

#### The GO3 Project and AQTreks

A DECADE OF AIR POLLUTION MONITORING WITH STUDENTS AND THE PUBLIC

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## Progression of Outreach Programs

|                        | GO3 Project<br>2009-present | GO3 Treks<br>2015-2016        | AQ Treks<br>2016-present                |  |
|------------------------|-----------------------------|-------------------------------|-----------------------------------------|--|
| Program Type           | stationary                  | mobile pilot project          | mobile                                  |  |
| Measurement<br>Type    | instrument-based            | instrument-based              | sensor-based                            |  |
| Parameters<br>Measured | O₃, weather                 | O <sub>3</sub> , black carbon | PM <sub>2.5</sub> , CO, CO <sub>2</sub> |  |
| Number of<br>Schools   | 112                         | 63                            | 95                                      |  |
|                        |                             |                               |                                         |  |

**2B** Technologies

#### The GO3 Project Stationary Ozone Measurements

Data displayed on Google Earth





2B Tech ozone monitor, computer, and Davis weather station



First GO3 School in Estes Park, Colorado calibrates their monitor



# GO3 Treks Mobile Pilot Project

Data displayed on Google Earth overlay and housed in a blog on our social network





2B Tech Personal Ozone Monitor and AethLabs microAeth



# AQTreks Our First Use of Sensors (PAM)

Mobile Trek data displayed on Google Maps





2B Tech Personal Air Monitor (PAM) sensor suite with Bluetooth broadcast sending real-time data to AQTreks phone app





#### Comparison of Stationary vs. Mobile Monitoring Projects



## Stationary and Mobile Projects Combined



PAM in enclosure



Community Air Monitor: stationary ozone with removable PAM



# Data Quality, Data Quality, Data Quality!

| 9:19 🚨                   |            | <b>₩</b> * * • \$ % | 77%         |           |  |
|--------------------------|------------|---------------------|-------------|-----------|--|
| $\equiv$ Regulatory Data |            |                     |             |           |  |
| <.                       | PAM        | vi 1038             | *           | •>        |  |
| Reg. Data                |            | 9                   | PAM Data    |           |  |
| CO                       | 0.4 PPM    |                     | 0.6 ppn     | n         |  |
| 31 k                     | am 🤇       | 9                   |             |           |  |
| PM,                      | 2.5µm      |                     |             |           |  |
|                          |            | 8                   |             |           |  |
| 4 kn                     | n 🤇        | 9                   |             |           |  |
| Temperature              |            |                     |             |           |  |
|                          | 4.4 C      |                     | 27.2 °C     |           |  |
| GOOL                     | MODERATE P | oor 📈               | POOR SEVERE | HAZARDOUS |  |
|                          |            | 0                   | <           | Annes     |  |



Rental model for the PAM with calibration checks between rentals (World of Inquiry School No. 58 in Rochester, NY testing air quality at city parks)

Data from nearest regulatory station brought into the app for comparison with PAM measurements. Location data also provided for the station.



#### AQSync: Community Sensor Calibration Station

FEM and near-FEM instruments for sensor calibration ( $O_3$ , NO, NO<sub>2</sub>, PM<sub>2.5</sub>, CO, CO<sub>2</sub>, black carbon)



Dimensions: 24"x20"x10"



#### **Next Steps**



The PAM hitches a ride with the City of Denver



PAM car topper







#### www.twobtech.com www.communityaq.com

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