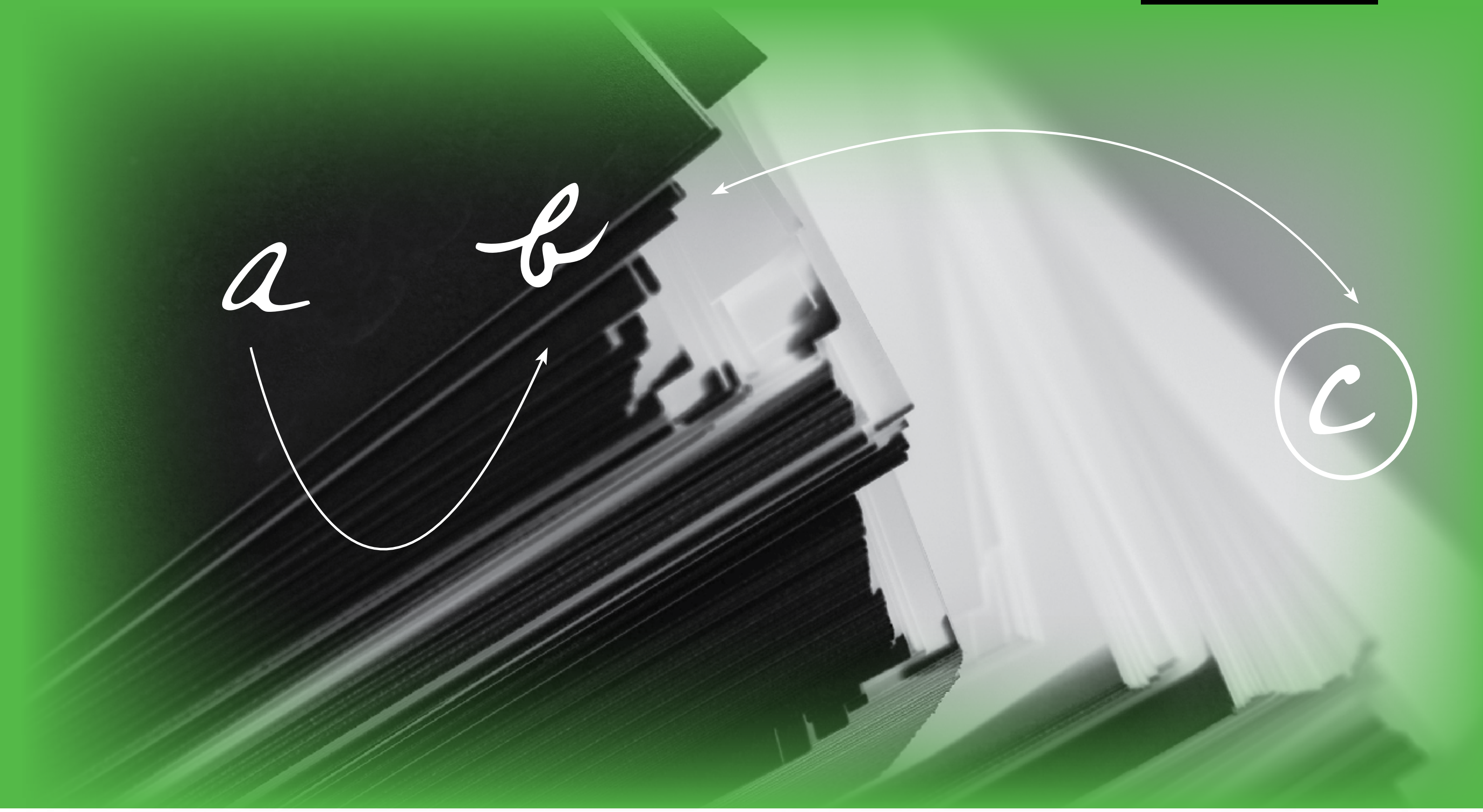
Designing Education Projects

SECOND EDITION



A MANUAL FOR NOAA MANAGERS

Needs Assessment, Project Planning
and Implementation, and Evaluation

Designing Education Projects

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Second Edition

National Oceanic and Atmospheric Administration
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Acknowledgments

This manual is intended to assist NOAA managers as they work with those who design and implement education projects.

Much of "Part II: Project Planning and Implementation" is based on the Project Design and Evaluation course offered by the NOAA Coastal Services Center.

