

FINAL REPORT

**EcoTeacho:
Eco-Action Adventures in the Galveston Bay Watershed**

TCEQ Contract No. 582-8-77802

April 2008-January 2010

**Prepared for:
Galveston Bay Estuary Program
17041 El Camino Read, Ste. 210
Houston, TX 77058**

**Prepared by:
Lawrence Spence
Crockett Elementary
2112 Crockett Street
Houston, TX 77007**

TABLE OF CONTENTS

Final Report

EcoTeacho: Eco-Action Adventures in the Galveston Bay Watershed

Executive Summary.....3

Introduction.....4

Program Methods.....7

Program Results.....12

Project Conclusions and Lessons Learned.....18

EXECUTIVE SUMMARY

The EcoTeacho: Eco-Action Adventures in the Lower Galveston Bay Watershed program provides innovative, engaging opportunities for under-served youth, their parents and teachers in Houston's inner-city neighborhoods focusing on watershed awareness, non-point source pollution prevention, local environmental issues, native flora and fauna, conservation, preservation, recreation, community activism and environmental stewardship in the Lower Galveston Bay watershed.

The EcoTeacho program began serving the Houston community in 2004 from Crockett Elementary in Houston Independent School District with the aid of campus support, fund-raising, small grants volunteers and in-kind donations. The target audience are at-risk and minority students

The grant agreement between Houston Independent School District and the Texas Commission on Environmental Quality was executed on April, 11th, 2008 and allowed for \$27,900.00 in expenditures for nearly 22 months until the grant period ended on January 31st, 2010.

Within that time period, the EcoTeacho program educated and activated youth participants, their parents and teachers as stewards and stake-holders in the Lower Galveston Bay watershed and ecosystem via:

- (38) Field classes to area environmental education venues
- (3) Wetland/riparian habitat restoration events
- (2) Community-action activities
- Weekly after-school environmental education club
- A four-day, over-night environmental camp for 5th grade students
- (3) Family Environmental Education events
- (9) Students and (2) teachers attend State of the Bay Symposium
- (3) Professional development trainings for educators
- Environmental Education conference for over 300 attendees
- Litter collected, trees, marsh grass, seeds planted

Since April of 2008, EcoTeacho has served over 1500 inner-city, under-served, at-risk, minority students, 150 of their parents and 400 educators. It has cultivated partnerships with school districts, universities, non-profits, city, county and state agencies in an effort to create more opportunities for inner-city youth, their families and teachers to get outdoors, learn about local environmental issues and develop a stewardship ethic for both their man-made and natural communities.

INTRODUCTION

This report serves to document the outcome of the award of grant funding for the period of April 2008 to January 2010 from Galveston Bay Estuary Program to EcoTeacho: Eco-Action in the Galveston Bay Watershed program (hence forth referred to as EcoTeacho) based at Crockett Elementary, Houston ISD.

The grant agreement between Houston Independent School District and the Texas Commission on Environmental Quality was executed on April, 11th, 2008 and allowed for \$27,900.00 in expenditures for nearly 22 months until the grant period ended on January 31st, 2010.

EcoTeacho serves the purpose of providing innovative, engaging opportunities for at-risk, under-served, minority youth, their parents and teachers in Houston's inner-city neighborhoods focusing on environmental issues related to the Galveston Bay Estuary.

The term "at-risk" is applied to students from a low-economic demographic that are at risk of dropping-out of school before they graduate with a high school diploma. The term "under-served" refers to those students residing in communities that might not otherwise experience the activities facilitated by EcoTeacho due to challenges such as low income, poor mobility, lack of interest by parents and/or lack of time due to over-worked parents trying to make ends meet. The term "minority" refers to the students ethnicity. The majority of the students served by the EcoTeacho program are Hispanic. The term "inner-city" refers to the geographic area where the student resides. The predominant number of students served in the EcoTeacho program attend schools located within the 610 Loop of Houston, a densely populated area of town closest to the Downtown area.

