Inventory and Assessment of K-12 and Professional Teacher Development Programs in the National Estuarine Research Reserve System

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Table of Contents

Table of Tables

Table of Figures

A. ACKNOWLEDGEMENTS

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B. EXECUTIVE SUMMARY

The National Estuarine Research Reserve System (NERRS) is ideally suited to offer unique opportunities to the K-12 and professional teacher development (PTD) market. Educational programming linked to research and stewardship was incorporated at the Reserves from NERRS' inception in 1972. Currently twenty-four Reserves are offering K-12 and PTD to a wide range of audiences.

In 2002-2003 NERRS Educators identified that a K-12 and PTD inventory and assessment project was a high priority action item. It would provide baseline data, synthesis, and recommendations for program improvements in support of the NERRS Strategic Plan. In September of 2002, Pandion Systems was contracted to complete the project with the following study objectives:

- An inventory and assessment, both quantitative and qualitative, of current programming for K-12 and professional teacher development (PTD) across the 25 Reserves and how these programs integrate state and national standards.
- Recommendations for improved program evaluation and performance measurement.
- Recommendations for improving program design and implementation, as well as needs for national-level support and capacity building activity.
- Recommendations and associated implications for a national "niche" or system-wide program or activity in the areas of K-12 education and professional teacher development.

In order to meet the project objectives, various data collection methods were used. Initially, three on-line surveys were administered to various staff members. The Education Coordinators (ECs) answered two online surveys: a general survey that collected data on their entire K-12 and PTD program and an individual program survey that collected specific data on each current K-12 and PTD program. The Reserve Managers (RMs), Research Coordinators (RCs), and Stewardship Coordinators (SCs) answered a survey that collected data about communication at each Reserve and about support for K-12 and PTD education programs.

After the data was collected from the online surveys, a follow-up survey for the ECs was designed and implemented through in-depth telephone interviews and four site visits. The open-ended questions were designed to clarify answers given in online surveys and to seek in-depth information for specific project objectives. The inventory data from the online individual survey was compiled into an accessible database format for future use by the Reserves and the NERRS national office. In addition, the data was compiled and analyzed.

The Survey revealed some very interesting results. Some of the more fascinating and important results are outlined below.

General Information

- 84% of the Reserves have an educational facility.
- 92% of the Reserves have one or more full-time education employees.
- 46% of the Reserves spend a large amount of time running K-12 programs.
- 83% of the Reserves spend a small amount of time running PTD programs.
- ECs spend 54% of their time on other responsibilities versus K-12 and PTD responsibilities.

K-12 Programs

- Approximately 66,000 to 67,000 students participated in K-12 programs in 2002.
- The most common K-12 program topics are estuary biology and ecology, human impacts on estuaries (including land use), and citizen stewardship.
- Sixth through eighth grades are the most common target audience for K-12 programs, followed by fourth and fifth grade.
- 51% of Reserves partnered with other organizations to deliver K-12 programs.
- 91% of K-12 programs use internal budget money to fund K-12 programs.
- The most common methods of program evaluation are staff observation and tracking participant attendance figures.

PTD Programs

- Approximately 1,800 to 2,000 teachers participated in PTD programs in 2002.
- The most common PTD program topics are estuary biology and ecology, human impacts on estuaries (including land use), and chemical/physical/geological sciences.
- Sixth through eighth grade teachers are the most common target audience for PTD programs, followed by high school teachers, and fourth and fifth grade teachers.
- 84% of Reserves use part of their internal budget and 53% use partners to help fund PTD programs.
- The most common methods of PTD program evaluation are staff observation, tracking participant attendance figures, and feedback cards.

After synthesizing and analyzing the data, the results were categorized into areas based on the study objectives: Program Design and Implementation; National and State Educational Standards; Program Evaluation and Performance Measurement; National or System-Wide Program or Activity; and Capacity Building.

<u>Program Design and Implementation</u>

Several study questions identify target audience selection and internal and external influences that shape K-12 and PTD. Target audience selection differs for K-12 and PTD programs. For K-12 programs, target audience selection is determined by the group's flexibility to attend a program. PTD target audience selection is determined in two ways: 1) providing half-day or full-day trainings for teachers who bring their students to the Reserve, and 2) targeting specific grade levels for longer workshops that give teachers

specific estuarine science and conservation knowledge. For both K-12 and PTD the most common external influences are frequency of requests and inclusion in a Reserve initiative. ECs say that the internal influences that shape program design and implementation are physical facilities, time of year a Reserve can offer a program, and the remoteness of the Reserve location.

National and State Educational Standards

Throughout the country, Reserves report that it is increasingly difficult to have students and teachers visit the Reserve if they do not correlate programs to state standards. Currently, 57% of K-12 programs are correlated to state standards and 67% of PTD programs are correlated to state standards. When correlating programs to state standards, the preferred method is to develop the program first and then match it to corresponding standards. Most programs are not correlated to national standards, which is not surprising because school systems are ultimately held accountable to state standards.

Program Evaluation and Performance Measurement

Little formal evaluation occurs for K-12 and PTD programs. The most common form of evaluation is staff observation and tracking participant attendance figures. Thirty-one percent of the K-12 programs reports having no formal evaluation and only a quarter of the programs have any type of follow-up surveys, pre- and post-program surveys, or feedback cards. For PTD programs, 22% of the programs have no formal evaluation and less than half have follow-up surveys, pre and post surveys, or feedback cards.

National or System-Wide Program or Activity

In general, there is support for some form of a system-wide program or activity. Around 60% of ECs agree that system-wide NERRS education objectives, educational program(s), and curriculum would help them improve educational programs at their Reserve. However, the support is mixed because there are contrasting opinions. ECs do agree that if any national program is implemented, it should be flexible and well supported with a long term commitment, adequate funding, and central coordination.

ECs indicated that a national-level NERRS curriculum or program might include:

- Introductory materials that each Reserve could use as springboard for site-specific programs
- Creative national marketing strategies that highlight commonalities in programs and focus among Reserves
- National PTD certification program
- National goals and objectives
- Comprehensive and Integrated
- Website
- Evaluation tools and methods

Capacity Building

Capacity building is defined as any activity or resource that might assist the K-12 and PTD programs. This includes strengthening partnerships, program support, communication, funding, and training.

Partnerships are used by Reserves in several major ways: to gain or share resources, to build programs, and to build relationships. Fifty-six percent of ECs use partnerships to gain or share resources for funding (for program salaries), people (staff, volunteers), facilities, (classrooms, dorms), equipment (canoes, boats, lab materials), education or training materials, time, audience mailing lists, and transportation services.

Reserve Managers are generally supportive of ECs, and allow the autonomy of ECs to manage their own areas of responsibility. ECs feel that increased communication with RCs would improve education programs. It was found that the Reserve staff at each site is small and the workload is great, so it is often easy for staff to become narrowly focused on their area. Communication between staff occurs at all of the sites, but in many cases only when a specific need arises.

Several questions probed ECs greatest needs for funding and training. Funding is needed for more paid education staff to assist with programs, teacher stipends, and transportation. The greatest training needs for EC professional development include training for program evaluation, education standards correlations, curriculum design, and to increase ecological knowledge and skills.

A key outcome of the project was to provide recommendations to improve NERRS K-12 and PTD programs. NERRS is a unique organization with many strengths. NERRS' mission, structure, and diversity give it the potential to be a leader in estuarine education on a national level. With this in mind, the following recommendations were developed.

Reserve Level Recommendations

Recommendation 1: *Develop an EC position description*

The EC position description should include some broad qualifications and duties that can be integrated with Reserve-specific qualifications and responsibilities. This could be used as a guide to create consistency across the network.

Recommendation 2: *Provide training for ECs*

The creation of an annual development plan for each EC that builds on their key strengths and identifies areas for further development would help each EC to increase their expertise in both estuarine science and education. ECs should be proactive to determine specific professional development opportunities for themselves and present a proposal to their RM so that they can expand their professional capabilities.

Recommendation 3: *Increase paid education staff*

The education staff has many program responsibilities including CTP, Coastal Decision Makers Workshops, school programs, and public programs. In addition, ECs have administrative and overall operations responsibilities that take over half of their time. ECs need more staff to run safer programs and to increase program attendance. It is important to identify the Reserves that need more staff and determine if it can be pursued on a federal or state level.

Recommendation 4: *Secure outside funding for K-12 and PTD programs*

Over 84% of all K-12 and PTD programs are funded by internal budgets. ECs indicate they need assistance in finding outside funding to increase or improve current Reserve programs.

National Level Recommendations

Recommendation 5: *Hire a national K-12 and PTD education coordinator; secure direct and consistent funding for any new system-wide K-12 and PTD programming*

If there is a commitment to K-12 and PTD programs from a system-wide standpoint, a central coordinator position needs to be established. The coordinator would take the leadership role on any national or system-wide program(s), including an evaluation and performance measurement framework.

Recommendation 6: *Provide assistance to Reserves to secure outside funding*

The national office or national education coordinator could serve as a repository for a catalog of funding opportunities. The national Education Coordinator could serve as the lead in writing proposals for grants to other federal agencies such as the Environmental Protection Agency and the National Science Foundation, as well as to private funding sources.

Recommendation 7: *Maintain a database of examples of NERRS K-12 and PTD programs*

Maintaining a database of examples of successful NERRS K-12 and PTD programs and "lessons learned" is more manageable and sustainable with today's technology. The database could be stored on a NERRS K-12 and PTD website for ECs. A separate website for the public could help market the programs.

Recommendation 8: *Provide assistance to correlate all NERRS programs to state educational standards*

Although ECs can be trained to correlate programs to state standards themselves, their workload prevents this from being a high priority. Correlating programs and curricula to

state standards will increase the likelihood that educators will use the materials, come to PTD trainings, and bring their students to Reserve K-12 programs. Assistance might include training and/or assistance performing correlations.

Recommendation 9: *Establish national performance measures and Reserve-level goals and objectives*

The national office, with EC input, should develop key national goals that are important and applicable throughout NERRS, and then tie them to measurable objectives. At the Reserve level, the national office should assist with the development of goals and objectives that would relate to each particular Reserve's target audiences. The objectives could be knowledge, attitude, or action based. The Reserves could mirror state benchmarks or standards for their objectives.

Recommendation 10: *Develop and implement an evaluation framework that would measure factors at a national level and Reserve level*

There is no established evaluation framework at the national level and only a few Reserves consistently evaluate their programs. It is important that Reserves define the level and types of formal evaluation that would be most useful and that ECs create an efficient and consistent plan to evaluate their programs.

Recommendation 11: *Provide assistance for a K-12 and PTD market analysis and needs assessment for newer Reserves or Reserves interested in re-assessing their programs*

A market analysis and needs assessment would assist Reserves in the development of effective programs, the development of an evaluation and performance measurement framework, and participation in a system-wide program.

Recommendation 12: *Provide assistance for a PTD market analysis and needs assessment for Reserves that offer or want to offer PTD programs*

A market analysis and needs assessment would assist Reserves that offer PTD programs in the development of effective programs, the development of an evaluation and performance measurement framework, and teacher recruitment.

Recommendation 13: *Continue national marketing to support local K-12 and PTD initiatives*

ECs want more marketing materials to supplement their programs or market any system-wide program. There is also a desire for a central NERRS K-12 and PTD website that could be a link among Reserve programs and any national program.

Recommendation 14: *Develop and offer a system-wide NERRS K-12 and PTD program focused on field-based estuarine research*

Many Reserve educational initiatives already integrate Reserve research and a majority of ECs (96%) indicate that research is a differentiating factor for their K-12 and PTD programs. There are many organizations doing coastal and marine K-12 and PTD education, but few of them are filling an estuarine education niche with a research focus. It makes sense that field-based estuarine research be the focus for a system-wide K-12 and PTD program.

C. INTRODUCTION

National Estuarine Research Reserve System K-12 and PTD Background

The National Estuarine Research Reserve System (NERRS), formed in 1972, incorporated an education program linked to research and stewardship at its inception. Twenty-four Reserves are currently offering K-12 and PTD programs for a wide range of audiences. Many have been conducting these programs for a number of years, others are re-evaluating current programs, and a third group of newer Reserves are developing programs.

NERRS education staff have diverse talents and each Reserve has it's own set of unique characteristics, challenges, and opportunities. Some of the differences and challenges stem from the diverse group of state partners, and the status of the school system and political climate in each state. With tightening school budgets and increasing pressure to meet standardized testing goals, teachers have had difficulty securing funding and time for workshops, programs, and fieldtrips.

NERRS is ideally suited to offer many opportunities to the K-12 and PTD market. Reserves have well defined goals and objectives and have the flexibility to create innovative programming that fits the needs of their local and regional communities. In addition to their "local flexibility," NERRS also has many common themes that can be explored to create a system-wide program or activity that will have a meaningful national impact on youth and teachers

Study Objectives

NERRS Educators initiated the K-12 and PTD inventory and assessment project as a high priority action item in 2002-2003. It was to provide baseline data, synthesis and recommendations for program improvements in support of the NERRS Strategic Plan. Specific study objectives include:

- Inventory and assessment, both quantitative and qualitative, of current programming for K-12 and professional teacher development across the 25 Reserves and how these programs integrate state and national standards.
- Recommendations for improved program evaluation and performance measurement.
- Recommendations for improving program design and implementation, as well as needs for national-level support and capacity building activity.
- Recommendations and associated implications for a national "niche" or system-wide program or activity in the areas of K-12 education and professional teacher development.

Methodology

In October 2002, the Formal Education Workgroup and members of Pandion Systems' team had an initial telephone meeting to begin development of the project. Following the meeting, Pandion Staff met with Education Coordinators (ECs) at their annual meeting in Cape Cod at the Waquoit Bay Reserve. At this meeting the formal objectives and data collection topics were discussed so that the Pandion team could confirm the objectives, refine a work plan, and establish deliverables for the project. The data collection methods agreed upon by the group were online surveys, in-depth telephone interviews, and limited site visits.

Data Collection

Pandion administered three on-line surveys to various NERRS staff members. The ECs answered two online surveys: a general survey that collected data on their entire K-12 and PTD program and an individual program survey that collected specific data on each current K-12 and PTD program. The Reserve Managers (RMs), Research Coordinators (RCs), and Stewardship Coordinators (SCs) answered a survey that collected data about communication at each Reserve and about support for K-12 and PTD education programs.

The first online survey was a general survey that targeted the ECs. It was designed to provide initial data to address the four project objectives. At the end of the general survey each EC was asked to list each current K-12 program and current PTD program (taught within the last year).

The second online survey was designed to capture information about each individual K-12 and PTD program that was listed in the general survey. ECs submitted a separate survey for each program. These questions were used to satisfy the first objective of the project: to provide a system-wide inventory of the NERRS K-12 and PTD education programs.

Following the two initial online surveys, each EC was interviewed in an in-depth telephone survey that included several follow up questions. The open-ended questions were designed to clarify answers given in online surveys and to seek in-depth information for specific project objectives.

The third online survey was sent to Reserve Managers (RMs), Research Coordinators (RCs), and Stewardship Coordinators (SCs). These questions were designed to capture data to determine how research and stewardship aspects of the Reserves contribute to K-12 and PTD programs.

Finally, site visits were conducted, spending one day each at four Reserves, asking the same questions from the in-depth telephone interview. Site visits allowed us to spend more time discussing some of these questions. In addition, we conducted brief face-to-

face interviews with other staff members including RMs, RCs, and SCs. We also viewed and gathered some samples of K-12 and PTD materials.

Of the 25 existing Reserves, 24 responded to the online surveys (the 25th Reserve does not have an EC), and 24 also responded to both the individual program online surveys, and the telephone interview (N=20) or site visit interview (N=4). We also collected online surveys from 19 RMs, 17 RCs, and 9 SCs. To protect respondent confidentiality each survey was coded and access was restricted to the study team.

Data Interpretation Constraints

A multiple-choice survey with Likert scale questions was used to determine responses for many categories. When this type of data is gathered there are constraints based on the choices available for respondents to answer. During the follow-up interviews, ECs were more flexible when they could explain their answers. An example occurred in the follow-up interview when each EC was asked about their feelings for developing a national program. Some ECs that indicated in the online survey that they did not want a national program were able to explain why and add clarifiers that identified the type of national program or activity that would work for them.

There are two other cases where there was confusion about a question and the study team found that there were multiple interpretations of the question.

The first case involves confusion about the definition of formal evaluation. The online individual survey posed the question "*What type of formal evaluation has been done for this program?"* with a list of corresponding answers to choose from. Another question in the follow-up telephone interview asked "*For programs that have been formally evaluated, what were the results?"* In both questions, ECs could have interpreted the definition of formal evaluation as a program that has had specific data collected and analyzed quantitatively; or as a program that has feedback collected and has been reviewed on a case by case basis, but has not had any formal quantitative results tabulated. In some cases ECs also interpreted the definition of formal evaluation as an evaluation conducted by an outside party.

The second case involves a question from the online general EC survey, "*Rate the degree to which your Reserve educational programs (K-12 and PTD) are different from other coastal related programs."* There were 10 parts where ECs were asked to rate on a scale of 1 to 10 (where 1 equals not at all different and 10 equals very different). When analyzing the results there was a double meaning that made the results unclear. The question was interpreted differently by ECs. For example, one part asked to rate on a 1-10 scale (where 1 equaled not at all different and 10 equaled very different) "*We integrate research from the Reserve into programs*." If a 5 rating was given it was unclear if they did not integrate research into their programs thus there is no differentiating factor or if they did integrate research and the other providers also did too. In retrospect this question should have been separated into two parts.

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D. INVENTORY SUMMARY

General Information

As the main objective for the project, it was important to gather specific information about each NERRS program. Several questions were asked on the general EC survey to get a clear picture of the current state of each Reserve's education facilities, staff size, and staff time spent on conducting K-12 and PTD programs. During the follow-up telephone interviews, questions were asked to elicit information about EC educational background and previous work experience, and the time each EC spent on K-12 or PTD programs versus their other responsibilities.

Facilities

In the general survey each EC was asked whether they have an educational facility (e.g. training facility, classroom, or environmental education center).

- 84% of the Reserves have an educational facility.
- 16% of the Reserves do not have an educational facility

Education and Volunteer Staff

ECs were asked to specify what types and how many staff members they have (Table 1).

- Twelve of the Reserves (50%) have one full-time staff member that works on K-12 and PTD programs.
- 21% of Reserves have two full-time education staff members.

Table 1. Full-time Education Reserve Staff including the Education Coordinator

	Number of Reserves	Percent
0 Full-time	2	8 %
1 Full-time	12	50 %
2 Full-time	5	21 %
3 Full-time	3	13 %
4 Full-time	2	8 %

The specific amounts of ¼, ½, and ¾ part-time employees were not significant enough to report individually, so these were summarized as simple binary responses (yes or no). The highest number of part-time staff in any category at one Reserve was four. The highest number of volunteers at one Reserve was seven (Table 2).

Table 2. Part-time and Volunteer Staff including the Education Coordinator

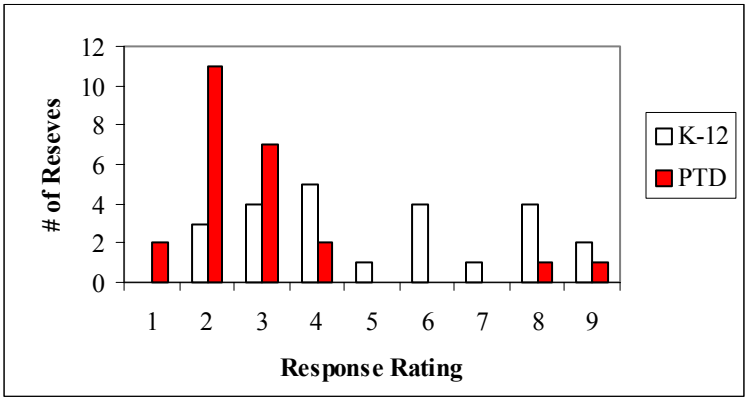
	Number of Reserves	Percent
At least one ¼ part-time staff	7	29 %
At least one ½ part-time staff	7	29 %
At lease one ¾ part-time staff	9	37 %
At least one volunteer	5	21 %

Time Education Staff Spends Running K-12 and PTD Programs

The amount of time that the education staff at each Reserve spends on running K-12 and PTD programs are reported on a scale of 1 to 10, where 1 equals none and 10 equals all. In the case of K-12 programs, the mean of 5.17 is misleading because the distribution of responses is grouped in large clusters on either end of the continuum. Fifty-four percent of the responses rate the time they spend running K-12 programs as a 5 or less versus 46% that rate the time they spend running K-12 programs as a 6 or higher.

Time staff spends running PTD programs has a mean of 2.92 and 83% of the respondents rate this as a 3 or less. Figure 1 shows the distribution of responses for this question.

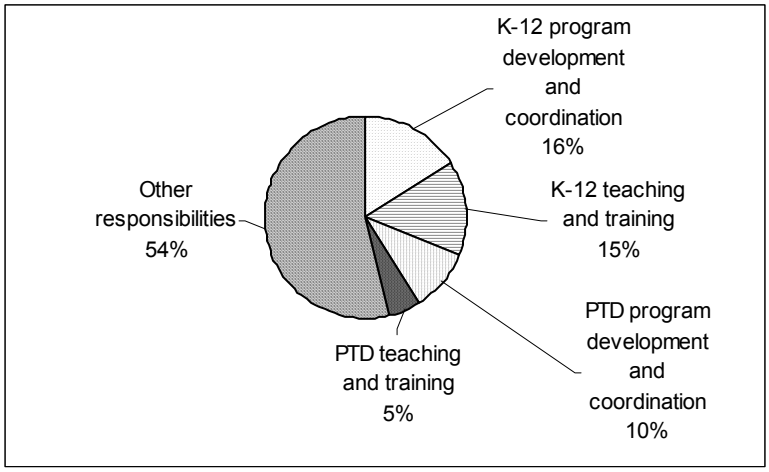
Figure 1. Time Education Staff Spends Running K-12/PTD Programs



K-12 and PTD Duties Versus Other EC Responsibilities

During the in-depth telephone interviews, a follow-up question was used to find out what activities and responsibilities the ECs focus on. Each EC divides their time between the following topics: *K-12 program development and coordination, actual teaching/training time of K-12 programs, PTD program development and coordination, actual teaching/training of PTD programs, and other responsibilities*. Each EC assigns a percent value so that all five areas total to equal 100%. Each EC also lists their other responsibilities. Figure 2 represents the average time ECs spend working on each activity.

Figure 2. Average Time Education Coordinators Spend on K-12, PTD and Other Responsibilities



A variety of responses were listed to describe ECs other duties. For ease of reporting, the list is classified into four areas (Table 3). The average percent of time ECs spend on each activity is located next to each heading.

Table 3. What are Education Coordinators Other Responsibilities?

Managerial Activities = 31%	**Other Activities = 29%**
Communications, Public Relations	Donor Relations
Administrative Tasks	Research Assistance
State Administrative Tasks (permits etc.)	Exhibit Design
Staff Supervision	Grant Writing
Budgeting/Finance	Facility Maintenance (buildings, trucks, aquaria)
Hiring and Training Staff and Volunteers	Development Opportunities
Other Education Activities = 24%	**Coordination Activities = 16%**
Coastal Training Program (CTP)	Volunteer Coordination
Public Education Programs	Coordinating Partners
Community Outreach	Program Logistics
Coastal Decision Maker Workshop	Coordinator from Water Quality Monitoring
	Coordinating Facility Use

Experience and Education Background of Education Coordinators

A diverse background of talent is noted within the NERRS system. Many ECs have received bachelors and advanced degrees (Table 4) in various scientific disciplines including the biological and physical sciences. To a lesser extent, ECs have studied general education and science education (Table 5).

Table 4. Education Coordinators Education Level

Highest Degree Attained	Percentage of ECs
High School	4%
Bachelors	52%
Advanced Degree (Masters, PhD)	39%
Missing Value	4%

Table 5. Education Coordinators Areas of Specialization Categories

Terrestrial Science = 44%
Zoology
Biology
Animal Behavior
Ecology
General Science
Wildlife Ecology
Wild Land Recreation Management
Environmental Science

Marine Science = 19%
Marine Science
Marine Biology
Marine Policy
Coastal Resources

Science Education = 16%
Agriculture and Natural Resource Education
Environmental Science Education
Science Education
Biology Education

General Environment = 13%
Environmental Studies
Environmental Policy

Education Other = 6%
English Education
Health Education
Outdoor Education

Other = 3%
Psychology
Sociology

ECs also have a diverse background of work experience ranging from positions at state agencies to work at informal science institutions (Table 6). For ease of reporting, work experience is grouped into six different areas.

Table 6. Education Coordinators Work Experience Categories

State Agencies = 26% Department of Natural Resources Department of Environmental Protection Fish & Game Commission Coastal Zone Management Parks Department	**Previous NERR Experience = 21%** Volunteer Research Technician Education Specialist Graduate Student/Fellow Internship
Informal Science Institutions = 21% Science Center Science Museum Nature Center Non-Profit Organizations	**Other Experiences = 13%** Boys and Girls Clubs Freelance Naturalist Recreation and Education Services Business Owner Carpenter/Mason Mail Carrier
Education =13% Teacher Substitute Teacher Community College Educator	**Other Scientific Experience = 4%** Fisheries Coastal Ecology

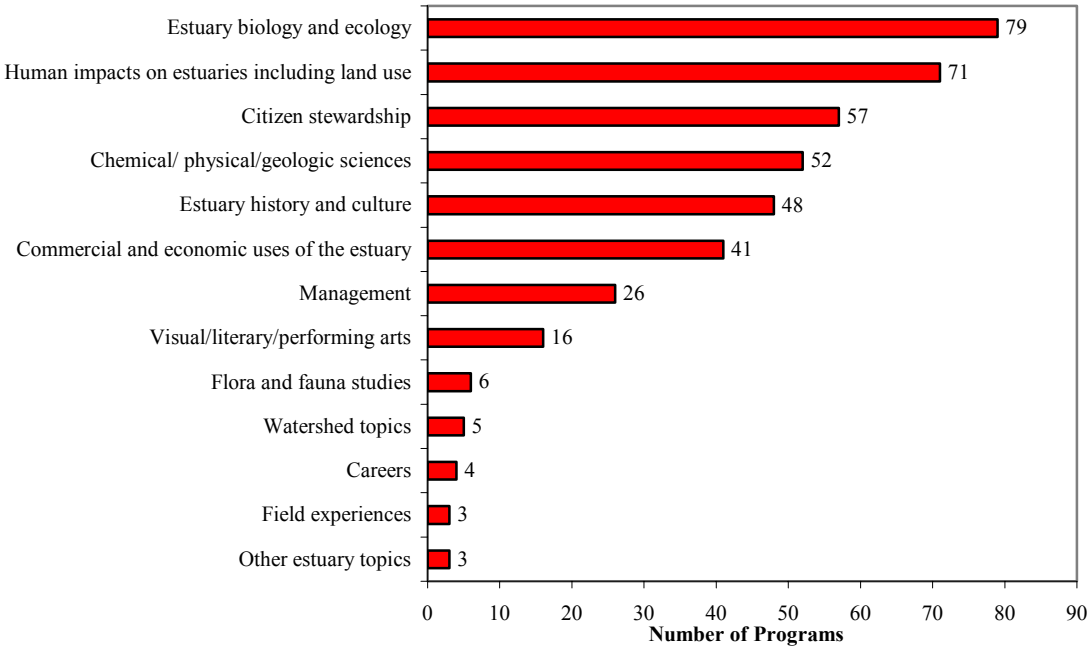
K-12 Program Inventory

A total of 86 K-12 programs were reported from 23 Reserves. What follows is a descriptive breakdown of the programs by topic, target audience, and format. Other questions relate to logistics, implementation, marketing, funding, and evaluation methods, which are also summarized in this section. Note that some programs list more than one choice for each area.

