EDUCATION MARKET ANALYSIS REPORT

Mission-Aransas National Estuarine Research Reserve

Report Submitted by:

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National Oceanic and Atmospheric Administration

National Estuarine Research Reserve System

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EXECUTIVE SUMMARY

There is a considerable amount of overlap in the counties served by the Mission-Aransas National Estuarine Research Reserve's (Reserve) education program and those served by other informal educators in the areas adjacent to the Reserve. Due to this overlap, it is important that local education providers collaborate with each other to improve environmental and estuarine literacy. The Reserve conducted a Market Analysis of informal education providers within the Reserve's nine watershed counties and one adjacent county, from March 2011 through February 2012. The goal of the Market Analysis was to gain knowledge about current programs and apply that knowledge to the development of Reserve education programs that complement existing programs and avoid unnecessary duplication.

The Reserve's Education Advisory Committee and Education Coordinator worked together to develop the Market Analysis survey instrument. The survey questions were designed to gather information on the respondents' K-12 education, community education, and teacher professional development offerings. The Market Analysis survey link was emailed to 37 informal educators and completed by 20 respondents, yielding a return response rate of 54%.

Some findings from this Market Analysis have already been applied to expand and improve K-12 student field experiences and community education programs. These applications include collaborating with partners to develop a Teacher Resource Guide for seven sites, including the Reserve's Bay Education Center, and developing a series of guided nature hikes to be offered at Reserve and partner sites. Other Market Analysis findings will be applied to implement a *Teachers on the Estuary* professional development training at the Reserve in the near future.

ACKNOWLEDGEMENTS

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INTRODUCTION

The Mission-Aransas National Estuarine Research Reserve (Reserve) conducted a Market Analysis of informal education providers in the nine counties that make up part of the Reserve's watershed and one adjacent county. The Market Analysis survey was posted online from March 2011 through February 2012. The goal of this Market Analysis was to gain knowledge about current programs and apply that knowledge to the development of Reserve education programs that complement existing programs and avoid unnecessary duplication. The primary objectives of the Market Analysis were to identify similarities and gaps in K-12 education, community education, and teacher professional development programs offered by the surveyed organizations. This report presents the findings of the Market Analysis and the applications of these findings to Reserve education programs.

Background

The Reserve encompasses approximately 185,708 acres in the southern coastal region of Texas. Designated in 2006, the Reserve is administered by the University of Texas Marine Science Institute (Institute) in Port Aransas. At the time of designation, the Institute's educational outreach program, Marine Education Services (MES), had offered K-12, adult, and community education programs for 32 years. The designation of the Reserve has enabled MES and Reserve staff to expand upon existing programs and offer additional opportunities. Reserve staff currently conduct K-12 and / or community education programs at several sites within the Reserve, including the Bay Education Center and Goose Island State Park in Rockport, the Wetlands Education Center in Port Aransas, and Fennessey Ranch in Refugio County. K-12 and community education offerings include inquiry-based field experiences, guided wetlands tours, *Science on a Sphere*© programs, and professional development trainings for teachers.

Future education plans include the expansion of the existing visitor center at the Institute to include an Estuarium. The Estuarium will allow the general public and K-12 students to explore the economic and ecological importance of estuaries and learn how estuarine organisms adapt and change as they transition from the ocean to the river. Knowledge gained from this Market Analysis will help guide the design of the Estuarium and direct the development of K-12 education, community education, and professional development programs as they continue to evolve and expand.

METHODS

This Market Analysis primarily targeted organizations that offer K-12 and community education programs within the nine counties that are part of the Reserve's watershed. The nine watershed counties are Aransas, Bee, Calhoun, Goliad, Karnes, Live Oak, Nueces, Refugio, and San Patricio (Figure 1). Organizations within these counties were targeted because of their potential to educate people who live in or near the Reserve's watershed. Residents of these counties live in or near areas that drain into the Mission-Aransas Estuary, so it is important that they understand the ecological and economic functions of estuaries and how their individual actions can impact the Estuary. One organization from Matagorda County was included in this Market Analysis because of its relatively close proximity to the Reserve and its focus on marine science education. Matagorda County lies adjacent to Calhoun County, located at the northeastern border of the Reserve.

Figure 1. **Map showing the Mission-Aransas Reserve's Watershed**
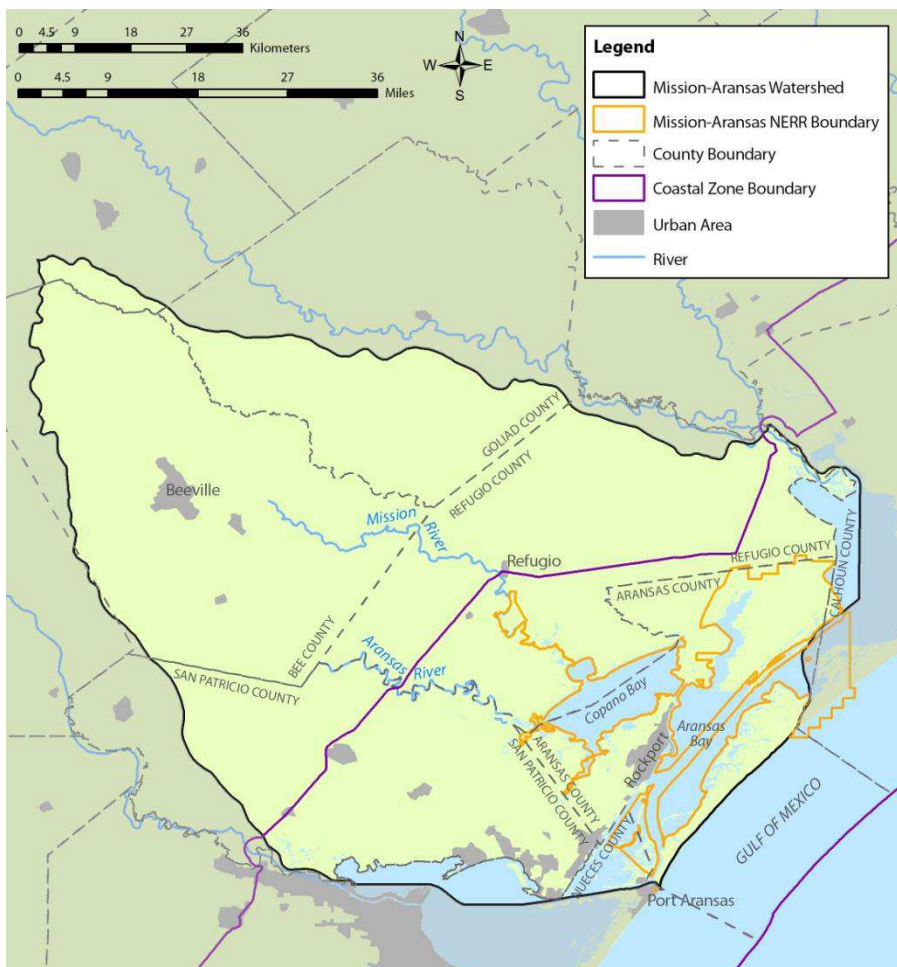
The surveyed organizations included state parks, museums, aquariums, universities, science and nature centers, and other informal education providers. Educators were identified through consultation with the Reserve's Education Advisory Committee and through listings posted on the Coastal Bend Informal Educators Online Resource (2012). Organizations that participated in this Market Analysis are listed in Appendix A.

The Market Analysis survey instrument was developed by the Reserve Education Coordinator in consultation with the Reserve's Education Advisory Committee. The survey questions were designed to reflect local needs that were identified by the Reserve Education Advisory Committee and to collect data required by the National Estuarine Research Reserve System (NERRS). The collected data included information on K-12 education, community education, and professional development programs offered by the surveyed organizations.

The survey was published via the web-based survey tool, *SurveyMonkey*[©] and the survey link was emailed directly to educators on March 11, 2011. Educators who were known to be active, but had not yet filled out the Market Analysis, were invited to participate a second time in February 2012. All data collected in the Market Analysis survey were downloaded from *SurveyMonkey*[©] to a Microsoft Excel spreadsheet and numerical results were calculated using Microsoft Excel functions. The Market Analysis survey instrument is provided in Appendix B.

RESULTS

Educators representing 37 organizations were invited to participate in this Market Analysis. The online survey was completed by 20 respondents, yielding a response return rate of 54%. The results presented below include descriptive and graphical summaries of numerical data and open-ended responses that could not be summarized graphically. Numerical responses are presented as percentages of respondents who selected a particular category. The percentages do not sum to 100 in cases where respondents were asked to select all answers that applied to their organization's education offerings.

K-12 Education Programs

The highest percentage of respondents (35%) represented *non-profit organizations* such as museums, nature centers, and private foundations (Figure 2). *Educational institutions*, primarily universities, and *state governmental agencies*, primarily State Parks, were the second and third highest represented organizations, respectively. Three of the 20 respondents represented a *federal governmental agency* and two represented a *municipal agency or department*. Only one of the surveyed organizations, Texas Sea Grant, was associated with the National Oceanic and Atmospheric Administration. There were no representatives of a *for profit business* who participated in this Market Analysis.

Figure 2. **Classification of Surveyed Organizations**
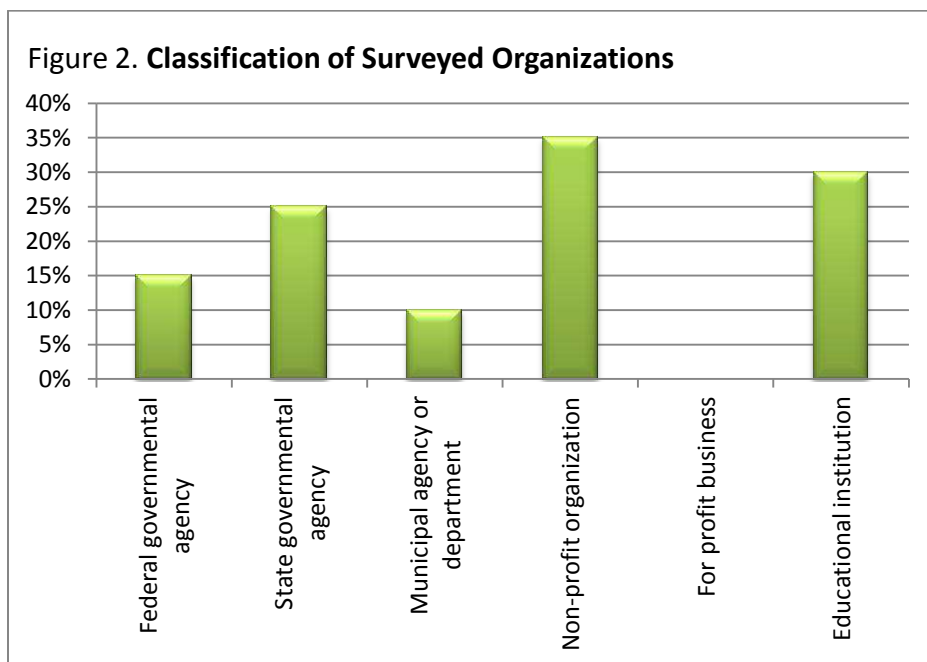
The highest percentage of respondents (55%) indicated that *program fees* were the primary source of funding for their education programs (Figure 3). *State funds* were of secondary importance and *grants from non-profits* were equal to *visitor donations* as the third highest funding source. Open-ended responses for funding sources included "private donations," "friends group," "admissions, gift shop sales, memberships, fundraisers," and "our local school district partly funds our program."