EcoTeacho began in 2001 as the Kids on the Bayou program, an environmental education outreach program of Houston's Bayou Preservation Association. It was developed and incorporated in 2003 as a component of Kids Environmental Education Projects or KEEP. In 2005, EcoTeacho grew out of KEEP and focused resources on Crockett Elementary, Houston ISD, the University of Houston-Downtown as well as the surrounding schools in the Reagan High School feeder-pattern of HISD.

EcoTeacho coordinates and facilitates environmental education programs in topics including:

- watershed awareness
- non-point source pollution prevention
- local environmental issues
- native flora and fauna
- conservation, preservation, recreation
- community activism and environmental stewardship

The EcoTeacho program delivers these topics utilizing the following program vehicles:

- Field classes to area environmental education venues and natural places
- Participation in native habitat conservation projects
- Wetland/riparian habitat restoration events (e.g. Marsh Mania)
- Community action activities (e.g. Trash Bash)
- Water-quality monitoring on Buffalo and White Oak Bayous, the Houston Ship Channel and Trinity River
- After-school Watershed clubs that educate and engage participants in watershed activities
- Family Environmental Education events
- Field class to 2009 State of the Bay Symposium
- Professional development training opportunities for educators in environmental education curriculum

MAJOR OBJECTIVES

The following represent the objectives stated in the grant agreement:

- 6.1. Educate and enrich at least four hundred (400) students, thirty (30) educators and (30) parents through environmental education field classes during the school day over the project term.
- 6.2. Educate and enrich at least one hundred twenty (120) students, ten (10) educators and (10) parents through all-day environmental education field classes taking place on weekends and school days over the project term.
- 6.3. Activate as environmental stewards at least eighty (80) students, ten (10) educators and ten (10) parents through conservation, restoration, storm drain-marking and de-littering events over the project term.

- 6.4. Educate and inspire at least twenty (20) students per long semester and ten (10) students per summer term through intensive environmental education programs in the after-school program, for a total of at seventy (70) students served over the full project term.
- 6.5. Educate and enrich at least twenty-five (25) families per year through the Family Environmental Education events.
- 6.6. Train and inspire at least twenty (20) teachers and school administrators through environmental education curriculum professional development, including components in aquatic habitats, watersheds, non-point source pollution, water conservation and Galveston Bay, over the project term.
- 6.7. In order to gauge whether learning is taking place on the field classes, knowledge and conservation attitude assessments will be administered before the majority of field classes and then again following the class. The attitude assessments are to be conducted to further assess if participants gain a greater community appreciation for the environment, how they feel about volunteering in the community, the likelihood that they would volunteer again and if they gained a sense of stewardship for the environment and community of which they are apart. Additional attitude survey points will be developed upon consultation with the National Wildlife Federation, an EcoTeacho program partner, which has experience using attitude surveys for environmental education activities.
- 6.8. Results from the assessments will be compiled and analyzed in order to determine if modifications need to be made to program activities. As the program develops, HISD anticipates discovering innovative ways to measure the program.

PROGRAM METHODS

During the 22 month funding period, the EcoTeacho program educated and activated youth participants, their parents and teachers as stewards and stake-holders in the Lower Galveston Bay watershed and ecosystem via:

- (38) Field classes to area environmental education venues
- (3) Wetland/riparian habitat restoration events
- (2) Community-action projects
- Weekly after-school environmental education club
- A four-day, over-night environmental camp for 5th grade students
- (3) Family Environmental Education events
- (9) Students and (2) teachers attending State of the Bay Symposium
- (3) Professional development trainings for educators
- Environmental Education conference for over 300 attendees
- Litter collected, trees, marsh grass, seeds planted

For the duration of the grant period, EcoTeacho served students, parents, families and teachers through the following institutions:

- Crockett Elementary, Houston ISD
- Harvard Elementary, Houston ISD
- Atherton Elementary, Houston ISD
- Piney Point Elementary, Houston ISD
- Crawford Elementary, Houston ISD
- Cornelius Elementary, Houston ISD
- West Briar Middle School, Houston ISD
- Hogg Middle School, Houston ISD
- Marshall Middle School, Houston ISD
- Reagan High School, Houston ISD
- Westside High School, Houston ISD
- The British School, Houston
- YES Prep Public School
- The University of Houston-Downtown

Field Classes

For the duration of the grant period, approximately all 400 students in grade-levels Pre-kindergarten through 5th at Crockett Elementary were served with at least one field class during each semester. In all, over 550 students, 150 parents and 45 teachers from the aforementioned institutions participated in EcoTeacho sponsored field classes.

