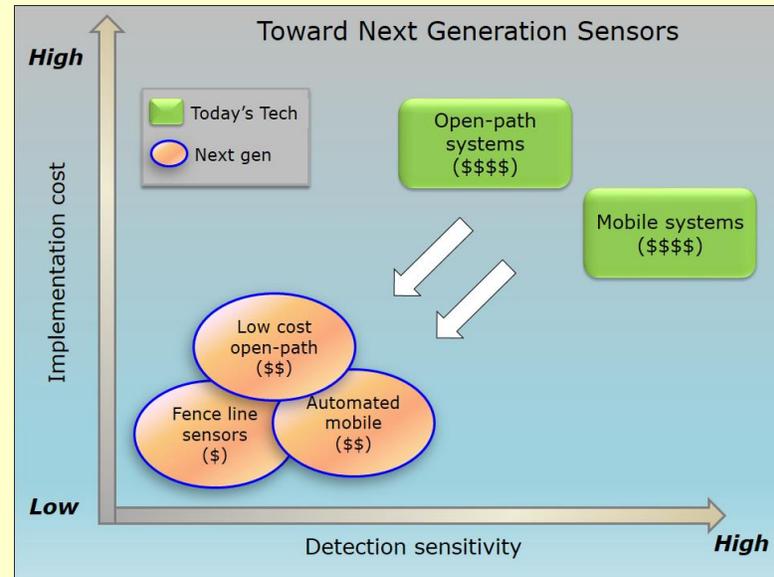


## Partnerships to Advance Next Gen. Source Measurements

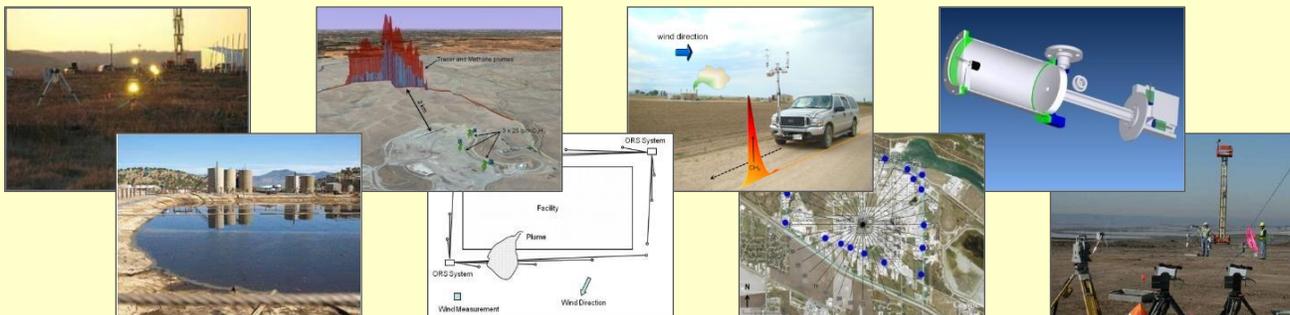
*A growing number of government, academic, and industry groups are recognizing the revolution in air pollution and greenhouse gas source measurement science enabled by the rapid advances in sensors, communications, data integration, and modeling strategies.*

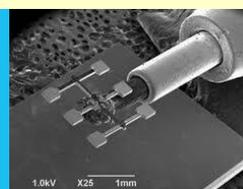
The Office of Research and Development (ORD) of the U.S. Environmental Protection Agency (EPA), in coordination with EPA's Program Offices, is exploring exciting new sensor and informetric technologies that may form the foundation of future leak detection and repair, source inventory, and emissions verification strategies. A primary focus of the ORD's effort is to facilitate development of cost effective and implementable systems with the right performance level to help bring advanced measurement technology from research to real-world application.