Examples and case studies integral to this manual were developed with the help of education and outreach staff in the following NOAA line offices: National Weather Service (NWS), National Marine Fisheries Service (NMFS), National Ocean Service (NOS) and Oceanic and Atmospheric Research (OAR) as well as field staff from the National Sea Grant College Program (NSGCP), the National Estuarine Research Reserve System (NERRS), and the Office of National Marine Sanctuaries.

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Introduction

A considerable amount of time, effort, and other resources go into the development and implementation of education projects. Quite obviously, the goal is to create effective projects that can serve as models of excellence. Whether the project is an hour-long endangered species talk, a family festival, a severe weather awareness workshop, marine resources monitoring, or a community forum, the aim of providing quality educational experiences remains the same.

Who Should Use This Manual?

This manual has been developed for program managers who supervise those responsible for designing education projects. The manual walks through the basics of needs assessment, project planning and implementation, and evaluation. This information is intended to answer questions about the project development process and to be used as an overall project improvement tool. It is designed to help you understand the process more fully so that you can assist those who implement NOAA's education programs. In addition, it will alert you to strategic points in the project development process where monitoring key performance measures may be most appropriate. A more detailed version of this manual (*Designing Education Projects: A Comprehensive Approach to Needs Assessment, Project Planning and Implementation, and Evaluation*) has been prepared with education coordinators in mind.

A systematic approach to the overall project planning and implementation process is outlined. Program managers are encouraged to use this manual as a tool to help education coordinators make informed decisions that result in increased efficiency, effectiveness, and accountability. Specifically, using the process described in this manual will help you and your staff:

- **Match agency's needs and capability:** Knowing how the project "fits" within the agency's priorities will ensure strategic use of resources and help build internal support for the project. It is important to articulate why a project is important and why NOAA should support it.
- **Set realistic and meaningful goals, objectives, and outcomes:** From the development of a needs assessment to designing the final evaluation, this process will identify what needs to be done and how to know if it was accomplished. Objectives and outcomes that are measurable and worth measuring are set. In a time of increasing attention to accountability, educational impacts can be documented.
- **Use limited resources wisely:** By identifying measurable objectives based on well-thought-out and researched priorities, projects will be focused and resources will be used efficiently. Re-inventing the wheel can be avoided by taking stock of existing materials. Judiciously adapting or adopting materials saves both time and money.

- **Design effective and sustainable projects:** Projects that are designed with best practices in mind are more effective: continuous project improvement becomes integral to the process, evaluation is not left to the end, stakeholders' needs are consciously addressed throughout, and credibility is built. When decision-makers and others see results and meaningful partnerships established, projects are truly sustainable.
- **Enhance the learning process:** In the end, education projects are developed because of the learner. Projects are developed because we want participants to gain specific knowledge and skills. Education projects are developed to promote public safety and the development of environmental and scientific literacy. Careful attention to the design and implementation of an education project will be reflected in learner outcomes.

A Word of Caution

It should be noted at the outset that this manual outlines an ideal process for the design of high quality education projects. Developing appropriate budgets and schedules are, obviously, key to the ultimate success of the education project. Without proper attention to budget details, a project may never make it beyond the early stages of planning. Similarly, poor scheduling may mean that materials are not ready when needed or evaluation opportunities are missed. Although both budgeting and scheduling will impact the quality of the project, the focus of this manual is on the design of the education intervention and its evaluation.

Each project is different, however, varying in scope and duration. Materials developed for a one-shot event at an elementary school will be very different from those developed for a community group that meets on a regular basis. Projects vary in the amount of resources (human as well as monetary) available. It is unrealistic to expect all education coordinators to follow all of the recommended steps. The steps outlined here are meant as a guide. Use them as a template to inform your decision-making. Use them to help ensure that NOAA education coordinators under your supervision are developing effective education projects.