K-12 Program Breakdown by Topic

Three program topics are the most common among Reserves. Seventy-nine programs cover the topic estuary biology and ecology, 71 programs cover the topic human impacts on estuaries (including land use), and 57 programs cover citizen stewardship as a topic (Fig. 3). These represent common topics that may be used as themes for a national niche.

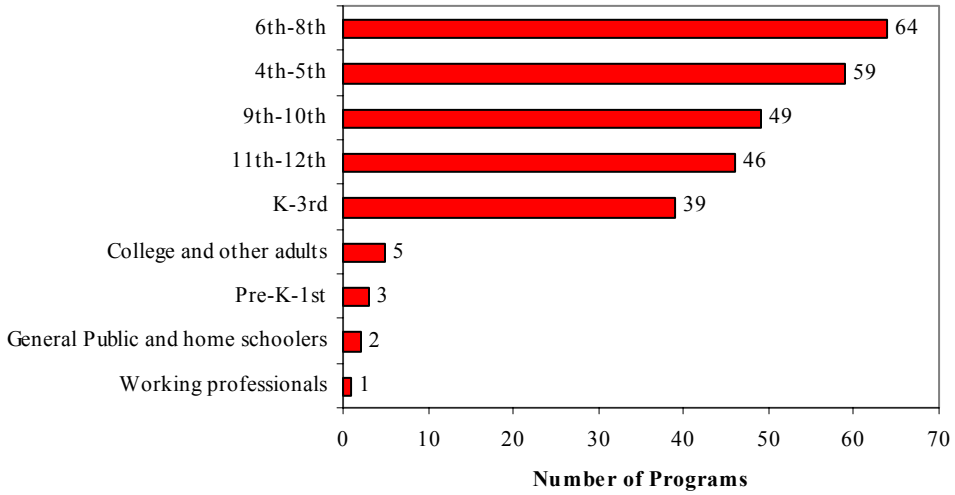
Figure 3. K-12 Program Breakdown by Topic (Based on 86 programs)



K-12 Program Breakdown by Target Audience

The highest number of programs targets grades six through eight (64) and then grades four and five (59) (Fig. 4). In the follow-up telephone interviews and site visits, it was found that grades six through eight are a common target because these students have the ability to comprehend the subject matter, they are physically capable of performing program activities, and have the flexibility to participate in field trips.

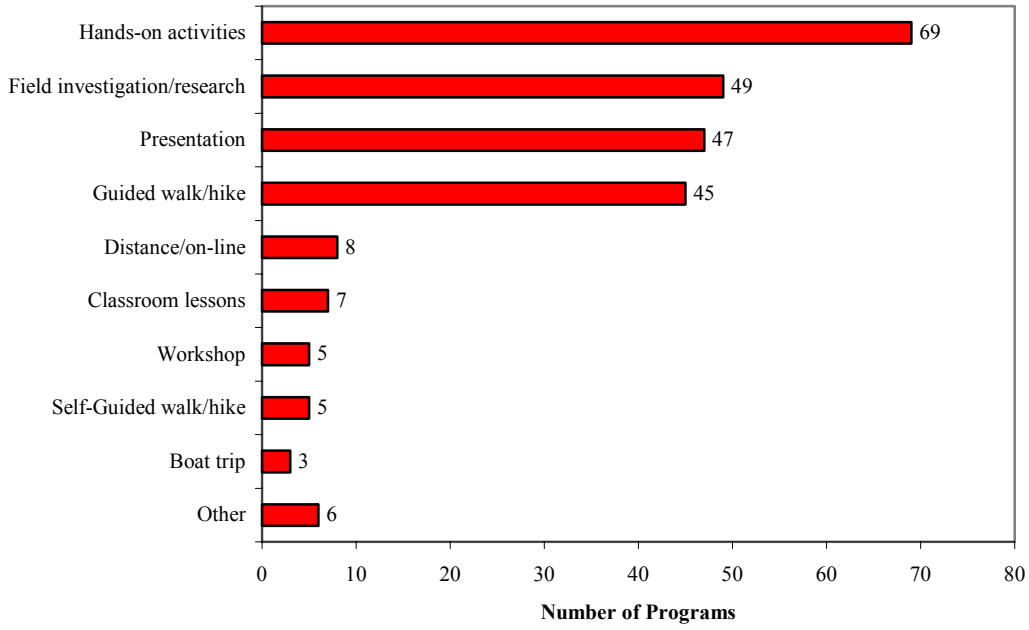
Figure 4. K-12 Program Breakdown by Target Audience (Based 86 programs)



K-12 Program Breakdown by Format

Sixty-nine K-12 programs use hands-on activities as a program format, followed by 49 that use field investigation/research as a program format. Presentations and guided walks/hikes are also common program formats (Fig. 5).

Figure 5. K-12 Program Breakdown by Format (Based on 86 programs)



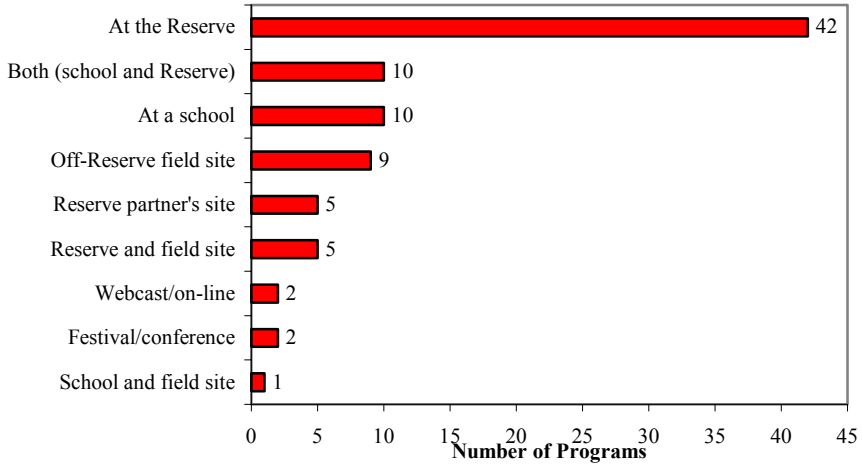
K-12 Program Number of Annual Participants

In 2002, approximately 66,000 to 67,000 students participated in Reserve K-12 programs. These numbers are based on the individual surveys submitted by each Reserve. In many cases summer camp programs were not included as a K-12 program, although some Reserves did submit these summer attendance numbers and they are included in the total numbers above.

K-12 Program Locations

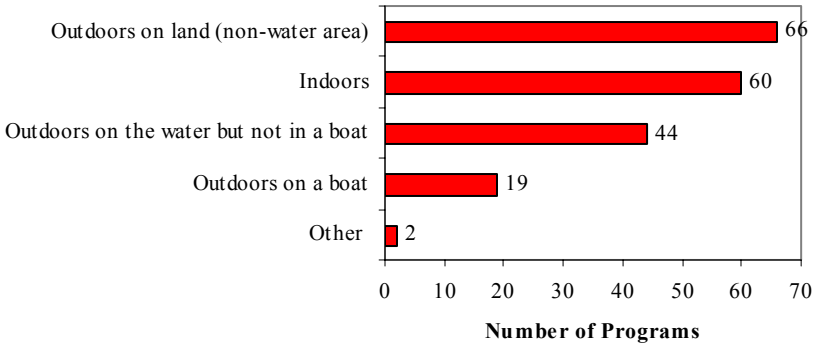
K-12 programs are presented at certain physical locations and environmental settings. Forty-two programs occurred at a Reserve. It is interesting to note that nine programs occurred out in the field but at field sites other than the Reserve (Fig. 6).

Figure 6. K-12 Program Physical Locations (Based on 86 programs)



In many cases, a K-12 program has more than one activity and therefore occurs in more than one environmental setting. Sixty-six K-12 programs include an activity that occurs outdoors on land, 60 programs include an activity that occurs indoors and 44 of the programs occur outdoors in the water but not on a boat (Fig. 7).

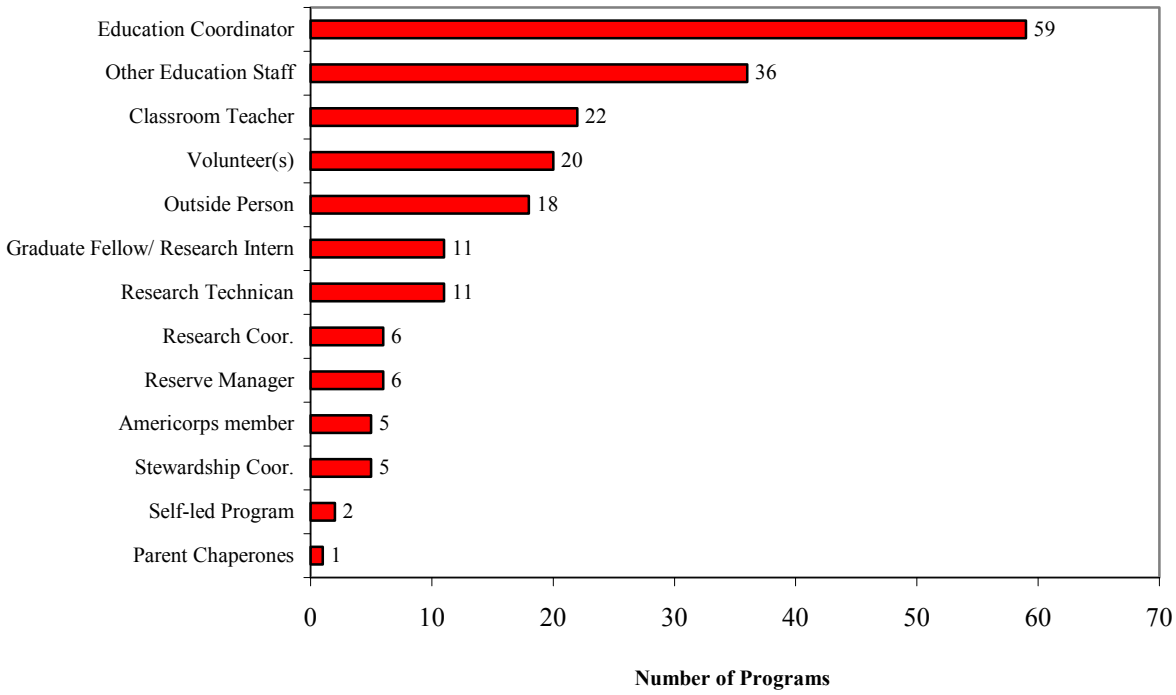
Figure 7. K-12 Program Environmental Setting (Based on 86 programs)



K-12 Program Instructors

Education Coordinators teach 59 K-12 programs and other Education staff members teach 36 of the programs. Classroom Teachers are the third largest group of instructors accounting for 22 programs (Fig. 8). Please note that different people often teach programs, or parts of programs thus there are more than 86 responses.

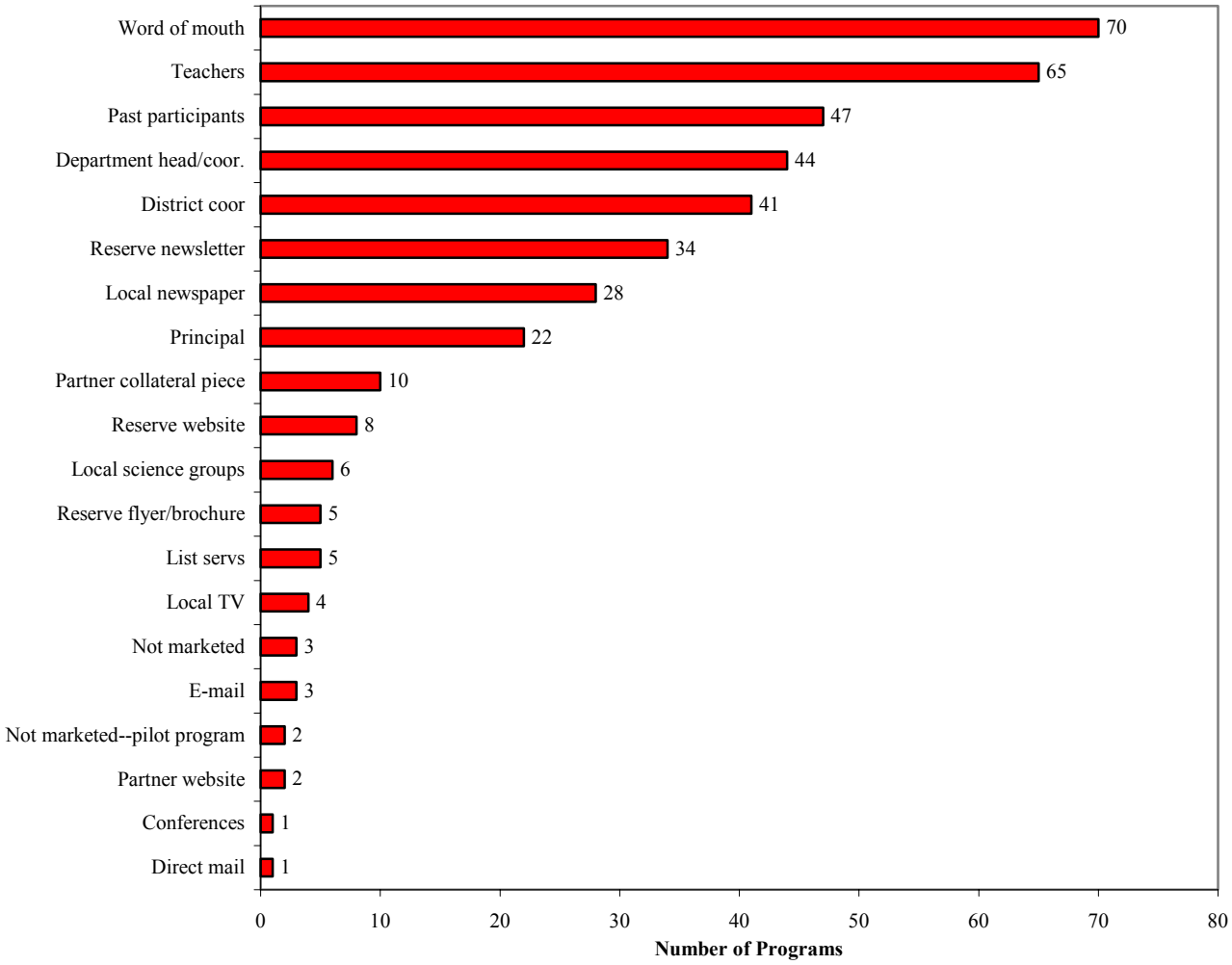
Figure 8. K-12 Program Instructors (Based on 86 programs)



K-12 Program Marketing

There are a variety of methods that various Reserves use to attract school participation and many ECs use more than one strategy to reach potential participants. The most common marketing methods among the Reserves are word of mouth (70 programs), passing information directly to teachers (65 programs), and contacting past participants (47 programs) (Fig. 9).

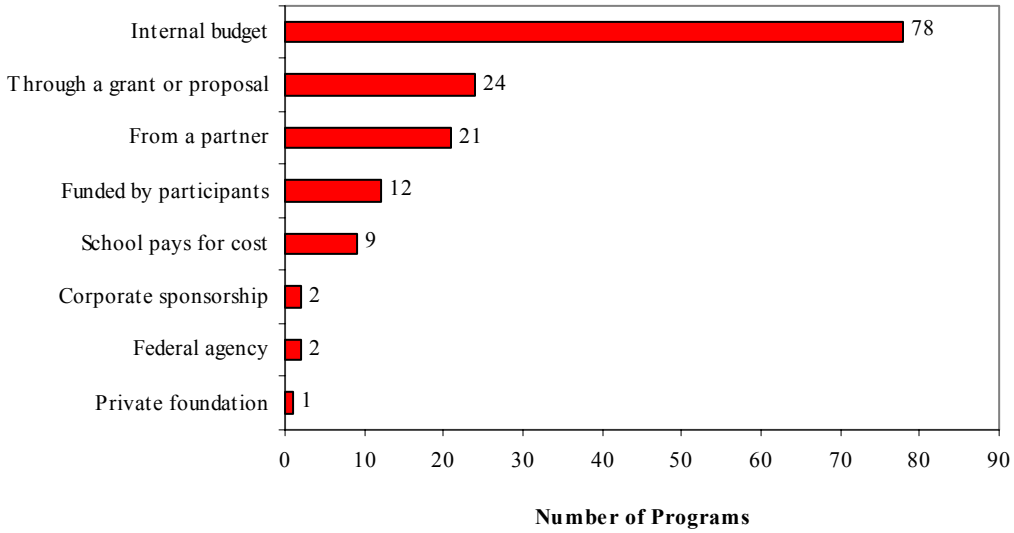
Figure 9. K-12 Program Marketing (Based on 86 programs)



K-12 Program Partnerships and Funding

Fifty-one percent of Reserves partner with others to deliver K-12 programs. Even though approximately half of the programs involve partnerships, it is clear that most of the programs are funded through their internal budgets. The second leading source of funds is grant proposals, and the third leading source of funds is from partners (Fig. 10). Some Reserves list multiple funding sources.

Figure 10. K-12 Program Funding Sources (Based on 86 Programs)



K-12 Program Pricing

Eighty-seven percent or 75 programs are priced individually or are free for participants. Thirteen percent or 11 programs are offered as a group price. Tables 7 and 8 show the breakdown of pricing levels among Reserves.

Table 7. K-12 Program Individual Pricing (Based on 75 programs)
Includes free programs

Price	Percent of Programs
Free	84%
$.01-$5.00	5%
$5.01-$10.00	4%
$10.01-$15.00	1%
$15.01-$20.00	1%
More than $20.00	4%

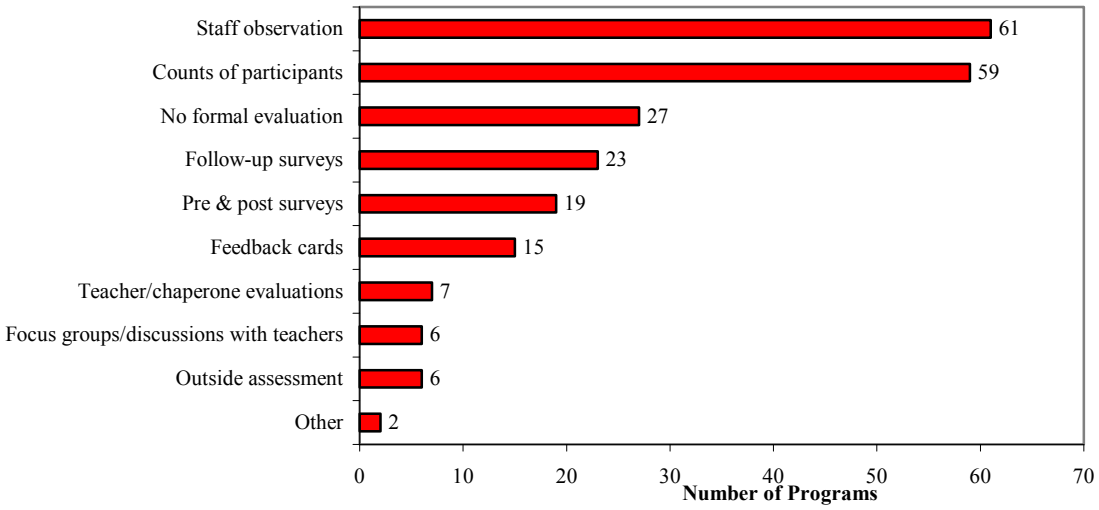
Table 8. K-12 Program Group Pricing (Based on 11 programs)

Price	Percent of Programs
$.01-$10.00	9%
$10.01-$20.00	27%
$20.01-$30.00	27%
$75.00	27%
$150.00	9%

K-12 Program Evaluation Methods

In many cases more than one type of evaluation method is used to evaluate a program. The most common evaluation methods for K-12 programs are staff observation (61 programs) and tracking participation attendance figures (59 programs), while 27 programs are not evaluated (Fig. 11).

Figure 11. K-12 Program Evaluation Methods (Based on 86 programs)



PTD Inventory

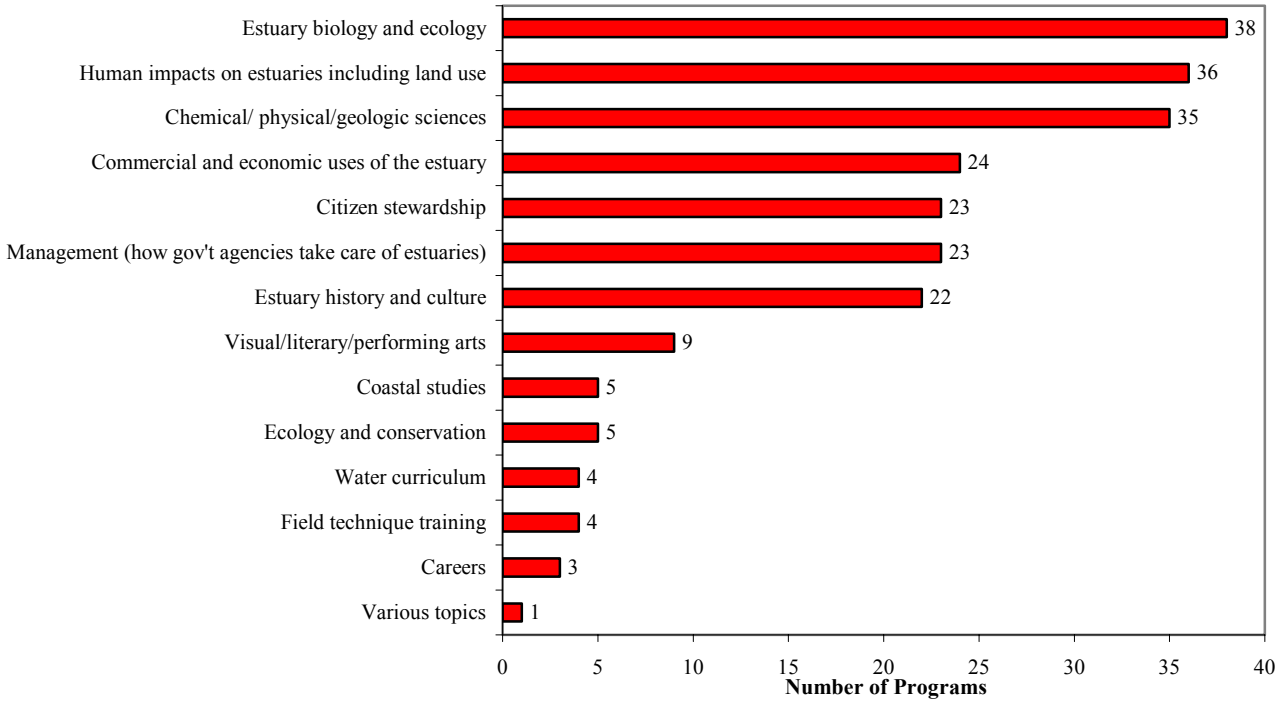
A total of 45 PTD programs were reported from 19 Reserves. What follows is a descriptive breakdown of the programs by topic, target audience, and format. Other questions relate to logistics, implementation, marketing, funding, and evaluation methods, and they are also summarized in this section. Note that some programs list more than one choice for each of these areas.

PTD Program Breakdown by Topic

Three PTD program topics are the most common among Reserves. Thirty-eight programs cover the topic estuary biology and ecology, 36 programs cover human impacts on estuaries (including land use), and 35 programs cover chemical/physical/geological sciences (Fig. 12). These represent common topics that may be used as themes for a national niche.

The two most common PTD program topics, estuary biology and ecology and human impacts on estuaries (including land use), are the same as the most common K-12 program topics.

Figure 12. PTD Program Breakdown by Topic (Based on 45 programs)

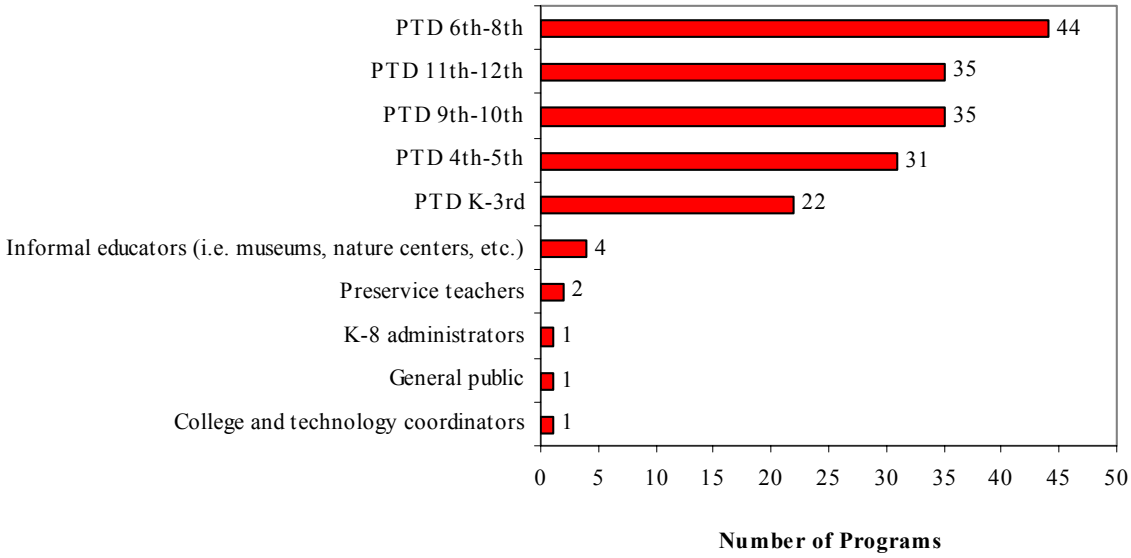


PTD Program Breakdown by Target Audience

The highest number of PTD programs target teachers of grades six through eight (44 programs). High school teachers are the second largest target group (35 programs). The third largest target group is teachers of grades four and five (31 programs) (Fig. 13). Many PTD programs cover a range of grade levels and list more than one target audience.

Similar to the K-12 program target audience group, teachers of grades six through eight are a common target audience because these students have the ability to comprehend the subject matter, they are physically capable of performing program activities, and have the flexibility to participate in field trips.