The purpose of the field class is to take students out of the classroom, off-campus, usually into an outdoor and natural setting and engage the students in hands-on, physical activities.

The field class provides an additional opportunity to reinforce subjects taught in the classroom through exploration of a “living laboratory”.

Field classes also provide students with much needed exercise, play, sunshine and fresh air in a stimulating environment. The topic of each field class revolved around the core-subjects of the EcoTeacho program:

- watershed awareness
- non-point source pollution prevention
- local environmental issues (air, water, food, transportation, energy)
- native flora and fauna
- conservation, preservation
- recreation
- community activism
- environmental stewardship

Field classes took place at the following venues:

- White Oak Bayou at Stude Park, Houston
- Downtown Aquarium and Buffalo Bayou, Houston
- Texas City Prairie Preserve
- Port of Houston/Buffalo Bayou, Houston
- Houston Museum of Natural Science
- Houston City Hall
- Oates Road Landfill and Material Recovery (Recycling) Facility, Houston
- Sea Center Texas, Lake Jackson
- Tinsley Park/Buffalo Bayou, Houston
- Edith L. Moore (Audubon) Nature Sanctuary, Houston
- Little Thicket Park (White Oak Bayou), Houston
- Jesse Jones Park and Nature Center, Houston
- Trinity River, Delta/Estuary, Anahuac, TX
- Sheldon Lake State Park
- State of the Bayou Symposium, Galveston
- Houston Arboretum and Nature Center
- Galveston Island State Park, Galveston, TX
- University of Houston-Downtown/Buffalo Bayou
- Camp Olympia/Camp Cullen, Lake Livingston, Trinity , TX

Restoration and Community-Action Projects

EcoTeacho either facilitated and organized projects or coordinated and sponsored students, parents and teachers to attend 5 restoration and community-action projects during the grant period. Over 180 students, 28 parents and 21 teachers participated in these events, 229 in all.

The restoration and community-action projects include:

- Two Marsh Mania events (5/31/08, 4/25/09) where 64 participants from Crockett Elementary, Bush Elementary, West Briar Middle School, Hogg Middle School, Marshall Middle School and Reagan High School removed hurricane debris from coastal estuaries at the Texas City Prairie Preserve and planted hundreds of marsh grass plugs
- Trash Bash at Little Thicket Park, Houston where 55 participants from Crockett Elementary and Hogg Middle School removed over 50 bags litter in the park and along the White Oak Bayou tributary as well as removed invasive plant species
- The First Ward Clean-up, Houston where over 80 participants from Crockett Elementary, Hogg Middle School and YES Prep Public School removed 90 bags of litter from the community, of which 35 were recycled and 10 were composted
- Birds and Bats on the Bayou, University of Houston-Downtown habitat restoration project where 29 university volunteers removed litter, hurricane debris, trimmed trees, chipped limbs, removed invasive plant species, sewed 40 lbs of native wildflower seed and constructed 2 compost bins.

Weekly Environmental Club Meetings

During the grant period, a weekly environmental club meeting took place nearly each week after school at Crockett Elementary. The club met at least one day a week and attendance ranged from 4 to 20+ as it competed with other after-school program activities. Environmental Club activities include:

- Aquatic animal/plant studies in school-yard pond
- Terrestrial animal/plant studies in school-yard habitat
- Maintenance of school-yard pond and habitat
- Maintenance/additions to school-yard garden, orchard, compost and rain catchment system
- Games, exercise
- Writing, drawing, painting with environmental/ecology themes
- Videos on watersheds, environmental issues, local flora/fauna

Family Environmental Education Events

EcoTeacho supported or facilitated 2 environmental education events aimed at including the entire family.

One event took place at Harvard Elementary's annual science night where EcoTeacho's WatershEducation exhibit was one of over 25 other science education exhibits. Over 75 families attended this popular event.

