

How a TikTok user used her platform to promote citizen science efforts in Ohio

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Credit: Unsplash/CC0 Public Domain

After being catapulted into the viral metaverse of TikTok, what began as a "slapdash initial document" transformed into a multipronged database encouraging citizen science in East Palestine, Ohio.

Buffalo, New York-based Devon Oship, 27, has been utilizing the [social platform](#) for years to teach viewers about neuroscience, using her master's degree and passion for [science education](#).

Then the train derailment in East Palestine happened.

When viewers living in and near East Palestine began reaching out via TikTok, expressing fear and concern over the derailment, she decided to put together a few resources for residents to conduct their own testing. Her repository, housed on Linktree, quickly grew to include an interactive map in addition to an app for uploading water, soil and air test results.

"This project is really about bringing people together and empowering the community to know they're being told the truth," Oship said.

Multiple testing and monitoring efforts are ongoing in East Palestine and the surrounding region, with air, soil, and surface and drinking water testing by groups including the Ohio EPA, the Columbiana Health Department and Arcadis, a third-party representing Norfolk Southern Railway. Citizens conducting their own tests can see whether readings match up with what government agencies are reporting, which is included for reference in the database.

To ensure testing is done correctly, Oship offers instructions on how to conduct water and soil testing, what tests can be done at home and which should be sent to an accredited lab, links to where residents can buy certified testing equipment, spreadsheets to input data and tutorials on how to do so, and more.

Once her efforts to develop the database gained traction online, experts including biostatisticians, [environmental scientists](#) and IT workers began reaching out to offer help.

"This plethora of people came together and said, 'We want to make this a real resource,'" Oship said. "It's been really amazing to see the scientific community come together. I think a lot of people wanted to do something to help but didn't know what."

The database now includes an interactive heat map that displays where testing has been done in the region and is updated in real time, with more sophisticated analyses being conducted as soon as the scientists can do so. The group of eight scientists who helped build it out hope to make the database an international resource that can be used by anyone at any time. Oship said more scientists are applying to join the team every day.

Oship's personal life inspired her passion for [citizen science](#): Her husband, Ben Oship, grew up in Buffalo around the time a nearby iron coke works factory, Tonawanda Coke, released hundreds of tons of the cancer-causing chemical benzene into the atmosphere from an unreported pressure relief valve. Ben Oship is the last surviving member of his immediate family after other members passed away from illnesses they believe were related to the benzene exposure, she said.

It was the work of citizen scientists in Buffalo and their data that helped hold Tonawanda Coke accountable.

In 2014, Tonawanda Coke was fined \$24.7 million in penalties for violating the Clean Air Act and the Resource Conservation and Recovery Act. The plant closed in 2018, and in 2021, three Tonawanda Coke smoke stacks were demolished.

The ideal goal for the East Palestine data, Oship said, is for residents to get solid information to illuminate which chemicals they were exposed to, and compile evidence to challenge corporations if discrepancies are found. She hopes the effort can inspire better safety regulations so events like the East Palestine train derailment don't happen again. After

the derailment, issues with Norfolk Southern's regulations of its trains have come to light.

"Living in the Rust Belt and being married into this family, I've seen so much that when people in power can get away with cutting corners, they will do so, even if it results in human death," Oship said.

No one has died in connection to the East Palestine incident, but some have visited emergency rooms complaining of headaches, sore throats, rashes and infections they believe are related to the chemicals present at the spill.

A citizen science effort may also help ease residents' minds by getting them involved.

"In that kind of emergency, you feel like things are happening to you. Having a citizen science effort gets you engaged in it," said Mary Fox, an assistant professor of health policy and management and the co-director of Risk Sciences and Public Policy Institute at the Johns Hopkins Bloomberg School of Public Health.

Residents have reported feeling confused by reports that air quality is normal when they are experiencing rashes and other symptoms. While these afflictions could be from acute or secondary exposure to the chemicals the train was carrying, including the controlled burn of vinyl chloride, environmental disasters burden those impacted with psychological stress, which can also cause bodily reactions. Research suggests that the intense stress, anxiety and even PTSD from environmental disasters like chemical spills can spike stress hormones and lead to stress rashes and other conditions.

A 2018 review published in the journal *Environment International* of more than 4,000 workers who helped clean up the Deepwater Horizon

2010 oil spill found that those workers had worse lung function over a year later—ostensibly due to [psychological stress](#)—compared to those who did not help with clean up. This was after researchers controlled for the effects of chemical inhalation.

"In many cases, even if the environmental data comes back fine, that doesn't preclude people from feeling concerned," said Dr. Maureen Lichtveld, dean of the University of Pittsburgh School of Public Health and a physician who spent decades working within emergency disaster management.

"It's not just the chemicals, it's the situation," Fox said.

That's why experts say it's crucial that residents feel heard in their fears and involved in the effort. "The people who live there are the ones who know their environment," Fox said. "The value of having citizen science is engaging with the community where they are."

Citizen science can also help translate complicated results—like water quality testing—to residents who are feeling overwhelmed or confused. "Five or 10 people involved can become advocates or translators to help others understand," Fox said.

And the project could lead to further policy involvement, allowing residents who have participated to testify in Congress.

Fox said the database sounded like a great resource, although she worried slightly about the hands-off approach: It can help to have leaders on the ground showing residents how to conduct testing, she said.

"As a scientist, I would like the public more engaged in science" in general, Fox said. "If done well, it can only be beneficial in the long term."

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