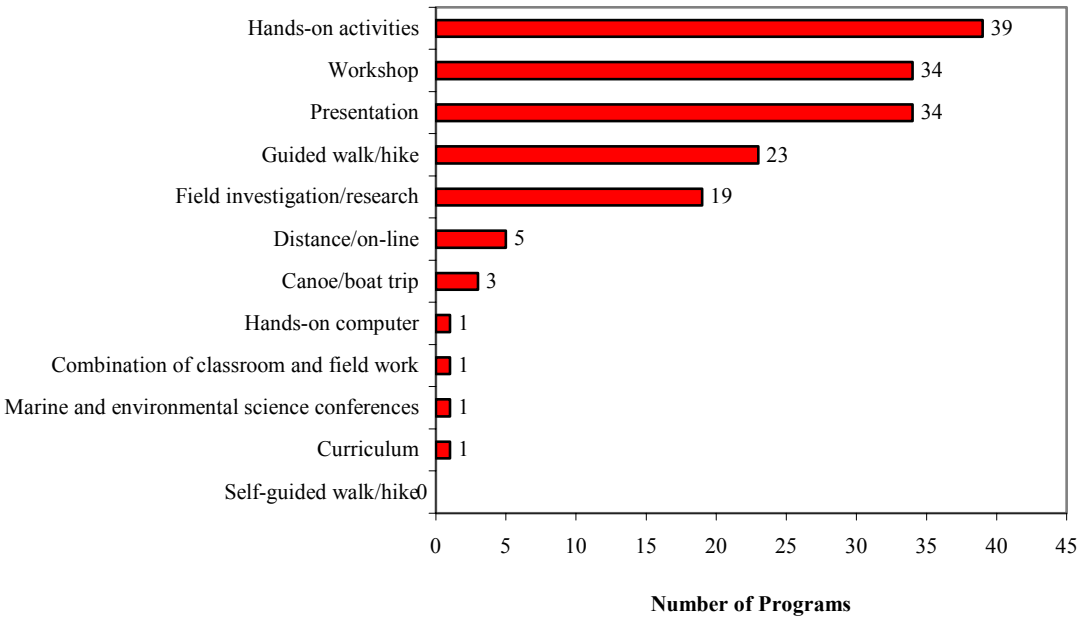
Figure 13. PTD Program Breakdown by Target Audience (Based on 45 programs)



PTD Program Breakdown by Format

The three predominant PTD program formats are hands-on activities (39 programs), workshops (34 programs), and presentations (34 programs). Guided walks/hikes and field investigations/research are also popular formats (Fig. 14).

Figure 14. PTD Program Breakdown by Format (Based on 45 programs)



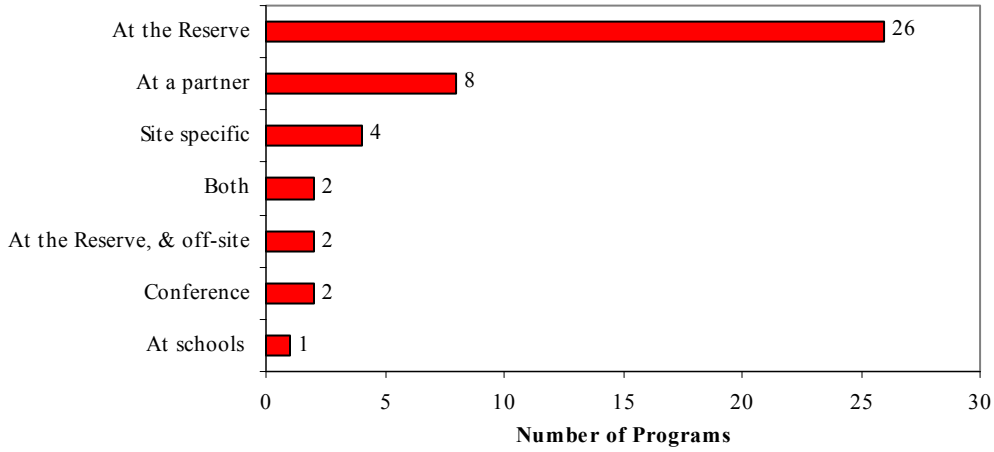
PTD Program Number of Annual Participants

In 2002, approximately 1,800 to 2,000 teachers participated in Reserve PTD programs. These numbers are based on the individual surveys submitted by each Reserve and include workshops offered during the summer.

PTD Program Locations

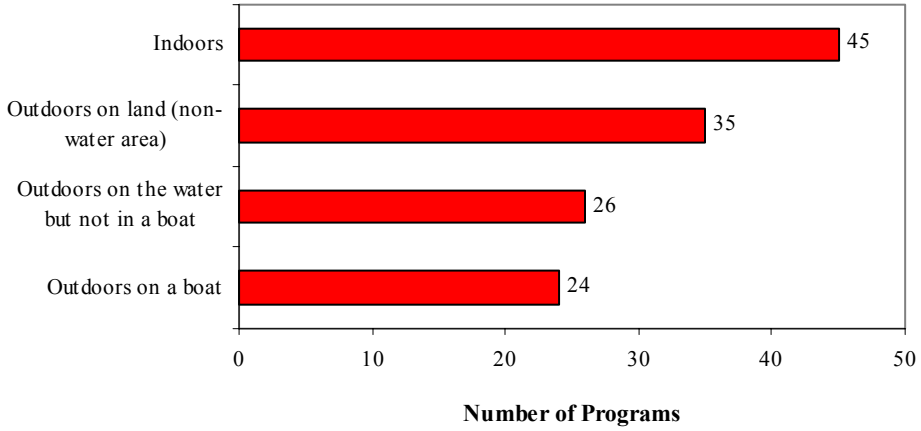
PTD programs are presented at certain physical locations and environmental settings. Twenty-six programs occur at a Reserve and eight programs occur at partner sites (Fig. 15).

Figure 15. PTD Program Physical Locations (Based on 45 programs)



In many cases, a PTD program has more than one activity and therefore occurs in more than one setting. All 45 programs inventoried have a portion of the program that is conducted indoors. The results indicate that 35 programs have activities that occur outside on land, 22 programs have outdoor activities that occur outside in a water area (but not on a boat), and 24 programs use a boat for a PTD activity (Fig. 16).

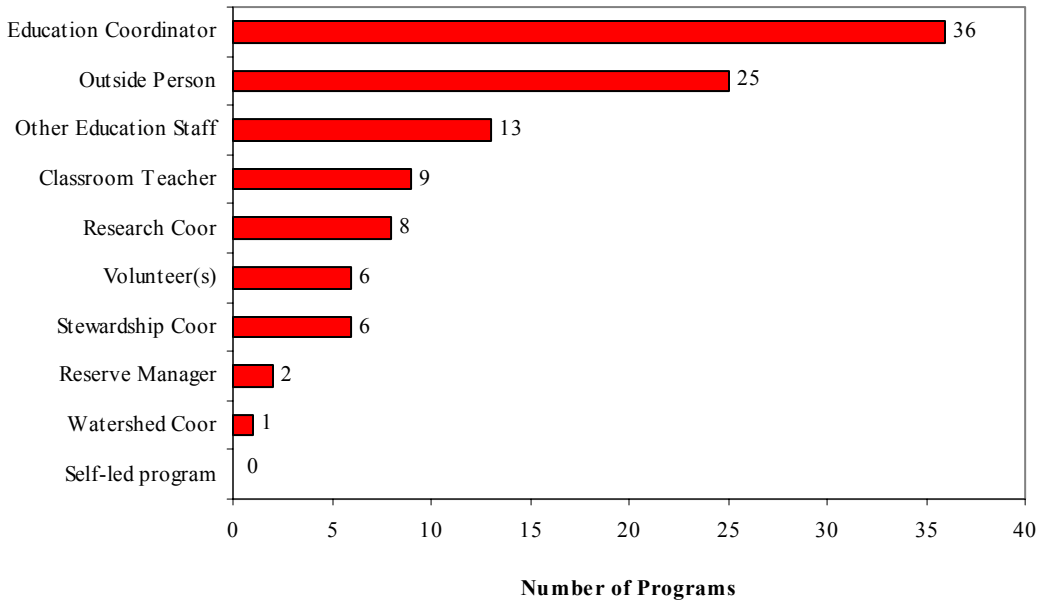
Figure 16. PTD Program Location Settings (Based on 45 programs)



PTD Program Instructors

ECs indicate in their follow-up interviews that they partner with other organizations to deliver PTD programs. The analysis of the data also supports this. Thirty-six programs are taught by the EC, the next largest group consists of 25 programs taught by outside people. The third largest group consists of 13 programs taught by other Reserve education staff (Fig. 17).

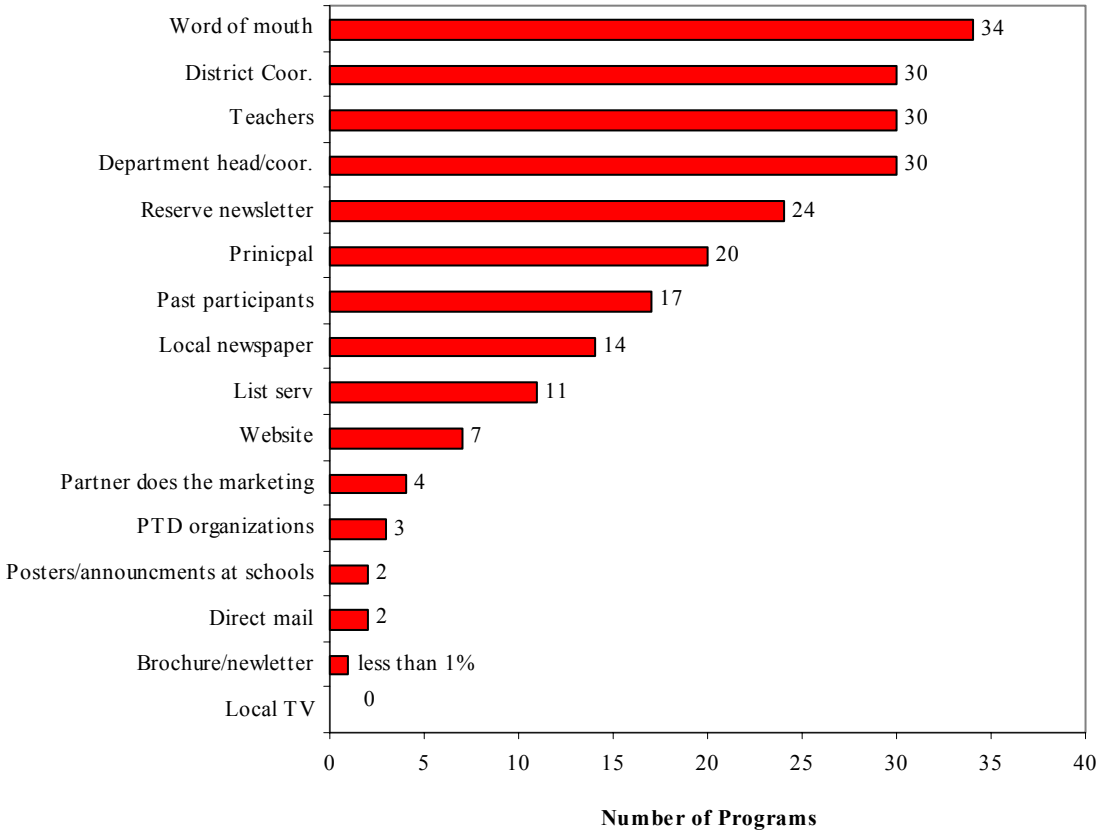
Figure 17. PTD Program Instructors (Based on 45 programs)



PTD Programs Marketing

Reserves use a variety of methods to attract teacher participation. Many Reserves employ more than one method. The most common methods among the Reserves are word of mouth (34 programs), passing information on to various school officials including teachers, district coordinators, and administrators (30 programs each), and 24 programs are marketed through Reserve newsletters (Fig. 18).

Figure 18. PTD Program Marketing (Based on 45 programs)

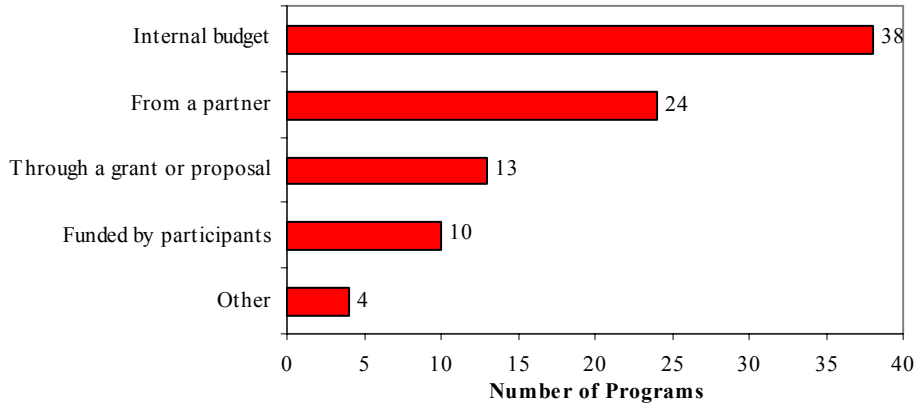


PTD Program Partnerships and Funding

Seventy-three percent of PTD programs use partnerships in some form to deliver their programs. Partners are used for program instruction, for facilities, added funding/sponsorship, and to increase visibility of the program.

Funds come from multiple sources. Thirty-eight programs use some funds from their internal budget and 24 programs receive funding from their partners. Thirteen programs gain funding from grant proposals (Fig. 19).

Figure 19. PTD Program Funding Sources (Based 45 programs)



PTD Program Pricing

PTD program pricing varies (Table 9 and 10). Many programs are a half-day or full-day workshop and some programs last for two or more days. Thus the pricing varies from free to $900 per participant.

Table 9. PTD Individual Program Pricing PTD Group Program Pricing

Price	Percent of Programs
Free	51%
$.01-$5.00	0%
$5.01-$10.00	12%
$10.01-$15.00	2%
$15.01-$20.00	2%
More than $20.00	28%

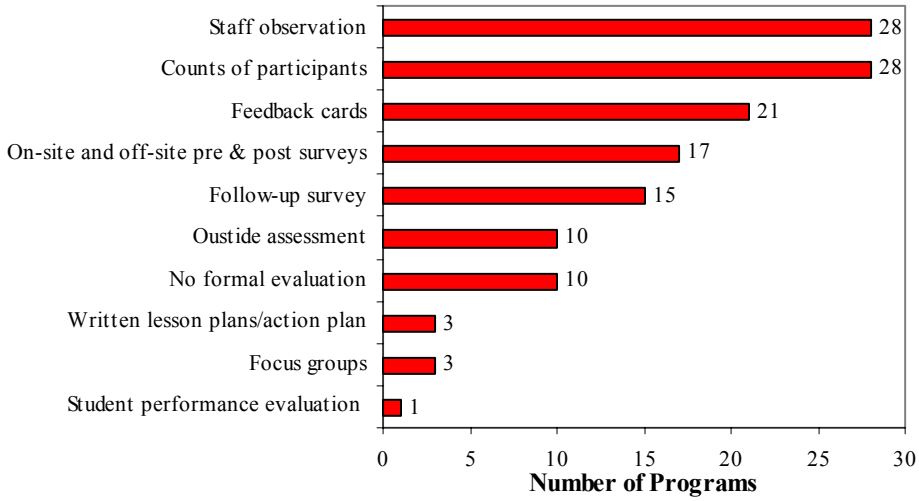
Table 10. PTD Group Program Pricing

Price	Percent of Programs
Group Fee $.01 - $10.00	100% (2 programs)

PTD Program Evaluation Methods

In many cases more than one type of evaluation method is used to evaluate a program. The most common PTD program evaluation methods are staff observation, participant attendance counts, and feedback cards. Ten programs have no formal evaluation method (Fig. 20).

Figure 20. PTD Program Evaluation Methods (Based on 45 programs)



E. RESULTS

Results are divided into five areas based on the study objectives. They are:

- Program Design and Implementation
- National and State Educational Standards
- Program Evaluation and Performance Measurement
- National or System-Wide Program or Activity
- Capacity Building

The findings and discussion that follow are based on the surveys and follow-up interviews of the staff, as well as a review of other coastal related educational programs.

While performing the analysis, the study team conducted several cluster analyses (Tukey post hoc) hoping to find two or three recurring distinct groups to categorize the Reserves and to determine specific needs and make recommendations according to their needs. From the cluster analyses it is clear that no distinct groups are found. This supports our earlier assessment that the differences among the Reserves is most likely due to their diverse group of state partners, and the status of the education system and political climate in each Reserve's state.

Program Design and Implementation

Program design and implementation is a critical objective for this study. Several study questions determine how programs are developed at each Reserve. The key internal and external influences that affect K-12 and PTD program development are reported in this section.

One of the questions on the individual online survey asks each EC to rate on a scale of 1 to 5 (where 1 equals not at all and 5 equals very much) "*How important are the following in your decision to develop and offer this program?"* There were seven factors in the question and their means are reported as follows:

K-12 Programs

Factor	**Mean**
It is frequently requested	3.73
It is part of a Reserve initiative	3.69
It fits school district curriculum	3.10
It fits and individual school's curriculum	3.09
It has been done for a long time	2.98
It meets funding agency's guidelines	2.81
Conducted a needs assessment	1.53

The two main influences for K-12 programs are it is frequently requested and it is part of a Reserve initiative. To a lesser extent, ECs feel that school districts or individual school curriculum influence the development of their programs.

PTD Programs

Factor	**Mean**
It is part of a Reserve initiative	3.95
It is frequently requested	3.66
It fits school district curriculum	3.38
It fits and individual school's curriculum	3.34
It meets funding agency's guidelines	2.70
It has been done for a long time	2.18
Conducted a needs assessment	1.93

Similar to K-12 programs, PTD program's two main influences are it is part of a Reserve initiative and it is frequently requested, although reversed in importance. To a lesser extent the factors it fits a school district or individual school curriculum influence the development of their programs.

To gain more detailed information about program development, some questions in the telephone interview focus on program ideas and target audience. The telephone interview question "*How do you come up with ideas for programs?*" elicits these common responses from ECs:

K-12 Programs

- Reserve research
- Tradition
- Teacher requests
- Adapt ideas from other Reserves
- Adapt ideas from other environmental education providers
- Informally determine gaps that need to be filled

PTD Programs

- In conjunction with a partner organization
- Specific funding determines program topic
- A steering committee or advisory board consisting of teachers, staff and in some cases volunteers

For both PTD and K-12 programs, needs assessments are not commonly used by Reserves to develop programs.

The question "*What are the outside influences that determine the content of programs?*" elicits these common EC responses about both K-12 and PTD programs:

- Teachers frequently contact them to request specific programs
- ECs contact other environmental education providers in the community to determine if there are gaps or niches that can be filled by the Reserve
- Programming is based on the need to educate the community about a particular local conservation issue
- The program has to meet a specific funding agency's requirements

Within the context of the same question, "*What are the outside influences that determine the content of programs?*" ECs report some factors that are valid and should be considered as internal influences on program development. These include Reserve specific physical constraints such as:

- Physical facilities available
- The time of year that the Reserve could offer a program
- The remoteness of the Reserve location

Another aspect that guides program design is the target audience. In the inventory summary section, results indicate that the sixth through eighth grade students and teachers are the most common target audiences for K-12 and PTD programs.

More detailed information is determined when each EC responded to the question, "*How are target audiences for programs chosen?*" For K-12 programs the determining factor is the flexibility to attend field trips. Thus the largest audience is sixth through eighth grade students and the second largest target audience is fourth and fifth grade students.

Target audience selection for PTD programs is approached from two angles. The first approach is to provide trainings for teachers who visit the Reserve with their students. These workshops focus on training teachers to lead a portion of a program or an entire program at the Reserve. The second approach targets specific grade levels for longer workshops (i.e. two days to a week). These workshops are designed to give teachers knowledge on specific estuarine science and conservation topics. An example of this type of workshop is the M.A.R.E. program that some Reserves provide, which gives teachers the tools to transform their elementary or middle schools into dynamic laboratories for the study of the ocean. Since Reserves often partner with other organizations to offer these longer workshops, the partner and the Reserve together choose the specific target audience.

In the online survey results, the relative importance of K-12 programs is rated higher than PTD programs for *increasing community support, understanding of estuaries, promoting stewardship, increasing awareness of the Reserve, and changing behaviors*. ECs common answers from follow-up telephone interviews are:

- By having direct contact with students, they feel that their mission and goals are conveyed in a more effective manner
- Tight state budgets and demand on teachers to cover state test objectives make it difficult to get them out of the classroom for even a half-day training
- It is increasingly difficult to have weekend trainings because teachers cannot commit the time unless they receive a stipend

Since these factors make it difficult to recruit teachers for training, in many cases ECs find that PTD is too time and labor intensive for the current number of teachers they reach.

The inventory summary section details the amount of time that education staff spends running K-12 and PTD programs. In summary, on a scale of 1 to 10 (where 1 equals none

and 10 equals all) 54% of ECs rate the amount of time education staff spends running K-12 programs as a 5 or less, meaning that they do not spend a lot of time running these programs. In addition, 92% of ECs rate the amount of time education staff spends running PTD programs as a 4 or less, meaning that they do not spend a lot of time running these programs.

A Tukey HSD post hoc cluster analysis shows that three groups form with varying answers (Table 11).

Table 11. Cluster Analysis of Time Spent Running Programs

"How much time does education staff spend running _____?"

	Group 1 (N=11)	**Group 2 (N=11)**	**Group 3(N=2)**
K-12	Medium	High	Low
PTD	Low	Low	Medium

Mean: Low = 1-3.33, Medium = 3.34-6.66, High = 6.67-10

This indicates that about half of the Reserves (Group 2) focus exclusively on K-12 and not PTD. Two Reserves (Group 3) spend more time on PTD and very little on K-12. Overall, about half of the Reserves (Group 1) place less emphasis on these types of education programs, but favor K-12 over PTD.

The question "*How do you keep current with new educational initiatives?*" indicates the most common methods:

- Attend conferences both in state and nationally
- Subscribe to professional journals and newsletters
- Subscribe to list servs and view internet sites
- Sponsor environmental education events in the local community
- Attend workshops
- Network and share knowledge with other environmental education organizations
- Learn about new initiatives from Americorp volunteers who are recent college graduates
- Learn about new initiatives through established relationship with teachers

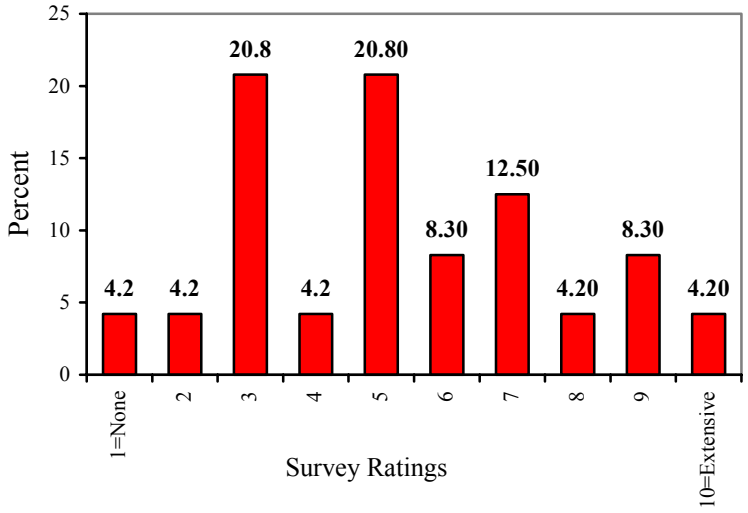
National and State Educational Standards

National content-based standards for science literacy were developed and first published in 1993. One hundred-fifty teachers and administrators from six school districts developed benchmarks for Science Literacy. The focus for these standards was to develop a tool that educators in every state and school district could use to create their curricula to achieve literacy in science, mathematics, and technology for all students upon graduation from high school.[1]

From that initial movement, each state developed or is in the process of developing or redesigning its own set of content-based standards. These standards are benchmarks that students must achieve. There are standards for each grade level and for each subject. Students' knowledge is determined by standardized tests designed to measure each benchmark. Since this movement took place in the early 1990's many informal science institutions (i.e. science centers, zoos, nature centers, etc.) have designed their programs to correlate with the content-based standards in their state. One of the objectives of this study is to determine if each Reserve correlates their programs to the standards in their state and to the national benchmarks.

On average ECs have moderate experience (5.27 on a 1-10 scale, where 1 equals no experience and 10 equals extensive experience) correlating programs to national and state education standards. The median is a 5.0 indicating that about half of the respondents rate their experience in this area as a 5 or less and about half rate it above 5. On closer inspection, over half (63%) rate their experience as a 6 or less (Fig. 21).

Figure 21. How much experience do you have correlating programs state and national standards?



[1] Benchmarks for Science Literacy, Project 2061, American Association for the Advancement of Science, Oxford University Press, 1993

In the individual program analysis each EC reported whether or not each of their programs are correlated with state education standards and national education standards. Most programs are not correlated to national standards, which is not surprising because school systems are ultimately held accountable to state standards (Fig. 22). Nearly 60% of the programs are correlated to state standards, however more than 40% of the programs are not (Fig. 23).

Figure 22. Is the Program Correlated to National Education Standards?

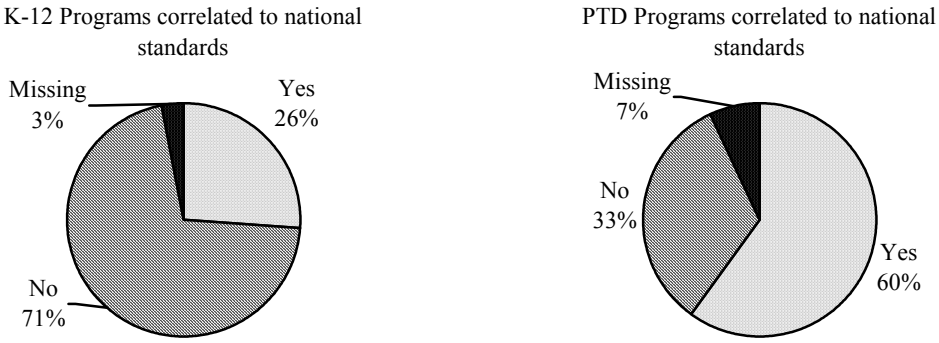
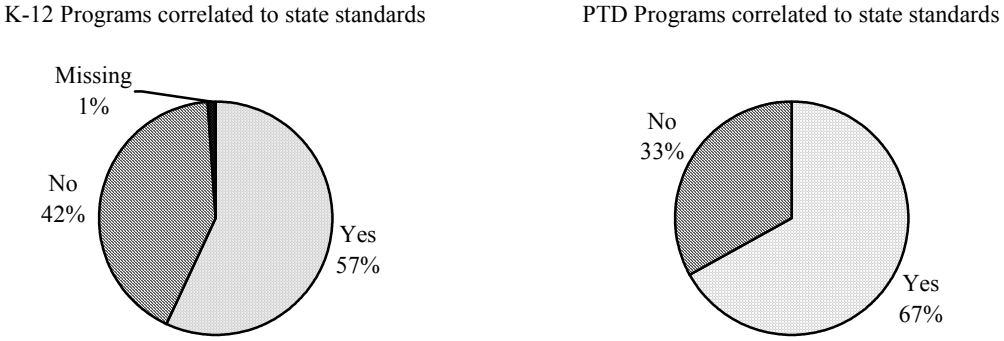


Figure 23. Is the Program Correlated to State Education Standards?



The question "*For the programs that you have correlated to state and national standards, how were the correlations done?*" reports that the program is developed and then state standards are identified and correlated to the program. This happens in most cases because many Reserve programs are well established. However, several also reported that for programs currently in development, they are working more closely with teachers to design them to meet state standards and fit the education system in their community.