A Word about Programs and Projects

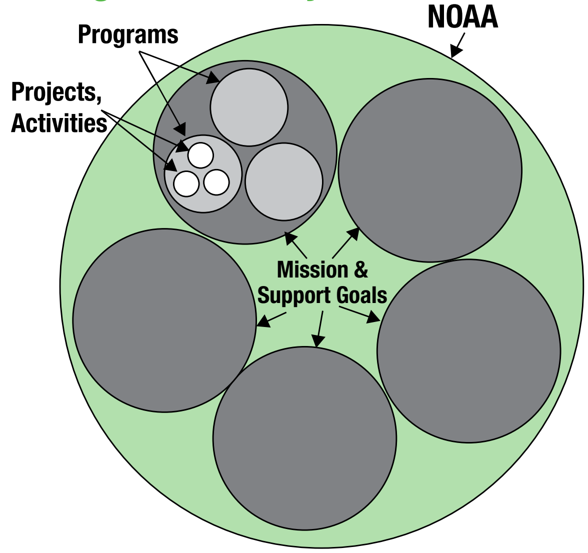
In everyday speech it would not be unusual to hear someone talk about the NOAA Education Program or for a presentation given to a group of fifth grade students at a local school to be described as a program. Similarly, it is not unusual to hear project and program used interchangeably. For purposes of clarity and consistency, "program" and "project" are used in this manual in very specific, distinct ways.

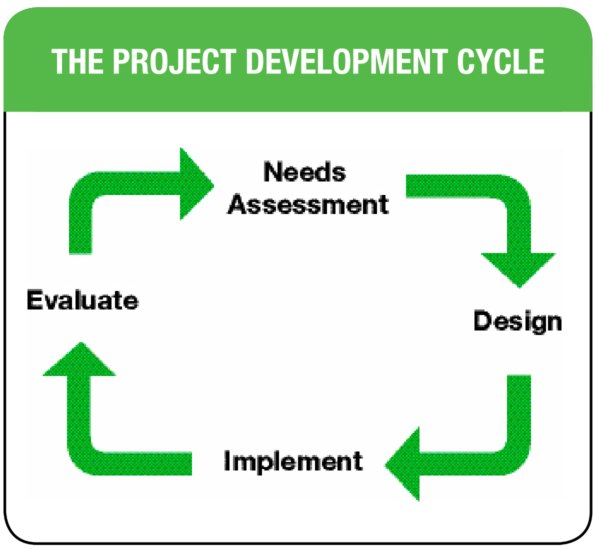
Programs derive directly from the agency's mission and represent a coordinated and systematic effort to address that mission. Programs support NOAA's Strategic Plan and goals. A set of **projects,** taken together, reinforce a program. In turn, a series of activities are devised to address project goals and objectives. Projects are focused on specific issues and audiences. The following graphic might help to illustrate the distinction.

Project Development as a Cycle

Project development requires a commitment to a systematic, iterative process of assessment, design, implementation, and evaluation. Whether the process is described using a flow chart or through text, it is important to remember that the process is not linear. Although each stage or phase of the project development and implementation process can be described (and will be in this manual), the stages are not discrete. These steps overlap and interrelate; they provide a dynamic and flexible guideline for developing effective projects efficiently. Project development is a cyclical process in which the results of one phase become the starting products for the next phase.

Programs vs. Projects





THE PROJECT DEVELOPMENT CYCLE

At each step in the process, the project team reflects on decisions and activities that have gone on before, and assesses successes and the need for course corrections. Underlying project planning and implementation is the premise that learning about how the project works takes place continuously throughout the process and that learning is fed back into the system.

It should be remembered that not all projects are alike. How the project development cycle plays out will depend on the politics surrounding the project, funding requirements, and the project's degree of complexity. For example, some projects will need review and approval at each stage, while others may only require limited oversight within the agency.

How is this Manual Organized?

For the convenience of the reader, the major sections of this manual will follow the project development cycle. It is divided into four major parts:

