Fall 2017

2B Technologies
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2B Buzz

New Multi-Channel Option for the Model 106 Ozone Monitor

An instrument can only be in one place at a time--of course. But with a new optional Multi-Channel configuration, our Model 106 Ozone Monitor can characterize as many as six different gas streams. The sequential sampling can be done automatically, using a sampling interval you specify. The Multi-Channel Ozone Monitor is inside a wall-mount enclosure that is suitable for wall or rack mounting in your air sampling system. We offer the Multi-Channel option on our Model 106-L, -M, and -MH Ozone Monitors, enabling you to choose the instrument that is right for the range of ozone concentrations you need to measure.

Multiply Your Ozone Measurement Capability

More Info: Model 106 Ozone Monitors

Schools Across the Country Go High-Tech with New AQTreks Program

Students connect with their atmospheric data in real time



The AQTreks program is officially launched!

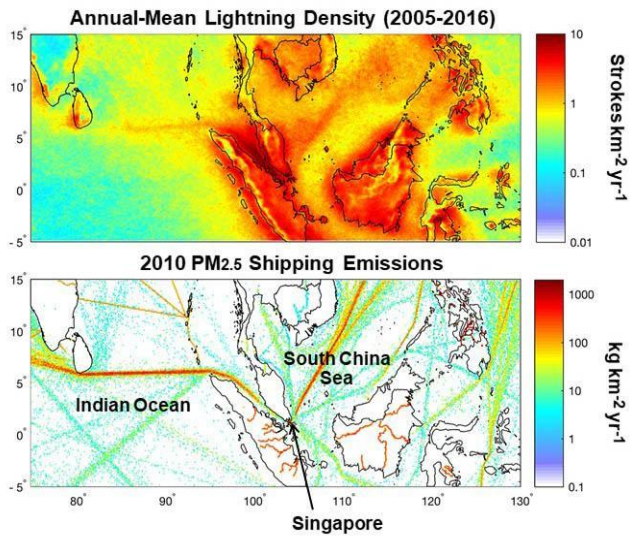
In September 2017, the program's Personal Air Monitors (PAMs) began reaching schools all over the United States. From California to New York and points in between, students are using the portable PAMs (developed at 2B Tech) to measure Air Quality on treks of their own design. They view the data in real time on their

smartphones as they trek, share the data on the AQTreks website, and later analyze it in the classroom.

The possibilities are endless, and students are rising to the task. In California's Bakersfield High School, they completed treks to compare air quality during a city-wide ride share week with data gathered during a "regular" week. Later this year, Navajo high schools near the Utah/Arizona border will take a look at wintertime air quality. The PAM simultaneously measures CO_2, CO, and particulate matter.

To keep costs low for schools, the AQTreks program rents the PAMs to the school. The cost is $300 plus $30 shipping for the minimum 2-week rental, with additional weeks offered at $150 per week. Curriculum materials are provided with the rental. If you'd like to schedule a rental for your classroom or as a donation for your local school, please contact us: info@aqtreks.com

More Info: AQTreks Educational Program



Lightning density (top) and shipping emissions (bottom) from global databases. Modified from Figure 1 of Thornton et al., Geophysical Research Letters.

Of Ships and Thunderstorms

Ship exhaust intensifies lightning, storms

A curious thing appears in the global map of lightning strokes: some nearly straight lines of high-density strokes across the oceans near Singapore (see Figure, top panel). Researchers at the University of Washington and NASA Marshall Space Flight Center published a new study that shows that the lightning strokes are above two of the world's busiest shipping lanes. Looking further, the researchers compared global databases of lightning activity and ship traffic, finding correlations throughout the Indian Ocean and South China sea.

The researchers showed that chemistry lies behind the phenomenon--specifically, the particles emitted by the ships' engines. The global database of ship emissions (bottom of Figure) shows the same intense lines streaking northwest and northeast from Singapore. The exhaust particles act as "seeds" for the formation of many small, light cloud droplets, which are more easily lofted upward and pump cloud water to higher altitudes. More freezing occurs at the higher altitudes--and collisions of the abundant ice crystals, droplets, and graupel cause the sparks to fly. Lightning frequency is nearly doubled above the two busiest shipping lanes.

As noted by lead author Joel Thornton (University of Washington), "It's one of the clearest examples of how humans are actually changing the intensity of storm processes on Earth through the emission of particulates from combustion."

