

Summer 2024 Newsletter

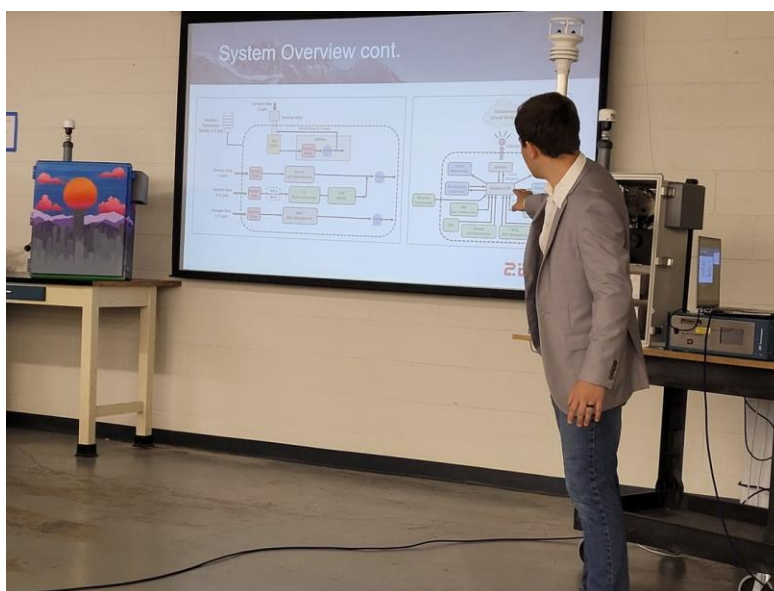
2B Tech Spotlight

Summer School at 2B Tech!

Customers Enthusiastic about In-Person Workshop on Our "Multi-Pollutant" Products

In July, class was in session at 2B Tech! We conducted a workshop for several customers interested in learning more of the nitty gritty about operating our multi-pollutant air monitoring packages.

On July 10, attendees heard presentations and participated in Q&A discussions about the [AQSync Air Quality Monitoring Station](#). After an overview of the AQSync system and capabilities, the discussion took a deep dive into data viewing and downloading, maintenance and repairs, and troubleshooting tips. Twelve people representing six projects from Denver to Alaska peppered 2B Tech with their questions in the highly interactive session, which was led by Luke Greenidge of 2B Tech and involved several of our staff. The group toured our facility and witnessed demonstrations of the AQSync during the presentations. And on a field trip to our parking lot, they saw our "mobile" AQSync on the [AQSync Solar Trailer](#).



2B Tech's Luke Greenidge kicks off the discussion of the AQSync Air Quality Monitoring Station on day 1 of the workshop.

The next day focused on 2B Tech's [AQLite Air Monitoring Package](#). After covering some of the fundamentals, participants heard details of using the web-based "dashboard" for data analysis, and discussed their applications of the instruments in their projects.

The two days with our customers brought into focus the range of possibilities opened up by our highly portable multi-pollutant products. From the far reaches of Alaska to the communities near highways or industrial facilities, the AQSync and AQLite can literally go "where no monitor has gone before." This is what pumps us up and keeps us working hard to develop innovative products. We appreciate you, our customers!



2B Tech's Craig Williford, Jessa Ellenburg, Luke Greenidge, and Hayden Aubermann show customers the [AQSync Solar Trailer](#).

AQSync Air Quality Monitoring Station

AQLite Air Monitoring Package

AQSync Solar Trailer

Employee Spotlight: Meet Our Program Manager

David Kopala

You never know where a high-school internship at 2B Tech might lead you... and in David Kopala's case, it led him right back to 2B Technologies 8 years later, now as the Program Manager of our company.

David's work at 2B Tech started in 2015 when he was at Northglenn High School in suburban Denver. His talents at programming and engineering were evident even at that early age, and he worked on software for some of our instrumentation and programming of an app for doing ozone units conversions.

After graduating high school, it was on to college at the University of Colorado Boulder, where David earned degrees in Computer Science, Electrical & Computer Engineering, and Applied Mathematics.



David's talents landed him some amazing internship opportunities, including at SpaceX and Tesla. Along the way he caught the attention of one of his professors, who recruited him to work at his company in Vietnam, where David worked for a year on the firmware for the company's new sleep-monitoring technology and managed a team of 12 engineers. As it turns out, these experiences gave David exposure to different managing and communication styles, along with some unique insights into what works best in the settings of companies that are innovating new products.