Throughout the country, Reserves report that it is increasingly difficult to have students and teachers visit the Reserve for programs if they do not fulfill specific state standards. This trend indicates that it is important for ECs and their education staff to work closely with schools and to keep current on education initiatives within their state.

Program Evaluation and Performance Measurement

Approximately four Reserves reported that K-12 is not a focus at their Reserve or that they are creating new programs or redesigning their older programs. There are approximately eight Reserves where PTD is not a priority and very little to no programming occurs. Thus, at the time of the study no program evaluation is occurring at these sites.

As evidenced from the K-12 and PTD program summary section there is little formal evaluation occurring for most programs. The most common forms of evaluation are staff observation and tracking participant attendance counts. Thirty-one percent of the K-12 programs report having no formal evaluation, and only a quarter of the programs have any type of follow-up surveys, pre- and post-program surveys, or even feedback cards. For PTD programs, 22% of the programs have no formal evaluation and less than half have follow-up surveys, pre- and post-program surveys, or feedback cards.

The responses to the question "*For Reserve programs that have been formally evaluated what are the results of the evaluations?"* indicate that many programs do not have formal evaluation results. There is confusion about the definition of formal evaluation (noted in the methodology section.). Some believe that formal evaluation is done by an outside party and others think that it is an evaluation with quantitative results. For the purpose of the study, we are looking for quantitative results. The main reasons for the lack of formal evaluation are:

- Evaluation takes time away from other education responsibilities
- ECs indicate that they do not have a lot of experience evaluating programs (72% rated this skill a 5 or less on a 10 point scale.)

The responses to the question "*Overall, do you think that K-12 and PTD programs at your Reserve were successful?"* indicate that most ECs believe their programs are successful enough based on subjective evaluation methods including monitoring the number of repeat visits, anecdotal feedback from teachers via discussion groups, individual conversations, focus groups, and meeting their capacity for K-12 programs.

Three Reserves mentioned that they conduct formal evaluations and have the data to prove their success, and that the informal feedback they have received from teachers, parents, and science supervisors are positive.

From the responses to the telephone survey, the success of professional teacher development is mixed. In many cases the Reserves feel that it has been more difficult to recruit teachers in the past couple of years because budget cuts and the increased emphasis on meeting state standards decreases the amount of time that teachers spend away from the classroom for professional development. Teachers also want stipends for participation in workshops. Many Reserves believe they offer high quality programs but that the factors listed above hinder their success. Some ECs express the need for marketing help at the local level to increase the visibility of Reserve programs, particularly in the case of PTD.

National or System-Wide Program or Activity

Support for System-Wide Program or Activity

In general there is support for a system-wide program or activity. This section takes a look at this question from a variety of different angles. The online survey rates ECs opinions on the different forms a national or system wide program or activity might take:

- 67% of ECs agree that system-wide NERRS educational objectives would help them improve educational programs at their Reserve (those who answered 5 or above on a scale of 1 to 10, mean 5.92). EC opinions are split on this item, with a cluster of responses around 4 and 5 and a cluster of responses around 9 and 10.
- 63% of ECs agree that a system-wide NERRS educational program(s) would help them improve educational programs at their Reserve (those who answered 5 or above on a scale of 1 to 10, mean 5.58). EC opinions are split on this item, with a cluster of responses between 3 and 7 and a cluster of responses at 10.
- 58% of ECs agree that a system-wide NERRS educational curriculum would help them improve educational programs at their Reserve (those who answered 5 or above on a scale of 1 to 10, mean 5.38). EC opinions are diverse.

As the results indicate, the averages are above 5 for every question, however the results are bi-modal for each question, signifying that the ECs perceive different needs and opportunities.

The follow-up interviews shed light on why there is so much disagreement in the initial survey. ECs agree that it is helpful to create a national identity or focus for NERRS, but they also said that it would be difficult to find the commonalities among the Reserves because each site is so different. If a national-level program is implemented, 75% of ECs indicate they would favor such a program, with the following caveats:

- The program has a broad thematic program that could be localized
- The program identifies unifying themes for Reserves and partners
- The program uses NERRS strengths
- The program matches current goals at each Reserve
- The program is of interest to school districts
- The Reserves have enough staff to implement the program
- Opportunities are available for partners to implement the program
- The program is strongly promoted by the national office
- The program is similar to CTP (e.g., it has a defined NERRS/NOAA mission and budget category)
- The program is supported with long-term resources

ECs indicate a national-level NERRS curriculum or program might include:

- Introductory materials that each Reserve could use as a springboard for their own site-specific programs
- Creative national marketing strategies that focus on commonalities in programs and focus among Reserves
- National PTD certification program

- National standards
- Resources or other national programs that sites can participate in
- Great website
- Evaluation tools and methods

Several ECs mention that Estuary Live may be a good focus for a national curriculum effort. What ECs did not want was a "top-down program" with a "canned curriculum" that would be irrelevant to their Reserve, their climate, or their season(s) of operation.

The 25% of ECs who did not favor adopting some kind of national program gave several reasons for their view, including that any new program would probably come at the expense of current programs and would likely not fit all Reserves. Since some Reserves do not have K-12/PTD programs, and others have been cut, they believe a truly national program would not be feasible.

System-Wide Activities and Topics

ECs feel that the following activities and topics that would be most appropriate for a national program:

A. Educational methods
B. Estuarine/environmental topics
C. Marketing/communications

A. Educational methods that would be appropriate for a national program include experiential programs (e.g. restoration efforts, seine netting), web-based programs, comparative programs between Reserves, PTD programs that are designed to address specific identified needs, science-based programs for secondary grades (e.g. based on SWMP data, salt marsh monitoring), programs that target a specific grade level, and system-wide program evaluation tools. ECs mention several programs that are appropriate models or venues for a national curriculum effort including Estuary Live, MARE, and Rivers Meet The Sea.

B. ECs indicate that these estuarine and environmental topics are appropriate for a national program:

- Estuaries- physical properties, functions, ecology
- Nekton- biological properties
- Estuaries- value, resource appreciation
- Estuaries- stewardship and protection
- Water quality and water pollution
- Watersheds
- Invasive species
- Migratory species
- Near-shore ecosystems
- Oceanography
- National environmental issues as they apply to local issues

C. ECs would like a national program to address several marketing and communications to: develop promotional items for each Reserve's use; develop and maintain a resource-based website; and provide national "introductory" materials (e.g., video or map of system) that explain why the Reserves exist and what this national network does to protect the environment.

System-Wide Niche

The study also investigates what niche a system-wide or national program might fill. There are already a number of coastal and marine environmental programs and curriculums. Appendix 1 lists all of the programs that ECs identified during the surveys as well others that were found during the project. While there are many unique and interesting programs, most reflect the mission of the sponsoring organization or a pressing coastal issue. The NERRS' unique role of Research Reserves suggests that using original research in their programs could be a niche for a system-wide or national program.

The suggestion is confirmed by the ECs responses to what made their programs different from other coastal-based educational programs. They rate the degree to which the following factors differentiate Reserve educational programs from other coastal educational programs on a scale of 1 to 10 (where 1 equals not at all different and 10 equals very different). The following show the results with means greater than five.

Question	**% Rated Above 5/Mean**
We integrate research from the Reserve into programs	96% / 8.09
Our programs provide access to unique coastal areas	82% / 6.68
We integrate Reserve scientists in our programs	76% / 6.43
Our programs have Reserve-specific curriculum	76% / 6.33
Our instructors are coastal scientists	67% / 5.52

Integrating research in their programs is perceived to be the biggest differentiating factor, however NERRS programs also differ because they use scientists in their programs as instructors or resource people. Most Reserves are fortunate to have access to unique coastal areas and most programs integrate those outdoor settings into their programs. These are key differences that should be translated into strengthening Reserve programs and creating a national niche. If research is to become a niche for NERRS K-12 and PTD, an area of emphasis or improvement might be to have program participants contribute to ongoing research. Based on a review of other national programs, this would be a significant difference and it is something that ECs currently rank the lowest as a differentiating factor (43% / 4.62).

Capacity Building Activity

To look at capacity building for NERRS K-12 and PTD programs, a very broad definition is used. For the purposes of this study, capacity building is any activity or resource that might assist K-12 and PTD programs. This includes strengthening partnerships, program support, communication, funding, and training.

Partnerships

Through the online survey, ECs rate how partnerships could help improve their programs. There is strong agreement about the positive impact of partnerships:

- 83% of ECs agree that cooperation with outside partners to develop programs would help them improve educational programs at their Reserve (those who answered 5 or above on a scale of 1 to 10, mean 6.75). EC opinions on this item are clustered around 5 and 8 and at 10.
- 83% of ECs agree that cooperation with outside partners to run programs would help them improve educational programs at their Reserve (those who answered 5 or above on a scale of 1 to 10, mean 6.46). EC opinions on this item are clustered around 3 and 5, 7 and 8, and at 10.
- 75% of ECs agree that cooperation with outside partners to fund programs would help them improve educational programs at their Reserve (those who answered 5 or above on a scale of 1 to 10, mean 6.96). EC opinions on this item are clustered at 3, at 7 and 8, and at 10.
- 71% of ECs agree that cooperation with outside partners to obtain funding for programs would help them improve educational programs at their Reserve (those who answered 5 or above on a scale of 1 to 10, mean 6.67). EC opinions on this item are clustered at 3, and at 8 and 10.

In the follow-up interviews, partnerships are mentioned frequently as a key aspect in delivering K-12 and PTD programs. Partnerships are also mentioned as something that a system-wide program could help to encourage. Partnerships are used by Reserves in several major ways to: gain or share resources, build programs, and build relationships. Of the ECs who said that they use partnerships, a majority (56%) use partnerships to gain or share resources for funding (programs, salaries), people (staff, volunteers), facilities (classrooms, dorms), equipment (canoes, boats, lab materials), education or training materials, time, audience mailing lists, and transportation services.

A few Reserves (12%) use partnerships to build relationships with the community and with other organizations. These partnership opportunities did not necessarily gain resources or programmatic support for a Reserve, but probably provide long-term benefits in goodwill development. Relationship building included serving on advisory boards, working closely with schools, and working to build a community constituency for the Reserve.

A third of the Reserves (36%) use partnerships specifically to: build better programs, work together, outsource delivery of K-12 and PTD programs, avoid overlapping

programs, build or "piggyback" programs on each other, develop and deliver joint programs, and enhance program marketing and PR efforts

The positive aspects of partnering cited by ECs include increased resources; the ability to access and serve larger audiences; the ability to accomplish more with less time and effort (or that you would not be able to accomplish alone); the selection of partners who add certain expertise or a different perspective; increased visibility and community goodwill; the joint use of well-trained volunteers; and the ability to prevent turf disputes.

The negative aspects of partnering cited by ECs include difficulty in planning and executing partnerships; differing missions, objectives, and needs among partners; unequal distribution of money or resources; lack of control of the process and product; and a host of logistical problems, such as communication difficulties, time management, increased demand for meetings, and personality conflicts.

ECs also identify three different categories that would improve their use of partnerships:

A. Identifying overall guidelines for effective partnering
B. Effectively addressing resource/logistics needs
C. Increase programming opportunities through distance or joint programming

A. Identifying overall guidelines for effective partnering would allow ECs to use partnerships at the optimal level, including finding the right person or organization to partner with, identifying new partners or renewing ties with partners that have fallen by the wayside, using the market analyses to find program overlaps and niches, and getting partnerships to be more beneficial and symbiotic overall.

B. ECs say that partnerships can be used more effectively to address program and resource/logistic needs. Increased funding levels, improved training for staff and volunteers, increased communication, and enhanced overall use of program time would enhance their capabilities to deliver programs.

C. ECs said that partnerships could be used to increase programming opportunities through distance programming or joint programming. They could accomplish this by finding partners to host off-site programs or share hosting duties, finding partners to teach programs that the EC cannot, and finding partners to expand the Reserves' reach to new audiences. An example that one EC mentions is seeking more opportunities to partner with universities and community colleges.

Program Support

The Reserves Managers are generally supportive of the ECs and their education programs. The question "*In what ways does the Reserve Manager help you?*" illustrates that RMs primarily assist with operations and administrative needs (Fig. 24). Reserve Managers are generally supportive of ECs, while supporting the autonomy of ECs to manage their own areas of responsibility. For ease of reporting, the variety of responses is categorized into four areas: operations, communications, administrative, and other (Table 12).

The RMs responses to the same question about what roles they play in K-12 and PTD correspond to the ECs responses.

Figure 24. Education Coordinators Answers to the Question: *"In what ways does your Reserve Manager help you?"*

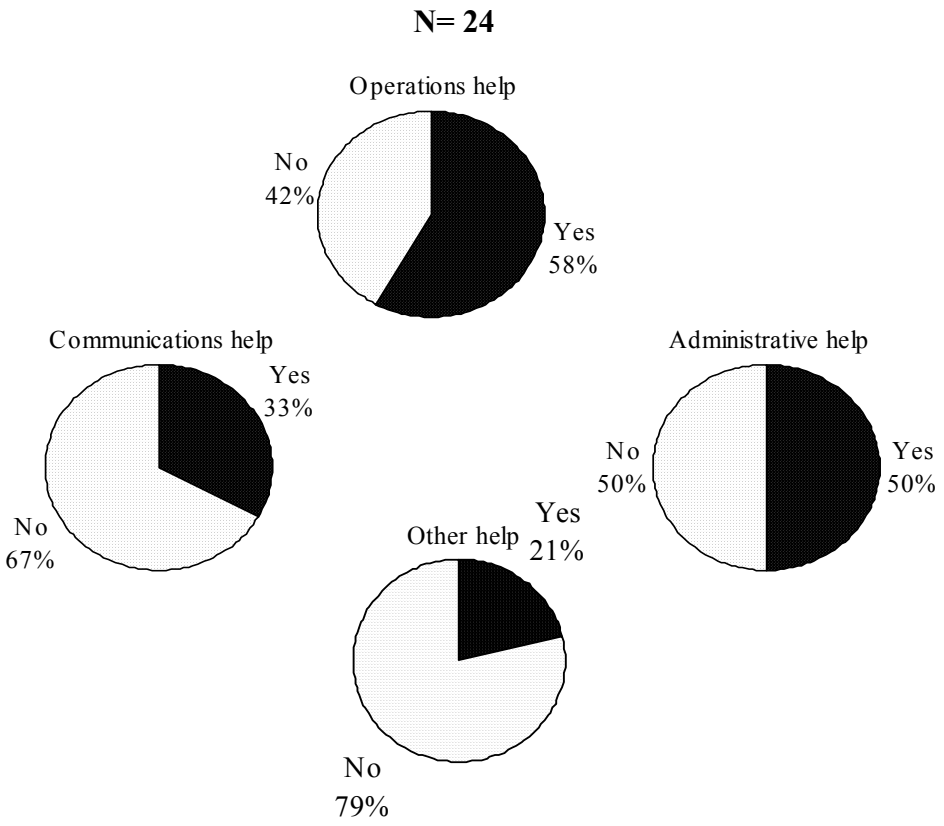


Table 12. Categories of Responses to the Question "*In what ways does your Reserve Manager help you?"*

Operations
- Developing ideas for programs
- Designing programs
- Coordinating programs
- Being a program instructor
- Evaluating Programs
- Gives insight/advice
- Allows other staff to help with education
- Reviews programs
- Give leeway to develop programs
- Give input into the direction of entire education program
- Picks up supplies
- On my education committee

Communications
- Helps with the political climate in my community
- Promotion of programs
- Strong community advice
- Marketing and PR

Administrative
- Finding outside funding for programs
- Administrative support
- Provides up-to-date office equipment
- Assists with budgeting

Other
- Long-term vision and guidance
- Coaching of education staff
- Problem solving

Communication Within Reserves

Many ECs feel that increased communication with RCs would improve education programs. The Reserve staff at each site is small and the workload is great. It is often easy for staff to become narrowly focused on their area. Communication between staff occurs at all of the sites, but in many cases only when a specific need arises.

Reserve staff have different perceptions of the role K-12 and PTD programs play in helping the Reserves meet their overall objectives. ECs, SCs, RCs, and RMs are asked about the relative importance of K-12 and PTD in *increasing community support for estuarine conservation, increasing understanding of estuarine ecosystems, promoting stewardship of estuaries, increasing citizen awareness of the Reserve*, and *changing behaviors*. There is a general feeling that K-12 plays a greater role in meeting these Reserve objectives than PTD programs do.

Out of those surveyed, SCs feel the strongest that K-12 and PTD programs meet Reserve objectives. They consistently rate all of these categories the highest of the group surveyed. ECs feel strongly that K-12 programs assist with meeting the different objectives, but they do not feel PTD programs meet these needs as well. The areas that received the highest scores from all groups for both PTD and K-12 are increasing understanding of estuarine ecosystems and promoting stewardship of estuaries.

ECs have the largest difference in their scores for promoting stewardship of estuaries, with PTD programs receiving a mean of 6.61 and K-12 receiving a mean of 8.46. From previous discussion in the program implementation and design section, K-12 is rated higher because ECs feel that there are tangible benefits from teaching K-12 students

directly and they are able to measure knowledge. ECs believe that they do not have the resources to follow-up with teachers after workshops to see if they understand the material and to find out how they will use the material in their classroom.

ECs also stated that many teachers are not interested or comfortable teaching this material to their students. Teachers have many different demands on their time and have less time to learn new subject matter. Therefore, teachers feel that the kids benefit from the Reserve education staff's instruction. Working with "experts" such as the Reserve education instructors, students are given the opportunities to explore possible careers as well as the chance to learn accurate information from instructors who have specialized training.

Table 13 and 14 show that all key staff rate K-12 and PTD as relatively important for achieving Reserve goals, indicating that there is relatively strong support for both K-12 and PTD. However, K-12 is viewed as more important to achieving Reserve goals rather than PTD.

Table 13. Summary of Answers to the Question: "*What is the relative importance of professional teacher development programs at your Reserve in relation to the following?"*

	Reserve Managers	**Education Coordinators**	**Research Coordinators**	**Stewardship Coordinators**
Increasing community support for estuarine conservation	5.79	5.92	5.94	7.88*
Increasing understanding of estuarine ecosystems	6.79	7.33	7.47	9.00*
Promoting stewardship for estuaries	6.79	6.61	6.71	8.00*
Increasing citizen awareness of the Reserve	6.07	5.25	6.88	7.75*
Changing behaviors	5.93	5.75	5.69	8.13*

* Highest Group Rating

Table 14. Summary of Answers to the Question: *"What is the relative importance of K-12 programs at your Reserve in relation to the following?"*

	Reserve Managers	Education Coordinators	Research Coordinators	Stewardship Coordinators
Increasing community support for estuarine conservation	6.86	7.33	6.63	7.75*
Increasing understanding of estuarine ecosystems	7.36	7.33	7.75	9.25*
Promoting stewardship for estuaries	7.57	8.46*	6.63	8.38
Increasing citizen awareness of the Reserve	6.93	7.00	6.75	7.63*
Changing behaviors	7.00	7.33	7.00	8.50*

* Highest Group Rating

Communication Between Reserves

Education Coordinators are asked *to indicate the degree the following types of cooperation between Reserves would help them improve educational programs at their Reserve*. Similar to the other questions, the results for this question vary among ECs. The following are some of the results:

- Better communication among Reserves about programs: 41% of ECs do not feel like this would help them with their programs (score of 5 or below). 37% rate this an 8, 9, or 10.
- Cooperation with other Reserves to run programs: The mean for this question is very low, 4.58 and 67% of ECs rate this a 5 or below.
- Cooperation with Reserves to fund programs: This mean is a 5.00 with 29% feeling this is important (rating 8, 9, or 10) and 56% giving it a 5 or below.
- Cooperation with other Reserves to develop programs: This mean is also low (5.13) although 41% of ECs rate it a 7, 8, or 10.
- Cooperation with other Reserves to obtain funding for programs: 33% feel this would be helpful and rate it an 8, 9, or 10, and 43% rate it a 5 or less.

These results show that ECs are split on their feelings about inter-Reserve support. When a Tukey HSD post hoc cluster analysis was run on the data to determine if different groups of ECs emerged with varied preferences, three groups formed. Group 3 has significantly higher means for each answer than the other two groups. Group 3 (consisting of eleven Reserves) indicates that they are interested in working with other Reserves to improve programs. The remaining Reserves have less interest in working together nationally. Members of group 3 consistently rate the 7, 8, 9, or 10 responses (Table 15).

Table 15. **Education Coordinator's Answers to the Question:** ***"Please indicate the degree the following types of support from the national office would help you improve educational programs at your Reserve."***

	Overall Mean	**Group 1 (n=10)**	**Group 2 (n=3)**	**Group 3 (n=10)**
Better communication among Reserves about programs	6.29	Medium	Medium	High
Cooperation with other Reserves to run programs	4.58	Medium	Low	Medium
Cooperation with other Reserves to fund programs	5.00	Low	Medium	High
Cooperation with other Reserves to develop programs	5.13	Medium	Low	Medium
Cooperation with other Reserves to obtain funding for programs	5.74	Low	Medium	High

Mean: Low = 1-3.33, Medium = 3.34-6.66, High = 6.67-10.00

Reserve Level Support

Results indicate the areas where ECs would like more support for their education programs. Surprisingly, they do not indicate that they want more support from volunteers. This is possibly because volunteers are not utilized as often for K-12 and PTD programs as they are for other needs such as public education programs. K-12 and PTD programs are more often taught by trained educators as opposed to volunteers who are utilized in other areas of the Reserve. In some cases ECs would like volunteers, but do not have the time to recruit, maintain, and train a volunteer force to help with educational programs.

ECs identify that these areas need the most support: 1) securing funds for programs and 2) increasing communication about Reserve research. Because the results are so mixed on this question regarding Reserve-level support for PTD and K-12 programs, we ran a Tukey HSD post hoc cluster analysis to determine if groups emerged from the data that had similar preferences. Three groups formed. Group 1 consists of ten Reserves and this group rates all of the questions lowest, indicating that they do not feel they need much support from within their Reserve. Group 3 contains 11 Reserves and rates the questions highest, expressing a need for assistance from within the Reserve. All of the results between groups 1 and 3 were statistically significant except for *volunteer need* (Table 16).

Table 16. Education Coordinator's Answers to the Question: "*Please indicate the degree the following types of support from within your Reserve would help you improve educational programs at your Reserve."*

	Overall Mean	Group 1 (n=10)	Group 2 (n=3)	Group 3 (n=10)
More volunteer staff to assist with programs	5.38	Medium	Low	High
Increased participation by paid Reserve staff in planning educational programs	5.13	Low	Medium	High
Increased participation by paid Reserve staff with teaching/training for your educational programs	6.00	Low	High	High
Increased participation by paid Reserve staff to secure outside funding for your educational programs	6.00	Low	High	High
Increased communication with you about research being conducted at the Reserve	5.58	Medium	Low	High

Mean: Low = 1-3.33, Medium = 3.34-6.66, High = 6.67-10.00

National Support

ECs showed mixed interest in working together on a national level. The question, "*Please indicate the degree the following types of support from the **national office** would help you improve educational programs at your Reserve"* includes five areas: "*System-wide NERRS educational program(s), system-wide NERRS educational curriculum(s), system-wide NERRS educational objectives, better communication with the national office, and National office assistance with securing outside funding*.

ECs indicate that they want assistance securing outside funding, and they are not of one mind concerning system-wide NERRS education programs, system-wide education curriculum, or improving communication with the national office. Since the results are so diverse on this question regarding national office support for Reserves, a Tukey HSD cluster analysis was conducted to determine if groups emerged from the data with similar preferences. Three groups formed. Group 2, containing ten Reserves, is most interested in receiving support from the national office in all areas. Group 3 consists of eight Reserves and gives the lowest scores, indicating that they feel less of a need for national support than the other Reserves. The answers between groups 2 and 3 were statistically significant (Table 17). Group 1, containing six Reserves rates each area as medium, meaning there is some interest in receiving support from the national office in these areas.

Table 17. Education Coordinator's Answers to the Question "*Please indicate the degree the following types of support from the national office would help you improve educational programs at your Reserve.*"

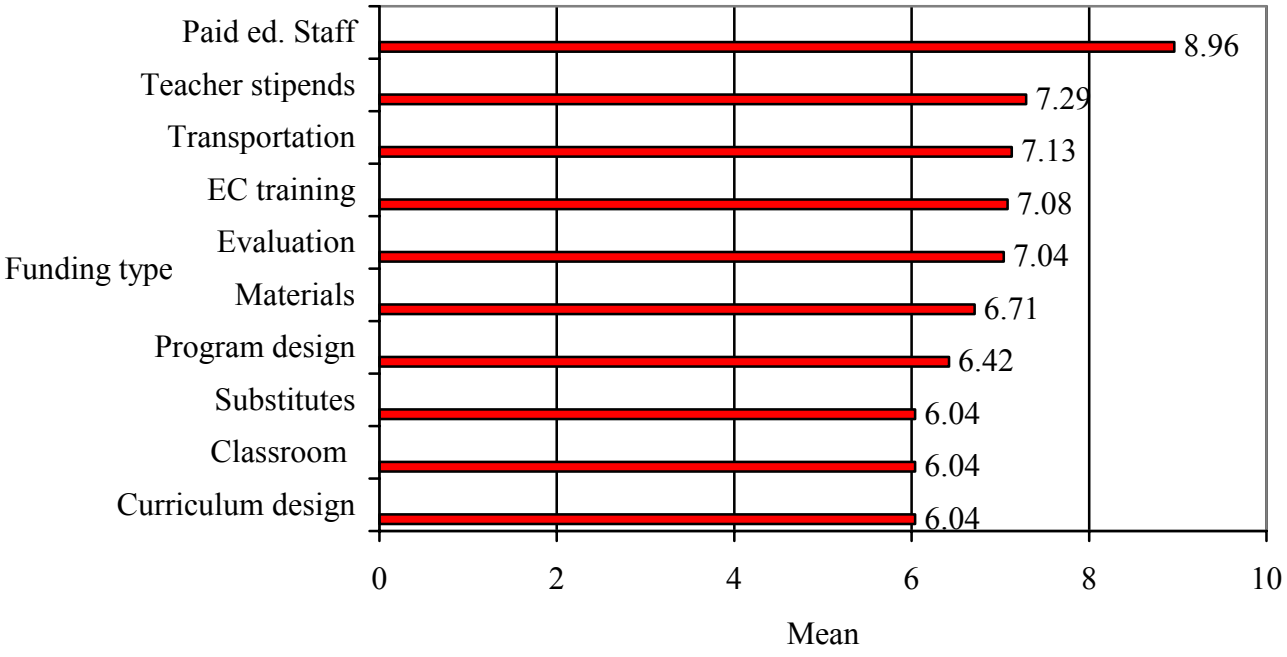
	Overall Mean	Group 1 (n=6)	Group 2 (n=10)	Group 3 (n=8)
System-wide NERRS education programs	5.58	Medium	High	Low
System-wide NERRS education curriculums	5.38	Medium	High	Medium
System-wide NERRS educational objectives	5.92	Medium	High	Low
Better communication with the national office	5.58	Medium	High	Low
National office assisting with outside funding	7.17	Medium	High	Medium

Mean: Low = 1-3.33, Medium = 3.34-6.66, High = 6.67-10.00

Funding

Funding is a key factor identified by ECs that could improve capacity at their Reserves. While this is not a novel discovery, the types of funding and the uses for the funding show some important results. ECs were asked about the types of funding they feel would help them improve education programs at their Reserves (Fig. 25). They rated each type of support on a scale of 1-10. All of the means are over 5, however the response that received the highest amount of interest is the need for more paid education staff to assist with programs (8.96 mean). The next two highest categories are teacher stipends (7.19) and transportation (7.13), which suggests that ECs think providing incentives to teachers or schools will increase enrollment in their programs.

