

BUEN AMBIENTE-BUENA SALUD: EDUCATIONAL STRATEGIES FOR ADDRESSING AIR QUALITY ON THE BORDER

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THE UNIVERSITY OF TEXAS AT EL PASO



OUR PROJECT



OUR PARTNERS AND COLLABORATORS

- Azuri Gonzalez and Jennifer Rodriguez, Center for Civic Engagement
- Bora Simmons, University of Oregon
- Susan Brown, Director, STEM Outreach, College of Education, NMSU
- Manuel Piña, Views Unlimited
- El Paso Independent School District

FUNDING

- \$1.25 MILLION from competitive grant from EPA/OAR

PROJECT PERIOD

- July 1, 2011 – December 30, 2016

CORE ELEMENTS



- Development of curriculum for grades 3-12 and outreach to schools – Elaine Hampton
- Internship program for undergraduate and graduate students – Wen-Whai Li
- Management – Bill Hargrove
- Evaluation – Manuel Piña

CURRICULUM



Objective 1.

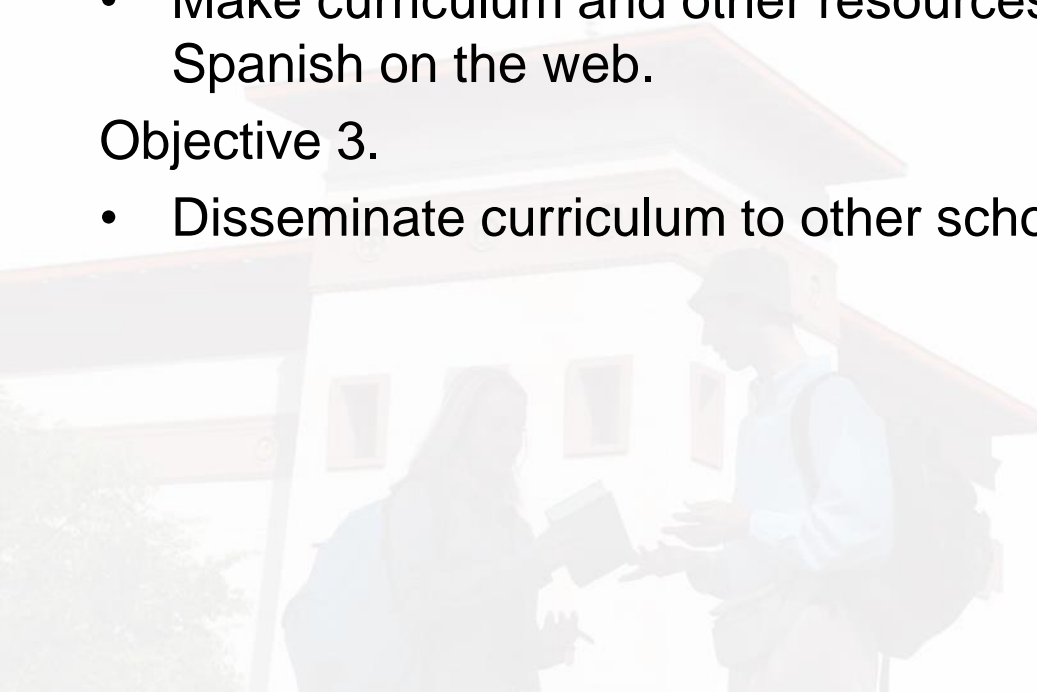
- Develop, test, and implement ten curriculum units on air quality, environmental health, and environmental justice that are inquiry based and meet national EE and Texas science standards.

Objective 2.

- Make curriculum and other resources available in both English and Spanish on the web.

Objective 3.

- Disseminate curriculum to other schools.