David is applying those insights now as 2B Tech's Program Manager. In this role, he's at the switchboard of the communications between our engineering team, management leadership, and sales team. His work is largely focused on our multi-pollutant products (AQSsync and AQLite). His goal is to foster the synergy that happens when good organization and good engineering are brought together. He sees this as a way to help 2B Tech excel as a team, and for our products to become even more robust and reliable. His strong personal relationships with the team at 2B Tech, together with his long history with our company, are helping him develop an approach that is a good fit for us here. To that end, he has set up new processes to

ensure that communications are good and priorities for the company are understood and addressed.

David lives in the Denver area, and right now he has added another goal to his long list-- to participate in his first triathlon. David, our Engineering Manager Craig Williford, and Mechanical Engineer Luke Greenidge are challenging each other in a September triathlon in Denver. They'll no doubt bring out the best in each other, in keeping with the theme here at 2B Tech!

Case Study: 2B Tech Model 205 Ozone Monitor

Study Spans Ground, Atmosphere, and Space Measurements

Ozone a Main Concern in Denver's Persistent Air Pollution Challenges

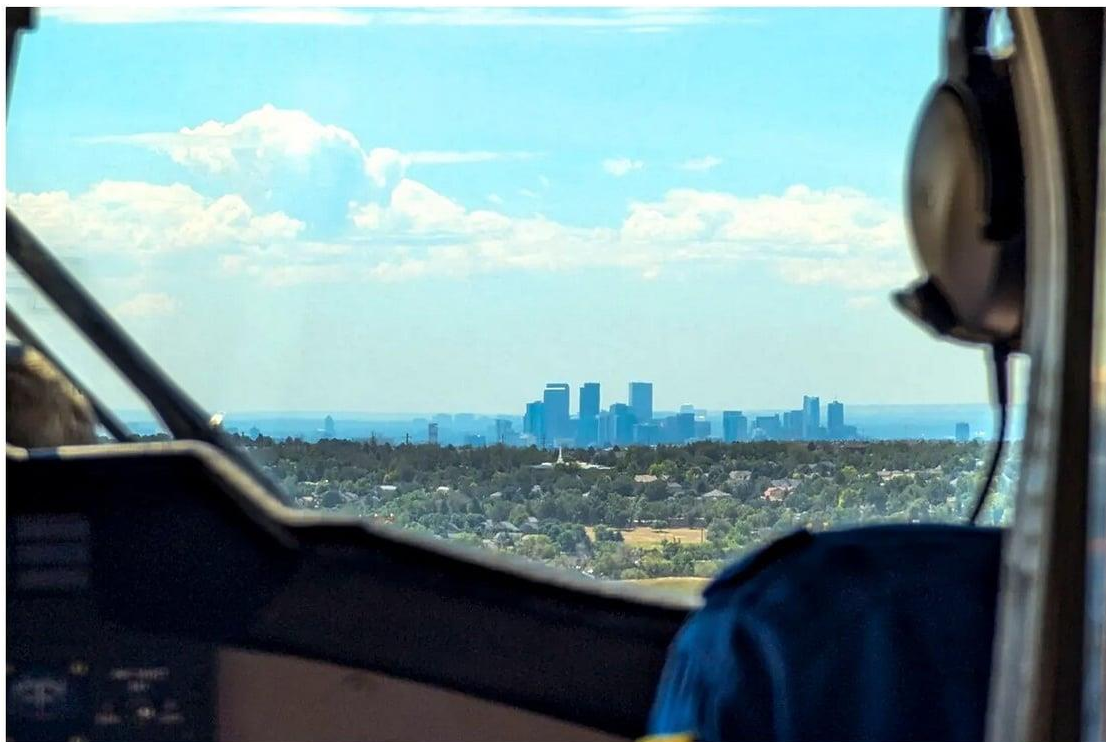
The clock is ticking on Denver's air pollution problems. Downgraded by the EPA to "severe nonattainment" status for ozone in 2022, the region has until 2027 to clean up its act.

This summer, scientists took their instruments into the skies to try to get a better grip on what's causing the persistent high ozone in the region. NOAA scientists from Boulder flew on a Twin Otter research aircraft and sampled air above the cities, power plants, oil & gas operations, agricultural areas, and cattle feedlots throughout the area. Among the instruments onboard was a 2B Tech Model 205 ozone monitor, measuring the pollutant that's center stage in the region's nonattainment woes.



