

Podcast Transcript: The Shrinking Salton Sea and Children's Health

[Theme music]

Ashley Ahearn (Narrator): You're listening to Environmental Health Chat – a show from the National Institute of Environmental Health Sciences that explores the connections between our health and our world.

I'm Ashley Ahearn.

In Southern California there is a manmade, inland sea... and it's drying up.

The Salton Sea was formed more than 100 years ago when the Colorado River broke through a dam and flooded an area of the desert. Since then, it's been fed by agricultural runoff from thousands of acres of surrounding farmland.

But now, with changing weather patterns, drought, and increased demand for water, the Salton Sea is disappearing.

As the water recedes, dust from the sea floor is exposed and blown around, and it's contaminated with pesticides, PCBs, heavy metals, and other pollutants that can be harmful to human health.

Esther Bejarano: And so we're breathing that anytime it's windy.

AA: Esther Bejarano has lived in the Imperial Valley since she was seven. Now she works as a public health advocate and organizer with the community-based nonprofit group, Comité Civico del Valle, or CCV.

EB: Most of our work has been in environmental justice and health education, really the focus is on what is happening in the community and how we can help to address the issues locally in this low-income, agricultural community with a lot of layers of inequities.

AA: The Imperial Valley has some of the worst air quality in California – and some of the highest rates of asthma in the children who live there, with nearly double the rate of hospitalizations for asthma and breathing issues compared to the rest of the state.

Esther knows this all too well.

EB: I have children who have asthma. I have two children. So this is very dear to my heart and this is very passionate work that I do because I know how it feels when my son was waking up in the middle of the night coughing and wheezing and I had to rush him to the emergency room.

AA: Dust from the receding Salton Sea is not the only contributor to air pollution in Imperial Valley. It's a busy corridor for trucks and trains delivering goods between Mexico and the U.S.

Farmers also often burn their fields – sometimes right near schools – after the growing season is over.

Scientists want to better understand the different factors that make Imperial County's air quality so bad and how those factors contribute to public health outcomes in the valley – especially among children.

That's where Esther shines. Esther is what's called a promotora. That means she's a community health worker who serves as a liaison – a connector between scientists and her community. She says it's about trust.

EB: Because the community and the schools trust us – they've seen our work and our dedication – they trust us because they know we care. We're part of the community. And if you come in and have just a pop-up researcher that's just trying to pick up data and then go back and we never see them again, they tend to shy away from that because of previous experiences.

AA: Esther and CCV were integral in getting a community air monitoring network set up throughout Imperial Valley, with funding from the NIEHS. They created a website called IVAN Air to share air quality data with schools and families. They also set up what's known as the flag program where a colored flag – green for good air quality, red for bad – is raised at schools to let community members know when it's dangerous for people to be outside.

People in the community trust Esther and know what she's done for them.

And Esther knows that if she wants to make more progress in her fight for clean air, she needs scientists... scientists like Shohreh Farzan. Shohreh is an associate professor in the Department of Population and Public Health Sciences at the University of Southern California. She's part of a collaborative team of researchers from USC who are working closely with Esther and CCV.

Shohreh Farzan: This is what is so important about community-based participatory research is that we have to listen to each other and trust each other and develop these ideas together. And our goal as researchers has never been to come in and say, here's what we want to do, and impose our ideas on the community and treat them like subjects. And so it's really been a dialogue and a back and forth, to develop these ideas.

AA: Shohreh and her colleagues heard loud and clear that people in Imperial Valley were worried about how dust from the Salton Sea and other sources of air pollution may affect their children. Parents worried about their kid's lungs, their ability to play and be active outdoors, and to lead long healthy lives.

SF: And so, we started thinking about what we could do in that area to be responsive to these community concerns. And we thought we can partner with them to learn more about air quality, but then also go into the schools, and think about collecting this health information.

AA: Starting in 2017, Shohreh and Esther and their colleagues worked together to set up a study called the AIRE study, with funding from NIEHS, that will follow 700 students starting in first and second grades.

SF: And we invited everyone in the classrooms in those two grades in five different schools to participate in a respiratory health survey.

AA: They sent the surveys home with the kids. They asked parents about their kids' breathing, whether they had asthma, whether they had wheezing, coughs, or trouble breathing under certain conditions.

Study participants also get an annual physical evaluation.

SF: We take measurements of height, weight, blood pressure, and then also spirometry to get a sense of how kids are breathing.

AA: Their results are preliminary, but so far, after analyzing health data for 350 kids, Shohreh says concerns about high asthma rates in Imperial Valley are valid. Asthma rates in the five schools they studied ranged from 20-35 percent – which is higher than the state average of 14.5 percent.

SF: We also analyzed respiratory symptoms and allergies, which were really widely reported. About a third of all children reported having wheezing, allergies, dry cough, and not surprisingly, the symptoms were more prevalent among the asthmatics. But we were really surprised to see relatively high rates of all of these respiratory symptoms among non-asthmatic children as well.

AA: As part of the study, Shohreh and her colleagues wanted to build on the robust air quality monitoring system that Esther and CCV had already established, so they added special monitors with filters to collect dust at the five participating schools closest to the Salton Sea.

SF: And then we can capture a sample of whatever's in the air and then analyze the elements to understand whether contaminants from the sea might be reaching the areas where people are living. And then we can understand more about whether playa dust is a contributor to air quality in these communities, or whether we need to consider other sources that might be important.

AA: The filters will measure small particulate matter – PM 2.5 and PM 10 – as well as black and brown carbon, which can indicate diesel combustion or agricultural burning. They'll also be able to identify things like pesticides or heavy metals, which could become airborne from the newly exposed dust of the receding Salton Sea.

SF: What we're hoping to do when we get those filter samples is to be able to tease that apart and to use the information from other investigators that have been looking more carefully at the elemental signatures to identify the specific sources that are contributing to air quality specifically in our communities.

AA: Shohreh says there's much more analysis to be done, but she and her colleagues are working closely with Esther and CCV to find the best ways to share their preliminary findings with the community.

SF: And she's been really instrumental in helping us think through the community health actions that could be possible after we communicate these results to the community. I hope that what we learn is informative to the community. And I hope that it can help parents, teachers, community members understand how we might be able to influence these environmental factors, whether it's through personal actions or through advocacy or policy change.

AA: For Esther Bejarano, research like the AIRE study is critical to making changes that will keep her kids – and her community – safer in the future.

EB: We need data for action to continue working collaboratively with our local government and state government to improve the air quality in Imperial County. And so that is something that is important to residents of Imperial County, a lot of students are participating in that study. And so what does that tell us? That they want to be informed. They want to know how their children's lungs are being impacted by air quality. And so that is important.

[Music comes up]

AA: I'm Ashley Ahearn. Thanks for listening to Environmental Health Chat.