Part I. Needs Assessment

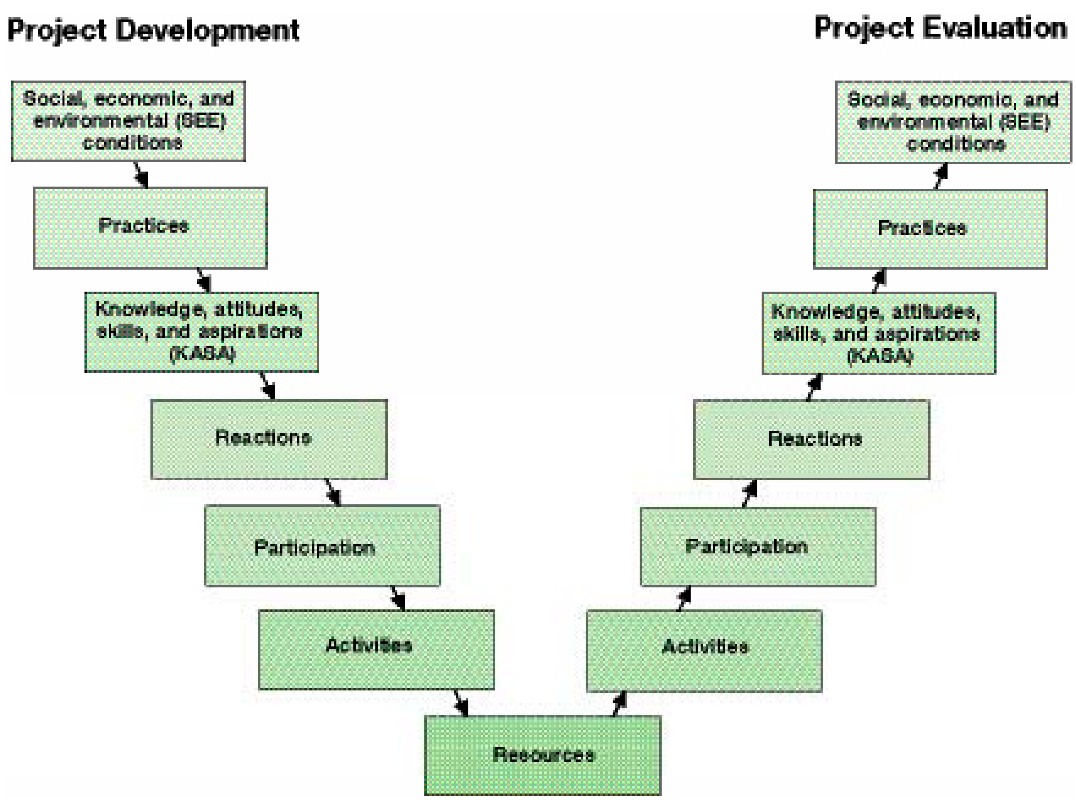
Part II. Project Planning and Implementation

Part III. Project Evaluation

Part IV. Data Collection Instruments

Parts I through III utilize a project development model created by Bennett and Rockwell (1995, 2004). *Targeting Outcomes of Programs* or the TOP model integrates evaluation within the project development process. When planning an education or outreach project, start at the upper left-hand side of the model by describing the social, economic, and environmental (SEE) conditions that need to be addressed. As education coordinators work their way down the programming staircase they identify the program design elements necessary to achieve the desired SEE conditions. At each level of project development, outcomes are identified and later used as benchmarks to help evaluate the extent to which they were achieved. Project implementation and outcome evaluation ascend TOP's programming staircase on the right-hand side of the model. Part IV describes a variety of common data collection instruments or tools followed by a series of appendices that provide a more extensive consideration of specific topics. A glossary of technical terms, especially those related to needs assessment and evaluation, and a list of references are included after the appendices.

TOP Model's Programming Staircase



Source: Bennett, C. and Rockwell, K. (2004). *Targeting Outcomes of Programs (TOP): A hierarchy for targeting outcomes and evaluating their achievement.* Retrieved January 2009, from University of Nebraska-Lincoln website: http://citnews.unl.edu/TOP/index.html

Throughout this manual, examples and case studies are provided. These examples are based on existing education projects run by or supported by NOAA. They offer a glimpse of how education coordinators handled a particular step in the design process. Hopefully, these examples, by being rooted in real world experiences, will help you see how the project development cycle can best be fitted to the work of education coordinators you supervise. As you read the examples and their accompanying text, please remember that this manual outlines a comprehensive project development process. Depending on the scope and scale of the education project, all of the steps may not be followed completely.

The following education and outreach projects are used to demonstrate different project planning, and evaluation concepts and approaches. Each project is in a different stage of development and has contributed either directly or indirectly to the content and examples provided throughout the manual. While not all of the examples followed the TOP Model, they provide insight into how NOAA education coordinators developed their projects.