The 2B Tech Model 205 Ozone Monitor, in a rack-mount configuration that can be special ordered, flies on the NOAA Twin Otter research aircraft in July 2024.

"Our ozone is not responding in the same way as other parts of the country. That's somewhat of a mystery to us, and something we'd like to address with these kinds of research flights," said Steve Brown, a research scientist at NOAA in Boulder who's helping to lead the study.



Sam Brasch/CPR News

The Denver skyline as seen from the NOAA Twin Otter research aircraft during a July flight.

We're happy to see our Model 205 Ozone Monitor at the center of the action. Follow the links below to read more about the research.

[The Front Range Can't Shake its Ozone Problem. Scientists are Taking to the Skies to Find Out Why](#), Sam Brasch, CPR News, 16 July 2024.

[Summer Airborne Research Targets Rocky Mountain Ozone Pollution](#), NOAA Communications and NOAA Chemical Sciences Laboratory, 8 July 2024.

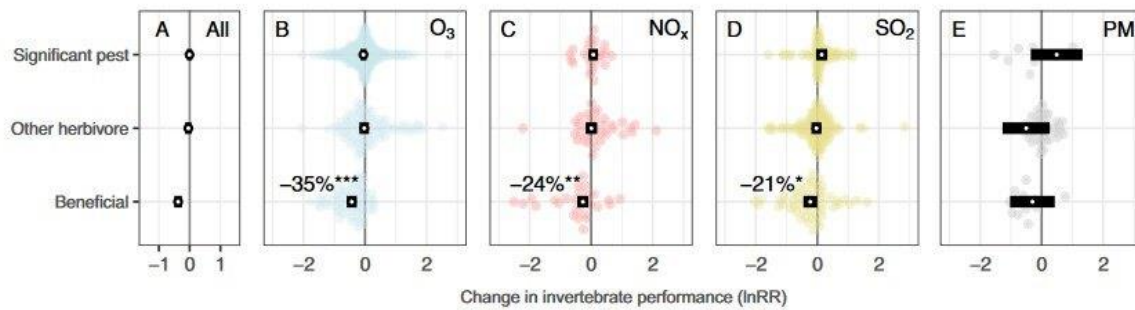
Atmosphere News

Air Pollution and Insects: Bad News for the Good Guys Pollinators Harmed, But Pests Not Affected

An exhaustive study of over 100 published papers about how air pollution affects various types of invertebrate insects has some unsettling results: The most beneficial insects are harmed, while the "pest" categories of insects appear to be unscathed. To make matters worse, the harmful effects don't depend on the concentration of the air pollutant. Even trace levels disrupt ecological and biological function of pollinators and other insects that are beneficial. And the worst pollutant? Ozone.



The [study](#), published on July 11 in *Nature Communications*, was led by researchers at the University of Reading in the UK and included colleagues in Australia and Canada. They looked at research papers on all the major air pollutants (ozone, particulate matter, nitrogen oxides, and sulfur dioxide) and covered 40 types of insects. Each pollutant showed a pattern of being detrimental to beneficial classes of insects (such as bees, moths, wasps, and butterflies), while having no effect on pests such as aphids that destroy crops. The foraging efficiency of pollinators declined a whopping 35% in some cases.



Responses of three broad categories of invertebrates to pollutants. Negative effects are to the left of zero in the plots. The white dots are means, and the black boxes give the 95% confidence intervals. (Figure credit: Figure 2 of Ryalls et al., *Nature Communications*)

Why the disproportionate effect? The authors point out that beneficial insects like pollinators literally sniff the air to find flowers, prey, and mates. Their airborne chemical signals are disrupted by air pollution. Pests, on the other hand, don't rely as much on the scent trails and instead use visual cues or direct contact for way-finding.

The results are concerning to lead author James Ryalls of the University of Reading: "Air pollution is an underappreciated threat to the insects that make our lives easier...We are facing a lose-lose scenario where air pollution harms helpful insects without affecting pests, potentially leading to greater crop damage, reduced yields, and less food on supermarket shelves."

[Air Pollution Disproportionately Impairs Beneficial Invertebrates: A Meta-Analysis](#), J.M.W. Ryalls, J. Bishop, A.O. Mofikoya, L.M. Bromfield, S. Nakagawa, and R.D. Girling, *Nature Communications*, **15**, 5447 (2024).