EcoTeacho also supported a community environmental event dubbed "The WAVE Eco-Fair" at Spott's Park in Houston on March 7th. Hundreds of people including families attended this all day festival. EcoTeacho provided the WatershEducation exhibit for attendees to explore and learn.

Additionally, EcoTeacho coordinated the Science Fair Family Fun Day at Crockett Elementary that included many exhibits and activities for families to explore including topics such as renewable energy, making terrariums, aquatic microscopy, making rockets, making birds feeders and recycled art projects. Over 30 families attended this event.

State of the Bayou Symposium 2009

EcoTeacho sponsored two teachers and nine students from Westside High School environmental science program to attend the 2009 Symposium. The students and one teacher attended one whole day of the 2-day event. The other teacher attended both days as well as presented in Public Participation and Education (PPE) track break-out session on the topic of environmental education/stewardship.

Professional Development

EcoTeacho sponsored and facilitated professional development from educators during the grant period. They include:

HUNCON: University of Houston-Downtown, February 21st, 2009 a STEM conference for educators. EcoTeacho presented to 21 attendees on the Buffalo Bayou watershed, it's hydrology, pollution sources, confluence with the Port and Bay history, threats, conservations measures, flora and fauna. A boat tour of the bayou followed the presentation.

American Red Cross Wilderness First Aid Basics, Huntsville, TX: EcoTeacho sponsored one teacher to attend this 2-day training course.

Gulf Coast Green: Sustainable Community Development Conference, April 16th-14th, 2009, Houston, TX. EcoTeacho sponsored 2 teachers to attend this conference.

Houston Arboretum and Nature Center (1-4-10), 16 teachers from Crockett Elementary, HISD attended a 1-day workshop at the Arboretum focusing on

using the outdoors for science education, local flora and fauna content/identification, keeping animals in the classroom, using the school-yard habitat, self-guiding a field class for one's own class at the Arboretum.

The Third Annual Houston Environmental Education Summit, University of Houston Downtown (1-23-10), over 300 educators convened for a full-day conference that included key-note addresses, workshops, hands-on activities, exhibits, networking and tours. Topics included development of school-yard habitats, environmental education curriculum, rain gardens, rainwater harvesting, field classes to area environmental education venues, gardening, composting and recycling.

PROGRAM RESULTS

In comparison with the stated grant program “Major Objectives” listed below, EcoTeacho has met and exceeded the goals for outreach and education with exception to Objectives 6.13 and 6.14 which are discussed in the Conclusion and Lessons Learned section below.

ARTICLE 1. PROJECT

In accordance with the goals and objectives of *The Galveston Bay Plan*, TCEQ and TCEQ’s Galveston Bay Estuary Program agree to participate with the Houston Independent School District (HISD) in the completion of the project described in Articles 5 and 6 of this Schedule of Grant Activities, for the purpose of providing innovative, engaging opportunities for under-served youth, their parents and teachers in Houston’s inner-city neighborhoods focusing on environmental issues related to the Galveston Bay Estuary.

ARTICLE 6. MAJOR OBJECTIVES

- 6.1. Educate and enrich at least four hundred (400) students, thirty (30) educators and (30) parents through environmental education field classes during the school day over the project term.

Objective 6.1 Met and Exceeded: EcoTeacho served over 1500 inner-city, under-served, at-risk, minority students. Over 175 parents and 75 educators have participated in field classes both during the school day, over-night, during the summer and on weekends.

- 6.2. Educate and enrich at least one hundred twenty (120) students, ten (10) educators and (10) parents through all-day environmental education field classes taking place on weekends and school days over the project term.

Objective 6.2 Met and Exceeded: EcoTeacho served over 1500 inner-city, under-served, at-risk, minority students. Over 175 parents and 75 educators have participated in field classes both during the school day, over-night, during the summer and on weekends.

- 6.9. Activate as environmental stewards at least eighty (80) students, ten (10) educators and ten (10) parents through conservation, restoration, storm drain-marking and de-littering events over the project term.

Objective 6.2 Met and Exceeded: EcoTeacho served over 180 inner-city, under-served, at-risk, minority students as well as over 28 parents and 21 educators through coordination/facilitation at two Marsh Mania events, one Trash Bash event, one First Ward Clean-up event and one Birds and Bats on the Bayou event.

