



Earthwatch Institute®

Engaging Schools with Air Quality Sensors

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How Earthwatch Engaged Schools in Air Quality Programs

Through Operation Healthy Air, Earthwatch partners with schools to introduce low-cost sensors to bring STEM curriculum life to classroom and engage students in a global open-source air quality project.



15

**SCHOOLS
ENGAGED**



38

**SENSORS
DEPLOYED**



250

**STUDENTS
ENGAGED**





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Operation Healthy Air

Operation Healthy Air (OHA) is a global open-source air quality project that makes local air quality data accessible and relevant to support community-based actions that reduce exposure to unhealthy air. As part of OHA, Earthwatch is partnering with schools to bring local air quality data into the classroom, making real-time data and the associated STEM curriculum relevant and more impactful.

Teachers face the challenge of finding relevant and real-time data to develop a creative and inventive STEM curriculum that is motivating and exciting for their students. While teachers have access to more content than ever before, they lack consistent access to applicable real-time data that connects the classroom with current environmental and social issues, such as air pollution. Educators are also eager to provide their students access to innovative and experimental technology that often is expensive and difficult to use.

Operation Healthy Air provides assistance and educational tools to teachers to bring new technology and science curriculum life into the classroom. In addition, OHA helps educators interpret complex data that can result in empowering students to take action to mitigate their exposure to poor air quality.

“This type of relevant real-world science investigation is exactly what I strive to include in our science classrooms. Our students will certainly be invested in gathering and interpreting data on our local air quality.”

Kevin Rohn, Science Teacher at Beaver Country Day School

Approach

Earthwatch’s mission is to connect people with scientists to conduct environmental research and empower them with the knowledge they need to take action to address local and global environmental issues.

Started in 2019, we have a growing network of over 15 schools in Boston, Southern California, Delhi (India), and Colombo (Sri Lanka). The programs engage a cross-section of educators and grades and are typically embedded in a variety of school curricula (sciences, math, environmental studies, communication, and social justice). The program is led by a local school lead (e.g. educator and/or student group) and assisted by the school administration. Schools are supported to deploy affordable air quality sensors (PurpleAir Sensors PS-II). We also support the interpretation of the real-time data, the complex science of air quality, and its interaction with the school community, including students, educators, and their families. Finally, we also provide a “data-to action” guide that helps students make use of the local air quality patterns observed to take action that addresses a chosen problem. For example, students can create action plans that reduced pollution from local idling buses, or notifying via a flag-system those vulnerable community members when air quality is particularly unhealthy.

By deploying PurpleAir air quality sensors, students contribute local data to a global open-source air quality-monitoring project—and the data is useful to the students themselves but also scientists worldwide to survey air quality trends. This hands-on approach is fundamental to helping teachers and students analyzing and assign meaning to their data and determine its implications so they could create appropriate, personalized action plans that provide a solution that answers the needs of those who suffer most from the inequalities of environmental justice.



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Lessons Learned

- Start early—Engaging educators and setting up sensors early in the school year helps teachers successfully integrate the sensors and data into their curriculum and student activities.
- Introduce the fundamentals of program to the schools, and allow teachers and students to use their personal interest to be fully engaged and guide the local direction of the program, especially action planning.
- Involve the school administrations, including IT and maintenance departments, as they are helpful during the sensor installation process and can efficiently resolve any maintenance or technological issue (e.g. to navigate linking the sensors to school servers).
- Connecting teachers with other participating schools, regionally and globally to build a community that can share experiences, questions, and air quality data and to introduce a social component of the program for educators and students.

“When people from the Earthwatch Operation Healthy Air citizen project came in to talk to us, I was inspired. This project to monitor the quality of the air to help reduce exposure to air pollution started small, likely from one person’s idea, and now it has been spreading all around. This gave me hope—hope about the change I can make. Now I am confident that one person can save the world.”

Buckingham Browne & Nichols Lower Senior