Internship Program

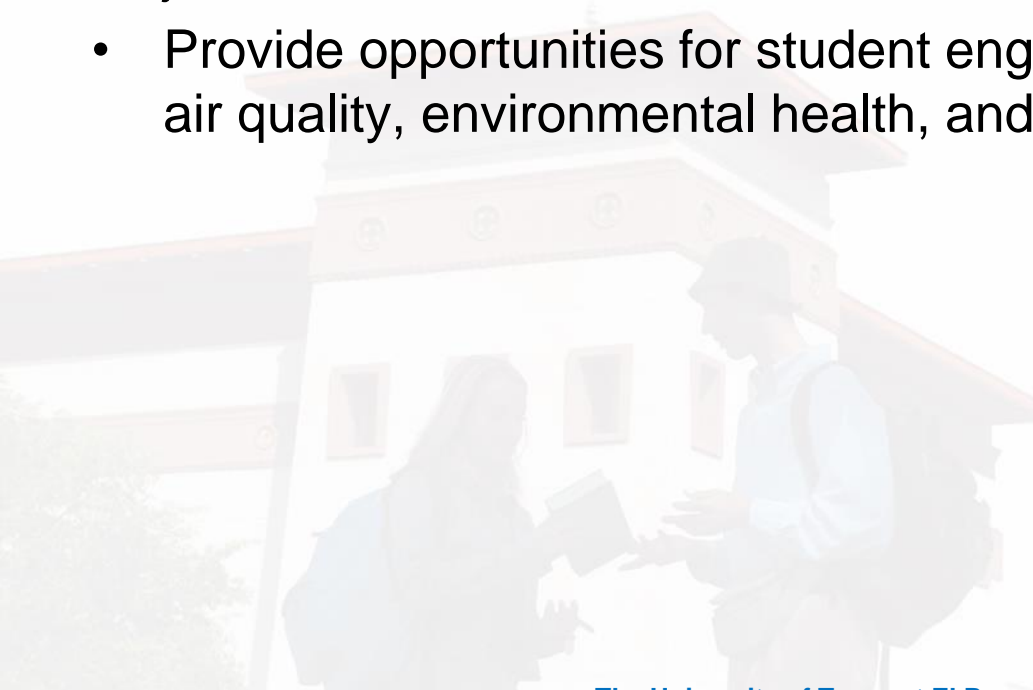


Objective 1.

- Develop and implement an air quality/environmental health internship program, including student preparation and mentoring.

Objective 2.

- Provide opportunities for student engagement in community related to air quality, environmental health, and environmental justice.