- 6.10. Educate and inspire at least twenty (20) students per long semester and ten (10) students per summer term through intensive environmental education programs in the after-school program, for a total of at seventy (70) students served over the full project term.

Objective 6.10 Met and Exceeded: EcoTeacho served over 20 students per long semester with after-school environmental education programs at Crockett Elementary. Over 50 students were served in summer school-based environmental education programs at Crockett Elementary.

- 6.11. Educate and enrich at least twenty-five (25) families per year through the Family Environmental Education events.

Objective 6.11 Met and Exceeded: EcoTeacho served over 100 families combined at Harvard Elementary Annual Science Night , Crockett Elementary Science Fair Family Fun event and the WAVE Eco-Fair at Spott's Park .

- 6.12. Train and inspire at least twenty (20) teachers and school administrators through environmental education curriculum professional development, including components in aquatic habitats, watersheds, non-point source pollution, water conservation and Galveston Bay, over the project term.

Objective 6.12 Met and Exceeded: EcoTeacho coordinated and facilitated professional development opportunities that served over 400 educators and provided continuing education credits. Most notably was sponsorship of the 2010 3rd Annual Houston Environmental Education Summit where over 300 environmental educators attended.

- 6.13. In order to gauge whether learning is taking place on the field classes, knowledge and conservation attitude assessments will be administered before the majority of field classes and then again following the class. The attitude assessments are to be conducted to further assess if participants gain a greater community appreciation for the environment, how they feel about volunteering in the community, the likelihood that they would volunteer again and if they gained a sense of stewardship for the environment and community of which they are apart. Additional attitude survey points will be developed upon consultation with the National Wildlife Federation, an EcoTeacho program partner, which has experience using attitude surveys for environmental education activities.

Objective 6.13 Did Not Meet Our Own Expectation for this Objective: The EcoTeacho program did administer pre/post activity environmental attitude surveys to 300 participants. The surveys were compiled and analyzed by Texas State University who was referred to us by National Wildlife Federation. EcoTeacho also administered pre/post content knowledge assessments to 50 participants. More details of these surveys and the challenges of utilizing them is discussed below in the Conclusion and Lessons Learned section of this final report.

- 6.14. Results from the assessments will be compiled and analyzed in order to determine if modifications need to be made to program activities. As the program develops, HISD anticipates discovering innovative ways to measure the program.

Objective 6.14 Met: The EcoTeacho program did utilize the results from the attitude surveys and content assessments to help guide program activities.

Since April of 2008, EcoTeacho has served approximately 1500 inner-city, under-served, at-risk, minority students. Of those, 300 fifth-grade HISD students attended a week-long environmental education camp in Trinity, TX located on Lake Livingston: Camp Olympia and Camp Cullen. Over 150 parents have participated in activities ranging from field classes, to restoration events to family environmental education events. Over 400 educators have participated throughout the program in all activities coordinated including over 350 receiving professional development credit.

EcoTeacho has strengthened and cultivated partnerships with the following groups:

- 14 schools
- the University of Houston-Downtown (UHD)
- UHD Environmental Club
- Texas State University
- Local environmental non-profit organizations
- City of Houston Parks and Recreation Department

