

# Paso del Norte Collaborative K12 GIS Capacity Building and Research for Environmental Quality Monitoring

Texas-New Mexico-Chihuahua Regional Workgroup



## KEY PROJECT HIGHLIGHTS:

- Enhanced environmental awareness of GIS use in classroom for K-12 educators
- 91 educators trained in GIS Platform
- 91 educators trained to utilize GPS units for hands-on exercises with students
- Workshop video material available on YouTube:
  - [Workshop 1 Part 1;](#)
  - [Workshop 1 Part 2;](#)
  - [Workshop 2 Part 1;](#)
  - [Workshop 2 Part 2;](#)
  - [Workshop 2 Part 3.](#)
  - [Workshop 2 Part 4\)](#)

Today's youth are growing up in a world where more and more technology and distance learning is being utilized and necessary. Because children learn in a variety of ways, teachers are turning to technology as a great way to engage students through visual learning. Geographic Information Systems (GIS) is an effective tool to teach and help students understand real-world local, regional or global issues and build their critical thinking skills to investigate these problems.

The University of Texas at El Paso (UTEP) received a Border 2020 grant to promote environmental literacy and awareness in K-12 schools using Geographic Information System (GIS) for schools in El Paso County, Texas and Dona Ana County, New Mexico. The project focused on training teachers to educate students on inquiry-based learning focusing on environmental issues including air, water quantity and quality issues; point and non-point source pollution of ecosystems, impacts of population increase and urban growth on the environment, and environment-human health interactions. UTEP's Center for Environmental Resource Management (CERM) partnered with the Young Women's STEAM Research & Preparatory Academy and Environmental Systems Research Institute, Inc. (ESRI) to introduce educators on ESRI's partnership with schools. ESRI, at no cost, provides US K-12

schools, school districts and states, the ArcGIS for Schools Bundle (a value of over \$10K). The license provides schools with a GIS web platform, mobile apps, ArcGIS Desktop Advanced and extensions.

UTEP conducted four, 2-day workshops in 2018 (June, August, November, December), two in El Paso, Texas and two in Sunland Park, New Mexico. In total 90 teachers (49 El Paso Independent School District (EPISD), 40 Gadsden ISD) were trained using the ArcGIS platform. Each participant received a GPS unit to keep and use for their own classroom teaching. The aim of the workshops was to get educators familiar with the GIS platform, develop teaching skills and confidence to integrate the use of this technology in their own classroom. UTEP Professor, Dr. Stanley Mubako taught portions of the hands-on assignments using the GPS unit, while ESRI staff, Dr. Joseph Kerski, taught participants via ZOOM Video Conferencing. Dr. Kerski presentations for the first two workshops are available online on YouTube ([Workshop 1 Part 1;](#) [Workshop 1 Part 2;](#) [Workshop 2 Part 1;](#) [Workshop 2 Part 2;](#) [Workshop 2 Part 3;](#) [Workshop 2 Part 4\).](#)



Figure 1. Dr. Joseph Kerski interacting with participants via Zoom during second workshop.

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The workshops included hands on exercises, as well as, interactive material utilizing 28 exercises. Topics focused on both STEM and non-STEM teaching, including investigations in local to global population change and demographics; mapping trees and other local physical objects; natural hazards, weather, climate, and ecoregions; spatial analysis in mapping human health and disease; using, symbolizing, classifying, saving, and sharing web maps; creating multimedia web-based story maps and other web mapping applications.

Through pre and post surveys, 69% - 93% participants had spent less than 2 hours using ArcGIS online prior to taking the workshop. Those that had never used ESRI resources in their classroom ranged from 81% - 96%. After the workshop, 35%- 68% indicated that they would use GIS in the classroom at least once a month, with some (40%) indicating they would be willing to use it up to once a week. Between 40-60% of the participants indicated that they would recommend that their colleagues attend a similar training to understand how GIS could be used in the school setting.



Figure 2. Learning to use the GPS unit and using the app Survey123 for ArcGIS installed on a smartphone for real-time data collection.

Overall, the project successfully completed its goal of enhancing environmental awareness through GIS of K-12 educators in the Paso del Norte Region.



Figure 3. Participants from Workshop 2, August 2018, at Ysleta Middle School in El Paso, Texas.

To learn more if your school has the ArcGIS for School Bundle license or if would like to apply please visit:

<https://www.esri.com/en-us/industries/education/schools/schools-mapping-software-bundle>