THE 2B BUZZ

Fall 2024 Newsletter

2B Tech Spotlight

Visitors Put the Spotlight on 2B Tech's AQSync and Solar Trailer

Our Mobile Air Quality Monitoring Solution is Heading to Saudi Arabia

Our distributor in Saudi Arabia, GEOTEK Consulting, and their customer, SGS, recently visited 2B Technologies and Wanco Inc. SGS will be deploying the AQSync on the customized Wanco trailer at various sites in Saudi Arabia.

The ability to be able to easily move the monitoring station between locations, while having a turnkey power solution, was key to the project. The visit allowed them to check out the manufacturing process of their AQSyncs and solar trailers. The solar trailers produced by Wanco are truly remarkable, turning 2BTech's vision of *High-Quality Air Monitoring Anywhere* into a tangible reality.

Above, from left to right: Gordon Pierce (2B Tech), Mr. Syed Adnan Hashmi (GEOTEK), Hayden Aubermann (2B Tech), M.D. Muzahed (SGS), Saqib Rashid (SGS), and 2B Tech's Jessa Ellenburg, Lupita Ortega, and Aime Neville visit the facility at Wanco, Inc., the manufacturer of the AQSync Solar Trailer.

Above left: Hayden Aubermann describes the AQSync to Mr. Syed Adnan Hashmi and Saqib Rashid.
Above right: The AQSync Solar Trailer, ready to take air quality monitoring on the road!

AQSync Air Quality Monitoring Station **AQSync Solar Trailer**

Case Study, Model 205: 2B Tech Ozone Monitors on 15 eBuses!

Salt Lake City Goes All-Out with Mobile Network for Air Pollution Monitoring

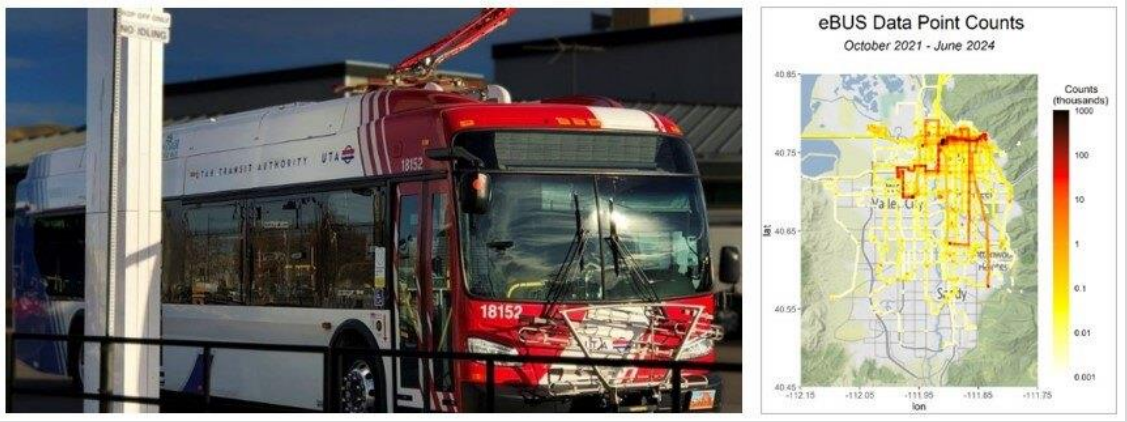
Making a Difference with Data

Click the picture below to watch the video, and then read our story! (Our Model 205 Dual Beam Ozone Monitor is in the green circle.)

One thing leads to another! So goes the rock song... and so it is with the expanding program to monitor air quality in Salt Lake City, Utah.

For over a decade, Salt Lake County has shown that the public transit system, and sophisticated air monitoring equipment, make a great team in tracking how air pollution affects residents. They started in 2014 with the 3 light-rail lines of Salt Lake's TRAX system. In the last 3 years, they've expanded to also using 15 electric buses that crisscross the County and cover much more ground. It's a collaboration of the University of Utah, the Utah Transit Authority, the Utah Division of Air Quality, and