- Alaska Fisheries Science Center (AFSC) Committee on Outreach, Education and Diversity (COED) Professional Development Project. National Marine Fisheries Service. Seattle, WA
- Aquatic Invasive Species Exhibit Development. Oregon Sea Grant College Program. Corvallis, OR
- Bay Watershed Education and Training (B-WET). NOAA Chesapeake Bay Office. Annapolis, MD
- Costal Training Program. Padilla Bay National Estuarine Research Reserve. Mt. Vernon, WA
- Florida Hazardous Weather Awareness Week. Florida Division of Emergency Management and National Weather Service. Melbourne, FL
- MERITO (Multicultural Education for Resource Issues Threatening Oceans). Monterey Bay National Marine Sanctuary. Monterey, CA
- Nab the Aquatic Invader! Be a Sea Grant Super Sleuth. Illinois/Indiana Sea Grant College Program. Urbana, IL
- Needs Assessment for Ocean Education in North Carolina. North Carolina Sea Grant College Program. Raleigh, NC
- Office Leadership Development Course. National Weather Service. Springfield, MO
- Science Spectrum Weather Center. National Weather Service. Lubbock, TX
- Southeast Alaska Cloudburst Chronicle. National Weather Service. Juneau, AK
- Turn Around Don't Drown!™. National Weather Service. San Angelo, TX
- Volunteer Weather Spotter, SKYWARN Training and Communication. National Weather Service. Lubbock, TX and Portland, OR

Part I.
Needs Assessment

1

Introduction

The design of an education project often begins with a phone call or a casual conversation. Some one suggests that a particular audience should be reached (e.g., school children, community leaders, families), a particular topic remains misunderstood, or a particular environmental issue needs to be addressed. The conversation soon ends with the suggestion that education may well be part of the answer, and that perhaps a project should be developed that would reach the target audience or cover the identified topic. But once the seed of an idea has been proposed, what should be done next? By conducting a needs assessment, education coordinators can focus their energies efficiently and develop an effective project.

ⓘ **The design of education projects should be rooted firmly in a documented need.**

What is a Needs Assessment?

On the surface, defining a needs assessment is quite simple – it is the effort to assess the need for a project or other activity.

ⓘ **A needs assessment is a systematic investigation of an audience to identify aspects of individual knowledge, skill, interest, attitude and/or abilities relevant to a particular issue, organization goal, or objective.**

It may be helpful to visualize needs assessment as a form of gap analysis. In this case a needs assessment can be seen as a systematic exploration of the divergence or discrepancy between the current situation or level of services ("what is") and the desired situation or level of services ("what should be"). In analyzing the "gap," project team members can begin to identify problems, opportunities, strengths, challenges, and possible new directions. Through a careful analysis of the existing "market," and an assessment of organizational strengths, a more strategic understanding of gaps and potential opportunities emerges, reducing the chance of duplicating the efforts of existing programs or becoming sidetracked.

A needs assessment should also include a process of self (agency) assessment of internal strengths and weaknesses relative to the agency's mission and the environmental issues it seeks to address. Importantly, a needs assessment provides decision-makers, such as yourself, with well-documented and considered evidence to support the project design process. An education needs assessment establishes the need for a particular project by systematically examining:

- audience interest and knowledge,
- agency mission and capability, and
- the significance of particular environmental conditions or issues.

A needs assessment does not merely justify a proposed project *after* critical decisions have been made, but helps to establish why a project may be needed, and provides critical data and information about the ultimate structure of a project. As might be expected, needs assessment takes place *prior* to undertaking the project. Needs assessment:

- Identifies and determines the scope of the social, economic, and environmental conditions or issues that need improving.
- Gathers information/data about the gap between the current and desired level of audience knowledge, attitudes, skills, aspirations (KASA), and behaviors.
- Helps confirm or negate assumptions of audience characteristics and appropriate content; defines goals and objectives; ensures goals and objectives are aligned with the agency's strategic plan and other planning documents; and identifies stakeholders[1] and potential collaborators.

"…some factors that are basic to a successful needs assessment:

- Keep in mind the value and necessity of broad-based participation by stakeholders.
- Choose an appropriate means of gathering information about critical issues and other data.
- Recognize core values in the group whose needs are being assessed.
- Needs assessment is a participatory process; it is not something that is "done to" people.
- Needs assessment cannot ignore political factors. Some people may view the process as causing a loss of control. The priorities derived may be counter to entrenched ideas in the system.
- Data-gathering methods by themselves are not needs assessments. The needs assessment is a total decision-making process, in which the data are but one component." (p. 17)

Source: Witkin, B.R. and Altschuld, J.W. (1995). *Planning and conducting needs assessments: A practical guide.* Thousand Oaks, CA: Sage Publications.

Why is Needs Assessment Important to Project Design and Implementation?

The initial idea spurring the development of an education project may have come from a variety of places. Casual conversations among co-workers, serendipitous opportunities such as the availability of grant funding, the publication of a scientific report or the long-term desire to enhance strategic partnerships may all spark the project development process. For example, sharing a facility with the Spectrum Science Museum in Lubbock, Texas presented the Weather Forecast Office (WFO) with an opportunity to showcase weather sciences. The WFO took advantage of the their shared space and worked with museum staff to design an interactive, weather-related exhibit, the Weather Center.