Figure 25. Indicate the degree these types of funding would help you improve educational programs at your Reserve



Although Figure 25 illustrates the overall means for the different Reserves, when the data is clustered, three groups are apparent. Group 2 represents the Reserves indicating that funding is a high priority in every a category of need while the other two groups have less needs or were able to better distinguish their priorities (Table 18).

Table 18. Cluster analysis summary indicating the degree these types of funding would help you improve educational programs the Reserves

	Overall Mean	Group 1 (n=7)	Group 2 (n=9)	Group 3 (n=8)
EC Training	7.08	High	High	Medium
Teacher Stipends	7.29	Low	High	High
Substitutes	6.04	Low	High	High
Classroom/Training Facility	6.04	Medium	High	Medium
Program Evaluation	7.04	Medium	High	Medium
Staff	8.96	High	High	High
Materials	6.71	High	High	Low
Transportation	7.13	Low	High	High
Program design	6.42	Medium	High	Low
Curriculum design	6.04	Medium	High	Low

Mean: Low = 1-3.33, Medium = 3.34-6.66, High = 6.67-10

Since paid education staff and teacher stipends, have the highest mean scores, greater detail is needed to explain their choices. ECs rated these highly because they feel that with more education staff they can provide more programs to reach more students and teachers, increase their menu of offerings, improve the safety aspects of the program, and give them the ability to target new and underserved audiences. In addition, some of the Reserves have staff that can focus on a particular age group. More Reserves want staff available to focus on specific grade levels, for example a staff person to focus on K-8 and one to focus on High school, college, and PTD. This would give staff the opportunity to focus on a smaller audience and learn about the specific needs of that audience.

In addition, different types of staff are requested. As discussed earlier, some ECs need part-time administrative assistance, some request a full or part-time volunteer coordinator, and some request full or part-time marketing assistance.

ECs indicate that funding for teacher stipends would help attract teachers to their workshops and trainings. Some Reserves feel that it is absolutely necessary because development and training is part of a teacher's responsibility and they should be paid for their services. In some cases teachers are used to teach PTD programs and respondents believe they should be compensated for their services.

Some respondents favor an education fellowship similar to a scientific fellowship that can focus on a specific task such as program development, coordination of a specific initiative, or even an evaluation project. Graduate students could serve as education fellows, students could gain valuable experience, and the Reserves could gain added resources for specific tasks.

Sixty-two percent believe their current funding levels are adequate to maintain their current programming while 33% do not. Seventy-nine percent disagree that there is adequate funding to increase their current allotment.

Training

Continued EC training (mean 7.08) is also an important factor to improve programs. The question "*How much experience do you have doing the following?"* asks ECs to rate their experience level in various tasks (Table 19). To gain detailed insight, a Tukey HSD post hoc cluster analysis separated the Reserves into three groups. Two Reserves did not answer this question. Comparisons of the clustered means for each group were analyzed.

Table 19. Cluster Analysis of Education Coordinators Experience Levels
"How much Experience do you have doing the following?"

Question	Overall Mean	Group 1 (n=9)	Group 2 (n=7)	Group 3 (n=6)
Creating curriculum*	5.64	Medium	High	High
Evaluating programs*	4.68	Medium	Medium	High
Developing education programs	8.41	High	High	High
Teaching K-12 students	8.55	High	High	High
Training teachers	7.45	Medium	High	High
Marketing education programs*	5.73	High	Low	High
Managing education programs	8.32	High	High	High
Correlating programs to state and national standards*	5.27	Medium	Medium	High

Mean: Low = 1-3.33, Medium = 3.34- 6.66, High = 6.67-10 * Area of need

In general, ECs believe they have a fair amount of experience, although group 3's ratings indicate they are more experienced than those in groups 1 and 2. Training in evaluation, marketing, and correlating programs to standards are three important areas that a training program can address.

ECs indicate the degree to which the following types of training would help improve educational programs at their Reserve. In addition, some insight is gained from the question *"How do you keep current with educational initiatives?"* and was also used to interpret the responses.

A Tukey Post hoc cluster analysis determined three groups requesting specific types of trainings (Table 20). Group 1 rates most training types as medium with the exception of program assessment and evaluation (high). This group can be described as having already had moderate training or experience in all of these areas or they do not have the time or resources to devote to training. Group 2 rates most training types as low, which indicates that they either do not need or already had training, were not encouraged to seek training opportunities, or do not have extensive time available for training. Group 3 rated every category as high, which indicates that they are very open and supportive of training in all forms.

The four areas that are rated the highest by all groups are training for program evaluation and assessment, ecological knowledge/skills, educational standards testing, and proposal writing and fundraising.

Table 20. Cluster Analysis of the Question: *"Please indicate the degree the following types of training would help you improve your educational programs at your Reserve?"*

Question	Overall Mean (n=23)	Group 1 (n=10)	Group 2 (n=6)	Group 3 (n=7)
Program assessment and evaluation	6.74*	High	Low	High
Curriculum design training	6.87*	Medium	Medium	High
Educational standards testing	6.48*	Medium	Medium	High
Proposal writing/ fundraising training	6.22	Medium	Low	High
Program marketing training	5.83	Medium	Low	High
Time management training	5.09	Medium	Low	High
Computer software training	5.17	Medium	Low	High
Supervisory training	5.22	Medium	Low	High
Trainings to increase ecological knowledge/skills	6.70*	Medium	Low	High

Mean: Low = 1-3.33, Medium = 3.34- 6.66, High = 6.67-10 * Area of need

F. RECOMMENDATIONS

The following recommendations arise from the analysis of the online surveys, the phone interviews and the site visits with the ECs and the other NERRS staff members.

This project is designed to inventory the current status of K-12 and PTD programs within NERRS and to provide baseline data and trends data for system-wide consideration of a possible niche or signature program potential for NERRS in this arena, as well as recommendations for improvements of current programs. All those surveyed and interviewed, including RMs, RCs, SCs, and other staff recognize the value of K-12 and PTD and support current programming efforts. However, there are unequal levels of commitment and resources at the Reserves for K-12 and PTD; some ECs are fighting to maintain K-12 and PTD programs while others are well supported. If K-12 and PTD programs are important to NERRS at a system-wide or national level, they should not continue to be unevenly supported and act as semi-autonomous units accountable only to their state partners and RMs. There should be more support and coordination on a system-wide level. NERRS is a unique organization with many strengths. NERRS' mission, structure, and diversity give it the potential to be a leader in estuarine education on a national level.

Reserve Level Recommendations

Recommendation 1:

Develop an EC Position Description

ECs have a complex and unique job based on their multiple roles and responsibilities. It is important to develop a description of EC qualifications and duties that could be used as a guide for future hiring, specifically at proposed Reserves to create consistency across the system. This description should have some broad qualifications and duties that could be integrated with Reserve-specific qualifications and responsibilities.

ECs play the role of liaison between the researchers at the Reserve and the teachers in the community. Therefore, their level of science knowledge will be key to help them interpret scientific material for their target audience. ECs should be "science educators," meaning they must be able to take the scientific information from the research and stewardship programs and synthesize it into a format that is understandable for K-12 and PTD audiences. This includes strong knowledge in both science and education. This is different from the term "science teacher" because ECs fulfill a different role than a classroom teacher. They act as a science resource or "expert" providing information to teachers on estuarine topics, but at the same time they must know current education initiatives so that they can talk the same language and provide a service to teachers that is of value. There should be specific training each year to help ECs keep current with the changes in education.

Recommendation 2:

Provide Training for ECs

The in-depth interviews revealed that some ECs do not make time for professional development, and it is evident that ECs do not always have allotted resources (both time and money) set aside for professional development in science education methods, constructivism, and science topics and skills including evaluation, correlating programs with standards, and grant writing.

The creation of an annual development plan for each EC that builds on their key strengths and identifies areas for further development would help each EC to increase their expertise in both estuarine science and education. ECs should also participate in the plan's creation by determining specific professional development opportunities for themselves and present a proposal to their RM so that they may expand their professional capabilities.

Annual EC national and regional meetings provide a perfect opportunity for both education and estuarine science training opportunities. Adding an extra day or half-day training to the meeting agenda to provide specific training would be beneficial to ECs. ECs also indicate that at these meetings they would like time to share their successes and failures with educational programming. Some time might be allotted to discuss specific topics for programming at each meeting, such as evaluation, teacher recruitment, and program development. Specific topics could be determined beforehand and ECs could prepare their materials ahead of time to make efficient use of allotted meeting time.

Recommendation 3:

Increase Paid Education Staff

As reported in the program inventory section, most Reserves have a very limited education staff. The education staff has many program responsibilities including the Coastal Training Program, Coastal Decision Makers Workshops, and public programs. In addition, ECs have administrative and overall operations responsibilities that take over half of their time. In some cases, ECs are asked to be acting Reserve Managers or Assistant Reserve Managers. It is increasingly difficult for ECs to teach, create, update, and evaluate their K-12 and PTD offerings without additional support. During the telephone interviews, ECs were asked, *"How would funding for more paid educational staff improve your educational programs?"* ECs said more staff would allow them to run safer programs and increase program attendance: they also need staff to create a wider variety of programs to target other grade levels or to develop new curriculum. Some ECs are consumed with the marketing aspects of their programs and indicated that a part-time administrative assistant or a marketing specialist would help them increase visibility for the Reserve, while freeing them to focus on education-related tasks.

In some cases it is difficult for the national office to help with staffing issues because there are specific guidelines for hiring in each state. It is important to identify the Reserves that need staff and determine if it can be pursued on a federal level or state level. In addition, if priorities are shifted through the market/needs assessment (See Recommendation 7), or if the system-wide program planning (See Recommendation 10) causes some Reserves to be more focused, the need for additional staff may be reduced.

Recommendation 4:

Secure Outside Funding for K-12 and PTD Programs

Over 84% of all K-12 and PTD programs are funded by internal budgets. ECs indicate that they are interested in finding outside funding to increase or improve Reserve programs. At the state level, Reserves can look for grants from private foundations such as the Ocean Fund, or regional foundations that support specific regions or issues. There are many resources listing foundations that can provide assistance, including the Directory of Environmental Grantmaking. The public library system has resources to facilitate a search for grant support. In addition, Reserves should continue to explore opportunities to partner with other organizations, companies, and agencies in their community for funding sources.

National Level Recommendations

Recommendation 5:

Hire a National K-12 and PTD Education Coordinator; Secure Direct and Consistent Funding for any New System-wide K-12 and PTD Programming

If there is a commitment to K-12 and PTD programs from a system-wide standpoint, a central coordinator position needs to be established. Individual ECs currently take the lead on system-wide initiatives with assistance from the national office, however, as evidenced by this assessment, most ECs are over-extended. The coordinator would take the leadership role on any national or system-wide program(s), including design and implementation of the evaluation and performance measurement framework. The coordinator would be able to focus on the big picture while using the input and direction from the Reserve ECs for any initiatives taken.

Most ECs believe that K-12 and PTD programming is at or above capacity at their Reserves and that if there are new system-wide programs initiated, there also needs to be additional funding for those programs.

Recommendation 6:

Provide Assistance to Reserves to Secure Outside Funding

The national office or the national education coordinator could serve as a repository for funding opportunities. It would also be advantageous for certain grants or proposals if Reserves could use other NERRS programs as backup experience for grant applications. The national office could keep a database of template proposal sections to streamline the grant writing process.

In addition, if a system-wide program is initiated, the national coordinator could serve as the lead to write proposals for grants to other federal agencies such as the Environmental Protection Agency and the National Science Foundation, as well as private funding sources. The National Science Foundation also awards planning grants of $50,000 for informal science education projects. This may be an excellent source of funding to explore a national initiative. The existing close relationship with the National Estuarine Research Reserve Association (NERRA) should be maintained as a potential mechanism for channeling funds that are granted only to non-profits.

Recommendation 7:

Maintain a Database of Examples of NERRS K-12 and PTD Programs

Maintaining a database of examples of successful NERRS K-12 and PTD programs and "lessons learned" is more manageable and sustainable with today's technology. The database could be stored on a NERRS K-12 and PTD website for ECs. A separate website for the public could help market the programs.

Recommendation 8:

Provide Assistance to Correlate all NERRS Programs to State Educational Standards

In most states, educators are under increasing pressure to document that they are teaching to the state educational standards. National standards are not a critical factor for most educators. Although ECs can be trained to correlate programs to state standards themselves, their workload prevents this from being a high priority. The presentation of uncorrelated programs or curricula can become a barrier for student and teacher participation. Correlating programs and curricula to state standards will increase the likelihood that educators will use the materials, come to PTD trainings, and bring their students to Reserve K-12 programs. Depending on the complexity of the standards, the process can be tedious and may require outside assistance or training. State correlations

should also be done if a system-wide program is implemented or if there is a national effort to offer programs in states where Reserves do not exist.

Recommendation 9:

Establish National Performance Measures and Reserve Level Goals and Objectives

The national office, with EC input, should develop key national goals that are important and applicable throughout NERRS, and then tie them to measurable objectives. At the Reserve level, the national office should assist with the development of goals and objectives that would relate to each Reserve's particular target audiences. The objectives could be knowledge, attitude, or action based. The Reserves could mirror state benchmarks or standards for their objectives. Currently there are no system-wide measures of whether K-12 and PTD programs are effective. Table 21 gives an example of how this might be done.

Table 21. Example of National and Reserve Level Goal Setting

National Goal	Increase awareness of the vital role of estuaries in coastal ecosystems.	
National Objective	The public will be able to identify the roles of an estuary.	
Reserve Goal(s)	Increase awareness in the local community that Padilla Bay is a major stopover site for migratory birds	Increase awareness in the local community that Padilla Bay is the nursery for Puget Sound's commercial fishing industry
Reserve Elementary School Objectives	75% of the students will be able to match a description of local migratory bird to its picture.	Students will demonstrate they understand that Padilla Bay is a nursery by drawing a picture of a Padilla Bay ecosystem.
Reserve Middle School Objectives	75% of the students will able to list two migratory birds that use Padilla Bay as a stopover site.	75% of the students will be able to identify two key human impacts to the nursery
Reserve High School Objectives	75% of the students will be able to identify four migratory birds by sight.	75% of the students will be able to list two key actions they can take to reduce human impacts to the nursery.
Reserve PTD Objectives	100% of educators will be able meet the objective for the grade level they teach. 75% of the participants will implement the curriculum or activities to teach the different objectives.	

A Reserve goal may correspond directly to an individual program or set of programs. There also may be more than one objective for a particular goal. It would not be necessary to measure every objective for a particular goal, but rather to focus on measuring high-priority objectives.

Recommendation 10:

Develop and Implement an Evaluation Framework that Would Measure Factors at a National Level and Reserve Level

There is no established evaluation framework at the national level and only a few Reserves consistently evaluate their programs. It is important that Reserves define the level and types of formal evaluation that would be most useful and then create an efficient and consistent plan to evaluate their programs. This commitment to evaluation will document effectiveness and establish whether programs are meeting the needs of target audiences and the funding agencies (i.e. private foundations, EPA, NSF). A formal evaluation framework will help focus K-12 and PTD efforts at a national and Reserve level. This could increase cooperation within and between Reserves, as well as increase the likelihood of obtaining additional funding for K-12 and PTD programs at a national and Reserve level.

After establishing goals and objectives (See Recommendation 9), the evaluation framework would outline the important program data that would be collected at a national level (e.g. number of participants, number of programs, target audience, teacher/participant satisfaction, national program effectiveness). Then the Reserve goals and objectives should be used to determine the evaluation framework at the Reserve level. This framework could be designed to capture data needed for specific grants or reporting purposes.

Each Reserve would use their own data from the Reserve-specific objectives to demonstrate how the national objectives were being met. The framework would outline processes, timeframes, and responsibilities for measuring the objectives and collecting the data. It would be the primary responsibility of the national coordinator (See Recommendation 5) to coordinate and analyze the data supplied by the Reserves.

Recommendation 11:

Provide Assistance for a K-12 and PTD Market Analysis and Needs Assessment for Newer Reserves or Reserves Interested in Re-assessing Their Programs

Reserves are offering a wide array of K-12 and PTD programs and some are very well established while others are just starting up. A market analysis and needs assessment would assist Reserves in the development of effective programs, the development of an evaluation and performance measurement framework, and participation in a system-wide program (See Recommendation 10).

Recommendation 12:

Provide Assistance for a PTD Market Analysis and Needs Assessment for Reserves that Offer or Want to Offer PTD Programs

ECs say that it has been a challenge to get educators to attend PTD programs. Effective PTD programs potentially can reach significantly more students than K-12 programs, considering that one educator can reach 20 to 300 students per year depending on the grade level they teach. Educators are always looking for quality programs and curricula. The challenge for PTD programs is attracting educators and packaging materials that can be easily used in the classroom. In addition, consideration should be given to reaching education students who will be entering the classroom. Table 22 contains sample assessment questions.

Table 22. Sample Questions to Help Develop an Effective PTD program

o Which grade levels are interested in attending workshops? o How does my program currently fit into the state/community school district? o How can my program be a better fit for the school system? o What types of materials best suit teachers' needs? o What is the key factor that allows teacher participation in the Reserve workshops? o What key factors are principals/administrators looking for in PTD programs? o What are the best times and locations for workshops?

Recommendation 13:

Continue National Marketing to Support Local K-12 and PTD Initiatives

ECs indicate that they appreciate national marketing materials and efforts, such as posters, videos, and brochures about NERRS and estuaries. ECs want more done to supplement their programs or market any system-wide program. There is also a desire for a central NERRS K-12 and PTD website that could be a link among Reserve programs and any national program. Marketing will be especially important if a system-wide program is established.

Recommendation 14:

Develop and Offer a System-Wide NERRS K-12 and PTD Program Focused on Field-based Estuarine Research

Many Reserve educational initiatives already integrate Reserve research and a majority of ECs (96%) indicate that research is a differentiating factor for their K-12 and PTD programs. There are many organizations offering coastal and marine K-12 and PTD

education (See Appendix 1), but few of them are filling an estuarine education niche with a research basis. As the name states, NERRS is a system of Estuarine *Research* Reserves. It makes sense that field-based estuarine research be the focus for a system-wide K-12 and PTD program. Table 23 demonstrates how this type of concept could be translated to different grade levels using an awareness to action type model for environmental education.

Table 23. Concept for National Estuarine Research Education Niche

	Curriculum and Program Focus	**Example Activities**	
Elementary	Exploratory and discovery	Touch tanks, models, field trips.	Awareness ↓ Knowledge ↓ Attitudes ↓ Skills ↓ Participation
Middle	Scientific process and monitoring	Transect maps, beach profiles, turbidity measurement. Basic scientific process, data collection, and analysis.	
High School	Monitoring and research development	Hypothesis/Testing, water quality testing and comparisons, Sedimentation comparison studies. Advanced data collection, analysis, sharing scientific data such as SWMP data, reporting research results.	

Most ECs were in favor of a system-wide program but with a number of important caveats that include:

- Ability to adapt to local conditions.
- Commitment of long-term support and resources
- Strong national office promotion and support

There is great potential for an effective national program within NERRS but there will have to be national level coordination and support with guidance from the ECs. It is imperative to recognize Reserve independence and input in the process, but it is also important for ECs to recognize that an effective national program could significantly benefit them. The benefits might include more support from professional staff, more funding, more attention and attendance at Reserve programs, shared resources among Reserves, and more focus for current programs. A national program should be a shift in focus rather than a supplanting of or wholesale change of current programs.

Appendix 1: National and Local Comparative Programs

National Comparative Programs

This is a list of national curriculums and programs that we looked at for the study, each program has a corresponding website.

A Child's Place in the Environment	http://www.acpe.lake.k12.ca.us/
Earth Education	www.eartheducation.org
Globe	http://www.globe.gov/globe_flash.html
GREEN-Earth Force	http://www.green.org/
The JASON Project	www.jasonproject.org
The Maury Project	www.ametsoc.org/amsedu/maury/
NASA Education	http://education.nasa.gov/
The Ocean Society	http://www.oceansociety.org/
Parks As Classrooms	http://63.90.162.72/npf/programs/education/PAC.htm
Project Learning Tree	www.plt.org
Project WET	http://www.projectwet.org/
Project WILD and Aquatic WILD	www.projectwild.org
Sea Grant Operation Pathfinder	http://www.seagrantnews.org/education/edu_programs.html

These are NERRS programs that we included in this portion of the study

Estuary Live—Coordinated by Susan Lovelace (EC at North Carolina NERR) Estuary Live is a live video streaming field trip to various estuaries around the country. Students and classes can register to view the broadcast over the Internet and submit questions to be asked live during the broadcasts. Participating Reserves include North Carolina, Jacques Cousteau, and South Slough.

Estuary Net—Estuary Net is a high school water quality monitoring program first implemented by the NERRS several years ago; the program has lost funding, but was important to the educational programming at the North Inlet-Winyah NERR, and they have modified it somewhat and still use classroom, field/hands-on, and follow-up activities with several area high schools. The reserve staff provides teachers with curriculum and sampling equipment, they visit classrooms for presentations on water quality issues, teach students to use test equipment in the lab and in the field and they select sample sites to monitor and then submit their findings to the Reserve.

MARE (Marine Activities Resources and Education)—MARE is an interdisciplinary K-8 whole school change program that engages teachers, students, parents, administrators, and the community to transform elementary and middle schools into dynamic laboratories for the study of the ocean. MARE is a supplemental curriculum, designed to enrich science instruction for all students while promoting equity, language acquisition and academic excellence among English language learners. The MARE curriculum focuses each grade level on a different ocean habitat. Individual teachers at MARE schools use the thematic curriculum at their own pace throughout the year as a

vehicle to coordinate and integrate their science instruction. At each grade level, the MARE habitat curriculum provides a minimum of 10 weeks worth of inquiry-based hands-on activities, covering an integrated treatment of earth & physical science, biology, environmental issues, mathematics, language arts/literature, social studies, art, music and drama. Participating Reserves include Jacques Cousteau and South Slough.

Local Comparative Programs (listed by State)

ALASKA
Organization: Pratt Museum
Program: Various Programs
Age Level: Junior High and High School
Website: http://www.prattmuseum.org/programs/
Offers various programs including: The Sperm Whale Project Kachemak Bay Discovery

ALABAMA
Organization: Dauphin Island Sea Lab
Program: Discovery Hall Programs
Age Level: High School & PTD
Website: http://dhp.disl.org/DHP.html
Programs include Touch Lab, Beach Walk and Maritime Forest, Salt Marsh History and Hurricanes, Coastal Oceanography, Research Vessel – Boat Excursion, Productive Plankton, and Summer Course in marine science for high school students. Teacher Training Workshops include Coastal Connections – Linking watersheds to the Gulf of Mexico, Grasses, Groupers and Gastropods, Beaches, Birds and Barrier Islands, World of Water for Teachers, Belize Teachers Workshop in Tropical Marine Biology, and Exploring the Florida Keys.

CALIFORNIA
Organization: Green Briar Nature Center
Program: Various Programs
Age Level: All ages
Website: http://www.thorntonburgess.org/Education%20Department.htm
Classes taught by Society Naturalists include Lessons in Field Ecology, Discovering Nature, Live Animal Story times, Coastal Rail Explorations, and Burgess Adventures in Nature Rental Kits.

Organization: Monterey Bay Aquarium
Program: School field trips and Teacher Programs
Age Level: K-12 and PTD
Website: http://www.mbayaq.org/lc/teachers_place
A variety of programs include School Field Trips, Splash Zone, Flippers, Flukes & Fun, Discovery Lab Explorations, Discovery Lab Mysteries, Discovery Lab High School, Discovery Lab Multi-Age, Ocean Explorers – Sea Stars, and Ocean Explorers – Shark's Lunch Box. Teacher Programs include Underwater Robotics Workshop, Field Trip Planning Workshop, Underwater Robotics Wiring Workshop, New Teacher Workshop, and Inquiry at Sandy Beach Simulation Workshop.

Organization: San Diego Natural History Museum / PROBEA
Program: The Making of a Naturalist
Age Level: Grades 4-10
Website: http://www.sdnhm.org/education/binational/

The Making of a Naturalist employs a unique mind-map model of the ecosystem that students can apply to any setting. They learn about the components of an ecosystem and how they are related through feedback loops. Watershed ecology is presented and, through mapping activities, students learn about their watershed and their place in it. These materials, suitable for use in grades 4-10, also guide students as they observe their watershed's ecosystems firsthand. Activities focus on plants, pollination, insects, and birds. A section on the urban environment teaches students to value their own "turf," as well as natural settings. The curriculum is available in Spanish, as well as English.

Organization: Save the Bay, San Francisco Bay
Program: Canoes in Sloughs and Teacher Institutes
Age Level: 6-12 and PTD
Website: http://www.savesfbay.org/teaching.html
6-12:Save The Bay teaches young people about the Bay-Delta so they appreciate and protect our waterways and wetlands. The primary education program for young people is Canoes in Sloughs. Canoes in Sloughs is an innovative, experiential program that places students from 6th to 12th grade in canoes to explore the estuary ecosystem up close.
PTD: During these Institutes, participants will discover how to integrate watershed concepts and San Francisco Bay curriculum into their teaching. Each day is filled with on-the-water experiences, expert speakers, and hands-on activities. The program also introduces educators to habitat restoration and ways of incorporating service learning projects into their work. Participants will have many opportunities to network with other Bay Area educators and receive a wealth of resource materials.

Organization: Seymour Marine Discovery Center
Program: Learning Programs, K-12 Teacher Training
Age Level: K-12
Website: http://www2.ucsc.edu/seymourcenter/lp-school.html
Marine Science Field Trips for K-12 School Groups: Discover how scientists think and work. Investigate the incredible creatures inhabiting Monterey Bay. Experience our gigantic blue whale skeleton

Organization: USFWS / City of Chula Vista Nature Center
Program: Sweetwater Safari
Age Level: Not Specified
Website: http://www.chulavistanaturecenter.org/Educational/default.asp
In partnership with U.S. Fish and Wildlife Service, Chevron, and the San Diego Zoo, a backpack program called Sweetwater Safari is offered to teachers who have already brought students to the Nature Center. In this hands-on program, students take backpacks containing binoculars, mini-microscopes, and other materials to discover plankton, birds, plants and animal tracks on the trails of the Sweetwater Marsh National Wildlife Refuge.

DELAWARE

Organization: Delaware Division of Fish and Wildlife Aquatic Resources Education Center
Program: Various Programs
Age Level: K-12 and PTD
Website: http://www.dnrec.state.de.us/fw/are.htm

A variety of facilities and field programs includes Wetland Activities for Delaware Educators, Field & Classroom Approaches to Wetlands Education, Fish Banks, PTD for Delaware Eco-Explorers, Delaware Adopt-A-Wetland, Horseshoe Crabs in the Classroom, NatureLink, Youth Fishing, Junior Duck Stamp Program, and other outdoor programs.