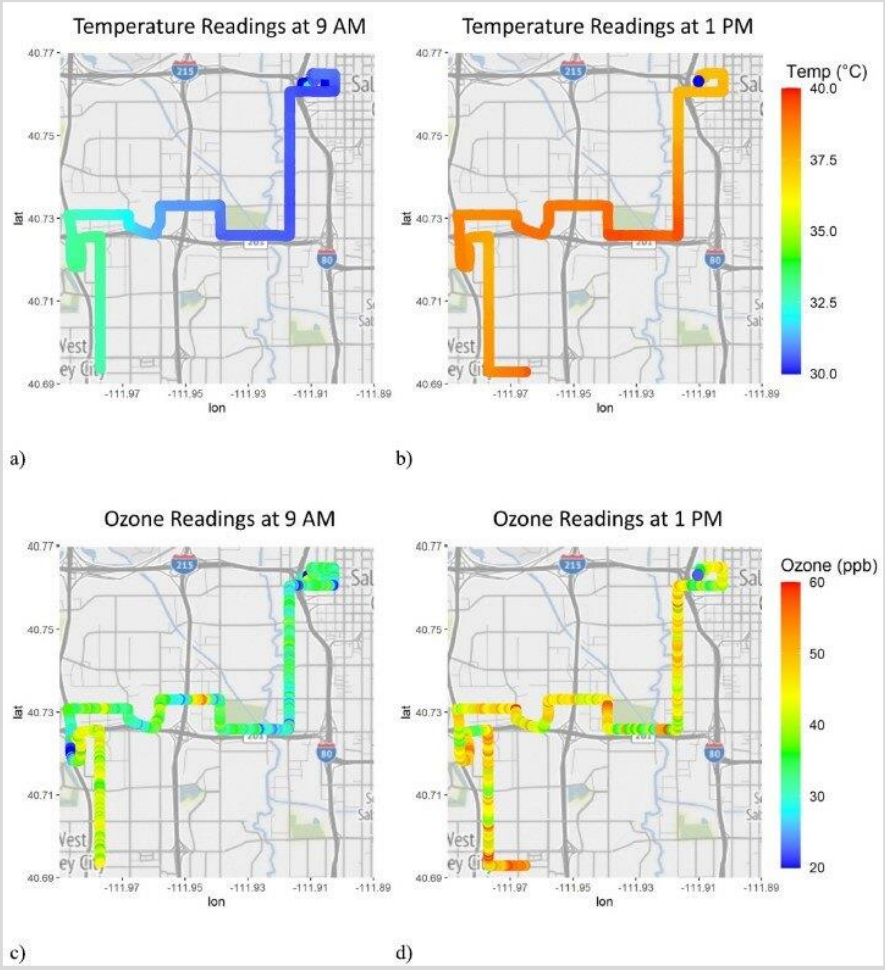
Salt Lake County experts. The aim is to get a better handle on how to improve the air quality situation in Salt Lake, which is in nonattainment of federal standards for particulate matter (PM2.5) and in moderate nonattainment for summertime ozone.



An array of air monitoring instruments, including 2B Tech's Model 205 for measuring ozone, is packaged with electronics and communication for data gathering into an enclosure that rides on the top of the eBus. The use of the battery-powered electric buses ensures that the monitors are not sampling the buses' own emissions, which can be an issue with using gas-powered vehicles for mobile monitoring.

A recent paper by University of Utah professor Daniel Mendoza and colleagues gives an overview of what has been accomplished so far with the program. It might just be the most data-dense program in the world for mobile AQ monitoring, says Mendoza. Over 25 million temperature and ozone readings were obtained from October 2021 to June 2024, and 18 million readings of particulate matter (PM2.5). The readings blanket the city and county in a way that the area's fixed network of 9 air quality measuring stations can't do. With all 15 e-buses now outfitted with the AQ monitors, over 100,000 measurements are logged on a typical weekday.

The wealth of data can be viewed in near real time on the web, enabling decisionmakers to locate the pollution hot-spots that call for a closer look at nearby emission sources. Residents, too, benefit from locating areas of lower pollution and adjusting plans for being outdoors, for example. It is hoped that the program could lead to more equitable policy development, because higher pollution exposure is often found to occur in less affluent neighborhoods.



Ozone and temperature readings during a "heat dome" event that occurred on 17 July 2023 in Salt Lake. [Figure credit: Figure 4 of Mendoza et al.]

Check out the published paper, and the video linked at the beginning of this story, for more information about this innovative program. And the next time you find yourself riding a bus in Salt Lake--think about the high-tech passengers riding above you measuring air quality!

Electric Buses as an Air Pollution and Meteorological Observation Network: Methodology and Preliminary Results, D.L. Mendoza, A. Gonzalez, A.A. Jacques, C.M. Johnson, P.T. Whelan, and J.D. Horel, *Science of The Total Environment* (2024) **951**, 175327.