Figure 3. **Program Funding Sources**
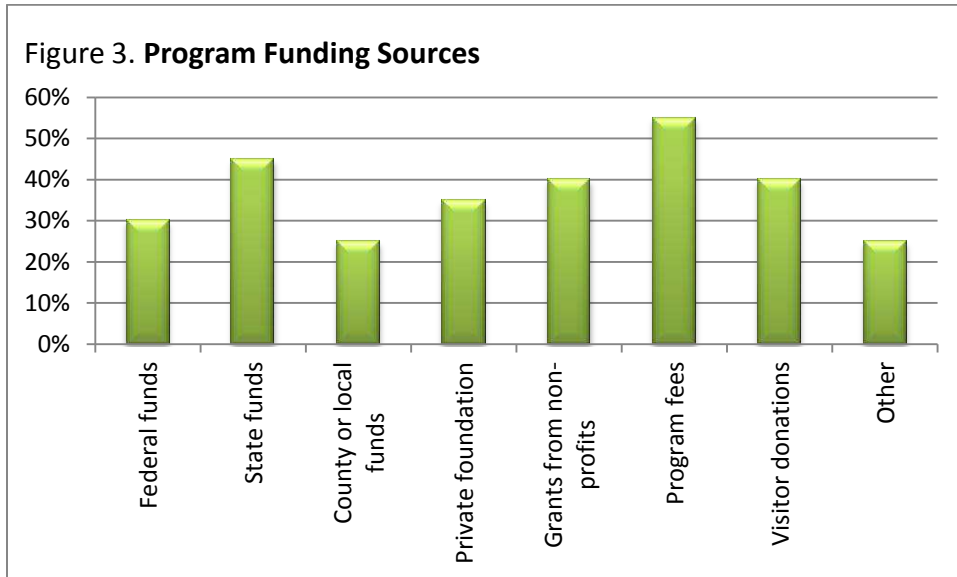
The numbers of paid education staff employed by the surveyed organizations ranged from one to ten, with two paid staff representing the average. Forty-two percent of the respondents indicated that they had only one paid educator on staff (themselves), but eighty percent of respondents indicated that volunteers assisted with education programs at their sites. Open-ended responses concerning the nature of volunteer involvement included:

- "as needed for safety and content delivered"
- "Aquateens help with our Sea Camp program in the summer"
- "We use volunteers for both grounds maintenance and to run stations when students are on the property."
- "beach clean-ups - usually students and teachers"
- "primarily serve in a support role"
- "Volunteers assist in presenting some programs and are in charge of other programs."
- "mainly high school age students helping with activities"
- "cultural resources - lifeways demonstrations (e.g., spinning, weaving, other 18th century lifeways activities); natural resources - birdwatching, birding hikes"
- "Earth Team volunteers help with conservation education outreach."
- "presenters at xeriscape symposium, World of Water celebration"
- "leading and/or assisting with K-12 groups, outreach events, teacher workshops"
- "Docents assist with grade level programs with CCISD."
- "We maybe have 15 times a year when volunteers help either at Aransas site or Matagorda. They usually do not lead the programs."

Public and *private K-12 school programs* were the types of education programs offered most by respondents (Figure 4). *Home school programs, outreach programs at schools,* and *outreach programs at festivals* were equally represented as the second most offered types of education programs. The fewest number of respondents (15%) indicated that they offered *distance learning* and/or *educational TV / radio programs*. Open-ended responses for the types of education programs offered included:

- "outreach programs at public libraries"
- "We offer speakers and topics on a variety of natural resource issues and concerns for all ages, including urban and rural audiences."
- "Our facility is available for organizations to use for meetings and workshops as needed. We will also build lessons to fit the needs of our visitors if possible. We have a few college/universities that bring groups out yearly."
- "college and adult programs"
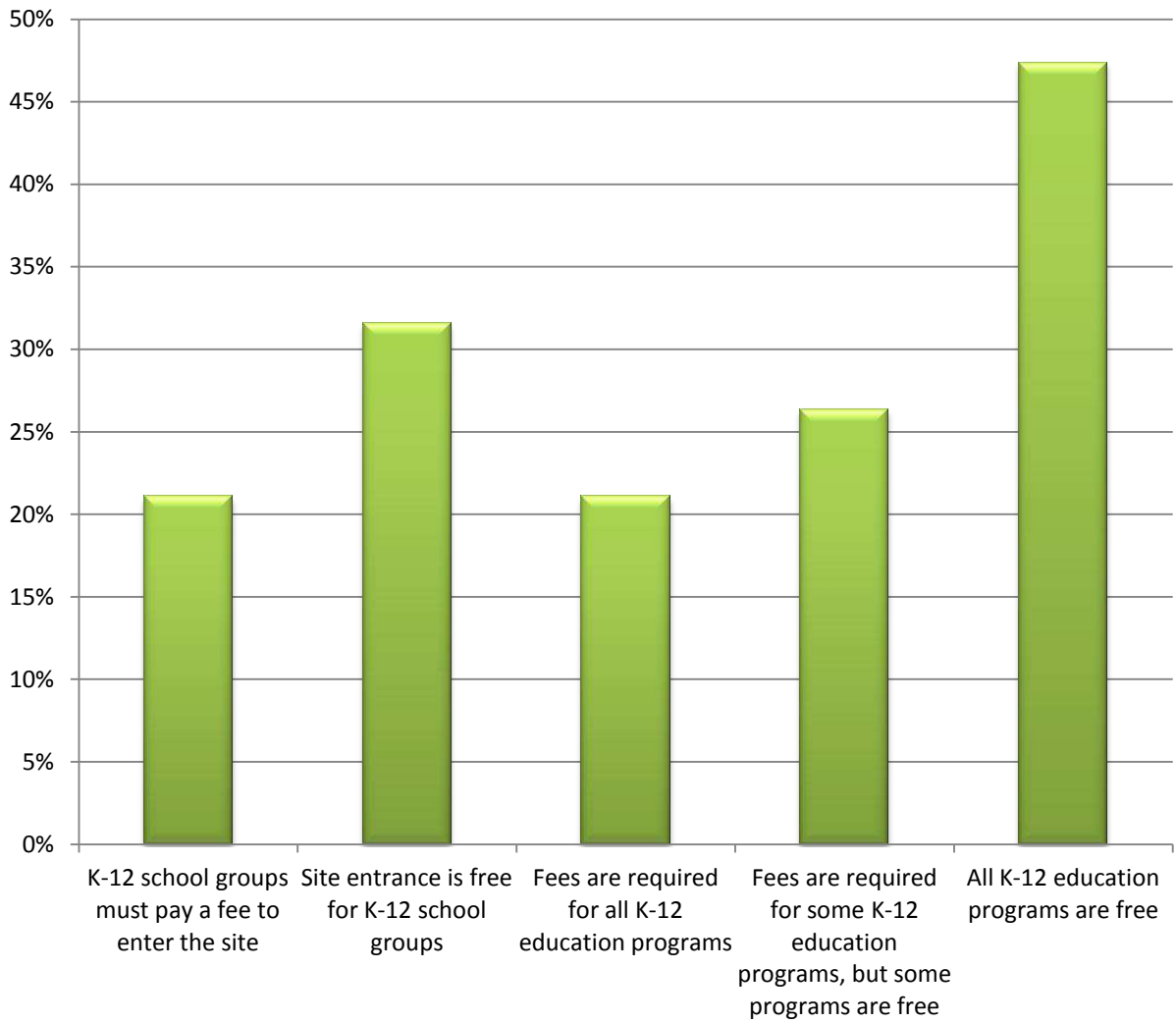

Figure 4. **Types of Education Programs Offered**
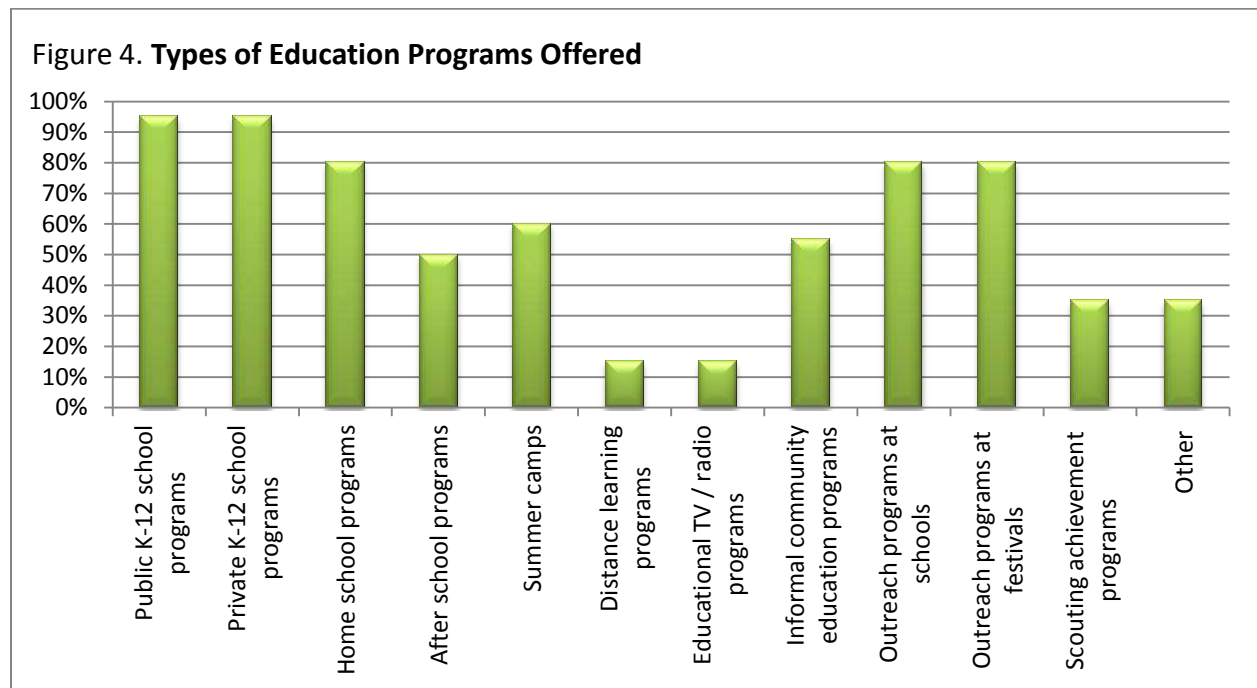
Most of the respondents who offered K-12 education programs served all grade levels (Figure 5). Of those respondents who targeted specific grade levels, the highest percentage targeted the middle school grades and the lowest percentage targeted *Kindergarten to 2nd* grade.