Organization: Delaware State Parks
Program: Various Programs
Age Level: All ages
Website: http://www.destateparks.com/Activities/eeprograms/EEPI.asp

Delaware State Parks offer a variety of environmental education programs specifically designed for students, scouts, adult groups, homeschoolers and other organized groups.

FLORIDA

Organization: Conservancy of Southwest Florida
Program: Environmental Education
Age Level: Grade 3-5
Website: http://www.conservancy.org/

The Environmental Education Division fosters conservation awareness through school programs, field trips, special events and an annual summer camp program.

Organization: Corkscrew Swamp Sanctuary, National Audubon Society
Program: Various Programs
Age Level: All ages
Website: http://www.audubon.org/local/sanctuary/corkscrew/

A variety of programs includes Insect Adventure, Water and Wetlands, A Swamp in Your Backyard, and a Guided Boardwalk Program.

Organization: Florida State University
Program: Saturday at Sea
Age Level: Not available
Website: http://bio.fsu.edu/eeo/sats.html

Designed to introduce students to the rich variety of marine creatures of the Gulf of Mexico by hands-on experience and study. The program is aimed to initiate an understanding of the biological relationships these sea creatures have to each other and to their physical environment. The program includes a slide presentation, a collecting trip to sample marine invertebrates and fishes by trawl net and beach seine, and a guided natural history field trip in the salt marsh.

Organization: Pelotes Island Nature Preserve
Program: Various Programs
Age Level: PTD and K-12
Website: http://pelotes.jea.com/
Teacher Workshops include Florida Wildlife, Project Learning Tree, Project WET, Project WILD and Aquatic WILD, Schoolyard Ecosystems, Orienteering, Schoolyard Wildlife, and Timucua Indians. School Programs include History, Animals, Plants, Science & Skills, Plant Adaptations, Survivor Island, Solar Science, Florida Archaeology, and Marine Science and the Salt Marsh.

GEORGIA
Organization: Jekyll Island 4-H Center
Program: Classes for teacher led student groups
Age Level: Not Specified
Website: http://georgia4horg.caes.uga.edu/public/facilities/jekyll/teacher/ee-welcome.htm
Welcome to our environmental education program. We have been sharing our barrier island environment with students since 1987. The program currently serves over 10,000 students annually. Our focus is barrier island ecology. Utilizing a multi-disciplinary approach, our participants are given the opportunity expand to their knowledge of, and experience in beach, marsh and forest environments.

Organization: Oatland Island Educational Center
Program: Various Programs
Age Level: Pre K and K-5 and PTD
Website: http://www.oatlandisland.org/
More than forty programs are available to students ranging from an hour-long barn animal program for kindergarten students to programs where older students study endangered species, organism classification, participate in team building activities and camp overnight. Education programs address defined objectives and are grade level specific to avoid duplication for students.

MASSACHUSETTS
Organization: Cape Cod National Seashore
Program: Classroom and Onsite Lesson Plans
Age Level: Grade 4-12
Website: http://www.nps.gov/caco/education/index.html
The National Park Service has prepared a series of lesson plans, which cover a variety of topics useful in the classroom and on site at Cape Cod National Seashore. These plans provide background information, student reading materials, and on site and off site activities. Groups visiting Cape Cod National Seashore for any time period, ranging from a day to a week will find these materials useful.

MARYLAND
Organization: MD Department of Natural Resources
Program: Various Programs
Age Level: K-12 and PTD
Website: http://www.dnr.state.md.us/education/
A variety of K-8 programs includes The Bay Game, Bay Grasses in Classes Project, Hooked on Fishing, Junior Rangers, Living History Characters, Four Seasons Activity Book, Outdoor Discovery Camps, Scales and Tales, and Stream Releaf Activities. High School programs include Envirothon, Maryland Conservation Corps, PTD, Bay Grasses in the Classes Project, Where do we grow from here?, and School Forests. Teacher Training programs include Project Learning Tree, Project WET, Project Wild, and The Maryland Association for Environmental and Outdoor Education National Wildlife Federation Educator Workshops.

MARYLAND, VIRGINIA, PENNSYLVANIA
Organization: Chesapeake Bay Foundation
Program: Education Department: Teacher Training Institute and Field Trips
Age Level: Not Specified
Website: http://www.cbf.org
Thirty years ago, CBF established an environmental education field program to teach people to Save the Bay. We offer professional development for teachers and educational opportunities for students. Over the past three decades, we have evolved into the largest, regional field-based environmental education program in the world. CBF's education program engages more than 100,000 people every year through its field programs, teacher training, curriculum materials, and restoration efforts.

MISSISSIPPI
Organization: J.L. Scott Marine Education Center
Program: Various Programs
Age Level: K-12 and PTD
Website: http://www.aquarium.usm.edu/
K-12 programs include Project Marine Discovery SEA CAMP and Project Marine Discovery WATER WORLD CAMP. PTD programs include Wonders of Wetlands Teacher Mini-Camp, Aquatic Nuisance Species Teacher Mini-Camp, COAST PILOT Leadership Institute, and Summer Field Program.

Organization: MSU Coastal Research and Extension Service
Program: Youth Education and PTD
Age Level: Not Specified
Website: http://www.msstate.edu/dept/crec/youth.html
Establishing and implementing a comprehensive youth education and outreach program with a primary focus in environmental education Providing support to field-level youth programs on environmental and related issues. This includes in-service training, dissemination of environmental information and education programming and Internet guidance.

NORTH CAROLINA

Organization: North Carolina Aquariums
(Roanoke Island, Pine Knoll Shores, Fort Fisher)
Program: Various Programs
Age Level: All ages
Website: http://www.aquariums.state.nc.us/files/program.htm

The North Carolina Aquarium on Roanoke Island is a wonderful educational opportunity for students of all ages. The Aquarium's purpose is to increase the public's awareness of North Carolina's coastal environment. Become involved! Take your class on a self-guided tour, see a film, participate in a special program, or let us come to you! Colorful exhibits and tanks teeming with aquatic life offer exciting ways to help your students experience the mysteries of the deep! A visit to the North Carolina Aquarium at Pine Knoll Shores can take several forms, including a teacher-led tour, an auditorium presentation, a marine life film or one of our extended field studies. The education staff invites you to schedule a visit or program. The experience will benefit students, teachers and especially the future health of our aquatic habitats. Fort Fisher: Group participation in an Aquarium program is an educational adventure. Whether you opt for an instructor-led program in the field or in an off-site classroom, it will be an exciting learning experience.

NEW JERSEY

Organization: New Jersey Audubon Society
Program: Various Programs
Age Level: PTD and K-12
Website: http://www.njaudubon.org/Education/

For school groups at our centers or at your school. These programs introduce basic natural history concepts as well as lay the foundation for learning how humans are part of these natural systems. For formal and non-formal educators: NJAS has a long history of providing natural history and environment-based education: Learn more about NJAS as a resource for educators in the state.

Organization: New Jersey Marine Sciences Consortium
Program: Various Programs
Age Level: K-12 and PTD
Website: http://www.njmsc.org/Education/Main_Page.htm

The Coastal Experience is NJMSC's collection of Marine Science field trip programs for school aged children. Programs are offered year round and all programs include active, "hands-on" participation in marine science activities. The *Coastal Experience* includes four programs: Marsh and Ocean Environments, Salt Marsh Ecology, Barrier Beach Dynamics, Comparative Studies of Barrier Island Communities, Marine Debris: A Critical Issue, and The Coastal Express: This Series of programs is ideal for after-school programs, informal groups and groups with time constraints. Programs run approximately 2 hours and can begin at locations near Sandy Hook's entrance to maximize the time spent on hands-on activities. Choose from the following: Estuary Exploration (for grades 4-12) Seashell Science (for grades pre K-6) Seining at Spermaceti Cove (for grades 2-12) A Closer Look at Sand (for grades 4-12) PTD: NJMSC Professional Development workshops help teachers integrate marine and environmental

science education into their classroom plans. Workshops are customized to specific user group needs. Typical workshops ranged from one-day in-services to year-long institutes.

Organization: The Wetlands Institute
Program: Various Programs
Age Level: K-12
Website: http://www.wetlandsinstitute.org/education.html
A variety of programs includes Field Trips, Electronic Field Trips, Summer Nature Classes, and Project WET teacher training workshops.

Organization: New Jersey Audubon Society
Program: NJ Waters
Age Level: Middle and High School
Website: http://www.njaudubon.org/Education/njwaters.html
New Jersey WATERS: A Watershed Approach to Teaching the Ecology of regional Systems. Provides an opportunity for students to collect, share, analyze, and compare scientific, cultural, economic, and historical data. Establishes a framework in which students can network with their peers and with professionals that work in the fields of habitat preservation and resource management. Enables students to examine the watershed system in a broad regional context. Encourages students to use critical thinking and decision-making skills in developing strategies to preserve the watershed system and its resources in order to meet the area's present and future needs.

NEW YORK
Organization: New York Sea Grant
Program: Hudson River Estuary Summer Course
Age Level: Middle and High School
Website: http://www.seagrant.sunysb.edu/NYSG@30/education.htm
The course is interdisciplinary, focusing on Hudson River ecology, cultural history and current social and economic issues. Field trips for the course - from which students are required to write related lesson plans to be used in their own classrooms - have included visits to Hudson Valley historic sites, environmental education centers, power generation and sewage treatment plants and Hudson River marinas and riverbank parks. Students experience the river as a living classroom, monitoring water quality in the Hudson's tidal marshes and creeks, beach seining and cruising the river's main stem on board research and educational vessels. In its first two years, over 30 teachers participated, including those employed by Rockland, Westchester, and Putnam Counties and New York City. About one half of the students teach science in New York's public schools.

Organization: Hudson River Sloop Clearwater
Program: Classroom of the Waves & Tideline Discovery Program
Age Level: All ages
Website: http://www.clearwater.org/
Classroom of the Waves takes place on the Clearwater. All voyages on the Clearwater—whether for groups of adults or school children, for Clearwater members of the public—share similar elements. On a typical day, the passengers assemble at the dock for a brief

orientation to the boat and crew. Once underway, an otter trawl is set to gather specimens for the fish tank. Then it's all hands to the halyards to help hoist the sails. Following sail raising, different learning stations can include fish, plankton, invertebrates, sediments, water chemistry, steering and sailing the vessel, navigation and a variety of other topics. Time is set aside during the sail for the entire group to come together to learn about Clearwater's history and mission. A highlight of nearly all sails is a period of silence allowing everyone to reflect on aspects of the boat, river, and life they have seen while under sail. Music by the crew may follow the silence, and passengers join in songs about sailing and environmental concerns helping to bring a sense of community to the day. The Tideline Discovery Program is a hands-on learning experience offered on the Hudson's shores from March to November. It enables students to embrace the many educational possibilities offered by our magnificent river. Program content and activities vary depending on grade level and topics of interest to the teacher. The program includes one classroom visit by a Clearwater educator and an interactive field trip to the river's shore. Typically, during the initial classroom visit, a Clearwater educator introduces students to the river's ecology, history, and environmental issues through a slide presentation and discussion.

OHIO

Organization: Ohio Department of Natural Resources
Program: Project WET
Age Level: K-12
Website: http://www.dnr.state.oh.us/water/educate/owep/guidetxt.htm

The Project WET Curriculum and Activity Guide, for kindergarten through twelfth grades, is a collection of innovative, water-related activities that are hands-on, easy to use, and fun! Project WET activities incorporate a variety of formats, such as large and small group learning, whole-body activities, laboratory investigations, discussion of local and global topics, and involvement in community service projects. Developed, field-tested, and reviewed by hundreds of educators and resource managers around the country, the Project WET Curriculum and Activity Guide addresses the goals of Project WET and The Watercourse.

RHODE ISLAND

Organization: Audubon Society of Rhode Island
Program: Various Programs
Age Level: PTD and K-12
Website: http://www.asri.org/

Audubon serves more than 20,000 local students and teachers, in RI and nearby Mass & CT. We offer comprehensive resources for environmental education, including classroom programs, after school programs, field trips, nature stories, teacher workshops, and a teacher resource center. These programs are designed to bring a wide variety of hands-on, environmental learning experiences for students as young as pre-school age and up to high school seniors. In some of our programs, such as "Owls of RI" and "Rainforests and Us", students get to witness a live animal. In our popular "Bring back the Leatherbacks" and "Inflatable Whale" programs, students perform a necropsy on a life-sized Leatherback Sea turtle replica and sit inside a 65 foot Fin whale model.

Organization: Save the Bay, Narragansett Bay
Program: Field Programs, Classroom Programs, Shipboard Programs, PTD
Age Level: PTD and K-12
Website: www.savebay.org
Serving teachers and students in Rhode Island and Massachusetts, Save the Bay has three categories of student programs. Student field programs focus on bringing kids into the coastal environment to explore the biological and physical characteristics, as well as to conduct specific science activities such as water quality and seine netting. Shipboard programs allow kids to travel on the Alletta Morris to study the bay bottom, plankton, and even the flora and fauna of Prudence Island (Part of the Narragansett Bay NERR). Classroom programs are actually outreach programs taken to local schools. They feature life-size models of various bay animals and some live specimens. PTD programs focus on bay issues and concepts and are field or boat based. Save the Bay does a thorough job of relating their K-12 and PTD programs to specific state and national standards for both Rhode Island and Massachusetts, as well as providing PTD credit specific to each state.

SOUTH CAROLINA
Organization: Project Oceanica
Program: COASTeam
Age Level: PTD K-8
Website: http://oceanica.cofc.edu/coasteam/
The COASTeam Program offers integrated courses in which teachers learn marine science concepts in the fields of geology, biology, chemistry, and physics. The courses teach these concepts using South Carolina's coast as an excellent "classroom," providing teachers with relevant, local examples to carry back to their own classrooms.

Organization: Seacoast Science Center
Program: Various Programs
Age Level: K-12
Website: http://www.seacentr.org/programs/school_program.html
The Seacoast Science Center offers schools and organizations a wide selection of Outdoor, indoor and outreach programs designed to meet the needs of any group size or budget. You can choose from a variety of habitats and program formats for your environmental education experience. SSC programs can help you meet your state Science Curriculum Frameworks.

Organization: South Carolina Marine Educators Association
Program: Resources for Marine Educators
Age Level: Not Specified
Website: http://www.coastal.edu/science/scmea/
SeaScripts newsletter for Marine Educators, available online. Provides marine education information and PTD opportunities.

Organization: South Carolina Science Council
Program: Professional Organization of Teachers

Age Level: K-12
Website: http://www.scscience.org/
The South Carolina Science Council $(SC)^2$ is a statewide professional organization of teachers and any others who are concerned with the improvement of science education in South Carolina. Offers links to various resources and curriculum.

VIRGINIA
Organization: Virginia Marine Science Museum
Program: Various Programs
Age Level: K-12
Website: http://www.vmsm.com/teachers.html
The Virginia Marine Science Museum offers both on- and off-site program options, as well as outreach, where the museum comes to you. Whatever your grade level, the Virginia Marine Science Museum has a program to supplement your curriculum and enhance the student's experience.

Appendix 2: General On-line Survey for ECs

General Survey Instrument for Reserve Education Coordinators
(Electronic Survey)

This survey is a part of the project to inventory and assess the K-12 and professional teacher development (PTD) programs for NERRS. As a part of the project you will be asked to complete this general survey concerning overall education programs. We will also ask you to complete a survey for each of the current K-12 and PTD programs done at your Reserve. Following the surveys we will be conducting phone interviews to gather additional information. The questions correspond to the project objectives and to some additional objectives requested at the annual meeting in October at Cape Cod. The project objectives include:

- An inventory and assessment, both quantitative and qualitative, of current programming for K-12 and professional teacher development across the 25 reserves and how these programs integrate state and national standards;
- Recommendations for improved program evaluation and performance measurement;
- Recommendations for improving program design and implementation, as well as needs for national-level support and capacity building activity;
- Recommendations and associated implications for a national "niche" or system-wide program or activity in the areas of K-12 education and professional teacher development.

Please complete and return the general survey and the individual program survey by January 10, 2003.

For this project the following definitions apply:

A **program** is a class, course, workshop, seminar, set of materials, curriculum, field trip, presentation, etc. where learning is the primary objective for the participants (students or educators). A brochure, interpretive signs, or exhibit are not a program but could be part of a program.

A **K-12 program** is a program that is specifically developed for K-12 age students (public/private school, home school). It does not include programs developed for general audiences where K-12 students are not the primary target group or programs for youth who are not attending as a part of a school related program. For example an interpretive walk designed for third grade classes is K-12 program but an interpretive walk led for general visitors on weekends is not a K-12 program. If your Reserve has a learning center, the learning center and its exhibits are not a K-12 program but a program may utilize the learning center as one of its components.

A **professional teacher development (PTD) program** is a program that is specifically developed for teachers that work with K-12 students. Participants include public, private, and home-school educators.

A **current program** is a program that was run in the past 12 months or will be run in the next 12 months.

If you have any questions or concerns about the survey or about whether you should include an activity that you do at your Reserve as K12 or PTD program, then please contact Christian Newman (cmnewman@pandionsystems.com) or Christine Denny (cdenny@pandionsystems.com) at (888) 372-4774.

1. Name: _____

2. Reserve Name:_____

3. State Partner/Employer: _____

4. Does your Reserve have an educational facility (e.g. training facility, classroom, environmental education center)? ____ yes ____ no

5.	**None**									**All the Time**
On a scale of 1-10 how much time does the educational staff at your Reserve spend on running K-12 programs?	1	2	3	4	5	6	7	8	9	10
On a scale of 1-10 how much time does the educational staff at your Reserve spend on running professional teacher development programs?	1	2	3	4	5	6	7	8	9	10

*Running=Designing, implementing, managing, coordinating, training, marketing, and/or supervising

6. How many educational staff work on K-12 and PTD programs at your Reserve, including yourself?
____ Full time employees
____ ¾ time employees
____ ½ time employees
____ ¼ time employees
____ Volunteers

7. What is the relative importance of K-12 programs at your Reserve in relation to the following?

	Not at All Important									**Extremely Important**
Increasing community support for estuarine conservation	1	2	3	4	5	6	7	8	9	10
Increasing understanding of estuarine ecosystems	1	2	3	4	5	6	7	8	9	10
Promoting stewardship for estuaries	1	2	3	4	5	6	7	8	9	10
Increasing citizen awareness of the Reserve	1	2	3	4	5	6	7	8	9	10
Changing behaviors	1	2	3	4	5	6	7	8	9	10

8. What is the relative importance of professional teacher development programs at your Reserve in relation to the following?

	Not at All Important									Extremely Important
Increasing community support for estuarine conservation	1	2	3	4	5	6	7	8	9	10
Increasing understanding of estuarine ecosystems	1	2	3	4	5	6	7	8	9	10
Promoting stewardship for estuaries	1	2	3	4	5	6	7	8	9	10
Increasing citizen awareness of the Reserve	1	2	3	4	5	6	7	8	9	10
Changing behaviors	1	2	3	4	5	6	7	8	9	10

9. Please indicate the degree the following resources would help you improve educational programs (K-12 & PTD) at your Reserve.

	Not at All									Very Much
Funding										
Funding for curriculum design	1	2	3	4	5	6	7	8	9	10
Funding for program design	1	2	3	4	5	6	7	8	9	10
Funding for participant transportation	1	2	3	4	5	6	7	8	9	10
Funding for program materials (e.g. paper, equipment, etc.)	1	2	3	4	5	6	7	8	9	10
Funding for more paid education staff	1	2	3	4	5	6	7	8	9	10
Funding for program evaluation	1	2	3	4	5	6	7	8	9	10
Funding for an on-site indoor classroom/training facility	1	2	3	4	5	6	7	8	9	10
Funding for teacher substitutes	1	2	3	4	5	6	7	8	9	10
Funding for teacher stipends for professional teacher development programs	1	2	3	4	5	6	7	8	9	10
Funding for training to increase your knowledge or skills	1	2	3	4	5	6	7	8	9	10
Outside Partnerships										
Cooperation with outside groups to run programs	1	2	3	4	5	6	7	8	9	10
Cooperation with outside groups to fund programs	1	2	3	4	5	6	7	8	9	10
Cooperation with outside groups to develop programs	1	2	3	4	5	6	7	8	9	10
Cooperation with outside groups to obtain funding for programs	1	2	3	4	5	6	7	8	9	10
Reserve Level Partnerships										
Better communication among Reserves about programs	1	2	3	4	5	6	7	8	9	10
Cooperation with other Reserves to run programs	1	2	3	4	5	6	7	8	9	10
Cooperation with other Reserves to fund programs	1	2	3	4	5	6	7	8	9	10
Cooperation with other Reserves to develop programs	1	2	3	4	5	6	7	8	9	10
Cooperation with other Reserves to obtain funding for programs	1	2	3	4	5	6	7	8	9	10
National Level Support										
System wide NERRS educational program(s)	1	2	3	4	5	6	7	8	9	10
System wide NERRS educational curriculum(s)	1	2	3	4	5	6	7	8	9	10
System wide NERRS educational objectives	1	2	3	4	5	6	7	8	9	10
Better communication with national office	1	2	3	4	5	6	7	8	9	10
National office assistance with securing outside funding	1	2	3	4	5	6	7	8	9	10
Intra (Within) Reserve Level Support										
More volunteer staff to assist with programs	1	2	3	4	5	6	7	8	9	10
Increased participation by paid Reserve staff in planning your educational programs	1	2	3	4	5	6	7	8	9	10

	Not at All									Very Much
Increased participation by paid Reserve staff with teaching/training for your educational programs	1	2	3	4	5	6	7	8	9	10
Increased participation by paid Reserve staff to secure outside funding for your educational programs	1	2	3	4	5	6	7	8	9	10
Increased communication with you about the research being conducted at the Reserve	1	2	3	4	5	6	7	8	9	10
Training for You (Educational Coordinator)										
Program assessment and evaluation training	1	2	3	4	5	6	7	8	9	10
Curriculum design training	1	2	3	4	5	6	7	8	9	10
State and National educational standards training	1	2	3	4	5	6	7	8	9	10
Proposal writing/fundraising training	1	2	3	4	5	6	7	8	9	10
Program marketing training	1	2	3	4	5	6	7	8	9	10
Time management training	1	2	3	4	5	6	7	8	9	10
Computer software training	1	2	3	4	5	6	7	8	9	10
Supervisory training	1	2	3	4	5	6	7	8	9	10
Trainings to increase ecological knowledge/skills	1	2	3	4	5	6	7	8	9	10

10. How much experience do you have doing the following things?

	None				Extensive
Creating curriculum	1	2	3	4	5
Evaluating programs	1	2	3	4	5
Developing education programs	1	2	3	4	5
Teaching K-12 students	1	2	3	4	5
Training teachers	1	2	3	4	5
Marketing education programs	1	2	3	4	5
Managing education programs	1	2	3	4	5
Correlating programs to educational standards	1	2	3	4	5

11. List two organizations that also offer effective K-12 or professional teacher development programs related to coastal issues in your region.

Organization Program Name

1)_____

2)_____

12. Rate the degree to which your Reserve educational programs (K-12 and PTD) are different from similar coastal related programs.

	Not at all Different				Extremely Different
Our programs provide access to unique coastal areas	1	2	3	4	5
We integrate research from the Reserve into programs	1	2	3	4	5

	Not at all Different				Extremely Different
We utilize Reserve scientists in our programs	1	2	3	4	5
We provide hands-on learning opportunities	1	2	3	4	5
We correlate our programs with educational standards	1	2	3	4	5
Our programs have Reserve-specific curriculums	1	2	3	4	5
Our instructors are coastal scientists	1	2	3	4	5
Our instructors are trained educators	1	2	3	4	5
Our programs are field based	1	2	3	4	5
Participants contribute to ongoing research	1	2	3	4	5
Our programs address unique topics	1	2	3	4	5

13. List two national or statewide programs that you believe could be used as model for a system-wide NERRS K-12 or PTD program.

1)_____

2)_____

14. List the current K-12 Programs being offered by your Reserve. (Please fill out a Program Survey for each). Current programs are programs that have been conducted in the last 12 months or will be conducted within the next 12 months.

15. List the current Professional Teacher Development Programs being offered by your Reserve. (Please fill out a Program Survey for each). Current programs are programs that have been conducted in the last 12 months or will be conducted within the next 12 months.

Thank you for your time.

Appendix 3: On-line Individual Survey for ECs

Individual Program Survey for Education Coordinators (electronic)

This survey should be completed after filling out the General Survey. The General Survey asked you to list all of your Reserve's K-12 and Professional Teacher Development programs. This Individual Program survey gathers the specific information about each one of the programs you listed in the General Survey.

We need for you to please fill out ONE survey for EACH program. This Individual Program Survey will take approximately 20 minutes to complete. For each program you will need to return to the on-line survey and start from the beginning. There are three different ways to complete each survey.

1) Complete the survey on-line. The one consideration for completing the survey on-line is that you cannot save the survey and come back later. Although there is no time limit to complete the survey because the survey can remain on your screen as long as you maintain your Internet connection, if you for some reason cannot finish and you disconnect from the page, you will have lost all your work.

2) Print out a copy of the survey for each program and fill out the survey by hand. You can either fax the surveys to us at (352) 372-4714 or you can mail them to:

   Pandion Systems, Inc.
   5200 NW 43rd Street
   Suite 102-314
   Gainesville, FL 32606.

3) Call (1-888-372-4774) or email us (cmnewman@pandionsystems.com or cdenny@pandionsystems.com) and we will email you copy of the survey in Microsoft Word. You can type in the answers to the questions and send them electronically back to us or you can print out the survey(s), fill them out by hand, and send them via fax or mail to us.

Completing the survey on-line is the simplest but if one of three methods does not work for you then please contact us.

Please complete an Individual Program survey for each of your programs by January 15, 2003.

For this project the following definitions apply:

A **program** is a class, course, workshop, seminar, set of materials, curriculum, field trip, presentation, etc. where learning is the primary objective for the participants (students or educators). A brochure, interpretive sign, or exhibit is not a program but could be part of a program.

A **K-12 program** is a program that is specifically developed for K-12 age students (public/private school, home school). It does not include programs developed for general audiences where K-12 students are not the primary target group or programs for youth who are not attending as a part of a school related program (e.g. boy or girl scout program). For example an interpretive walk designed for third grade classes is K-12 program but an interpretive walk led for general visitors on weekends is not a K-12 program. If your Reserve has a learning center, the learning center and its exhibits are not a K-12 program but a program may utilize the learning center as one of its components.

A **professional teacher development (PTD) program** is a program that is specifically developed for teachers that work with K-12 students. Participants include public, private, and home-school educators.

A **current program** is a program that was run in the past 12 months or will be run in the next 12 months.

If you have any questions or concerns about the survey or about whether you should include an activity that you do at your Reserve as K-12 or PTD program, then please contact Christian Newman (cmnewman@pandionsystems.com) or Christine Denny (cdenny@pandionsystems.com) at (888) 372-4774.