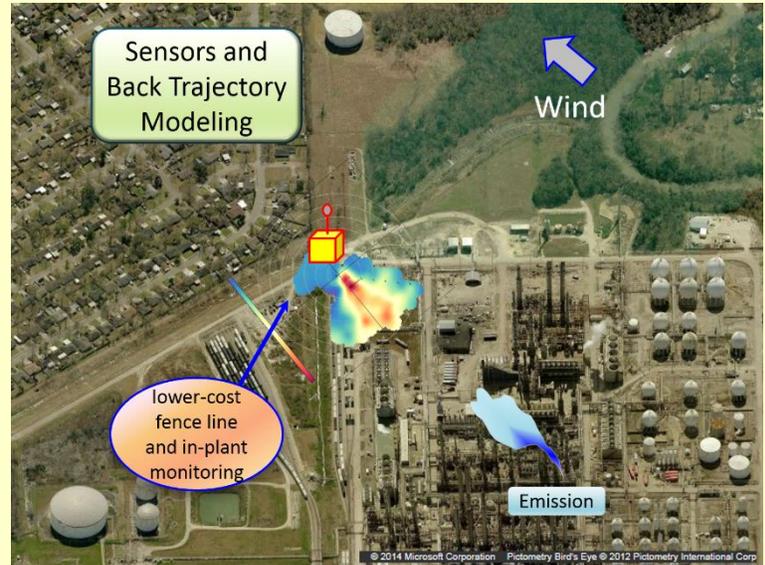
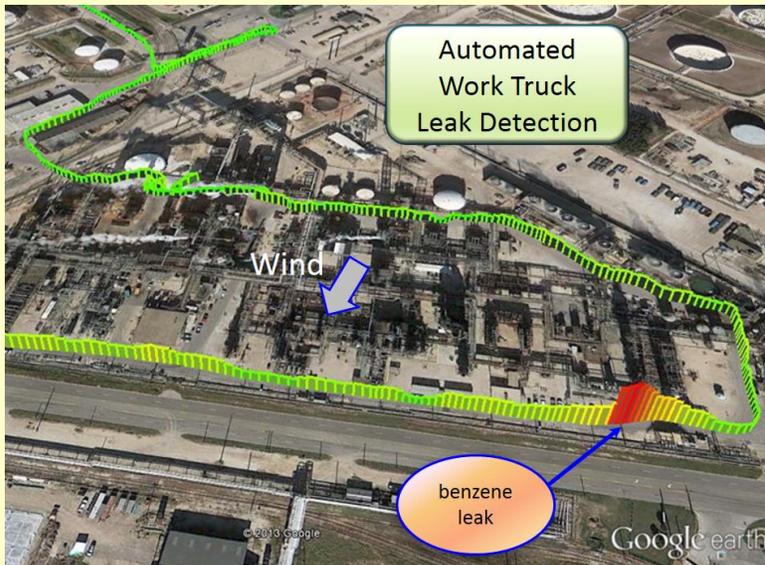
Through the Federal Technology Transfer Act (FTTA), ORD scientists can partner with industry, instrument and information technology vendors, and academic collaborators to develop and demonstrate promising new approaches for a range of source measurement applications. Through FTTA's Cooperative Research and Development Agreement (CRADA) framework (<http://www.epa.gov/osp/ftta.htm>), EPA and collaborators can define and execute shared resource programs that maximize the efficiency of technology development and impact while protecting intellectual property and business information through a defined legal framework.

Currently ORD next generation source measurement research focuses on development of automated, robust, and low cost mobile and fixed place sensor networks that utilize automated cloud data processing to transform near source concentration and meteorological data into industry relevant information (e.g. alerting to malfunctions, or potential safety issues).





Ultimately, automated mobile and fixed-place fence line and in-plant sensor systems will provide continuous information on emissions to help verify operational capabilities, ensure safe working environments, and inform emission inventories for a number of sectors including oil and gas production and distribution, landfills and waste water treatment, agriculture operations, and petrochemical and other industrial facility emissions. Next generation source technologies will reduce emissions and save companies money.



Select EPA Next Gen. source measurement publications:

- Brantley, H.L., Thoma, E.D., Squier, B.C., Guven, B.B., Lyon, D., 2014. *Assessment of Methane Emissions from Oil and Gas Production Pads Using Mobile Measurements*, Environ. Sci. Technol. 2014, 48, 14508–14515.
- Foster-Wittig, T.A., Thoma, E.D., Green, R.B., et al. 2014 *Development of a Mobile Tracer Correlation Method for Assessment of Air Emissions from Landfills and Other Area Sources*, Atmospheric Environment, 2015, 102, 323-330.
- Thoma, E.D., *Geospatial Measurement of Air Pollution-Remote Emissions Quantification-Direct Assessment (GMAP-REQ-DA), OTM 33, 33A (Ver 1.2)*. U.S. Environmental Protection Agency <http://www.epa.gov/ttn/emc/prelim.html>.
- Verkerke, J.L., Williams, D.J., Thoma, E.D., 2014, *Remote Sensing of CO<sub>2</sub> Leakage from Geologic Sequestration Projects*, Int. J. Applied Earth Observation and Geoinformation. 31, 67-77.
- Thoma, E.D., Jiao, W., Brantley, et al. *South Philadelphia Passive Sampler and Sensor Study*, Proceedings of the 108th Annual Conference of the A& WMA, June 23-26, 2015, Raleigh, North Carolina.
- Jiao, W., Thoma, E.D., et al. *Deployment of Sensor Network Intelligent Emission Locator (SENTINEL) for Fence line Emission Measurements*; Proceedings of the 108th Annual Conference of the A& WMA, June 23-26, 2015, Raleigh, North Carolina.
- Snyder, E. G., T.H. Watkins, P.A. Solomon, E.D. Thoma, R.W. Williams, G.S. Hagler, D. Shelow, D.A. Hindin, V.J. Kilaru, P.W. Preuss, 2013, *The Changing Paradigm of Air Pollution Monitoring*. Environ. Sci. Technol. 47 (20), 11369-11377.
- Thoma, E.D., Secrest, C.D., Mitchell, W.A., Squier, W.C., 2013, *Optical remote sensing of fugitive releases*, United States Patent #US8445850 B2.

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