[1] The term "stakeholder" means anyone with an interest in the goals of the project. Stakeholders may be the participants in the education project or customers who use the product. They may be project sponsors, those individuals or agencies to whom NOAA is accountable through the project's outcomes. They also may be partners with similar goals who may or may not receive a direct benefit from the project.

In the enthusiasm and excitement of the moment, however, it must be remembered that not all projects are timely or appropriate. Conducting a needs assessment allows project managers to take a step back and systematically consider whether or not there is a gap in existing services or materials, and if so, the nature of that gap.

ⓘ **A needs assessment helps to determine if an education project is warranted.**

There are additional benefits of including needs assessment as an integral component of the project design and implementation process:

- **Serving the Audience:** Ultimately, the people who participate in education projects benefit from needs assessments. Education services are more targeted and delivery systems are designed better to reach their intended audiences when founded on data, rather than hunches. Because needs assessments systematically gather data, previously unexpressed needs can be uncovered and, consequently, the audience can be better served.
- **Setting Priorities:** For any one problem or issue, the "need" is rarely one-dimensional. A needs assessment helps project planners to systematically describe the audience(s) impacted by the issue and their relationships to the issues as well as the underlying causes. With this level of information, administrators and project planners make informed decisions about which possible solution or combination of solutions can best address the need. Faced with a long wish list, the needs assessment provides the data to develop criteria necessary for priority setting.
- **Re-inventing the Wheel:** Any time a new project is initiated there is some danger that it duplicates efforts already taking place elsewhere within the agency or the wider community. A needs assessment will determine if materials or projects developed elsewhere can be adapted or adopted to the new situation. Considerable time, effort, and resources can be saved by taking stock of what already exists and not falling to the temptation of creating something "new" for its own sake.
- **Resource Allocation:** No matter what the problem or issue, project planners must confront the budget process sooner or later. Administrators will want documentation to substantiate decisions about which proposed projects should be fully funded, postponed, or rejected. By documenting the need for a project and providing data-based evidence of how the project will address the need, project managers can make a reasoned case and assist administrators in allocating resources appropriately.
- **Coalition Building:** Well-designed needs assessments are highly participatory. Not only are agency staff members involved in setting project priorities, but a wide variety of stakeholders are identified and involved at each step in the process. Participation can demystify a project and help ensure greater buy-in from agency personnel, partners, and potential audiences. If true coalitions are to be built, stakeholder participation cannot be approached as a public relations ploy. The needs assessment must be open and welcoming of ideas and not designed to validate a pre-determined course of actions.
- **Strategic Planning:** In defining the gap between what is and what is desired, a needs assessment can be a powerful strategic planning tool. First and foremost, a needs assessment focuses project planners' attention on the end goal. By mapping out the

Spotlight on MERITO
Multicultural Education for Resource Issues Threatening Oceans

MERITO's mission is to help advance ocean literacy among culturally diverse residents and promote a culturally inclusive ocean stewardship ethic by engaging diverse communities to protect coastal and marine ecosystems.

In response to the growing social, economic, and environmental (SEE) issues threatening the oceans off the coast of central California, the Monterey Bay National Marine Sanctuary (MBNMS) undertook a needs assessment to determine how they could more effectively conduct community-based education and outreach. Assessing the current situation was the first step in the process. A literature review of the demographics of California's central coast called attention to the culturally diverse Hispanic communities that surround the Sanctuary. According to the US Census Bureau, over 47% of Monterey County's population is Hispanic. In addition, this region of central California is considered a nationally significant agricultural center, growing more produce than any other region in the United States. Studies show that Hispanics in this area earn significantly less and achieve lower educational levels than other ethnic groups making this population less likely to acquire the desired understanding of environmental issues threatening local marine resources. For MBNMS, the desired situation was to increase public understanding of specific ocean-related issues within sanctuaries and promote community participation to address these issues.

It was evident that the Sanctuary needed to develop projects that targeted their Hispanic constituents. MBNMS staff conducted interviews with thirty community leaders representing local school districts, universities, non-profit organizations, government agencies, and the farming community. These stakeholders provided valuable information resulting in a list of critical needs and guidelines for a multicultural education program. With attention to the agency mission and capabilities, the needs were prioritized and grouped into themes, which guided the MERITO program design and strategic plan. The resulting program focuses on four core components: 1) Community-based ocean outreach; 2) Site-based ocean outreach; 3) Professional development and internship program; and 4) Bilingual outreach products and media. Within each component, a series of projects are conducted which address the goals of the MERITO program.