"Lightning enhancement over major oceanic shipping lanes," Joel A. Thornton, Katrina S. Virts, Robert H. Holzworth, and Todd P. Mitchell. *Geophysical Research Letters*, September 14, 2017. DOI: 10.1002/2017GL074982.

Link to GRL Paper

Case Study:
Health Canada Using 2B Tech's Model 405 nm NO_2/NO/NOx Monitor

Research focused on indoor air quality

Eight of 2B Tech's Model 405 nm NO_2/NO/NOx Monitors will be used by the Air Health Science Division of Health Canada, a federal institution responsible for helping Canadians maintain and improve their health. This will be the biggest application yet of our Model 405 nm, the only instrument on the market today that provides a direct measurement of NO_2 (via absorbance at 405 nm), while also providing NO and NO_x measurements.

Getting good NO_2 data has been an elusive goal of the Health Canada's IAQ research, largely because of limitations of the instruments. By bringing in the Model 405 nm, researchers hope to address the issues because the 405 is a smaller, lighter instrument with lower power requirements (16 watts during operation) than other instruments on the market. These features will make remote monitoring more feasible.

A first target of the Health Canada research is to use the Model 405s to look at NO_2 levels in ice arenas. Fuel-burning ice resurfacing vehicles can lead to high indoor amounts of NO_2, as well as carbon monoxide and particulate matter. Indoor NO_2 can also be high in homes using gas stoves, another focus of the group's research.

Our Model 405 nm NO2/NO/NOx Monitor is now a Federal Equivalent Method for compliance monitoring of NO_2 (see EQNA-0217-243).

Info: Model 405 nm NO_2/NO/NOx Monitor

Top: John Birks (2B Tech's President) and Hayden Aubermann (2B's Tech's Technical Sales Representative) at the booth during the ISES Annual Meeting. Bottom: Lingamanaidu Ravichandran (Ravi), NIH/NIEHS Health Specialist and program officer (left), stopped by the booth to talk with John Birks, 2B Tech's President.

ISES Annual Meeting

Some great "exposure" for 2B Tech!

2B Tech was well represented at the 27th Annual Meeting of the International Society of Exposure Science, held Oct 15-17 at Research Triangle Park, North Carolina. Dr. John Birks, 2B Tech's President, gave a talk at a session on "Inspiring the Next Generation: Bringing Exposure Science into the STEM Community." His focus was the AQTreks program described earlier in this newsletter. He showed some of the data-gathering "treks" that students are doing this semester to study air pollution in their communities. In the exhibit hall, Hayden Aubermann (our Technical Sales Representative) and John showcased several of 2B Tech's instruments at our booth and fielded many questions from attendees.

2B Tech instruments even showed up at the poster session... Researchers at Johns Hopkins Applied Physics Laboratory and Rutgers School of Public Health used the Personal Ozone Monitor (POM) in an extensive study of how personal exposure to ozone compares with ozone concentration values obtained by ambient monitoring networks. A second poster by scientists at the US Environmental Protection Agency surveyed air pollution technologies available on the market and included 2B Tech's POM, Personal Air Monitor, and Model 205 Ozone Monitor.

Link to Conference

See Us at the AWMA Measurements Conference in Long Beach

We'll be at the Air and Waste Management Association (AWMA) specialty conference on "Air Quality Measurement: Methods and Technology" from November 7-9 2017 in Long Beach, California. If you're headed that way, please stop by our booth in the exhibit hall. Peter Andersen and Morgan Allers will be on hand to demonstrate several of our instruments and answer your questions. We hope to see you there!

Employee Spotlight: Shannon Rodriguez

2B Tech's VP of Finance keeps it all running smoothly

For over 10 years, Shannon has directed the finance department of 2B Technologies. Shannon received her B.S. in Business Administration, Operations Management from the University of Colorado, Boulder. Her specialties include financial reporting, forecasting, budgeting, grants management and cost control. Shannon has created and manages all procurement and subcontracting procedures, as well as financial and account aspects of cost control systems. She also directs all human resource activities and assists with business planning, as well as mergers and acquisitions. Under her watchful eye, 2B Tech stays in compliance with public laws and regulations, such as overhead rate calculations and the Federal Acquisition Regulations (FAR) requirements.

Shannon's just as busy at home in nearby Longmont, where she and her husband are raising their three children. Shannon proudly serves her community as a board member for the GO3 Foundation, a non profit corporation in the State of Colorado dedicated to promoting science, technology, engineering and mathematics (STEM) education in the United States and throughout the world.

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