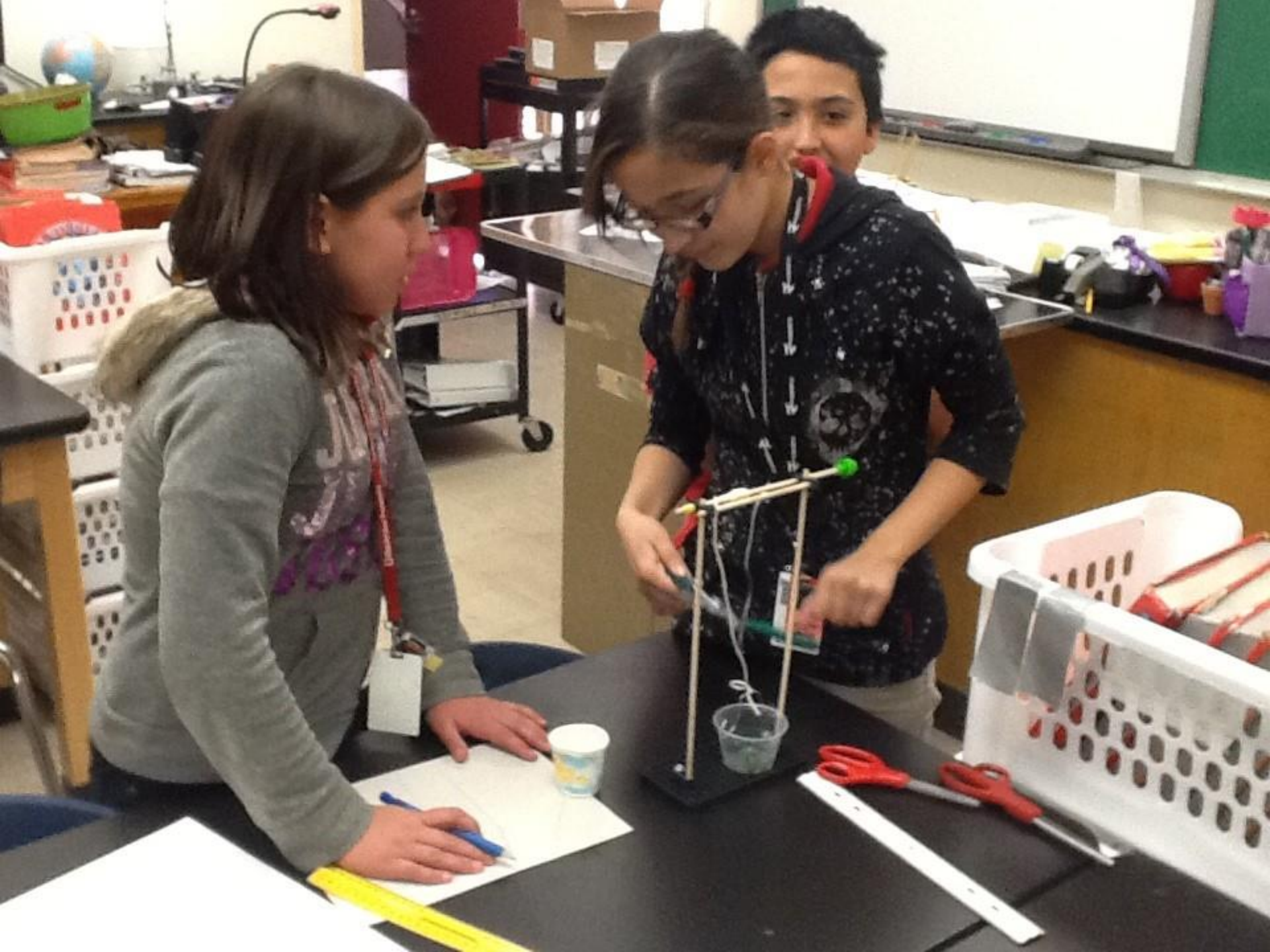


WHAT WE DID - CURRICULUM



- Engaged 25 EPISD science teachers to develop and test the curriculum
- Develop inquiry based modules, including air quality, environmental health, environmental justice
- Each module met Texas Science Education Standards and Environmental Education Guidelines for Excellence (funded by EPA)
- Ten modules developed, tested once, revised and tested again
- Available on web in English and Spanish at: BAQed.utep.edu
- Additional resources on the website; i.e. *Smelter in the City: The ASARCO Case Study*, including history, lesson plans, and resources for teaching about the environmental impacts of a copper smelter
- 25 master teachers trained their colleagues (500)
- Curriculum implemented in 300 classrooms





Third Graders posting the
AQ Index for the day
at their school



IMPACTS - CURRICULUM



- Elementary school children started teaching younger children about AQ index
- Teachers use take home survey to assist families to take actions to reduce carbon
- AQ Index charts posted in every school
- Schools created no-idle zones at schools to reduce emissions
- Military maneuvers at Fort Bliss left black particulate matter on playground at elementary school; teachers discussed with military liaison; tank maneuvers moved away from school as a result
- Students created public service announcements about reducing carbon emissions and presented them at school
- High school students created pod casts and posters about ASARCO's legacy

CURRICULUM DISSEMINATION



- 5th grade module adopted at Clint elementary school (rural school outside El Paso)
- Modules adopted by NMSU STEM Outreach Center in after school science program in New Mexico, reaching 300 teachers and 5000 students
- Shared with over 200 public school science administrators in Texas
- Director of curriculum for all schools in Ciudad Juárez is arranging for all science curriculum directors to be trained
- High school science teacher in Ysleta will use the curriculum in environmental science program (120 students)
- BAQ interns trained in the curriculum and taught the modules at YMCA and Boys and Girl Clubs after school programs as a community service project

COMPONENTS OF THE INTERNSHIP PROGRAM



- Monthly meetings during the academic year to prepare
- Attend a number of public meetings about air quality at a local level
- For graduates students, 1 graduate course in air quality
- 1 Credit hour workshop course in air quality, focusing on principles, measurement, and soft skills
- 8 week internship
- Participate in community service project
- Present internship experience to peers