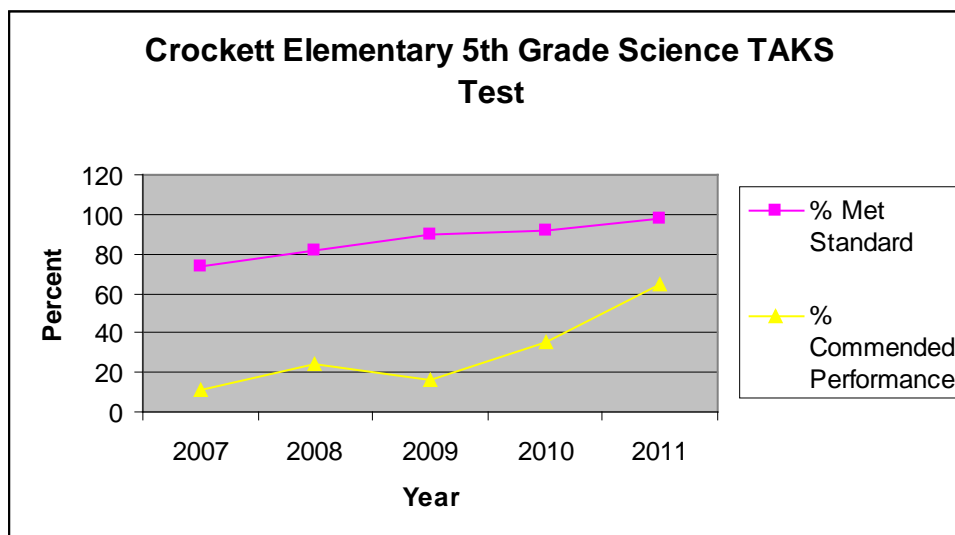
As part of the EcoTeacho program, some participants were administered pre-tests and post tests to assess whether they gained content knowledge during their experience. Other participants were assessed for any changes in their attitude towards the environment which was measured using surveys.

The results of both the testing and surveys assisted us in determining the effectiveness of our programs as well as directing focus of future activities. The pre-testing and post-testing took place on field classes conducted on the Trinity River, Delta and Estuary with Water-borne Education Center. The assessment tool utilized was a twenty-question, multiple-choice test that included questions on estuaries, watersheds, river hydrology, animals, plants and invasive species.

Fifth-grade students from Crockett Elementary were quizzed as we departed on our field class and then again upon returning. Analysis of the data demonstrates a 20% gain in knowledge of content.

Another measurement of the affect of the EcoTeacho program on increasing knowledge of science content is revealed in fifth-grade TAKS Science test results from students at Crockett Elementary between 2007 and 2011.

The EcoTeacho program was funded by GBEP in April 2008 whereby activities began immediately and commenced through January 2010. The chart below shows TAKS Science scores for 5th graders between 2007 and 2011 where a steady increase is observed.



We acknowledge that this is not a truly scientific test of whether the EcoTeacho program has a direct affect on 5th grade TAKS Science Test scores. We did not set-up proper experimental design, isolate proper variables or identify a control group. That was not the focus of the EcoTeacho program, nor was it a true deliverable goal of the program. However, considering that all 400 students at Crockett elementary from PreK to 5th grade were served by the program to greater and lesser degrees throughout the year from April 2008 to January 2010, it is interesting to note the increase in test scores even though we did not set-out to prove a direct correlation.

However, we did embark on some scientific study of our program in cooperation with Texas State University.

Several of our participant groups were surveyed before and after EcoTeacho sponsored activities to determine their perception of the environment before and after participation.

The survey tool utilized was developed and assessed by Professor Tina Marie (Waliczek) Cade, Professor of Horticulture, Department of Agriculture, Texas State University, San Marcos, TX 78666. She can be reached at 512.245.3324 or by email at tc10@txstate.edu.

The survey was designed to assess two perceptions of participants before and after participation. One perception is the participants over-all attitude towards the environment, environmental issues/challenges and possible solutions. The other measured perception is termed the "locus of control". That is, whether the participant feels/believes he or she has some power or ability to apply solutions to environmental issues/challenges.

A group of 30+ students at Westside High School, Houston ISD, participated in an all-day field class to Galveston Island State Park where they hiked, identified native species and explored. They also rode on a boat in West Bay where they viewed birds and dolphins. They were administered the pre/post environmental attitude assessment. The results are below in Professor Cade's synopsis.

Also assessed with the same survey tool where 260 fifth grade students from 4 HISD elementary schools attending a 4-day/3-night environmental science camp on Lake Livingston. This camp, operated by Houston ISD, serves only 5th grade students and immerses them in a natural-setting, away from home and the city, where they participate in science and recreation activities all day. They too were administered the pre/post environmental attitude assessment of which the results are below in Dr. Cade's synopsis.

The following is brief conclusion of the data assessed by Professor Cade:

"High school data was run separately and no statistically significant differences were found in comparisons of the pre and post-test scores on either scale. However, the means were higher in both instruments on the post-test when compared to the pre-tests, so this is probably due to the very limited sample size of high school kids.