Figure 5. **K-12 Grade Levels Served**
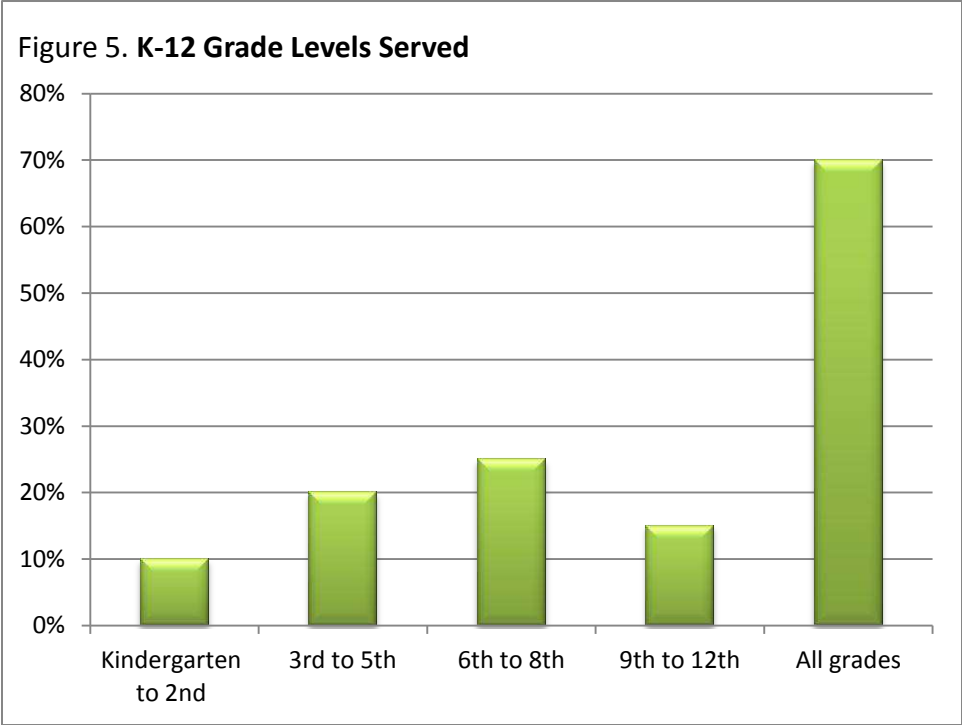
The highest percentage of respondents (47%) who provided K-12 programs indicated that their programs and entrance to their sites were free (Figure 6). Seventy-eight percent of the respondents who charge no site entry or program fees are municipal, state, or federal government agencies or departments. Some respondents indicated that they offer free or reduced rate programs and/or site entry for certain K-12 student groups, but charge full price for others. Open-ended responses that explain the fee structure of these organizations are as follows:

- "Touring the Museum for Aransas County Students is free; all other schools must pay a fee. Most educational programming is free, minus weeklong camps for summer and spring break; except SEA Camp which is free for Aransas County Residents due to grant funding."

- "Entry to park is free (waiver required) for K-12 school groups, but we do charge for activity fees such as: guided history tours ($1.00 per child), package programs with cost based on staff complexity/involvement ($3, $5, $10), autumn cultural/natural resource special event ($1.50 per child), and summer camp ($15)."

- "Entry fees are usually waived for educational groups. The waiver must be applied for in advance, through the park office. There are no fees for our programs."

- "We offer reduced rates ($2 self guided tours or $3 for guided tours). We also charge $75 for special programs at schools to partially cover staffing costs."

- "Out of district schools pay $4.00 a day for all visitors (students and adults) when doing lessons at the center and $8.00 per day per visitor when using boats for some or all of the lessons. Our local school district does not pay a fee as the district partly funds our program."

- "day groups free, overnight fee of $5 per person per night"

Figure 6. K-12 Education Program and Site Entrance Fees

A bar chart with the y-axis labeled from 0% to 50% in 5% increments. The categories along the x-axis and their approximate values are:

- K-12 school groups must pay a fee to enter the site: ~21%
- Site entrance is free for K-12 school groups: ~31.5%
- Fees are required for all K-12 education programs: ~21%
- Fees are required for some K-12 education programs, but some programs are free: ~26.5%
- All K-12 education programs are free: ~47.5%

Hands-on learning activities were the types of K-12 education programs offered by most respondents (Figure 7). Ninety percent of respondents offered these types of activities. *Presentations or lectures* and *field-based experiential learning activities* were the second and third most frequently offered K-12 programs, respectively. The fewest number of respondents indicated that they offered *vehicle tours* and *educational programs aboard a motorized ship or boat*. Open-ended responses for the types of K-12 education programs offered included:

- "We are developing in depth experiential learning activities; large autumn special event with cultural/natural resource themes appropriate to site, e.g., 18th century lifeways demonstrations & hands on, natural resource exhibits/hands on, etc."
- "Toby Globy Eco Action (K - 2nd grade), Major Rivers (4th grade), Learning to be Water Wise (5th grade)"

Eighty-four percent of respondents indicated that their K-12 education programs were aligned to the Texas Essential Knowledge and Skills state teaching standards.

Figure 7. **Types of K-12 Education Programs Offered**
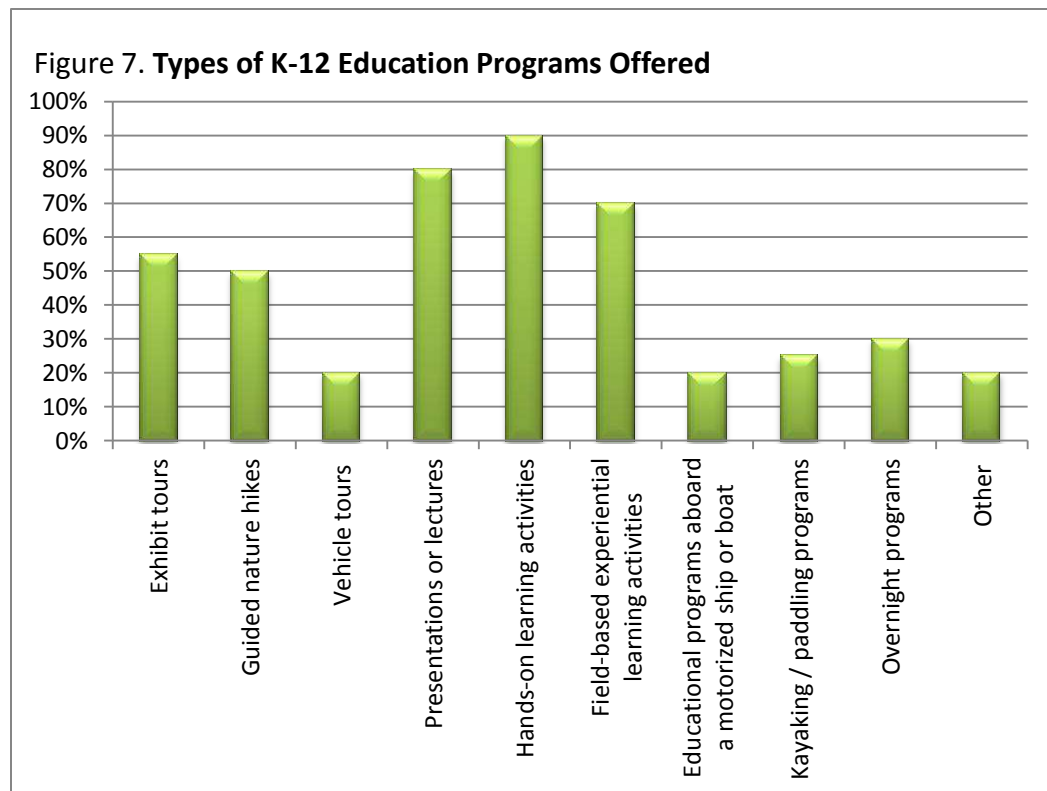
The topics most frequently addressed in K-12 education programs were *human impact on the environment*, *water quality and pollution*, and *adaptation* (Figure 8)*.* All of these topics were addressed in programs by 75% of respondents. Sixty-five percent of respondents addressed *recreation*, *erosion and sedimentation*, the *importance of estuaries*, and *nutrient cycles and food webs* in their K-12 programs. Of the topics supplied to respondents as examples, the least addressed (20%) was *commercial fisheries*. *Climate change* and *sea level rise,* topics of special interest to the National Estuarine Research Reserve System, were addressed in K-12 programs by 35% and 25% of respondents, respectively. Open-ended responses concerning topics addressed in K-12 education programs included: "economics of marine transportation," "beach ecology," and "butterfly life cycles; food chain; native plant identification and historical/wildlife uses; native reptiles/amphibians."

Figure 8. **Topics Addressed in K-12 Education Programs**
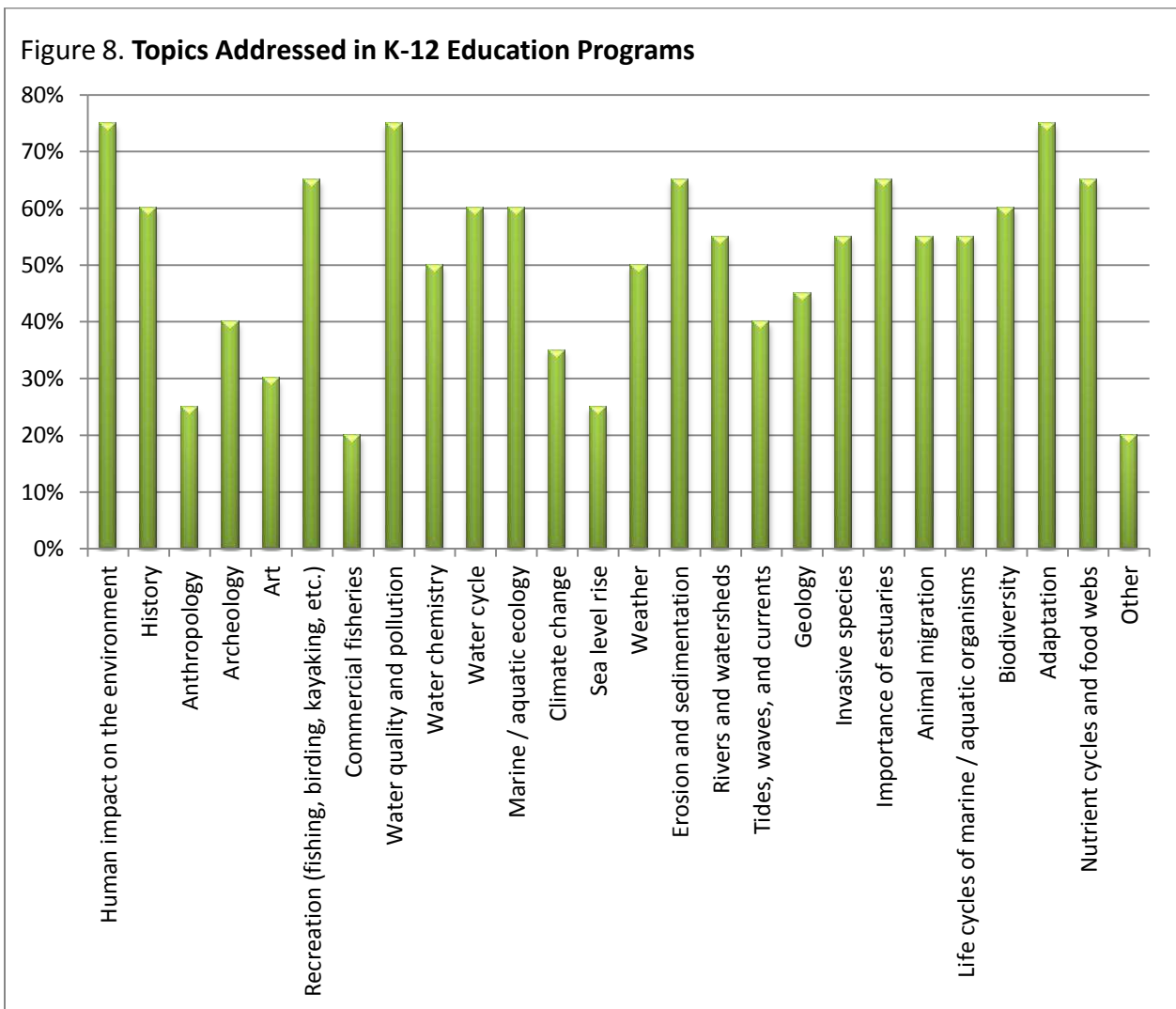
Forty percent of respondents indicated that the level of attendance at K-12 education programs was high but at a manageable level (Figure 9). Fifteen percent of respondents indicated that they had to turn groups away because they could not accommodate so many students. More detail concerning program attendance is provided by the following open-ended responses:

