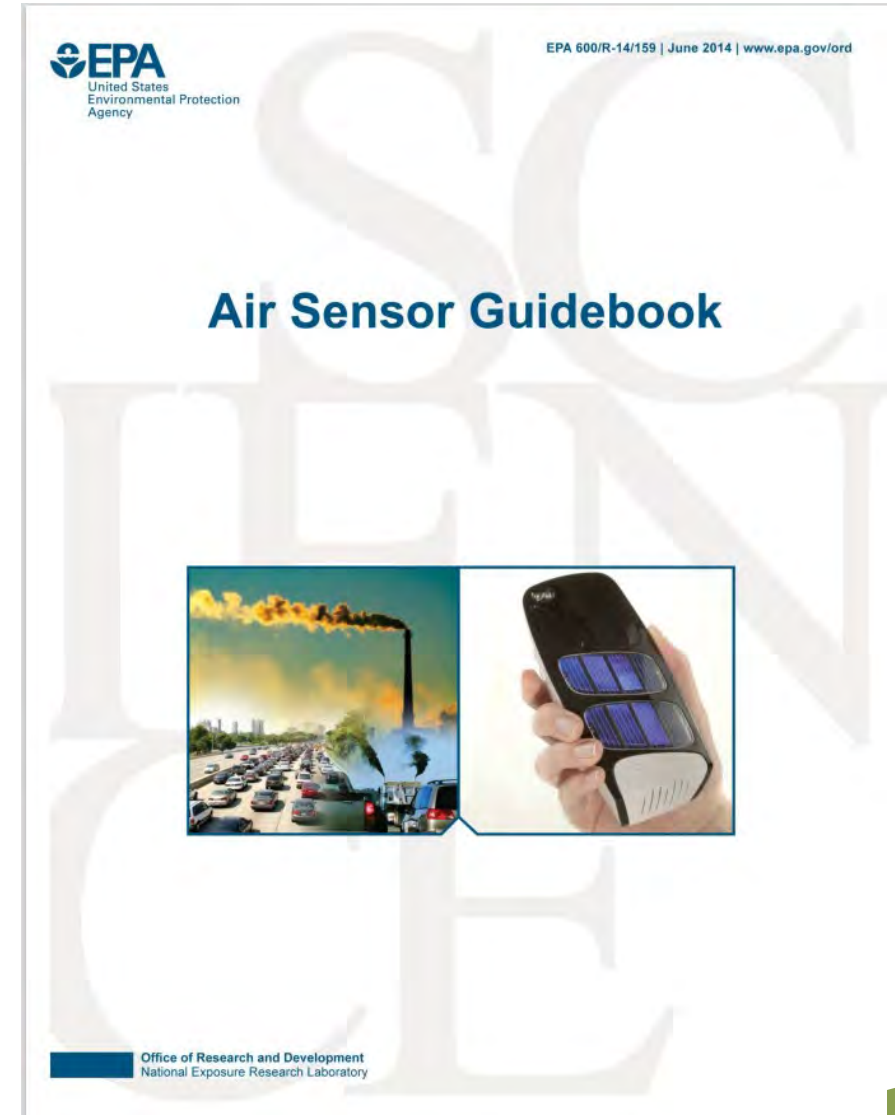
# Current AQD Inventory

- 20 PurpleAir PAll – PM<sub>2.5</sub>
- 2 Aeroqual Starter – PM<sub>2.5</sub>, NO<sub>2</sub>, O<sub>3</sub>
- 1 Aeroqual Pro – PM<sub>2.5</sub>, NO<sub>2</sub>, O<sub>3</sub>, VOC
- 1 AirBeam – PM<sub>2.5</sub>



# Resources

- [www.epa.gov/air-sensor-toolbox](http://www.epa.gov/air-sensor-toolbox)
- National Ambient Air Quality Conference Presentations (see me)
- <https://map.purpleair.com/>
- EGLE's regulatory air monitoring sites: [Air Monitoring Sites](#)





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**Environment, Great Lakes, and Energy**

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