Link to Published Paper

Employee Spotlight: Meet Our Product Specialists
Lupita Ortega and Aime Neville

We are thrilled to introduce our new Product Specialists, Lupita Ortega (left) and Aime Neville (right)! They are focusing on our AQSync and AQLite product lines. With their expert help, along with our new service ticketing system, we're taking our customer service to new heights. Here's a quick snapshot of Lupita and Aime:

Lupita Ortega: I started in manufacturing almost three years ago, where I spent a significant amount of time building various instruments. The AQSync was my favorite instrument to build due to its complexity and the precision required. This experience has been incredibly rewarding and has prepared me for the next step in my career. I am excited to further develop my skills as a Product Specialist at 2B Tech.

Aime Neville: After excelling in client service, problem-solving, and team collaboration over the past 9 years as a Case Manager and Rate Entry Specialist, I'm thrilled to bring these skills to my new role as a Product Specialist at 2B Tech.

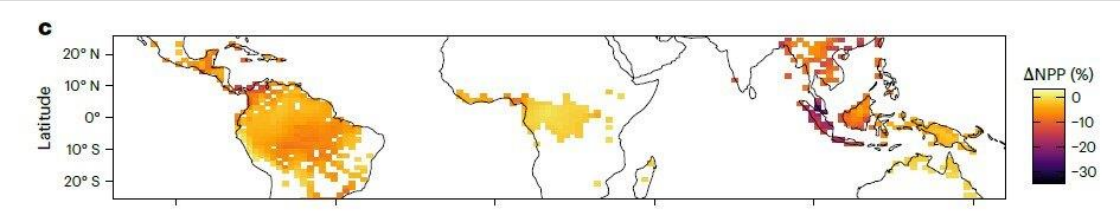
Navigate to our Support page and click on Tech Support to send Lupita and Aime a ticket and they will help you out!

Atmosphere News
Tropical Forests Feeling the Ozone Blues
Ozone Pollution Reduces Forest Productivity, Slowing Climate Progress

Studies of air pollution's effects on forests have largely focused on temperate and boreal forest species, but little is known about the effects on the kinds of trees found in the tropics. And yet unlike forests in the higher latitudes, trees in the tropical environment work year-round to carry out

photosynthesis and remove carbon dioxide from the atmosphere. Indeed when it comes to global carbon uptake, tropical trees do the heavy lifting, accounting for 60% of the world's photosynthesis. Their good deed for the planet's warming climate is getting tougher as ozone pollution is becoming more of a problem at tropical latitudes.

A new study in *Nature Geosciences* fills in some of the blanks in our understanding of how ozone pollution affects tropical species, and shows how the consequences will spill over increasingly into the climate change arena.



Current impact of ozone (2005-2014) on Net Primary Productivity of tropical forests, modeled assuming a scenario of species having a "moderate" sensitivity to ozone. Figure 2C from Cheesman et al., Nature Geoscience.

Scientists from around the globe teamed up to carry out the new research. They first tested ten different species of tropical trees for ozone sensitivity, using open-top chambers (and the 2B Tech Model 205 Dual Beam Ozone Monitor!) to study how ozone exposure affected the trees' uptake of CO2. They found a wide range in sensitivity, and created "high/moderate/low sensitivity" scenarios to test in models of global net primary productivity (i.e., photosynthetic uptake of carbon). As shown in the above Figure 2c of the study, even the scenario that assumes moderate sensitivity to ozone leads to ~5 to 10% loss in productivity (pronounced in Asia, less so in Africa). The authors calculate that as a result, the uptake of carbon by tropical forests has been reduced by an astonishing ~17% in the twenty-first century.

An interesting sidebar to the study is that since 1990, the region with most of the pollution precursor emissions has shifted away from the temperate Northern Hemisphere and is now in the tropical and subtropical regions. This means tropical forests will feel more and more stress from ozone pollution in the coming years. The authors also found that reforested areas are experiencing greater impacts than undisturbed, established forests. Both of these factors imply that efforts to mitigate climate impacts have even more of an uphill battle ahead.

Reduced Productivity and Carbon Drawdown of Tropical Forests from Ground-Level Ozone Exposure, A.W. Cheesman, F. Brown, P. Artaxo, M.N. Farha, G.A. Folberth, F.J. Hayes, V.H.A. Heinrich, T.C. Hill, L.M. Mercado, R.J. Oliver, M. O'Sullivan, J. Uddling, L.A. Cernusak, and S. Sitch, *Nature Geoscience*, **17**, 1003-1007 (October 2024).

Link to the Published Paper

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