- "It depends on the program; we have contracts with some local school districts, but we also book programs as other schools call and make reservations. We would like to improve our numbers of bookings."
- "I see a lot of students each year, but we are hoping to grow and perhaps hire other educators."
- "We are currently understaffed and not able to provide the quantity and quality of programs that we normally do."
- "For our busiest season (spring) we are sometimes unable to accommodate groups."
- "We would like to have more school groups but are able to handle current annual school visitation (2000-2500)."
- "During some seasons (Sept-Nov and March - May) we are fully booked and have to turn some organizations away. We are closed most of the summer and our winter months (Dec.-Feb) are booked about a third of the time we are open."

Figure 9. **Level of K-12 Education Program Attendance**
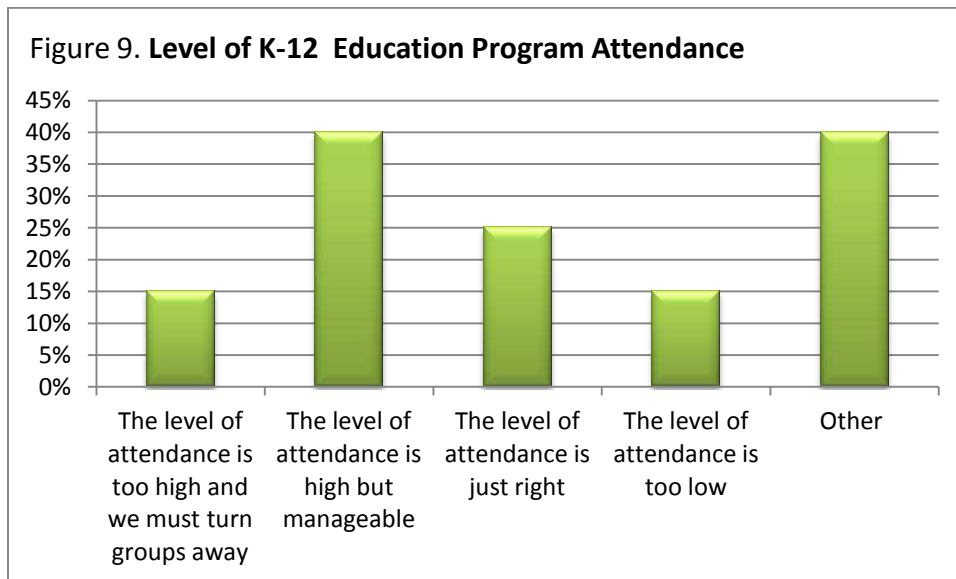
Community Education Programs

Presentations or lectures were the types of community education programs offered by most respondents (Figure 10). Seventy-eight percent of respondents offered these types of programs. *Hands-on learning activities* and *field-based experiential learning activities* were the second and third most frequently offered community education programs, respectively. The fewest number of respondents indicated that they offered *vehicle tours, educational programs aboard a motorized ship or boat, kayaking / paddling programs, or overnight programs*. Open-ended responses for the types of community education programs offered included:

- "seminars on environmental/horticulture topics; summer day camps"
- "Most visitors that are not from an educational facility are birders and they self-guide themselves through the nature trail and marsh."
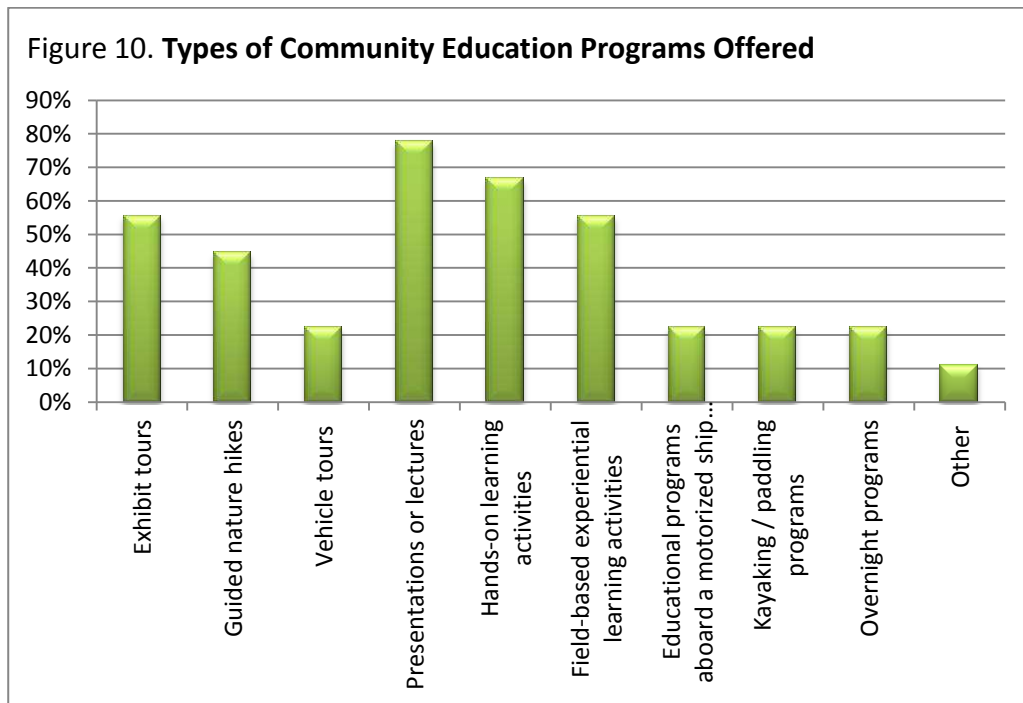
Figure 10. **Types of Community Education Programs Offered**

When asked what types of community education programs were most popular with their visitors, respondents provided the following open-ended responses:

- "birding, history"
- "tours of the aquarium and the shows"
- "programs about sea turtles and also ones about marine debris"
- "guided nature hikes"
- "our Brown Bag Lunch lecture series"
- "activities on board teaching vessel"
- "guided history tours, nature themed tours/hikes"
- "birding and fishing; seining in the bay is also popular"
- "Backyard Conservation"
- "seminars, mini reptile presentations at community events"
- "public tours of refuge"
- "hands-on programs that engage the audience in cultural history and natural history/science"
- "coastal ecology, birding"

The highest percentage of respondents who offered community education programs targeted *families*, but *winter Texans* were a close second (Figure 11). Winter Texans are visitors who live further north during the warm weather months and spend the cooler months in south Texas. Open-ended responses concerning community education audiences included:

- "We have partnerships with the Texas State Aquarium and several other local non-profits."
- "When we offer these classes they target families. Walks are welcome any day we are open. Walk-in traffic self-guides, as we are most often working with school groups."

Figure 11. **Target Audiences for Community Education Programs**
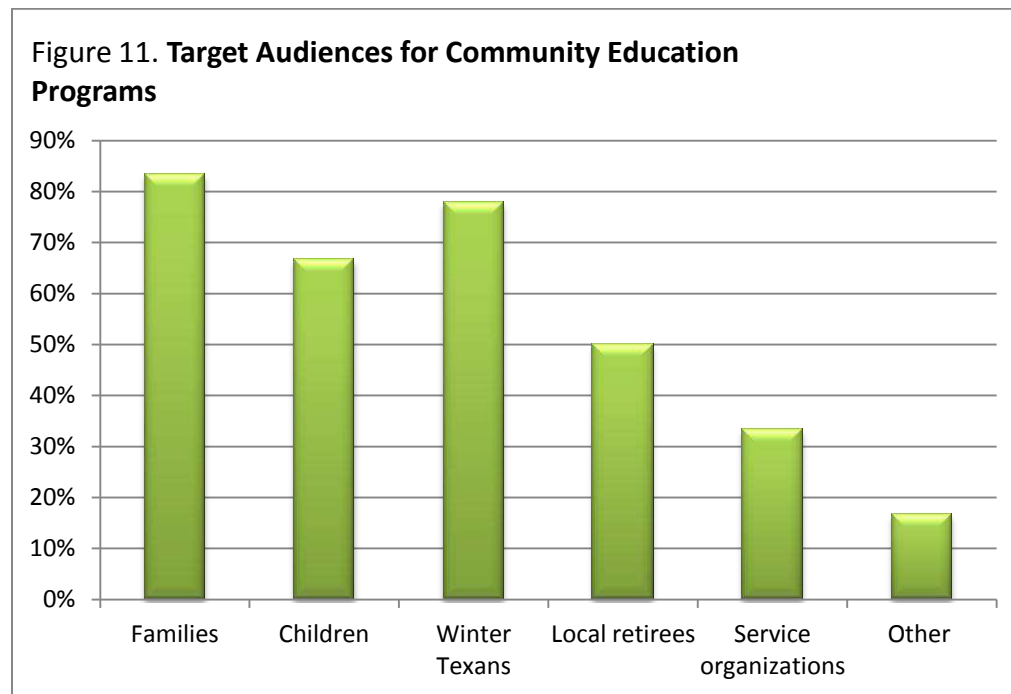
The highest percentage of respondents (53%) who provided community education programs offered them for free and all of the respondents offered at least some free programs (Figure 12). However, some of the respondents indicated that, although their community education programs were free, there is a fee charged to enter their sites. In reference to fees for community education programs, one respondent wrote, "Again, this area is not fully developed and there is no answer that truly fits here. When we have offered programs in the past they have a material fee or are free."

