



# SLATES: A COLLABORATIVE SERVICE-LEARNING PROGRAM FOR TWO-YEAR AND FOUR-YEAR COLLEGE STUDENTS IN THE EL PASO, TEXAS REGION

Diane Doser(doser@utep.edu), Dept. of Geol. Sci., Univ. Texas at El Paso (UTEP)  
Robert Rohrbaugh and Joshua Villalobos, Geol. Sci., El Paso Community College (EPCC)

## Abstract

SLATES (Service Learning Activities Targeting the Earth Sciences) is a project to diversify service learning opportunities for undergraduates at the Hispanic serving University of Texas at El Paso (UTEP) and El Paso Community College (EPCC). A series of short-term activities (< 10 hrs/semester) were developed to target students in introductory geoscience courses to help increase the number of geoscience majors, as well as long-term (>10 hrs/semester) activities for majors to apply their knowledge and skills outside the classroom. In the first year of SLATES we focused primarily on short-term activities while laying the groundwork for longer-term activities and encouraged students to assist in designing new activities. EPCC students chose to focus on water and sustainability projects, including serving as tour guides for the El Paso Water Utilities' Tech2O Center and desalination facility, and developing lesson plans on El Paso's groundwater for 4th grade students. These activities involved over 170 students (K-14), parents and teachers. Students at UTEP focused on tutoring lower division majors in key classes (e.g. mineralogy, petrology) and K-12 outreach (involving over 40 students). We also offered a variety field trips that highlighted local geology (GeoVentures) for students, family and friends. A total of 242 participants (35% non-science majors) attended or assisted with GeoVentures.

## Motivation:

The overall objectives of SLATES are to use short-term service learning activities to demonstrate how geoscience impacts the local community, increase the number of students who decide to major in the geosciences at UTEP and EPCC, and ease the transfer of students from EPCC to UTEP. Long-term service learning activities will build on this foundation by improving students' soft skills and technical skills in the geosciences. The long- and short-term learning activities will also introduce students to a range of careers in the geosciences.

UTEP and EPCC are both minority serving institutions whose student population (over 80% Hispanic) mirrors our local community. Place based learning and service learning have been shown to increase and retain minority students in the geosciences. Service learning provides our students with culturally relevant context in a community where interpersonal relationships are important motivators. It involves multiple learning styles to appeal to our diverse students and develops higher order thinking skills. Our focus on links between EPCC and UTEP is critical since over 70% of UTEP students take some of their courses, especially introductory courses, at EPCC.

**Partners in Service-Learning Activities:**  
**El Paso Water Utilities (Tech2O Center)**  
**City of El Paso (Rio Bosque Park)**  
**Texas Parks and Wildlife (Franklin Mountains State Park, Hueco Tanks State Park)**  
**El Paso Geological Society**  
**El Paso and Ysleta Independent School Districts**  
**Keystone Heritage Park**

## El Paso Community College Based Activities

### Tech2O Center (El Paso Water Utilities)

One project at EPCC focused on El Paso's water supply and its sustainability. Students visited the El Paso Water Utilities' educational facility, the Tech2O Center, and toured the adjacent desalination plant, with some receiving subsequent training to become tour guides at the facility. In November 2017 two EPCC students developed a short lesson plan and activities they presented to three 4th grade classes at HD Hilly Elementary School (total of 108 students). The lesson served as a prelude to visiting the El Paso Water Utilities' Tech2O center in January 2018. One of the EPCC students assisted parents of the 4th graders in organizing a bake sale to raise the \$150 needed to charter school buses to bring the students and chaperones to the center. Four EPCC students assisted three Tech2O staff in event support and related hands on activities for the 4th grade students.



K-12 students visit Tech2O Center



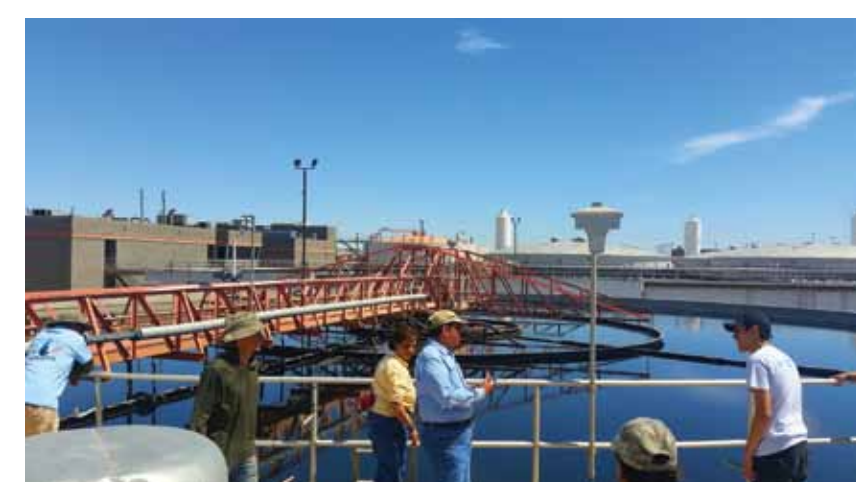
Tour of desalination plant

### Rio Bosque Park/ Bustamante Water Treatment Plant

Forty EPCC students toured the Bustamante water treatment plant and adjacent Rio Bosque Park, a restored wetland that receives water from the treatment plant. EPCC geoscience majors assisted in developing informational handouts for the visits and collected drone video of the wetlands so that attendees received a "birds eye" view of the park.