1. Reserve Name: _____
2. Program name: _____

3. Is this program for K-12 students or teachers? ___ K-12 ___ Teachers

4. Please write a short description (2-3 sentences) of the program.

5. What are the main topics of the program? Choose all the apply.
___ Estuary biology and ecology
___ Commercial and economic uses of the estuary
___ Estuary history and culture
___ Chemical/ physical/geologic sciences
___ Visual/literary/performing arts
___ Management (how government agencies take care of estuaries)
___ Citizen stewardship (what citizens can do to help including how to influence management)
___ Human impacts on estuaries including land use
___ Other:_____

6. What form is the program in? Choose all the apply.
___ Presentation
___ Guided walk/hike

___ Hands-on activities
___ Self-guided walk/hike
___ Workshop
___ Field investigation/ research
___ Distance/ on-line
___ Other_____

7. If the program is a K-12 program, what grade level does the program address? Choose all that apply.
___ K-3rd
___ 4th-5th
___ 6th-8th
___ 9th-10th
___ 11th-12th
___ Other:_____

8. If the program is a PTD program, what grade level educator is the program targeted at? Choose all that apply.
___ K-3rd educators
___ 4th-5th educators
___ 6th-8th educators
___ 9th-10th educators
___ 11th-12th educators
___ Other:_____

9. Approximately how many participants attend this program per year? _____

10. Where is the program conducted?
___ At the Reserve
___ At a school
___ Other:_____

11. In what setting is the program conducted? Choose all the apply.
___ Indoors
___ Outdoors on land (non-water area)
___ Outdoors on a boat
___ Outdoors in the water but not on a boat
___ Other:_____

12. Who teaches the program? Choose all the apply.
___ The Education Coordinator
___ A paid staff member other than the EC. Please indicate which one
___ Reserve Manager
___ Research Coordinator
___ Stewardship Coordinator
___ Volunteer(s)

___ An outside person not associated with the Reserve
___ The classroom teacher
___ The program is self-led
___ Other(s):_____

13. What materials do participants receive for the program. Choose all the apply.

Before Program	During or At Program	After Program
____ nothing	____ nothing	____ nothing
____ worksheets	____ worksheets	____ worksheets
____ handouts	____ handouts	____ handouts
____ posters	____ posters	____ posters
____ video	____ video	____ video
____ slides	____ slides	____ slides
____ over heads	____ over heads	____ over heads
____ CD Rom	____ CD Rom	____ CD Rom
____ curriculum	____ curriculum	____ curriculum
____ power point	____ power point	____ power point
____ other: _____	____ other: _____	____ other: _____

14. How are your programs marketed? Choose all the apply.
___ Directly to individual school principals
___ Directly to individual school department head/coordinators
___ Directly to individual school teachers
___ To school district coordinators (science, curriculum, etc.)
___ Word of mouth
___ Reserve newsletter
___ Local newspaper
___ Local television
___ Directly to past participants
___ Other_____

15. To what extent does the program incorporate the following:

	Not at all				A Lot
Results of Reserve research	1	2	3	4	5
The scientific process of research	1	2	3	4	5
Reserve scientists in programs	1	2	3	4	5
Hands-on learning opportunities	1	2	3	4	5
Data collection by participants	1	2	3	4	5

16. Did you partner or work with other groups or institutions to offer this program?
___ No
___ Yes, with whom do you partner/ work? _____

17. Where do you get funding for this program? Choose all the apply.
___ Internal budget
___ From a partner
___ Through a grant or proposal
___ Funded by participants
___ Other:_____

18. If there is a participant or per student fee for this program, what is it?
___ The program is free for participants
___ The program has a group fee, see next question
___ $.01-$5.00
___ $5.01-$10.00
___ $10.01-$15.00
___ $15.01-$20.00
___ More than $20.00

19. If there is a group fee for this program, what is it? If this question does not apply to this program, skip to the next question.
___ $.01-$10.00
___ $10.01-$20.00
___ $20.01-$30.00
___ $30.01-$40.00
___ $40.01-$50.00
___ More than $50.00

20. If busses are used to transport students to your program, who pays? If this question does not apply to this program, skip to the next question.
___ The Reserve
___ The school
___ The students
___ Other_____

21. How important were the following in your decision to develop and offer this program?

	Not at All				Very
We conducted a needs assessment that indicated this program was desired/needed	1	2	3	4	5
The program meets funding agency guidelines or requirements	1	2	3	4	5
The program is part of a Reserve initiative	1	2	3	4	5
It has been done for a long time	1	2	3	4	5
It is requested frequently	1	2	3	4	5
It fits in with an individual school's curriculum	1	2	3	4	5
It fits in with a school district's curriculum	1	2	3	4	5

22. Is the program correlated with national education standards?___Yes___No

23. Is the program correlated with state education standards?_____Yes___No

24. What type of formal evaluation has been done for this program? Choose all the apply.
___ No formal evaluation has been done
___ Counts of the number of people who participate in a program
___ Feedback cards
___ Follow-up survey (mail or phone) of participants
___ Staff observation of the program
___ Outside assessment (by separate party)
___ Onsite pre and post survey of program participants to measure change in knowledge, attitudes, or behavior
___ Other:_____

25. Are there written objectives for the program?
___ yes ___ no

26. If yes, what are they? Remember if you have them written in some electronic format, you can copy and paste them into the following text box.

27. Do you have any formal curriculum or lesson plans that have been developed for this program?
____Yes ___ No

Thank you for your time.
We will review this information and look forward to speaking with you.

Appendix 4: On-line RM, SC, RC Survey

Survey Instrument for Reserve Manager, Research Coordinator, and Stewardship Coordinator (Electronic Survey)

This survey is a part of the project to inventory and assess the K-12 and professional teacher development (PTD) programs for NERRS. We are asking you to complete this general survey concerning education programs at your Reserve. The questions correspond to the project objectives requested at the annual meeting in October at Cape Cod. They project objectives include:

- An inventory and assessment, both quantitative and qualitative, of current programming for K-12 and professional teacher development across the 25 reserves and how these programs integrate state and national standards;
- Recommendations for improved program evaluation and performance measurement;
- Recommendations for improving program design and implementation, as well as needs for national-level support and capacity building activity;
- Recommendations and associated implications for a national "niche" or system-wide program or activity in the areas of K-12 education and professional teacher development.

Please complete and return this survey by February 21, 2003.

For this project the following definitions apply:

A **program** is a class, course, workshop, seminar, set of materials, curriculum, field trip, presentation, etc. where learning is the primary objective for the participants (students or educators). A brochure, interpretive signs, or exhibit are not a program but could be part of a program.

A **K-12 program** is a program that is specifically developed for K-12 age students (public/private school, home school). It does not include programs developed for general audiences where K-12 students are not the primary target group or programs for youth who are not attending as a part of a school related program. For example an interpretive walk designed for third grade classes is K-12 program but an interpretive walk led for general visitors on weekends is not a K-12 program. If your Reserve has a learning center, the learning center and its exhibits are not a K-12 program but a program may utilize the learning center as one of its components.

A **professional teacher development (PTD) program** is a program that is specifically developed for teachers that work with K-12 students. Participants include public, private, and home-school educators.

A **current program** is a program that was run in the past 12 months or will be run in the next 12 months.

If you have any questions or concerns about the survey then please contact Christian Newman (cmnewman@pandionsystems.com) or Christine Denny (cdenny@pandionsystems.com) at (888) 372-4774.

1. Name:_____

2. Reserve Name:_____

3. Position: (Check only one)
_____ Reserve Manager
_____ Research Coordinator
_____ Stewardship Coordinator

4. Briefly describe your primary responsibilities at your Reserve:

5. Briefly describe your involvement with educational programs at your Reserve:

6. What is the relative importance of professional teacher development programs at your Reserve in relation to the following?

	Not at All Important									**Extremely Important**
Increasing community support for estuarine conservation	1	2	3	4	5	6	7	8	9	10
Increasing understanding of estuarine ecosystems	1	2	3	4	5	6	7	8	9	10
Promoting stewardship for estuaries	1	2	3	4	5	6	7	8	9	10
Increasing citizen awareness of the Reserve	1	2	3	4	5	6	7	8	9	10
Changing behaviors	1	2	3	4	5	6	7	8	9	10

7. What is the relative importance of K-12 programs at your Reserve in relation to the following?

	Not at All Important									**Extremely Important**
Increasing community support for estuarine conservation	1	2	3	4	5	6	7	8	9	10
Increasing understanding of estuarine ecosystems	1	2	3	4	5	6	7	8	9	10
Promoting stewardship for estuaries	1	2	3	4	5	6	7	8	9	10
Increasing citizen awareness of the Reserve	1	2	3	4	5	6	7	8	9	10
Changing behaviors	1	2	3	4	5	6	7	8	9	10

8. What is your degree of involvement in the following educational related activities at your Reserve?

For K-12 Programs	**None**				**A Lot**
Developing ideas for programs (advice, information, input, brainstorming, etc.)	1	2	3	4	5
Designing programs	1	2	3	4	5
Coordinating programs (setting up, getting participants, etc.)	1	2	3	4	5
Being a program instructor	1	2	3	4	5
Finding outside funding for programs (proposals, grant writing, etc.)	1	2	3	4	5
Evaluating programs					
For Professional Teacher Development Programs	**None**				**A Lot**
Developing ideas for programs (advice, information, input, brainstorming, etc.)	1	2	3	4	5
Designing programs (designing curriculum, activities, events, etc.)	1	2	3	4	5
Coordinating programs (setting up, getting participants, etc.)	1	2	3	4	5
Being a program instructor (teaching, training, facilitating, etc.)	1	2	3	4	5
Finding outside funding for programs (proposals, grant writing, etc.)	1	2	3	4	5
Evaluating programs	1	2	3	4	5

Appendix 5: Follow-up EC Telephone and Site Visit Outline including RM, RC, and SC Site Visit Questions

Follow-up EC Telephone and Site Visit Question Outline

Introduction

1. Tell me about yourself, personal history?
   Degree(s) in what?

   Previous work experience

Program Development

1. How do you come up with the ideas for your programs?

2. What are the outside influences that determine the content of programs? (NOAA, State partner, other)

3. How are target audiences for programs chosen? What are the drivers? State or national or other?

4. Why do you focus on K-12 or PTD? What are the factors?

5. From the general survey we found that on average, the relative importance of K-12 programs was significantly higher than PTD programs for increasing community support, understanding of estuaries, promoting stewardship, increasing awareness of the Reserve, and changing behaviors, why do you think that is?

6. Are your programs created or planned to meet overall Reserve goals?

7. Are your programs created or planned to meet over all NERRS goals?

8. For the programs that you have correlated with State and National Standards, how were the correlations done? (Who did them, why?) Which came first program or standard?

9. How do you keep current with new educational initiatives?

Program Implementation

1. During the survey analysis we noticed that many Reserves rated the use of volunteers highly but that many sites do not utilize volunteers in great numbers. Are you able use volunteers? What is limiting you from using some or more volunteers?

2. What percent of **your time** is devoted to K-12/PTD development/coordination, to K-12/PTD teaching/training, and other duties by you the Education Coordinator? Please give each area a percentage adding up to 100%
   _____ K-12 development/coordination
   _____ K-12 teaching/training
   _____ PTD development/coordination
   _____ PTD teaching/training
   _____ Other responsibilities

What are your other responsibilities?

3. How much time do you spend with staff training? What do you cover in staff training? (Operations, content knowledge, teaching skills, group management skills)

Program Evaluation

1. Overall do you think that K-12/PTD education programming at your Reserve is successful? Why or Why not?

2. How do you determine if your current programs are successful?

3. Do you have performance measurements for programs? If yes, what are they?

4. For Reserve programs that have been formally evaluated, what were the results from the evaluations? Do you have data that you can send to us to include in the study?

5. What factors would make your programs more successful?

Organizational Communication

1. What do you feel are the top three goals for your Reserve? **Follow up if education is not in the top three.**

I noticed that you did not mention K-12/PTD Education as a goal in your top three where would it rank and why?

2. In what ways does the Reserve Manager help you?

3. In what ways does the Research Coordinator help you?

4. In what ways does the Stewardship Coordinator help you?

5. How can ECs from different Reserves work together to improve their own programs?

National Level Coordination

1. Should a national program be developed for all the NERRS? Why or Why not?

2. If a national program were developed would you implement it? Why or Why not?

3. What activities and topics would be appropriate for a national program?

4. What do you believe needs to be done at a national or system-wide level to strengthen K-12/PTD educational programming at your Reserve?

5. What do you believe needs to be done at a Reserve level to strengthen K-12/PTD educational programming at your Reserve?

Funding

1. How would funding for more paid education staff improve your educational programs?

2. How would funding for teacher stipends improve your educational programs?

3. How would funding for program evaluation improve your education programs?

4. To what degree do you agree with the following statement?

Funding for our K-12 and PTD educational programs are adequate to maintain our current programming.
a) __strongly disagree b)___disagree c)___neither disagree or agree d)__ agree e) ___strongly agree

Funding for our K-12 and PTD educational programs are adequate to increase our current programming.
a) __strongly disagree b)___disagree c)___neither disagree or agree d)__ agree e) ___strongly agree

Partnerships

1. Do you use partnerships? How do you use them?

2. What are the pros and cons of partnering with other organizations?

3. How could you use them better?

Follow up to General Survey Instrument for Reserve Managers, Research Coordinators, Stewardship Coordinators (On-site Interviews Only)

1. What do you feel are the top three goals for your Reserve? **Follow up if education is not in the top three.** I noticed that you did not mention K-12/PTD Education as a goal in your top three where would it rank and why?

2. Are there research elements or management concepts that could be incorporated into K-12 or PTD programs?

3. Are there activities that K-12 students or teachers could assist the researchers with their work/research?

4. What do you believe needs to be done at a national or system-wide level to strengthen K-12/PTD educational programming at your Reserve?

Appendix 6: Summary Matrix of K-12 and PTD Programs

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
Apalachicola NERR, Florida				
Treasure Chests	Treasure chests are boxes of artifacts, publications, models and lesson plans on various subjects.	K-8th	100	Hands-on activities, classroom lessons and materials
Classroom Curricula	Project Estuary is a middle school curriculum. Estuarine Habitats is an elementary school curriculum.	K-8th	unknown	Presentation, hands-on activities, classroom lessons
Field Programs	Interpretive and hands-on activities at various field locations in Reserve	K-12th	2,500	Guided walk, workshop
Coastal Management workshops	Periodic workshops for coastal managers	working professionals	100	Presentation, guided walk, Hands-on activities, field investigation/research
Chesapeake Bay NERR, Maryland				
Chem Craze	Four (4) day summer program targeted to 5th & 6th graders. Each day focuses upon a different science aspect with both a field and lab component. Guest experts are brought in and activities are as hands-on as possible.	4th-8th	150	Presentation, Guided walk, Hands-on activities, investigation/research
Otter Point Creek Environmental Survey	This is a class program dealing with a simulated scenario whereby the students take on the role of an environmental survey team to evaluate a local watershed development project. The students must gather data, evaluate results, and offer recommendations on the proposed development project.	6th-10th	120	Presentation, Guided walk, workshop, investigation/research

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
Teen Adventure	A summer program targeted at junior and senior high school students interested in pursuing a career in the environmental sciences. Environmental science professionals lead workshops that involve the students in actual work and expose the students to various careers.	11th-12th	30	Presentation, guided walk, hands-on activities, workshop, investigation/research
Chesapeake Bay NERR, Virgina				
Oyster Restoration Field Trips	Students who have been growing and monitoring oysters during the school year through Oyster Reef Keepers of Virginia will be taken on a 1-day field trip. The field trip will have a oyster theme and we will investigate a restored oyster reef (count spat and mature oysters, collect nekton, perform water quality measurements, etc.) prior to releasing the oysters grown by the students all year. CBNERRVA will be working in cooperation with Oyster Reef Keepers of Virginia on these programs.	4th-12th	250	Hands-on activities, investigation/research
Marine Science Field Trip	This 1-day field program option will appear in the spring of 2003. Participants will investigate a topic of choice (salt marsh, shallow water fish, groundwater) during a field trip designed to allow students to gather data for use back in the classroom. Time will be taken to collect replicate samples, record biological and physical data, ID specimens to species level and perform other duties often used during marine science fieldwork.	6th-12th	250	Hands-on activities, investigation/research
General Estuarine Field Trip	The General Estuarine Field Trip is for groups that do not have the background preparation or ability for the Marine Science Field Trip option. This 1-day field trip program will serve as an introduction to estuarine habitats and species. More topics will be addressed than the Marine Science Field trip, although in less detail.	4th-12th	400	Hands-on activities

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
Multi-day Summer Program	Three 7-day long issue based programs will be conducted in the summer of 2003. Presentations, lectures, interviews, debate, field trips and hands-on field trips incorporating data gathering and interpretation will be used to investigate the many stakeholder positions and fishery science involved in managing blue crabs in the Chesapeake Bay.	9th-12th	55	Presentation, hands-on activities, investigation/research, stake holder interviews
Delaware NERR, Delaware				
Muckless Marsh Walk	Students are led on a hike over and around a salt marsh. Basic plants, animals, and functions are discussed. Program also gives a generic overview of the Reserve and the watershed.	K-12th	2000	Guided walk
Beach Ecology	Students conduct a dune hike, seine in the Delaware Bay, and beach comb.	K-12th	500	Presentation, guided walk, hands-on activities
Horseshoe Crabs and Shorebirds	Students are introduced to the complex biological interactions between these two species and how humans fit into the picture. Students see the animals on the beach and conduct mock research.	K-12th	2000	Presentation, hands-on activities, investigation/research
Watersheds	Students are given a presentation on what a watershed is. A demo is given about how pollution occurs in the watershed. Local watershed history is discussed.	K-12th	200	Presentation, hands-on activities
Water Quality	Students take an in-depth look at watersheds and how pollution that runs off into the St. Jones River can affect the health of the entire watershed. Students use LaMotte Kits to test water at the Reserve.	K-12th	1000	Presentation, hands-on activities, investigation/research
St. Jones River Boat Trip	Students are taken on a Carolina Skiff to look closely at salinity changes in the St. Jones River and how it affects plant and animal life. A history of the River is given, as well as functions and values.	K-12th	1000	Presentation, investigation/research, boat trip

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
St. Jones Reserve Canoe trip	Students will travel by canoe as a means to look closely at the salinity changes in the St. Jones River.	6th-12th	60	Hands-on activities, canoe trip
History Hike	Students hike from the Reserve Center to Kingston Upon Hull, a national historic site adjacent to the Reserve. Along the way they are told about the historic uses of the estuary.	K-12th	100	Guided walk, self-guided walk
A Fishy Situation	Students dissect an estuarine fish to learn about basic fish biology and adaptations to living in the estuary.	K-12th	300	Presentation, hands-on activities
Insect Zoo	Students explore both land and water at the Reserve to find insects that use the estuary.	K-12th	300	Presentation, guided walk, hands-on acitivites, investigation/research
Elkhorn Slough NERR, California				
Elkhorn Slough Environmental Education Program: Field Experience	After completing a 1.5-day training so that they can be their own tour guides, teachers are able to schedule their classes for field trips and have access to 5 miles of hiking trails, a visitor center with interpretive exhibits, teaching lab with microscopes, picnic area, and a variety of kits for activities on the trails or in the classroom.	K-6th	10 000	Presentation, guided walk, hands-on activities, workshop, investigation/research
MERITO: Cielo al Mar (Sky to Sea); (Multicultural Education for Resource Issues Threatening Oceans)	As part of the Monterey Bay National Marine Sanctuary's multicultural education plan, we work closely with a bilingual education specialist who is developing and testing bilingual curriculum about Elkhorn Slough wetlands and watersheds. This is a pilot program currently being implemented at an after school program of a nearby middle school.	6th-8th	30	Guided walk, hands-on activities, investigation/research

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
Camp SEA Lab Monterey Bay	Camp SEA Lab (Science, Education and Adventure) is a youth-oriented marine science education program offering week-long residential and day camp sessions for children ages 8-13. Students learn about coastal and ocean habitats through field experiences at ESNERR and participate in hands-on activities at several key marine research facilities in the Monterey Bay Area.	K-8th	250	Guided walk, hands-on activities, investigation/research
Nomadic Science Webcasts	Develop, deploy and test the technology necessary for wireless webcasts at ESNERR in collaboration with Henrik Kibak, a professor and science curriculum specialist at Calif. State University Monterey Bay. Work with teachers at selected school sites to develop accompanying curriculum.	4th-8th	60	Investigation/research, distance/on-line
Great Bay NERR, New Hampshire				
Spring/Fall Natural and Cultural Histories of Great Bay	These three hour programs are designed for a grade 1-5 audience, focusing on the natural and cultural history of Great Bay. Both staff and volunteer educators conduct the programs.	K-5th	3000+	Hands-on activities
Grand Bay NERR, Mississippi				
Celebrate the Gulf Marine Education Festival	This is an annual Marine Education Festival that we sponsor for all age groups but especially K-8. We have approximately 40 booths set up by local resource agencies that address coastal issues and students participate in a scavenger hunt of coastal facts at each of the booths. The schools that send the highest percentage of their students win a monetary award to buy science materials for their school.	K-12th	3000	Hands-on activities

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
Estuary Gumbo	This program is based on Alex's Monsieur Detritus's Estuary Soup program only I usually present it at outdoor earth day or conservation day activities. I pose as Chef Emerald (based on Emeril Live) and make an estuary gumbo filled with Mississippi mud, detritus salt, etc.	K-8th	depends	Presentation, hands-on activities
Regional Science Fair	Our agency is co-sponsor of the regional science fair. In addition to the sponsorship we also award Excellence in Marine Science Awards to the students whose projects best address coastal issues especially those that offer solutions to coastal problems. I also partner with the Marine Ed Center to provide training to the teacher-sponsors of the science fair.	K-12th	1000	Hands-on activities
GTM NERR, Florida				
Ocean to Estuary Walk	learn about the variety of habitats found between the ocean and the estuary. The guided tour will take you from the beach, over the dunes, through scrub habitat, deep into the maritime hammock and out into the salt marsh.	6th-12th	500	Guided walk
Salt Marsh Exploration	Explore the most productive natural habitat on the planet. Discover the interconnectedness between the salt marsh plants and animals, measure elevation changes along a transect, and examine plant and animal abundance with regard to elevation.	6th-12th	100	Guided walk, self-guided walk, investigation/research
Fish Adaptations and Identification	Students will learn how different adaptations can tell us about how fish move and what they eat. This program may involve fish printing or seining depending on age and weather.	6th-12th	60	Hands-on activities, art class (fish prints)
Beach Exploration	Explore the living coast. Students will comb the beach for shells and other sea life. Afterwards we will examine and identify the items found on the beach followed by a slide show.	4th-12th	100	Guided walk

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
True Crabs vs Pretender Crabs	Fiddler crab, blue crab and horseshoe crab ecology. Discussion about exotic crab research.	K-8th	60	Presentation
Jacques Cousteau NERR, New Jersey				
Shore Bowl	The Shore Bowl is one of 22 high school academic competitions around the country that serve as regional competitions for the National Ocean Sciences Bowl. Teams of 5 students each compete against one another to test their interdisciplinary knowledge of the ocean sciences.	9th-12th	100	Academic competition
Estuary Live	Live video streaming field trips to various estuaries around the country. Students and classes can register to view the broadcast over the Internet and submit questions to be asked live during the broadcasts.	4th-12th		Presentation, guided-walk, investigation/research, distance/on-line
North Inlet-Winyah NERR, South Carolina				
Estuary-Net	Estuary-Net is a high school water quality monitoring program first implemented by the NERRS several years ago; the program has lost funding, but was important to our educational programming and we have modified it somewhat and still use classroom, field/hands-on, and follow-up activities with several of our area high schools. We provide teachers w/curriculum and sampling equipment, visit classrooms for presentations on water quality issues, teach students to use test equipment in the lab and in the field and they select sample sites to monitor and then submit their findings to us at our Reserve.	9th-12th	Varies by semester, but roughly 350-400 per year	Presentation, investigation/research, distance/on-line

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
Tidal Creek Catches	Half-day field trip to an intertidal salt marsh creek where participants use a variety of sampling devices (seines, plankton & dip nets, mud cores and sieves, water testing kits) to learn about the estuarine environment and its inhabitants. Usually runs late spring through late fall.	4th-8th, families, home school groups	60	Presentation, guided walk, hands-on activities, investigation/research
Fishes of North Inlet Estuary	This is a program open to all ages, currently used by home school groups and also the general public and Reserve volunteers, offered at least once each month. This program allows hands-on participation with Reserve scientists in the field and the lab. Participants help take the sample at the creek, sort and identify the catch by species, and help with the length and weight measurements of the catch. We also include a slide show of the local fish and shrimp species and summaries of data trends from this long-term research project.	4th-12th, general public	75-100	Presentation, guided walk, hands-on activities, investigation/research
Old Woman Creek NERR, Ohio				
Birds with 2 Homes	To increase student awareness of the neotropical bird species shared between Northern Ohio and the Crooked Tree Wildlife Refuge Sanctuary in Belize Central America	K-8th	1500	Presentation, hands-on activities, investigation/research
Estuarine Ecology	A general introduction to estuaries, their functions as wetlands and their use. Information is based on the age (grade) of the learner, each program is tailored to the needs of the teacher.	K-12th	1000-1500	Presentation, hands-on activities, investigation/research
Jobos Bay NERR, Puerto Rico				
Exploring Estuarine Ecosystems at Jobos Bay	Students come to the Visitor Center and they are introduced to Jobos Bay and its estuarine and marine ecosystems through a talk with slides and a video film. They have an opportunity to visit the exhibits then they go on a guided walk through one of our trials.	6th-12th	2 000	Presentation, guided walk

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
Narragansett Bay NERR, Rhode Island				
Narragansett Bay Basics	This program introduces students to Narragansett Bay and its importance as an estuary by taking a close look at some of the bay's inhabitants. A dry touch tank and traveling aquarium may accompany this program.	K-10th	200	Presentation, hands-on activities
Sharks of Narragansett Bay	Discover the truth about these not-so-cold-blooded-killers and learn which species can be found in Rhode Island's waters.	3rd-8th	100	Presentation, hands-on activities
Horseshoe Crab Hour	Did you know the horseshoe crab was named after a giant one-eyed monster from Greek Mythology? You will learn all about the horseshoe crab's history, biology, and their importance to humans and other animals. Current monitoring techniques used in Rhode Island will also be discussed.	4th-10th	100	Presentation, hands-on activities, investigation/research
House for Hermit Crab	This Eric Carle book is used to introduce children to Narragansett Bay and its inhabitants. The traveling aquarium and dry touch tank may accompany this program.	Pre-K through 1st	100	Presentation, hands-on activities
Great Sharky Shark	In this book, Suzanne Tate describes the life of this apex predator who himself becomes one of the hunted when he is caught in trash left by humans. Children will learn why it is important to keep our oceans and estuaries clean.	Pre-K through 1st	100	Presentation, hands-on activities
Crab Moon	This Ruth Horowitz story relays the message that each of us must do our share to protect our ancient mariner, the horseshoe crab. Following the story, children will make horseshoe crab picture frames to take home.	Pre-K through 1st	50	Presentation, hands-on activities