Figure 12. **Community Education Program and Site Entrance Fees**
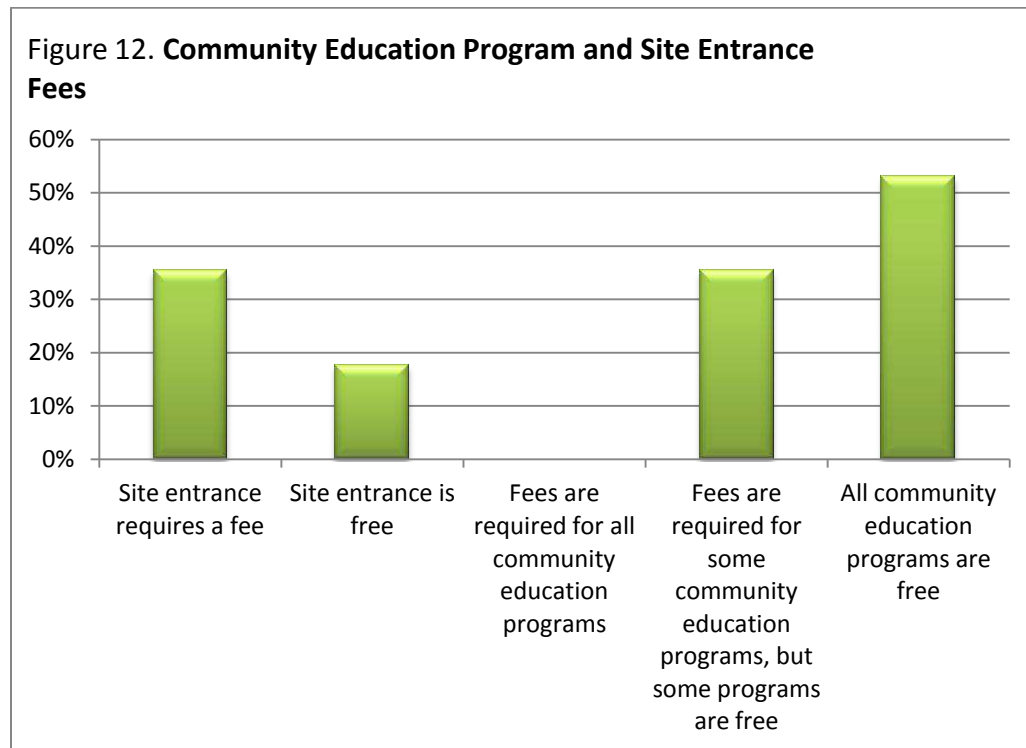
The topic most frequently addressed in community education programs, by 72% of respondents, was *human impact on the environment* (Figure 13). The next most frequently addressed topics were *history, water quality and pollution*, *erosion and sedimentation*, *rivers and watersheds*, the *importance of estuaries*, and *adaptation.* These topics were all addressed by 56% of respondents. The least addressed topics, by only 11% of respondents, were *art, commercial fisheries*, and *sea level rise. Climate change* was addressed in community education programs by 28% of respondents. Open-ended responses in reference to topics addressed in community education programs included:

- "economics of marine transportation"
- "depends upon topic requested by group"
- "We offer a public lecture series each winter with approximately 10 lectures that cover a wide range of scientific topics."
- "backyard conservation"
- "buttefly life cycle; web of life/food chain; native reptiles/amphibians/birds; native plants (identification and uses); general horticulture"
- "art (Gyo Taku, digital photography, jewelry making) "
- "rangelands, management issues and techniques"

Figure 13. **Topics Addressed in Community Education Programs**
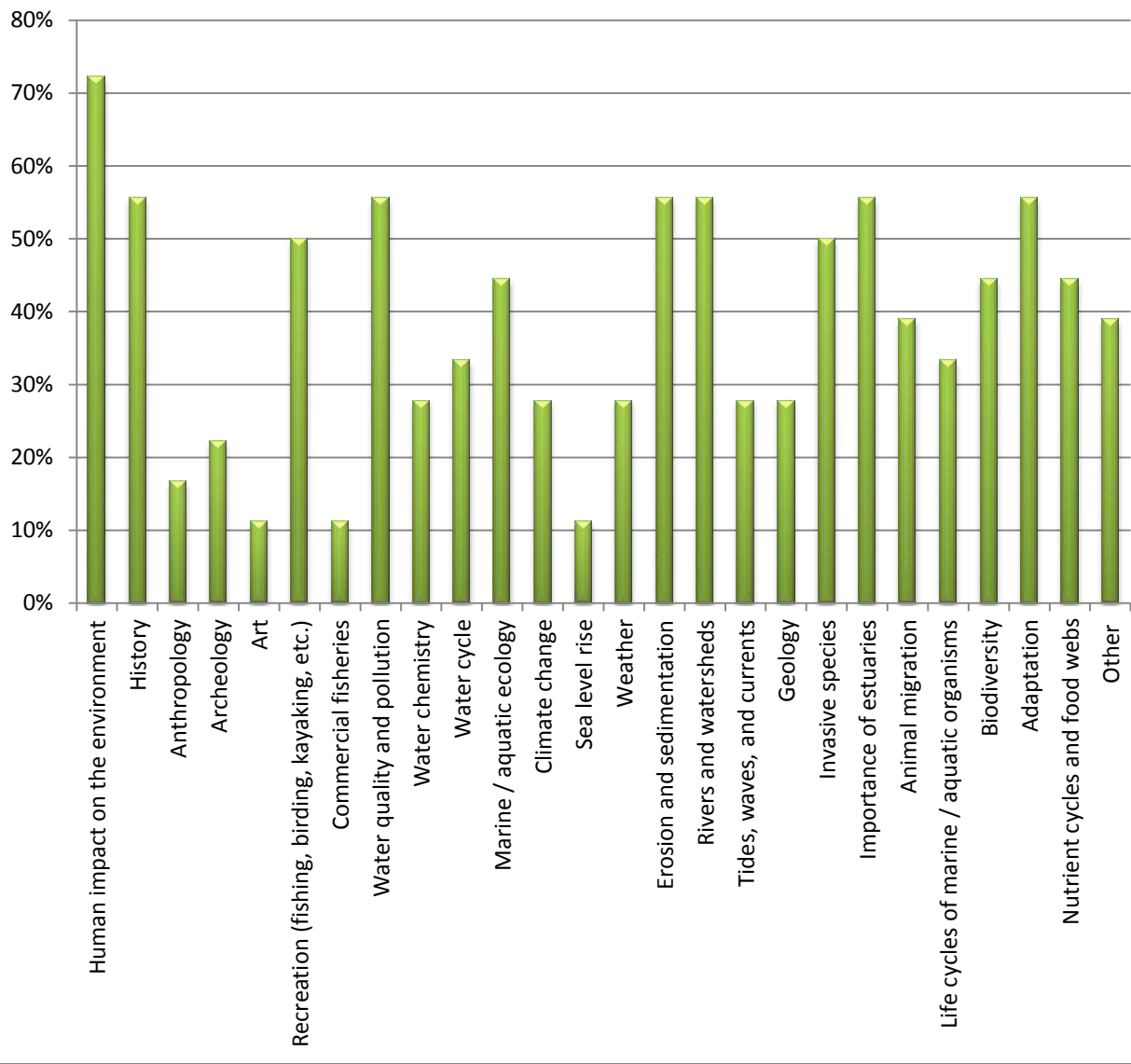
The highest percentage of respondents (41%) indicated that the level of attendance at their community education programs was just right, however 29% of respondents indicated that attendance was too low (Figure 14). In contrast to the results for K-12 education program attendance, none of the respondents indicated that community education program attendance was so high that visitors must be turned away. Open-ended responses included the following:

- "Again, it varies; but we would always like to improve our numbers."
- "attendance is good to low"
- "We currently reach capacity but are expanding education classroom facilities to allow further program expansion."

Figure 14. **Level of Community Education Program Attendance**
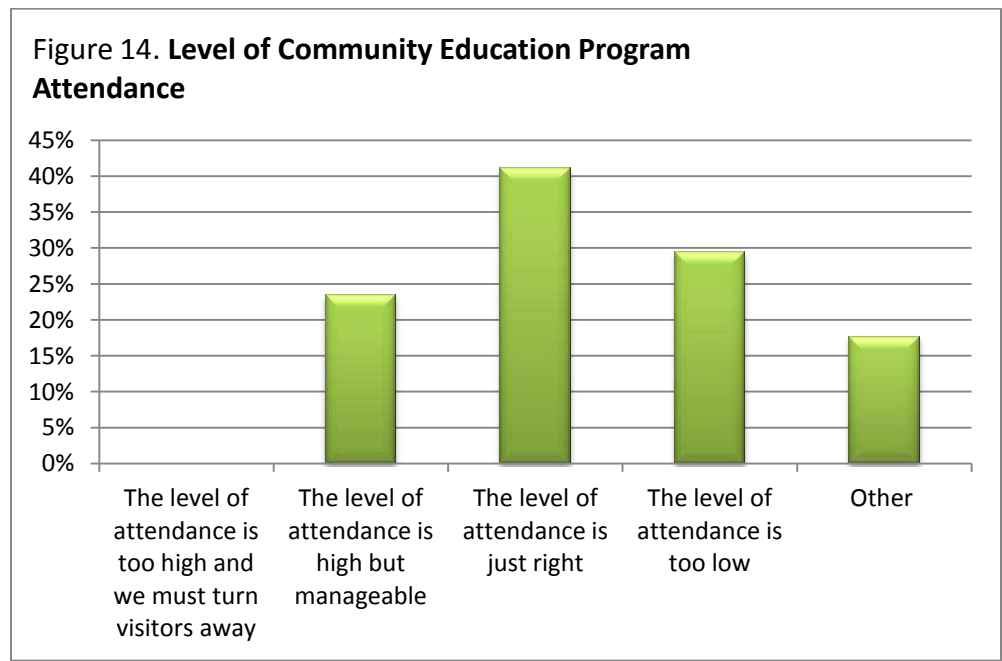
Professional Development Programs