Elementary school data was run separately and again statistically significant differences were found from the pre-test to the post-tests on both environmental attitude and environmental locus of control scores with post-test scores being more positive.

The high school and elementary school data was combined for paired t-test analyses (used when doing pre and post test).

Statistically significant differences from the pre and post-tests were found on both the environmental attitude (feel more positively about the environment) and locus of control (measures whether they personally could make a difference, sense of empowerment) scores with post-test scores being more positive for the overall combined groups." (Cade, 2010)

According to her analysis, all the groups data combined showed a statistically significant difference" between the pre-test and post-test was detected on both the environmental attitude and locus of control portions of the test. This means that the students' attitude towards the environment and perception of empowerment to change things around them increased over the course of the activities.

CONCLUSION and LESSONS LEARNED

One of the goals of the program was to administer knowledge and attitude surveys throughout the program. This became much more challenging than had been previously anticipated. One of the challenges was in the development of effective survey tools for attitude. We originally envisioned creating our own attitude surveys. We learned that doing so is quite complicated to create an effective measurement tool. Therefore, we fell-back on using one already established. We also learned that assessing the surveys was quite an arduous task and one that we had not budgeted into our funding projections. The majority of our personnel funding was budgeted to coordination, facilitation and implementation of EcoTeacho activities. In the future, we would budget time to develop, implement and compile results from the surveys.

A partnership with Texas State University in San Marcos developed during the grant period. We utilized an attitude survey developed by them to gauge the effect of environmental education on our participants. As an in-kind donation to the program, they provided the people-power to compile the results of the attitude surveys as well as the expertise and computer programs to analyze the data. Without their assistance, we would not have realistically been able to analyze the results of the surveys.

Assessing the knowledge of our students in an objective manner was also more difficult than we had previously anticipated. We soon realized that attempting to develop multiple assessments on varying subjects was not practical nor accurate in detecting retention of science topics taught through the EcoTeacho program activities. We variety of education venues visited was broad. Each venue had a unique focus on the science content offered. Ideally, each education venue could develop and administer their own pre/post content knowledge assessment. This was made available through Water-borne Education Center in Anahuac, TX.

They have developed their own content-specific pre/post-trip assessment that focuses on the information taught on one of their educational cruises. One of our groups did participate in this assessment and did demonstrate a gain in content.

After the grant program began, we realized that it would require a great amount of people-power to develop separate instruments for each educational venue. Like the surveys, we had not budgeted properly for this aspect. Instead, we reported the gains on a standardized test, the 5th Grade TAKS Science test, by the students of Crockett Elementary who participated in the majority of the EcoTeacho program activities.

One thing realized in relation to successful assessment is that in future programs, it would be wise to use the results of standardized tests such as TAKS Science and Stanford 10 Science section to gauge part of the effectiveness of an intensive environmental education program such as EcoTeacho. To do so takes some initial organizing with campus-based administrators to secure support and access to standardized test results before, during and after the program treatment phase. Additionally, it would be useful to coordinate the participation of academics in universities to assist in compiling and analyzing the test results. They have access to graduate students to assist, the latest research as well as the latest analytical software. To do this, it would be appropriate to seek parental permission to make scores available to researchers outside of the school district. While such a more complex and thorough research plan would yield more useful and precise results, it would take much more planning and organization prior to implementation of a treatment program such as EcoTeacho.

Even though anecdotally, we know that environmental education programs that serve any youth, especially minority, under-served, at-risk populations, is extreme helpful in improving attitudes, sense of empowerment, content knowledge and over-all social health, many find it necessary to "prove" these results in order to justify the expense of funding environmental education programs. Therefore, in order to satisfy those funders that require the "proof" some of the lessons learned by managing this education program will aid in developing an assessment regime that can produce such "proof" of results in future environmental education programs.

Thank you for intrusting the EcoTeacho program with the tax-payers funds to support environmental education. The funding improved natural habitats, urban communities, urban parks as well as served over 2000 citizens of by providing them access to the natural capital and price-less value of protecting and conserving the Lower Galveston Bayou Watershed.