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
North Carolina NERR, North Carolina				
Field trips for specific grade level	Reserve staff direct students in the estuary for a 2 hour interpretive, hands on learning experience based on grade level objectives and teacher requested needs.	K-12th, pre-service and college level	3000	Presentation, guided walk, hands-on activities, investigation/research
EstuaryLive	EstuaryLive is an online, interactive internet field exploration of an estuarine site.	K-12th, college	5000	Presentation, guided walk, distance/on-line
Outreach	Programs on coastal/estuarine topics designed for target audience	K-12th, college	500	Presentation, hands-on activities
Padilla Bay NERR, Washington				
K-12	Teachers call us to request an on-site field trip lasting from 1.5 to 5 hours. These field trips include indoor and field experiences.	K-12th	8,000	Presentation, hands-on activities, investigation/research
Rookery Bay NERR, Florida				
On-the-Water Marine Science Programs	Designed primarily for high school students. Includes 30 minute classroom presentation followed by a boat trip that includes a variety of experiential learning activities related to estuarine ecology and marine science. Activities vary depending on teacher's preferences, tides, time of year, etc.	9th-12th, college	1500	Presentation, hands-on activities, boat trip
Sapelo Island NERR, Georgia				
Sapelo Island History	Visitors are introduced to the rich natural and cultural history of Sapelo Island, including elements of local maritime industry, the Gullah-Geechee community of Hog Hammock, as well as the agriculture and timber activities of the 1800s. Instructors may also wish to include local Native American history and/or to highlight the influence of Spanish and French settlers on the island during the 1500-1700s.	5th-12th	1100-1200	Presentation, guided walk

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
Coastal/Barrier Island Ecology (both Marsh and Beach systems)	Programs feature typical barrier island ecosystems including estuarine, maritime forest and beach habitats. Field and lab activities (seining, vegetation studies, plankton collection, etc.) highlight the marsh and ocean systems of Sapelo Island.	4th-12th	900-1000	Guided walk, hands-on activities, investigation/research
South Slough NERR, Oregon				
Estuary Study Program - In Search of the Treasures of South Slough	Students embark on a search to discover the riches of the estuary through exploring four different stations based on four habitat zones. Night Prowlers, World Travelers, Estuary Soup, and Estuary Garden stations are focused on upland, salt marsh, mudflat, and open water channel habitats.	4th-5th	1,000	Guided walk, hands-on activities, investigation/research
Estuary Study Program - Secret of the Lost Medallion	Students seek the story of a medallion that describes the physical, biological, and chemical processes that make up the estuary. They seek truths through investigation at 7 stations located along the shoreline.	4th-8th	1,000	Guided walk, hands-on activities, investigation/research
Estuary Study Program - An Ecosystem and a Resource	This program is a collection of laboratory and field based activities that has been developed for high school students.	9th-12th	<150	Guided walk, investigation/research, self-directed classroom
Estuary Study Program - The Lore of South Slough	Students investigate the history and nature of South Slough through investigative reporting and interviews with several characters including a scientist, Native American, transporter, settler, and logger.	6th-8th	0	Guided walk, investigation/research
The International Brant Monitoring Project	Students conduct field surveys and take part in classroom activities to understand the biology and ecology of brant geese, their habitat and migrations. The students communicate data with students in other countries along the flyway via the internet.	4th-12th	120	Hands-on activities, investigation/research, distance/on-line

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
Estuary Live	We have participated in this internet based program for the past two years. Through a live webcast (pre-recorded in year one) classrooms throughout Oregon and the country are able to learn about the South Slough NERR and research activities being conduced at the site.	4th-10th	difficult to estimate (~500???)	Guided walk, hands-on activities, distance/on-line
Signs of Life - Boys and Girls Club	Monthly offering of classroom based activities at the local Boys and Girls Club. Students participate in hands-on investigations of estuary life.	4th-5th	~90	Presentation, hands-on activities
Tsalila Festival	This three day festival features the story of the salmon as an important focus for the area. Students from local schools participate in the first day of the festival as a part of school and then return with families over the weekend. South Slough features hands-on exhibits and guided activities.	K-5th	~300	Presentation, hands-on activities
Apprenticeships in Science and Engineering	2-3 High School freshman, sophomores, or juniors are competitively selected to participate in an 8-week mentorship working with Reserve staff on science based projects. Students are required to present a poster and oral discussion of their work.	9th-10th	2-3 locally 200 statewide	Presentation, hands-on activities, self-guided walk, investigation/research, informational poster development
Tijuana River NERR, California				
Tijuana Estuary Explorers	Tijuana Estuary Explorers is an in-class and field trip program, targeted at 3rd - 5th grade, that meets state standards and incorporates reading, writing and science into four comprehensive activities (what is watershed?, birds, marsh plants and plankton) about the Tijuana Estuary and its watershed.	3rd-5th	200	Guided walk, hands-on activities, investigation/research
Jr. Rangers	Jr. Rangers is an after school program for kids ages 7-12 that explores estuarine ecology, natural and cultural history, plants and wildlife. It is a statewide program for California State Parks.	3rd-7th	520	Presentation, guided walk, hands-on activities

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
Waquoit Bay NERR, Massachusettes				
Grade 5 Watershed Walks	Students trace the path of a rain drop flowing through the watershed that includes their school. They make stops and keep a journal with water quality measurements and observations to notice the differences as they pass from fresh to salt water environments. Teachers who participate must take a training workshop on groundwater concepts.	4th 5th	120	Guided walk, investigation/research
Grade 3 Estuary Program	Citizens for the Protection of Waquoit Bay, the friends group that supports many of the educational activities of Waquoit Bay Research Reserve, has sponsored presentations about estuaries in grade 3 classes for 5 years. The presentations, which last 30-40 minutes according to the class time available, are made by a certified teacher with expertise in estuaries and coastal ecosystems and include live estuary animals. In the programs, nearby estuaries and local organisms are highlighted. Connections are made in the presentation between the estuary concepts and the grade 3 curriculum. The estuaries program includes a poster contest, in which the third graders are invited to create colorful pictures on a theme connected with estuaries. This year's theme is “Together We Can Make a Difference”. The poster component is done in cooperation with school art teachers. All participating students and their parents are invited to a free gala art opening and reception at the Reserve to view all the student's posters on display. The third component of the estuaries program is a field trip to study and observe a local estuary. The field trip is optional and is scheduled at the most appropriate date and time for the class, often in mid to late May or early June. Parents are invited to accompany the field trip.	K-3rd	350	Presentation, guided walk, hands-on activities, investigation/research

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
The Bay Team	The Bay Team is an after-school science club for low income or underprivileged students in grades 4-6 who live in the neighborhood of Waquoit Bay National Estuarine Research Reserve. Bay Team members learn about the water in the bay estuarine habitats, winds and tides, and the creatures that live along the shore and in the water.	4th-8th	15	Presentation, guided walk, hands-on activities, investigation/research, Classroom lessons
Grade 6 Estuary Program	All grade 6 students in Falmouth come to the Reserve 2 classes at a time for a day of estuary lessons.	6th-8th	375 students and 20 teachers	Presentation, guided walk, hands-on activities, investigation/research, classroom lessons
Grade 8 Pond Study	All grade 8 students in Falmouth participate in sampling two ponds on school property. Each class samples 3 times per year. Data are collected and analyzed. Students discuss and communicate results about water quality in the ponds.	6th-8th	400	Presentation, guided walk, hands-on activities, investigation/research, classroom lessons, and data analysis
Junior Ranger Program	The Massachusetts Department of Environmental Management encourages the Junior Ranger program at the State Parks staffed with Interpretive Naturalists. It takes different forms in different parks. At WBNERR, we sponsor a series of one hour programs once a week for 6-12 year olds (with an accompanying adult) on various topics the Reserve is studying.	K-5th	50	Presentation, hands-on activities, investigation/research
Waquoit Bay Science School	This is a week-long hands-on day program which includes estuary explorations, modeling, experiments and aquarium observations on estuary and groundwater topics. There are two special sections for boys and girls (grades 6-8) which include an overnight camp out on Washburn Island.	K-8th	84	Hands-on activities, investigation/research

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
Summer Estuary Exploration programs	Various groups (usually from camps, sailing clubs, etc) can request a hands-on program at the Reserve which usually consists of groundwater modeling activities and field explorations down at the estuary. They are catered to individual group's needs.	K-12th	350	Presentation, guided walk, hands-on activities, investigation/research
High School Classes	Programs for high school students are presented at the school, at the Reserve, or at a field study site. These programs include readings for students, presentations about research, field sampling and a follow-up project in which students prepare reports, posters, or a public display about the topics they studied.	9th-12th	275	Presentation, hands-on activities, workshop, investigation/research, distance/on-line, scientist presentations in connection with study topic, student projects
Programs for Middle School Students	Programs are presented at the Reserve for classes of students in grades 5-8. In these classes, students are introduced to estuaries, their ecology, and human impacts on them, and students sample water and biology in Waquoit Bay.	4th-8th	200	Presentations, hands-on activities, investigation/research
Weeks Bay NERR, Alabama				
K-12 Environmental Education Program	This program is the curriculum (compilation of hands-on activities) that we use with the K-12 students who come to the Reserve for fieldtrips. The activity objectives are correlated to the Alabama Course of Study in Science for all grade levels. The activities for K-8 are grade level specific for theme and objectives. Activities for high school students are field oriented and focus primarily on water quality and how it affects diversity.	K-12th	3,500-4,000 students and approximately 400 teachers and chaperones	Guided walk, hands-on activities, investigation/research, distance/on-line

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
Teacher Theme Boxes	Theme boxes are resource boxes which teachers may check-out for a period of two weeks to use in their classroom. The boxes are designed for a range of grade levels primarily K-4 but a couple are 5-8. Themes include reptiles and amphibians, insects and spiders, birds and mammals, sea life, marine mammals, bats and wetlands. The boxes include puppets, books, posters, video and cassette tapes and water quality test kits for the older students.	K-8th	10 different boxes	Resource boxes that are loaned out to teachers.
Wells NERR, Maine				
Vital Signs	Uses palm pilots and probes to test water quality and monitor salt marsh restoration sites.	6th-12th	New program	Guided walks, hands-on activities, investigation/research
Exploring Estuaries	Students come to our site and go through several stations teaching them about the importance of estuaries and their connections to surrounding habitats	K-5th	1000	Guided walk, hands-on activities
Water Quality Monitoring Field Studies	Students collect water samples from three different spots in the estuary and analyze the samples in our teaching lab	6th-12th	300	Presentations, guided walk, hands-on activities, investigation/research
Watershed Evaluation Team	Students monitor water quality at 22 different sites throughout two estuaries on Reserve property	6th-12th	50	Presentation, guided walk, hands-on activities, self-guided walk, investigation/research
Microscopic Drifters	Students learn about plankton, and collect and analyze plankton samples during a half day program	6th-12th	New program	Presentation, hands-on activities
Discovery Program	10 different booklets designed for 2 different age levels that lead small groups along trails of the Reserve. Equipment for the activities is included in a backpack they borrow.	K-5th	300	Hands-on activities, self-guided walk

NERRS K-12 EDUCATION PROGRAM INVENTORY MATRIX

Program name	Program description	Grade Level	# of participants per year	Program Format
Self Guided Field Trips	Teachers bring their classes and, using Reserve background information, curriculum, and equipment, explore a topic that fits within their curriculum	K-12th	1500	Hands-on activities, self-guided walk, investigation/research
Kachemak Bay NERR, Alaska				
Estuarine Ecology Research	During this field trip investigation, students learn about functional values of estuaries, especially coastal marshes, past and present KBNERR research projects and new ecological information on the local estuaries.	4th-8th	500	Presentation, guided walk, hands-on activities, investigation/research

NERRS PROFESSIONAL TEACHER DEVELOPMENT INVENTORY

Program name	Program description	Which teacher grade level is this training for?	Approximately how many participants attend this program per year	Program Format
Ace Basin NERR, South Carolina				
ECO (Educate Colleton Outdoors)-Project	The ECO (Educate Colleton Outdoors)-Project works to provide hands-on learning opportunities for the middle and high school teachers of Colleton County, SC. Through field trips, workshops, and conferences, the ECO-Project strives to educate and encourage the teaching of environmental science within the classroom especially focusing on the ACE Basin.	6th-12th	25-30	Presentation, guided walk, hands-on activities, workshop, investigation/research, conferences
Apalachicola NERR, Florida				
Teacher Training	Periodic workshops for teachers related to local topics or Reserve curricula.	K-12th	20	Workshop
Chesapeake NERR, Maryland				
Physics & Chemistry in Environmental Science	This is a workshop that was developed for education conferences and other related gatherings of formal and informal educators. The purpose is to reveal aspects of physics and chemistry that can be related in a fun and easy manner to environmental science.	6th-12th & Informal Educators	100	Presentation, hands-on activities, workshop

NERRS PROFESSIONAL TEACHER DEVELOPMENT INVENTORY

Program name	Program description	Which teacher grade level is this training for?	Approximately how many participants attend this program per year	Program Format
Chesapeake NERR, Virgina				
Restoration on the York River	These 3-day teacher trips are designed to give teachers a working understanding of important local estuarine habitats by using restoration of those habitats as a theme. Presentations by restoration experts and hands-on field trips will be used during the program.	K-12th	60	Presentation, hands-on activities
Estuarine Aquarium Keeping	This 1 (or two)- day teacher training will instruct teachers how to maintain estuarine aquaria in their classroom. Specimen collection identification life history and transportation will be covered in the field. Demonstration tanks will be created during the program.	K-12th	20	Presentation, hands-on activities
Delaware NERR, Delaware				
Introduction to the DNERR	Teachers come to an all day workshop to learn how the DNERR can add to their classroom learning.	K-12th	50	Presentation, guided walk, hands-on activities, workshop, investigation/research
Introduction to the Estuary	Teachers learn basic estuarine ecology and are given an introduction to the St. Jones Watershed.	K-12th	30	Presentation, guided walk, hands-on activities, workshop, investigation/research

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Program name	Program description	Which teacher grade level is this training for?	Approximately how many participants attend this program per year	Program Format
Green Eggs and Sand	Green Eggs and Sand (GES) is a weekend workshop that teaches teachers how to use the GES curriculum and gives them background information on the science and management of horseshoe crabs and shorebirds.	6th -12th	100	Presentation, hands-on activities, workshop, investigation/research
Elkhorn Slough NERR, California				
Elkhorn Slough Environmental Education Program: Teacher Training	This is a 1.5-day teacher workshop designed to provide educators with the information and tools needed to lead an informative and enjoyable field experience for their students. They receive a curriculum packet, review the interpretive exhibits in our visitor center and spend most of the time in the field getting hands-on experience with the various curriculum activities designed for the trails or classroom. From the pallet of choices presented, the teachers choreograph their own program appropriate for the age of their students, emphasizing the themes and topics being covered in the classroom.	K-8th	60-80	Presentation, guided walk, hands-on activities, workshop, investigation/research
Great Bay NERR, New Hampshire				
It's All Connected Curriculum Teacher Training	Great Bay curriculum for teachers		20	Workshop

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Program name	Program description	Which teacher grade level is this training for?	Approximately how many participants attend this program per year	Program Format
GTM NERR, Florida				
Bringing Estuaries Into the Classroom	Teachers learn hands-on classroom activities that can be used to demonstrate concepts relating to estuarine ecology. Most activities use easily obtained, inexpensive materials. Teachers receive copies of all the instructions and other printed materials to take home.	6th-8th	30	Presentation, guided walk, hands-on activities, workshop
Collectors Permit Workshop	Teaches proper collection, transportation of animals and rules and regulations for collecting marine species along with alternatives to collecting live specimens. Provides teacher with State of FL collecting permit.	K-12th	20	Presentation, hands-on activities
How to do Field Studies with your Students	Currently putting a program together that will teach how to use scientific equipment out in the field, includes data collection and fieldtrip safety.	6th-8th	15	Presentation, investigation/research
Hudson River NERR, New York				
Collaboration with Clearwater's Hudson River Teacher Training Program	The Hudson River Sloop Clearwater offers a week-long training program for teachers during the summer. Teachers are exposed to the natural, historical and cultural, and industrial histories of the Hudson River. Hudson River NERR provides the field-based portion of the training, via interpreted canoe trips to a reserve site: Tivoli Bays.	K-12th	15-20	Presentation, guided walk, hands-on activities, guided canoe trips

NERRS PROFESSIONAL TEACHER DEVELOPMENT INVENTORY

Program name	Program description	Which teacher grade level is this training for?	Approximately how many participants attend this program per year	Program Format
Collaboration with Hudson River Ecology Course	The Hudson River Ecology Course is a week-long teacher training program which focuses on the natural, physical, historical and industrial history of the Hudson River. The Reserve provides the field-based portion of the training: a guided canoe trip the Iona Island Reserve site.	K-12th	15-20	Presentation, guided walk, hands-on activities, guided canoe trips
NYS DEC Hudson River Teacher Training Program	The NYS DEC based at StonyKill Farm offer a week-long program for teachers, introducing them to the natural, physical, historical and cultural aspects of the Hudson River Estuary. The Reserve provides the field-based portion of the training, with a guided canoe trip to a Reserve site.	K-12th	10-15	Presentation, guided walk, hands-on activities, guided canoe trips
Hudson River Educators' Series	The series consists of day-long programs offered twice a year which focus on specific aspects of the Hudson River Estuary. The day offers a combination of presentations, workshop activities and (where appropriate) field programs.	K-12th & Informal Educators	150	Presentation, guided walk, hands-on activities, guided canoe trips

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Program name	Program description	Which teacher grade level is this training for?	Approximately how many participants attend this program per year	Program Format
Jacques Cousteau NERR, New Jersey				
Marine Activities Resources and Education (MARE)	Marine Activities Resources & Education (MARE) is an interdisciplinary K-8 whole school change program that engages teachers, students, parents, administrators, and the community to transform elementary and middle schools into dynamic laboratories for the study of the ocean. MARE is a supplemental curriculum, designed to enrich science instruction for all students while promoting equity, language acquisition and academic excellence among English language learners. The MARE curriculum focuses each grade level on a different ocean habitat. Individual teachers at MARE schools use the thematic curriculum at their own pace throughout the year as a vehicle to coordinate and integrate their science instruction. At each grade level, the MARE habitat curriculum provides a minimum of 10 weeks worth of inquiry-based hands-on activities, covering an integrated treatment of earth & physical science, biology, environmental issues, mathematics, language arts/literature, social studies, art, music and drama.	K-8th	35-40	Presentation, hands-on activities, workshop, investigation/research

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Program name	Program description	Which teacher grade level is this training for?	Approximately how many participants attend this program per year	Program Format
COSEE Coastal Observatories Workshop	This workshop is designed to provide middle and high school educators with an appreciation and understanding of a variety of coastal habitats, scientific research being conducted in these habitats, and a particular emphasis on the importance, research, and data associated with coastal ocean observatories. This program is a collaborative effort between the partners of the Mid-Atlantic Center for Ocean Science Education Excellence (MA-COSEE) - MA-COSEE partners include Rutgers Marine and Coastal Sciences, the Jacques Cousteau NERR, Stevens Institute of Technology, University of Maryland, Virginia Institute of Marine Sciences, NY Aquarium and Hampton University.	6th-12th	12	Presentation, hands-on activities, workshop, investigation/research
MARE Summer Institute	The Marine Activities Resources and Education (MARE) program conducts a professional development institute each summer for ~40 educators. MARE is an interdisciplinary, whole-school program that teaches basic concepts and principles across a variety of subjects using marine science content as a learning vehicle.	K-8th	35-40	Presentation, guided walk, hands-on activities, workshop

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Program name	Program description	Which teacher grade level is this training for?	Approximately how many participants attend this program per year	Program Format
Advanced MARE workshops	A series of workshop conducted over 4-5 days that serve to provide educators with advanced training in the science, content, and curricula associated with the Marine Activities Resources and Education (MARE) program. These workshops go into greater depth and detail than the MARE Summer Institute.	K-8th	20-25	Presentation, guided walk, hands-on activities, workshop
Coastal Observatories Workshop	A workshop designed to familiarize middle and high school educators with the technology, research and data associated with coastal ocean observatories and the surrounding coastal habitats	6th-12th	12-20	Presentation, guided walk, hands-on activities, workshop, investigation/research, distance/online
Administrators Workshop	A one-day annual workshop to inform administrators from around the state about the education programs we offer and how they can get their staff/schools involved in incorporating the ocean sciences into the classroom	K-8 Administrators	20	Presentation, guided walk, hands-on activities, workshop
Middle School Ocean Science Workshop	A multi-day workshop to introduce middle school educators to various pedagolical techniques and curricula to bring ocean sciences into the classroom as an interdisciplinary learning tool	6th-8th	15	Presentation, guided walk, hands-on activities, workshop

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Program name	Program description	Which teacher grade level is this training for?	Approximately how many participants attend this program per year	Program Format
C.O.O.L. Classroom Workshop	A workshop to provide professional development for educators in using the C.O.O.L. Classroom with their students. The C.O.O.L. Classroom is a series of Internet-based lessons that are focused on the research, technology and data (real-time) of the Rutgers Long-term Ecosystem Observatory in the coastal Atlantic Ocean.	6th-12th	20	Presentation, guided walk, hands-on activities, workshop, distance/online
Kachemak Bay NERR, Alaska				
Current Issues in Science Education: Coastal Climate Change and the Intertidal Environment	Intertidal Environment. A 2.5-day classroom and field oriented course designed to enable teachers and their students to become involved in real life science by making observations and collecting data that can be used by local scientists studying change in Kachemak Bay and global scientists studying climate change around the world. Students learned how to set-up a coastal monitoring program in their school (following new GLOBE protocols. Strategies for teaching environmental science were explored through field activities conducted in sandy, muddy, and rocky intertidal environments.	4th-12th	15-25	Presentation, hands-on activities, Workshop, investigation/research, hands-on computer

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Program name	Program description	Which teacher grade level is this training for?	Approximately how many participants attend this program per year	Program Format
Current Issues in Science Education: Physical Oceanography research and its techniques	This three-day course presents lab demonstrations and strategies for teaching science concepts and process skills based on current research studies and findings about the local and regional environment. This unit will focus on oceanography research and its techniques.	6th-12th	15-20	Hands-on activities, investigation/research
Current Issues in Science Education: Focus on Watershed and Aquatic Science	This 3 day course will introduce students to basic watershed and aquatic science concepts of stream dynamics, water quality, and stream and wetland habitats; develop your confidence in teaching environmental science using current environmental scientific research and research techniques in the local or regional environment; present field demonstrations of these concepts and a classroom unit for rearing salmon in the classroom; demonstrate stream monitoring and sampling techniques for fish, aquatic insects, and water quality; and survey recent watershed research studies and techniques for fish and resource management issues in the Kachemak Bay Watershed.	4th-12th	15-25	Hands-on activities, investigation/research

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Program name	Program description	Which teacher grade level is this training for?	Approximately how many participants attend this program per year	Program Format
North Carolina NERR, North Carolina				
Coastal Explorations	A Coastal Exploration provides some general activities for use in the classroom as well as some basic information about Estuaries and their importance. Teachers and educators learn about North Carolina's 2 million acres of estuaries and their importance in our seafood industry; general ecological concepts; and impacts on estuaries.	4th-12th & Pre-service teachers	75	Presentation, guided walk, hands-on activities, workshop
EstuaryLive	How to use EstuaryLive and integrate into curriculum	K-12th & college and technology coordinators	20	Guided walk, hands-on activities, workshop, investigation/research, online
Coastlive	Topical online interactive seminars with scientists and educators	6th-12th & pre-service teachers	15	Presentation, workshop, distance/online
Old Woman Creek NERR, Ohio				
L.A.K.E.R.S	Lake Aware Kids Engaged in Relevant Science. (LAKERS) is a workshop for teachers about Lake Erie and the Great Lakes Ecosystems.	6th-12th	50	Presentation, hands-on activities, workshop, investigation/research
Project WET	Project WET is a national nonprofit water education program for teachers, grade K-12. The goal of Project WET is to facilitate and promote awareness, appreciation, knowledge, and stewardship of water resources.	K-12th	100	Presentation, hands-on activities, workshop

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Program name	Program description	Which teacher grade level is this training for?	Approximately how many participants attend this program per year	Program Format
Padilla Bay NERR, Washington				
Clockhours	Padilla Bay offers credit for professional teacher continuing certification. These credits can be offered at approved classes, conferences, workshops etc.	K-12th	100	Presentation, guided walk, workshop, investigation/research
Sapelo Island NERR, Georgia				
Coastal/Barrier Island Ecology	One, two, and three-day programs can be arranged for groups of 10-30 teachers. Instruction and materials highlight the ecology and wildlife of barrier island systems (estuarine, upland and beach habitats) as well as the history of Sapelo Island.	4th-8th	120-150	Presentation, guided walk, hands-on activities, workshop, investigation/research
South Slough NERR, Oregon				
Marine Activities and Resource Education (MARE)	MARE has been adopted by the local Coos Bay School District as their science curriculum. We have been working with a partnership to promote development of a teacher training institute for MARE while conducting training for MARE teachers.	K-8th	20-30	Presentation, guided walk, hands-on activities, investigation/research
Estuary Study Program	Teachers participate with parent volunteers in 4-6 hours of training on-site to gain background knowledge in estuary ecology and the delivery of site based curricula.	4th-12th	80-100	Presentation, guided walk, hands-on activities

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Program name	Program description	Which teacher grade level is this training for?	Approximately how many participants attend this program per year	Program Format
Waquoit Bay NERR, Massachussetts				
Teacher Training	Staff at the Waquoit Bay Reserve present teacher training programs as individual presentations and in series. 10 Professional Development Points are available for each workshop. Topics include groundwater, watersheds, estuaries, coastal dynamics and geology, renewable energy, climate change, weather, water quality monitoring, field trip techniques, and data analysis.	4th-12th & Vocational-technical teachers; informal educators	80	Guided walk, hands-on activities, workshop, investigation/research, online
Project WET	Project WET (Water Education for Teachers) is a national program to train teachers to use a curriculum and activity guide to promote awareness, appreciation, knowledge, and stewardship of water resources. We conduct teacher trainings and provide support for WET festivals at schools.	K-12th & Informal Educators	15	Hands-on activities, workshop, curriculum
Museum Institute for Teaching Science (MITS)	Museum Institute for Teaching Science is a state-wide consortium of informal science education museums. They sponsor 2-week long institutes across the state during the first two weeks of July. Last year our portion of the institute focused on renewable energy. This year we will be focusing on sustainable schools.	4th-8th	20	Hands-on activities, workshop, investigation/research

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Program name	Program description	Which teacher grade level is this training for?	Approximately how many participants attend this program per year	Program Format
Presentations at Professional Conferences	Teacher training presentations are made at professional teacher conferences. These presentations serve to reach regional and national audiences of teachers with estuarine and coastal science topics.	4th-12th	80	Presentation, hands-on activities, workshop, distance/online
Weeks Bay, Alabama				
Non-point Source Pollution and Watersheds for Educators	This is a two and a half day workshop for educators both formal and informal about non-point sources of pollution in watersheds. The workshop has been conducted for six years and draws participants from the entire state.	6th-12th & General Public	25	Workshop
Wells NERR, Maine				
Project WET	Teacher training workshop about water resources	K-12th	50	Presentation, guided walk, hands-on activities, workshop
Project Wild	A teacher workshop on wildlife, the environment, and conservation	K-12th	40	Workshop
Project Learning Tree	A teacher workshop about environmental education and fostering stewardship.	K-12th	20	Workshop