Most of the respondents who offered professional development programs targeted all grade level educators with their programs (Figure 15). Percentages of respondents who targeted 3rd through 12th grade educators were equally spread, at 27% for each category. The lowest percentages of respondents targeted pre-kindergarten through 2nd grade.
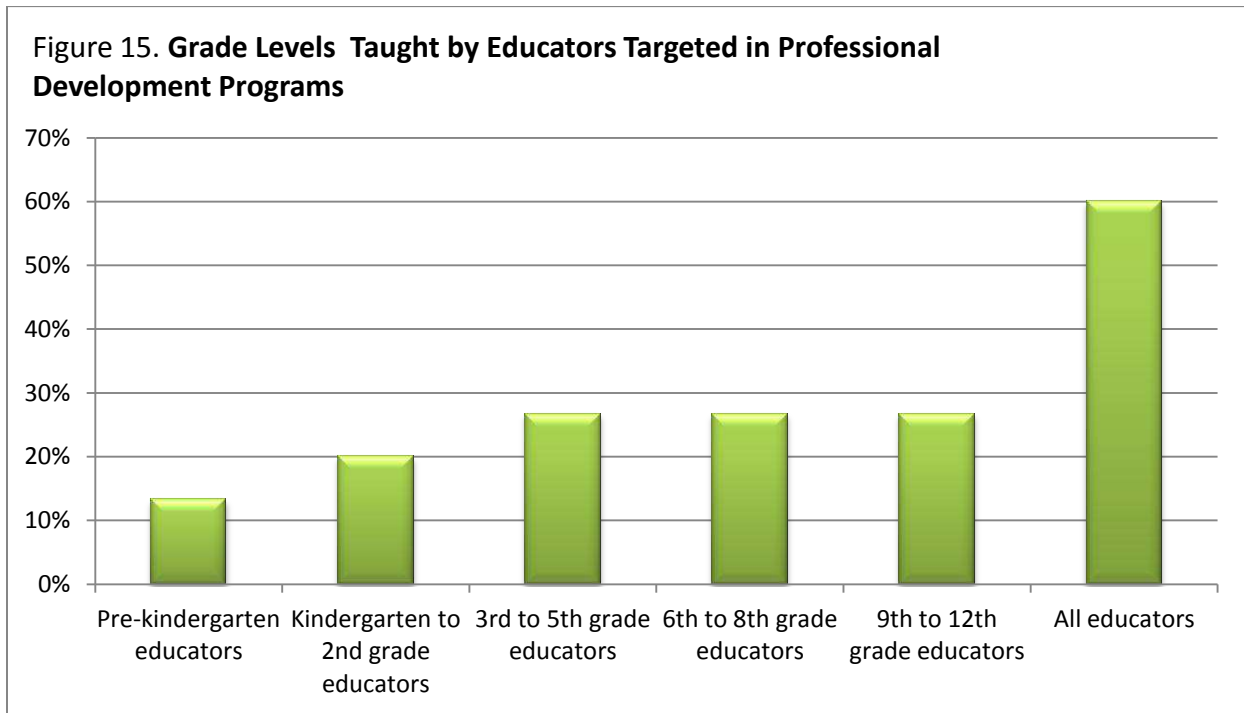
Figure 15. **Grade Levels Taught by Educators Targeted in Professional Development Programs**

The highest percentage of respondents who offered professional development programs offered *full day* programs, followed by *half day* and then *multiple days* (Figure 16). The percentages of *weekday* and *weekend* programs offered were equal across respondents. Eighty-six percent of respondents indicated that they offered professional development programs year-round, while 14% offered them only during the summer.

Field based and *hands-on* were the first and second most frequently used professional development delivery methods, respectively. Far fewer respondents indicated that they offered *classroom based* programs and none offered *internet based* or *video / DVD based* programs. The only open-ended response was that the program format "varies depending on who is offering the event."

Figure 16. **Professional Development Program Formats Offered**
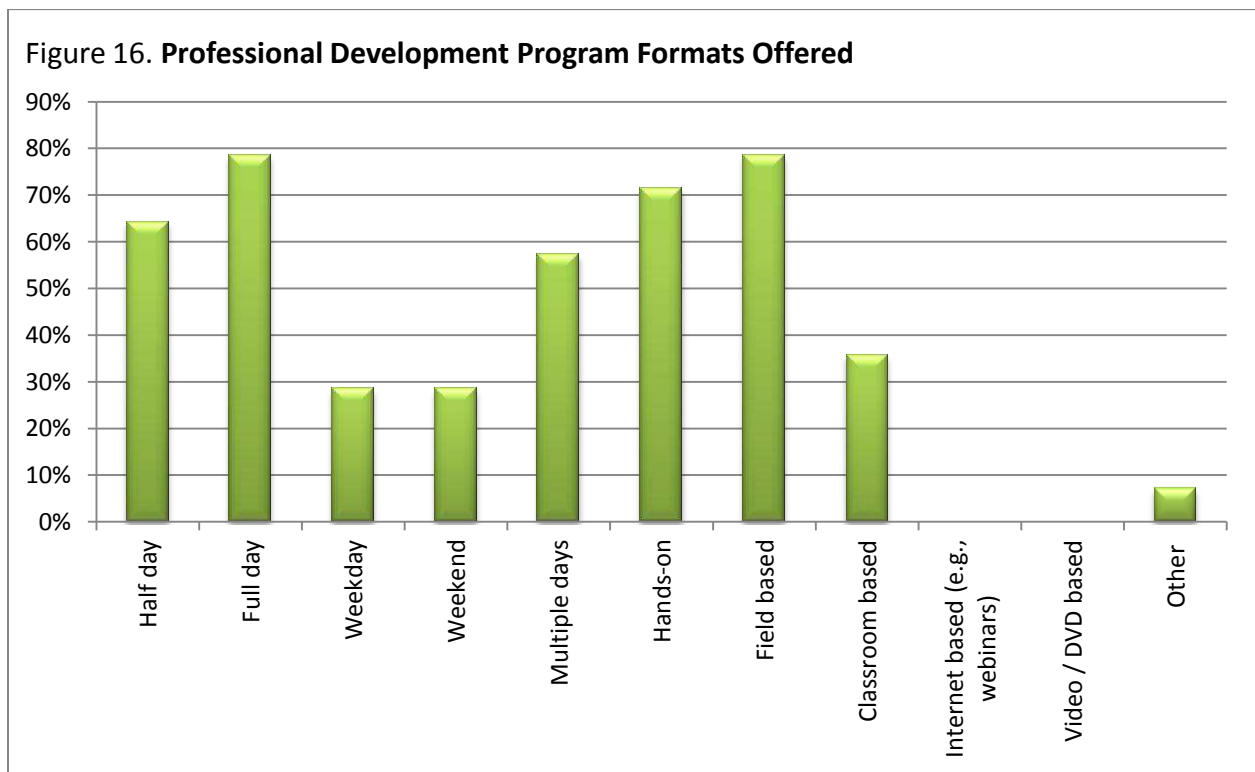
All of the respondents indicated that their professional development programs targeted *public school educators* and 93% indicated that they targeted *private or parochial school educators* (Figure 17). Sixty four or more percent of respondents targeted *informal educators* and/or *pre-service public, private, or parochial educators.* Only 36% of respondents indicated that they targeted *volunteer educators* in their professional development programs.

Figure 17. **Educational Settings of Teachers Targeted in Professional Development Programs**
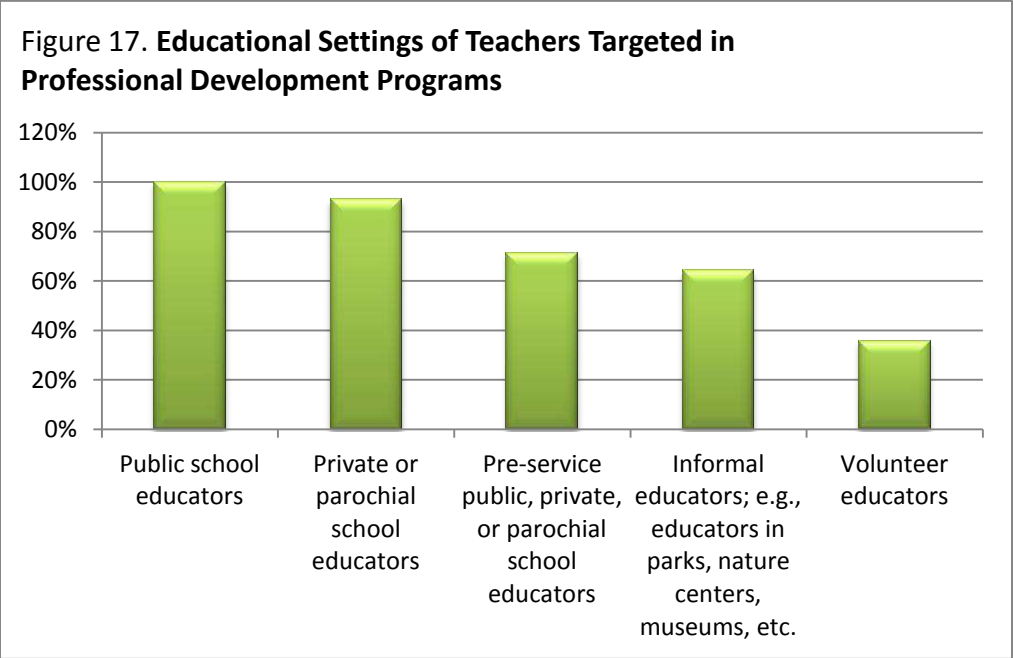
Marine / Aquatic Science and *Life Science / Biology* were the first and second most frequently addressed subjects in professional development programs, respectively (Figure 18). The next most frequently addressed subjects, were *Earth science* and *Environmental Science.* Of the subjects supplied to respondents as examples, the least addressed were *Art* and *Anthropology* and none of the respondents indicated that they addressed *Archeology* in their professional development programs. The only open-ended response concerning subjects addressed in professional development programs was "rangelands, management, ethics, sustainability, conservation."

Figure 18. **Subjects Addressed in Professional Development Programs**
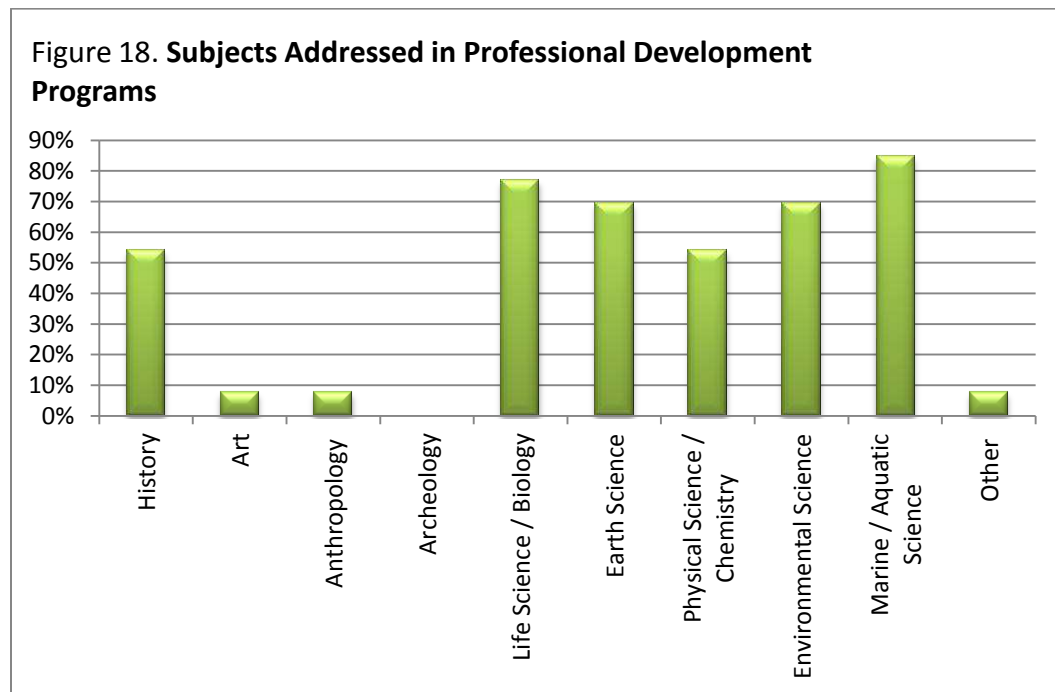
The highest percentage of respondents (67%) indicated that *scheduling* professional development programs posed the greatest challenge to offering them (Figure 19). *Funding* and *lack of staff* were the second and third greatest challenges, respectively.