INTERN HOSTS

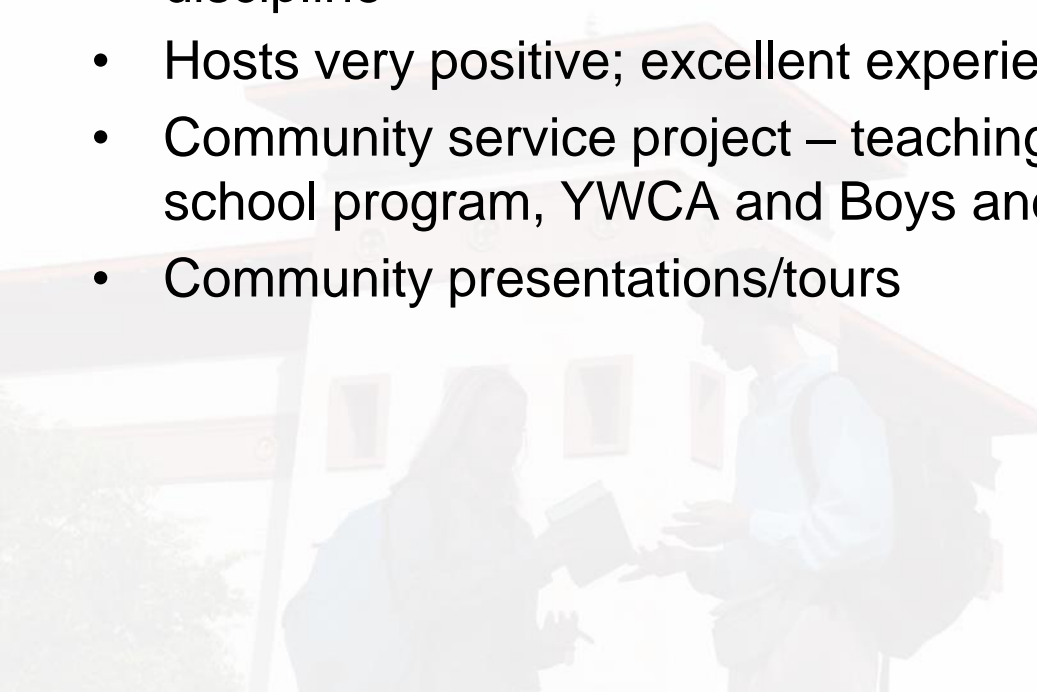


- TCEQ Region 6, El Paso
- U.S. EPA Region 6 Air Quality Division, Dallas
- U.S. EPA Region 6 Border Office, El Paso
- Pan American Health Organization, El Paso
- Freeport McMoran Inc., El Paso
- El Paso Electric
- City of El Paso
- Center for Environmental Resource Management, UTEP
- Department of Public Health, UTEP
- Department of Biology, UTEP
- New Mexico Environmental Division, Las Cruces, NM
- El Paso MPO
- NOAA, Washington, DC
- U.S. Army Fort Bliss, El Paso
- U.S. Army Research Laboratory, White Sands, NM
- U.S. Department of Agriculture, Las Cruces, NM
- Berkeley National Laboratory, Livermore, CA
- US Forest Service, Fort Collins, CO
- New Mexico Climatologist Office, Las Cruces, NM
- Border Health Commission, El Paso

IMPACTS OF INTERNSHIP



- Total of 55 interns
- 96% minority
- 100% continued their studies to graduation
- 10 of the undergraduates have entered graduate school in a STEM discipline
- Hosts very positive; excellent experience, hard working, several hired
- Community service project – teaching the air quality curriculum at after school program, YWCA and Boys and Girls Club
- Community presentations/tours





Field Trip to Region 6 EPA Lab in Houston, TX





QUOTES

“To me, the community outreach was the most important skill I gained in the EPA internship program. I want to be the torch that brings this information to the community.”

- BA-BS Intern

“If I could hire her, I would. She is hard-working, great at working independently, very thorough in her work and very kind. She always asks clarifying questions to make sure she produces research that we need and she works very well in a team. She helped teach others and was always very good at communicating her progress. “

- BA-BS Intern Host

SUMMARY AND CONCLUSIONS



CURRICULUM FOR PUBLIC SCHOOLS

- 10 modules developed for grades 3-12; each includes air quality, environmental health, and environmental justice; developed and tested by teachers themselves, conforming to science standards and EE Standards for Excellence
- 500 teachers trained in EPISD; 600 teachers trained in NM; 25 teachers trained in Clint
- Curriculum implemented in 300 classrooms in El Paso (about 40% of those eligible); and several other local schools
- Curriculum (in English and Spanish) and resource materials on website: BAQed.utep.edu
- Several schools took actions in their community

SUMMARY AND CONCLUSIONS



INTERNS

- 55 students did internships
- Field trips exposed them to air quality professionals, research, regulation, policy
- Community service projects allowed interns to “give back” to their communities; extend knowledge to communities
- Experience with community presentations; for many of the students the experience of community outreach was one of the most significant of their internship
- When asked if community participation aspect of internships helped them to see how knowledge could be applied to everyday life, 100% agreed or strongly agreed.