Bridge at Rio Bosque Park



Wastewater treatment plant tour



Wastewater treatment plant tour

## Tracking/Evaluation:

EPCC sponsors the Tezano passport program, a program for short-term (1-8 hours) service learning projects. This program allows students to participate in a variety of activities to accumulate points toward silver or gold "medallions" that recognize students' service efforts and may be worn at their graduation ceremonies. Service learning activities associated with the Tezano passport program were provided with QR Codes that students scanned to receive credit at the end of the activity.

Feedback from the elementary teachers involved in the visit to the Tech2O Center was very positive, with all expressing the desire to bring another group of students during the 2018-2019 academic year and expanding it to other grade levels.

## University of Texas at El Paso Based Activities

### Peer Tutoring

Students at UTEP expressed an interest in beginning a service learning project to provide tutoring support for geoscience majors, especially majors taking critical sophomore level classes including mineralogy, geoscience processes (fall 2017) and igneous and metamorphic petrology (spring 2018). An initial kick-off meeting of students interested in tutoring with those students who sought tutoring (who immediately voted to call themselves "learnees" rather than "tutees") was held in September 2017. Nine undergraduate juniors and seniors volunteered more than 65 hours of tutoring support in fall 2017. Two students who volunteered for more than 20 hours received certificates of appreciation. Fifteen sophomore and junior "learnees" sought tutoring support in fall 2017. Tutoring was also available in spring 2018, provided by 4 tutors with only 8 "learnees" seeking support, since not as many students' degree plans required the petrology course. Five tutors are currently involved in the fall 2018 tutoring program. Students volunteering as tutors received 1 hour of training prior to beginning their service.

### K-12 Outreach

UTEP students volunteered to assist with visits to local K-12 schools to lead hands-ons in-class activities, judge at science fairs and make presentations at science nights. They also gave tours to students visiting UTEP and were involved in a diverse range of activities including launching weather balloons, stream table and aquifer demonstrations, and adopting "pet rocks". In late spring 2018 we were able to advertise outreach "needs" and track volunteers through the UTEP Center for Civic Engagement's CUE website (see below).



Students examine rock and mineral specimens



Tracking a weather balloon launch

## Tracking/Evaluation:

We have worked with UTEP's Center for Civic Engagement's volunteer tracking system, the CUE (Community-University-Engagement), to develop a special "SLATES" web page where UTEP students can sign up for service learning activities (needs) and we can more easily track volunteer hours. See: [https://utep.galaxydigital.com/agency/detail/?agency\\_id=82706](https://utep.galaxydigital.com/agency/detail/?agency_id=82706) for examples of SLATES "needs" for volunteers. This system has the advantage that we can track any volunteer (UTEP students, EPCC students, alumni, etc.) who participates in an activity. We are planning to eventually use the CUE to track all SLATES participants and their number of volunteer hours. The UTEP Geological Science Department's undergraduate and graduate coordinators are helping us maintain the web pages, publicize and advertise service learning opportunities and help tabulate total hours of service.



## Joint Activities

### GeoVentures

The GeoVentures program is a series of field trips offered for students in introductory and sophomore level courses at EPCC and UTEP and their family and friends. In fall 2017 five field trips were offered with a semester total of 94 participants: 65% were from EPCC, 14% from UTEP, and 21% were non-students. Forty six percent were enrolled in a geology class, but 35% were non-science majors. In the spring 2018 four field trips were offered that attracted a total of 148 students. Thirteen of the students received service learning credit for bringing a friend on the trip, eight received service learning credit for providing logistical support on the day of the field trip and four received service learning credit for serving as assistant leaders on the trip. The use of student volunteers for logistical and leadership support enabled us to increase the maximum number of participants for each trip so that over 50% more students could be accommodated. In fall 2018 we have offered 4 field trips, with two more planned before the end of the semester.



Keystone Heritage Park



Franklin Mts. State Park



Gypsum Cave, Carlsbad Caverns N.P.

### Earth Science Week

UTEP and EPCC host a series hands-on demonstrations and presentations during Earth Science week. UTEP also hosts an Earth Science Saturday open-house that can attract several thousand people. Students from both institutions assist in the open house as tour guides, field trip leaders, facilitators and cooks (a free lunch is provided). Students in introductory geoscience classes often receive extra credit for attending the event. Geoscience and environmental science majors may also receive credit as volunteers.



One of the many Earth Science Saturday activities



Preparing for Earth Science Saturday

## Future Plans:

UTEP will offer a 1-credit course in "Service-Learning in the Geosciences" during the spring 2019 semester. Students will be expected to complete a minimum of 20 hours of service. Two class sessions at the beginning of the semester will introduce students to the concepts and benefits of service learning. At the end of the semester two class sessions will be held to "report out" about experiences and allow for reflection on the service learning experience. EPCC plans to offer a similar class during the 2019-2020 academic year.

### Acknowledgements

This research is supported through grant 1700772 *GP-Impact: Service Learning Activities Targeting the Earth Sciences (SLATES)* from the National Science Foundation.