Figure 19. **Challenges to Offering Professional Development Programs**

The highest percentage of respondents (43%) indicated that the level of attendance at their professional development programs was just right (Figure 20). More respondents indicated that the level of attendance was too low than those who indicated that it was too high. Open-ended responses included the following:

- "2011-2012 is the first time we have not had workshops filled to capacity."
- "We would like to do more but don't have the staff."

Figure 20. **Level of Professional Development Program Attendance**
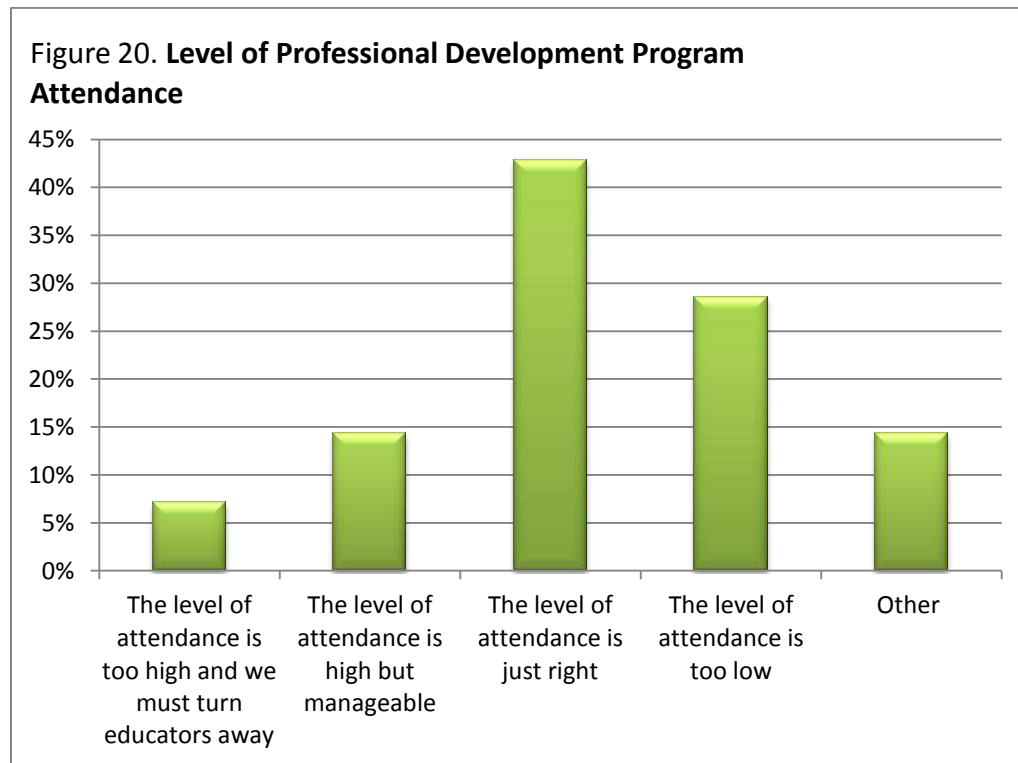
CONCLUSIONS AND APPLICATIONS

There is a considerable amount of overlap in the counties served by the Reserve's education program and those served by the Market Analysis respondents. The respondent's organizations serve some or all of the nine counties that are part of the Reserve's watershed. Because of this overlap, it is important that local education providers collaborate with each other to improve environmental and estuarine literacy. The knowledge gained from this Market Analysis will direct the development of Reserve education programs that complement existing programs and avoid unnecessary duplication. Applications of the Market Analysis findings to Reserve K-12 education, community education, and teacher professional development programs are presented here.

Application of Findings to K-12 Education Programs

The Market Analysis findings revealed that the surveyed organizations had very small education staffs. Although, on average, there were two education staff members per organization, 42% of the organizations had only one paid educator. Many of the organizations had volunteers who assisted with their education programs, but respondents indicated that the small sizes of their education staffs limited the quantity and/or quality of programs they could offer. In addition and relevant to these findings, the Reserve conducted a teacher Needs Assessment concurrent with this Market Analysis. Several Needs Assessment respondents indicated that many informal education venues could not accommodate the large numbers of students that they needed to bring on field trips. This created an obstacle to field trips because the teachers needed to bring all or none of their students.

After reviewing the findings of this Market Analysis and the teacher Needs Assessment, Reserve education staff produced a Teacher Resource Guide to help teachers plan meaningful field trips for large groups of students. Reserve staff collaborated with partner site education staffs to discuss methods of breaking students up into smaller and more manageable groups and then rotating the groups through several sites during one field day. Information about Reserve and partner site K-12 programs, contact information for site educators, and suggestions for rotating students among sites are included in the Teacher Resource Guide. Seven partner sites in Rockport, Fulton, and Aransas County, including the Reserve's Bay Education Center, are covered in the Teacher Resource Guide. Several of these partners were also Market Analysis respondents. As a result of this collaboration, the Reserve's Bay Education Center has shared many students with other local sites, such as the Aquarium at Rockport Harbor and the Texas Maritime Museum.

Another application of Market Analysis findings to Reserve K-12 programs is the elimination of fees for Aransas County Independent School District (ACISD) students at some Bay Education Center programs. Many surveyed organizations indicated that their programs were free or offered at a reduced fee for students from the local school district. One of these organizations, the Texas Maritime Museum, shares students with the Reserve's Bay Education Center. The Texas Maritime Museum and the other partner sites within walking distance of the Bay Education Center do not charge ACISD students for site tours or programs that do not require the purchase of special materials and equipment. Reserve staff decided that, when possible, the fee structure at the Bay Education Center should reflect that of similar K-12 programs offered by partner sites. The resulting change in fee structure means that ACISD students are no longer charged for exhibits tours and *Science on a Sphere*[©] programs at the Bay Education Center.

Helping students understand the science of climate change is an emerging priority for the National Estuarine Research Reserve System. Only 35% of Market Analysis respondents indicated that they addressed climate change in their K-12 education programs. This percentage is relatively low when compared to other topics addressed by respondents that are also targeted by Reserve education programs. For example, *human impact on the environment* and *water quality and pollution* were both addressed by 75% of respondents and the *importance of estuaries* was addressed by 65% of respondents. Also relevant to these findings is that over half of the teachers surveyed in a Needs Assessment follow-up questionnaire indicated that they were interested in incorporating the effects of climate change on coastal areas into their curricula. The presence of *Science on a Sphere*[©] (SOS) at the Reserve's Bay Education Center provides a powerful tool for teaching the effects of climate change on ocean and coastal environments. SOS is a visualization system, designed by the National Oceanic and Atmospheric Administration, to help students better understand Earth's oceans, atmosphere, land, and planetary systems. Several SOS visualizations (datasets) model the effects of climate change on ocean and coastal environments. SOS datasets will be used to develop climate focused K-12 programs, aligned to the state teaching standards, for teachers and students who visit the Bay Education Center.

Only 10% of Market Analysis respondents indicated that they served kindergarten through second grade students in their K-12 education programs. It cannot be determined from this Market Analysis whether or not there is a lack of such offerings due to limited need for these early grade level programs. However, several kindergarten and early grade level teachers who responded to the Needs Assessment indicated that few environmental education sites offered K-12 programs for very young students. These findings have led Reserve staff to begin developing education programs that target early grade level students. These programs will offer hands-on education activities aligned to the state teaching standards for the targeted grade levels.

Sixty-eight percent of Needs Assessment questionnaire respondents indicated that they were interested in more field experiences that focused on history and culture. Sixty percent of Market Analysis respondents indicated that they offer K-12 programs that address history, but archeology and anthropology were only addressed by 40% and 25% of respondents, respectively. Field experiences that incorporate the use of estuarine resources by prehistoric cultures and Native Americans provide opportunities to integrate the cultural and natural history of the Mission-Aransas Estuary and to help students understand how humans benefit from and impact the estuarine environment. More emphasis will be placed on integrating archeology and anthropology in future K-12 program development.

Application of Findings to Reserve Community Education

When asked what types of community education programs were most popular with their visitors, almost 70% of the Market Analysis respondents listed active programs such as guided nature hikes, tours, and birding programs; rather than more passive programs, such as lectures or presentations. Only 44% of the surveyed organizations offered guided nature hikes and these programs fell in the exact middle between the most and least offered programs. Reserve staff see the relatively limited availability of guided nature hikes as a deficit that should be addressed, considering the popularity of hikes with visitors and the opportunity they provide for helping people understand the importance of coastal habitats.

Based on these findings, Reserve staff are currently developing a series of "Habitat Hikes" that will be offered at Reserve and partner sites during the spring of 2012. The three programs under development focus on coastal woodland, salt marsh, and freshwater wetland habitats within the Mission-Aransas Reserve. The goal of these Habitat Hikes is to help visitors understand the importance of coastal habitats for wildlife, people, and plants, while offering them an interactive outdoor recreation opportunity.

As with the K-12 programs described above, anthropology and archeology were among the least addressed topics in community education programs. These topics are being incorporated into the guided hikes to show how past people relied on the resources provided by coastal habitats. By increasing understanding of the ecological and economic functions provided by coastal habitats to past and present people, visitors will better appreciate why these habitats deserve their protection.

Application of Findings to Reserve Teacher Professional Development Trainings

The professional development programs currently offered by Market Analysis respondents seem to fit well with the formats and delivery methods preferred by respondents to the Needs Assessment. According to Market Analysis findings, they are primarily full-day programs that focus on field-based and hands-on activities. However, 85% of these programs are focused on Marine / Aquatic Science and less than 70% are focused on Earth Science, Environmental Science, or Physical Science / Chemistry. The teacher Needs Assessment revealed that interdependence between organisms and environments, human impact on the environment, and water chemistry were among the topics of greatest interest to teachers for professional development trainings. All of these topics could easily be presented around an estuary theme in a field-based *Teachers on the Estuary* (TOTE) training that incorporates state teaching standards for Earth Science, Environmental Science, and Physical Science / Chemistry and integrates activities from the NERRS *Estuaries 101* curriculum that employ computer visualizations of real-time data. This type of Reserve professional development training is planned for implementation in the summer of 2013.

REFERENCES CITED

Coastal Bend Informal Educators. "Educator Resource Organizations / All Subjects." Assessed February 2012. http://cbinformaleducators.org/CBIEpartners.html.

APPENDIX A

Organizations that Participated in the Market Analysis

Aquatic Education Program
Center for Coastal Studies
6400 Ocean Drive, NRC 3200
Corpus Christi, TX

Aransas National Wildlife Refuge
1 Wildlife Circle
Austwell, TX

City of Corpus Christi Water Department
2726 Holly Road
Corpus Christi, TX

Coastal Bend Bays & Estuaries Program
1305 N Shoreline, STE 205
Corpus Christi, TX

Corpus Christi Museum of Science and History
1900 N. Chaparral
Corpus Christi

Goliad State Park
108 Park Road 6
Goliad, TX

Goose Island State Park
202 South Palmetto Street
Rockport, TX

Gulf of Mexico Foundation
3833 South Staples Street
Corpus Christi, TX

Mustang Island State Park
PO BOX 326
Port Aransas, TX

Nueces River Authority

400 Mann Street, STE 1002
Corpus Christi, TX

Padre Island National Seashore
P. O. Box 181300
Corpus Christi, TX

South Texas Botanical Gardens & Nature Center
8545 South Staples
Corpus Christi, TX

Texas A&M University-Corpus Christi
6300 Ocean Drive
Corpus Christi, TX

Texas Sea Grant and AgriLife Programs
6300 Ocean Drive
Corpus Christi, TX

Texas Maritime Museum
1202 Navigation Circle
Rockport, TX

Texas State Aquarium
2710 N. Shoreline Drive
Corpus Christi, TX

Texas State Marine Education Center
102 Marine Center Drive
Palacios, TX

University of Texas Marine Science Institute
750 Channelview Dr.
Port Aransas, TX

USDA-Natural Resources Conservation Service (NRCS)
13430 Leopard St., STE A14
Corpus Christi, TX

Welder Wildlife Foundation
P.O. Box 1400
Sinton, TX

APPENDIX B

Market Analysis Survey Instrument

1.

Dear Coastal Bend Educator,
The goal of this survey is to help identify gaps in formal and informal educational programming in the Coastal Bend and to coordinate the efforts of outreach educators to best serve teachers, students, and the public. The survey questions are divided into K-12 education, informal community education, and teacher professional development offerings. Please feel free to skip those questions that do not apply to your organization.
Thank you very much for taking the time to help with this project.

1. Please tell us about yourself and your organization:

Your name:

Your position:

Organization:

Street address:

City / Town:

Phone number:

Email address:

2. How would you classify your organization? Please check all that apply.

☐ Federal governmental agency

☐ State governmental agency

☐ Municipal agency or department

☐ Non-profit organization

☐ For profit business

☐ Educational institution

☐ Other (please specify)

3. How are your programs funded?

☐ Federal funds

☐ State funds

☐ County / local funds

☐ Private foundation

☐ Grants from non-profits

☐ Program fees

☐ Visitor donations

☐ Other (please specify)

4. How many paid education staff members do you have?

[ ]

5. Do volunteers assist with your education programs?

[ ] Yes

[ ] No

Please comment on the nature of volunteer participation in your educational programs, if you wish:

[ ]

6. What types of education programs does your organization offer? Please check all that apply.

[ ] Public K-12 school programs

[ ] Private K-12 school programs

[ ] Home school programs

[ ] After-school programs

[ ] Summer camps

[ ] Distance learning programs

[ ] Educational TV / radio programs

[ ] Informal community education programs

[ ] Outreach programs at schools

[ ] Outreach programs at festivals and expositions

[ ] Educational achievement programs for scouting groups

[ ] Other (please specify)

[ ]

7. If your organization offers K-12 programs, what grade levels do you serve? Please check all that apply.

(If your organization does not offer K-12 programs, please skip to question number 13 below.)

☐ K-2

☐ 3-5

☐ 6-8

☐ 9-12

☐ All

8. If your organization offers K-12 programs, please provide information about facility entrance and education program fees by checking all that apply below.

☐ K-12 school groups must pay a fee to enter the facility

☐ Entrance to the facility is free to K-12 school groups

☐ Fees are required for all K-12 education programs

☐ Fees are required for some K-12 education programs, but some programs are free

☐ All K-12 education programs are free

If your organization requires entrance or program fees, how much do you charge for each? Please explain whether you charge per student, per class, per activity, per time period, or if fees are based on other criteria.

9. If your organization offers K-12 programs, are these programs aligned to the Texas Essential Knowledge and Skills (TEKS)?

☐ Yes

☐ No

10. If your organization offers K-12 programs, what types of programs do you offer? Please check all that apply.

☐ Exhibit tours

☐ Guided nature hikes

☐ Vehicle tours of your site

☐ Presentations / lectures

☐ Hands-on learning activities

☐ Field-based experiential learning activities

☐ Educational programs aboard a motorized ship or boat

☐ Kayaking / paddling programs

☐ Overnight programs

☐ Other (please specify)

11. If your organization offers K-12 programs, what topics do you address in your programs? Please check all that apply.

- [ ] Human impact on the environment
- [ ] History
- [ ] Anthropology
- [ ] Archeology
- [ ] Art
- [ ] Recreation (fishing, birding, kayaking, etc.)
- [ ] Commercial fisheries
- [ ] Water quality and pollution
- [ ] Water chemistry
- [ ] Water cycle
- [ ] Marine / aquatic ecology
- [ ] Climate change
- [ ] Sea level rise
- [ ] Weather
- [ ] Erosion and sedimentation
- [ ] Rivers and watersheds
- [ ] Tides, waves, and currents
- [ ] Geology
- [ ] Invasive species
- [ ] Importance of estuaries
- [ ] Animal migration
- [ ] Life cycles of marine / aquatic organisms
- [ ] Biodiversity
- [ ] Adaptation
- [ ] Nutrient cycles and food webs
- [ ] Other (please specify)

12. If your organization offers K-12 programs, how would you characterize the level of attendance at your programs?

☐ The level of attendance is too high and we must turn K-12 groups away

☐ The level of attendance is high but manageable

☐ The level of attendance is just right

☐ The level of attendance is too low

☐ Other (please specify)

[text box]

13. If your organization offers informal community education programs, what types of programs do you offer? Please check all that apply.
(If your organization does not offer informal community education programs, please skip to question number 19 below.)

☐ Exhibit tours

☐ Guided nature hikes

☐ Vehicle tours of your site

☐ Presentations / lectures

☐ Hands-on learning activities

☐ Field-based experiential learning activities

☐ Educational programs aboard a motorized ship or boat

☐ Kayaking / paddling programs

☐ Overnight programs

☐ Other (please specify)

[text box]

14. If your organization offers informal community education programs, what types of programs are the most popular with your visitors?

[text box]

15. If your organization offers informal community education programs, who are the target audiences for your programs?

☐ Families

☐ Children

☐ Winter Texans

☐ Local retirees

☐ Service organizations

☐ Other (please specify)

```
[text box]
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16. If your organization offers informal community education programs, please provide information about facility entrance and education program fees by checking all that apply below.

☐ Entrance to the facility requires a fee

☐ Entrance to the facility is free

☐ Fees are required for all community education programs

☐ Fees are required for some community education programs, but some programs are free

☐ All community education programs are free

If your organization requires entrance or program fees, how much do you charge for each? Please explain whether you charge per person, per activity, per time period, or if fees are based on other criteria.

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[text box]
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17. If your organization offers informal community education programs, what topics do you address in your programs? Please check all that apply.

- [ ] Human impact on the environment
- [ ] History
- [ ] Anthropology
- [ ] Archeology
- [ ] Art
- [ ] Recreation (fishing, birding, kayaking, etc.)
- [ ] Commercial fisheries
- [ ] Water quality and pollution
- [ ] Water chemistry
- [ ] Water cycle
- [ ] Marine / aquatic ecology
- [ ] Climate change
- [ ] Sea level rise
- [ ] Weather
- [ ] Erosion and sedimentation
- [ ] Rivers and watersheds
- [ ] Tides, waves, and currents
- [ ] Geology
- [ ] Invasive species
- [ ] Importance of estuaries
- [ ] Animal migration
- [ ] Life cycles of marine / aquatic organisms
- [ ] Biodiversity
- [ ] Adaptation
- [ ] Nutrient cycles and food webs
- [ ] Other (please specify)

18. If your organization offers informal community education programs, how would you characterize the level of attendance at your programs.

☐ The level of attendance is too high and we must turn visitors away

☐ The level of attendance is high but manageable

☐ The level of attendance is just right

☐ The level of attendance is too low

☐ Other (please specify)

[text box]

19. If your organization offers professional development programs for educators, to what grade-level educator are your programs targeted? Please check all that apply.
(If your organization does not offer professional development programs for educators, please skip to question number 26 below.)

☐ Pre-K educators

☐ K-2 educators

☐ 3-5 educators

☐ 6-8 educators

☐ 9-12 educators

☐ All educators

20. If your organization offers professional development programs for educators, what program formats do you offer? Please check all that apply.

☐ Half-day

☐ Full-day

☐ Week-day

☐ Week-end

☐ Multiple days

☐ Hands-on

☐ Field-based

☐ Class-room based

☐ Internet-based (e.g., webinars)

☐ Video / DVD

☐ Other (please specify)

[text box]

21. If your organization offers professional development programs for educators, when are they offered?

☐ Summer only

☐ Academic year only

☐ Year-round

22. If your organization offers professional development programs for educators, who are the target audiences for your programs? Please check all that apply.

☐ Public school educators

☐ Private or parochial school educators

☐ Pre-service public, private, and/or parochial school educators

☐ Informal educators (e.g., educators in parks, nature centers, museums, etc.)

☐ Volunteer educators

☐ Other (please specify)

[text box]

23. If your organization offers professional development programs for educators, upon what subjects are your programs based? Please check all that apply.

☐ History

☐ Art

☐ Anthropology

☐ Archeology

☐ Life Science / Biology

☐ Earth Science

☐ Physical Science / Chemistry

☐ Environmental Science

☐ Marine / Aquatic Science

☐ Other (please specify)

[text box]

24. If your organization offers professional development programs for educators, what have been your biggest challenges in offering these programs? Please check all that apply.

☐ Funding

☐ Scheduling

☐ Facilities

☐ Attendance

☐ Time constraints

☐ Lack of staff

☐ Other (please specify)

[text box]

25. If your organization offers professional development programs for educators, how would you characterize the level of attendance at your programs.

☐ The level of attendance is too high and we must turn educators away

☐ The level of attendance is high but manageable

☐ The level of attendance is just right

☐ The level of attendance is too low

☐ Other (please specify)

26. Data from this survey will be available to participants via email. Would you like to be contacted when the results are available?

☐ Yes

☐ No

3.

Your help is very much appreciated!