Source: Monterey Bay National Marine Sanctuary (2001). *Multicultural Education Plan: Hispanic Component "M.E.R.I.T.O." Multicultural Education for Resource Issues Threatening Oceans.* Monterey, CA: NOAA, Dept. of Commerce. For more information on MERITO visit the Monterey Bay National Marine Sanctuary website at http://montereybay.noaa.gov/educate/merito/welcome.html

current situation systematically, planners have the data to make decisions about realistic and meaningful goals. Additionally, a project needs assessment can serve as an important supporting document to the Program Baseline Assessment in NOAA's Planning, Programming, Budgeting and Execution System (PPBES).

Planning a Needs Assessment

As mentioned earlier, a needs assessment can be seen as a systematic exploration of the divergence or discrepancy between the current situation or level of services ("what is") and the desired situation or level of services ("what should be"). In analyzing this gap, project team members begin to identify problems, opportunities, strengths, challenges, and priorities. The needs assessment process can be time consuming and, as with most processes that involve multiple stakeholders and multifaceted issues, it can be complex. The following is an outline of 13 steps involved in conducting a needs assessment. The outline is intended to break down a complex process into manageable steps. Please recognize, however, that in providing an overview of the process, nuances and detail are necessarily omitted. Similarly, recognize that determining how much of the process should be followed depends on the project. The time and effort involved in conducting a needs assessment must be balanced against the time and resources available to be invested in the project as a whole. A project that involves developing a 30-minute weather awareness activity for local kindergarten classes suggests a very different needs assessment process than a project that involves developing a comprehensive weather awareness curriculum for pre K–12 students throughout the state. The steps outlined below should be adapted to meet the specific needs and resources of the project. Look at the examples provided throughout this section as an indication of how others have used needs assessments in situations similar to yours.

Steps for Planning a Needs Assessment

PLANNING
Step 1. Set the focus, refine the issue(s) and identify the stakeholder(s)
Step 2. Establish the planning team
Step 3. Draft a plan for carrying out the needs assessment
Step 4. Use the TOP model to direct data collection efforts
Step 5. Gauge the likelihood of project success through opportunity assessment
Step 6. Define participants in the needs assessment
Step 7. Design data collection strategies
DATA COLLECTION
Step 8. Determine sampling scheme
Step 9. Design and pilot data collection instrument(s)
Step 10. Gather and record data
DATA ANALYSIS, DATA REPORTING, AND PRIORITY SETTING
Step 11. Perform data analysis
Step 12. Determine priorities and identify potential solutions
Step 13. Synthesize information and create a report

Planning

Step 1. Set the focus, refine the issue(s) and identify the stakeholder(s)

It is probably safe to assume that the desire to conduct a needs assessment did not fall out of the sky. Specific areas of interest may have been selected based on expectations and needs delineated in the agency's strategic or management plan. Research conducted by NOAA scientists may prompt targeting a specific issue as an education priority. Comments and other anecdotal evidence collected over time from facility users and program participants may have steered project planning in a particular direction.

Where do ideas for education programs come from?

Although it would be great if all programs grew out of a true needs assessment, most education and outreach programs start with someone having an idea. In these cases, the needs assessments look at gaps the idea could fill or ways the idea could be adapted to fit a particular audience. So who comes up with these ideas?

Most ideas for educational programs come from the people most closely involved in a particular area – it's "my passion," or "my field," or "my experience" that determines the topic. Sometimes the idea for a program comes down from 'above' and is a passion or pet project of someone higher up in the organization. A third source of ideas is from a friend, a stakeholder, or a member of the public at large.

Often these ideas work very well. For example, one National Weather Service (NWS) Weather Coordination Meteorologist (WCM) based his project on what he knows best, disaster preparedness. This WCM recognized the need for improved education about flood and flash flood safety for people who are driving or walking into flood waters. His experience led to Turn Around Don't Drown!™, a successful education campaign that continues to garner support and funding from many partners and stakeholders. In another situation, the Sea Grant project coordinators for Nab the Aquatic Invader! Be a Sea Grant Super Sleuth recognized the need for teachers and students in the Great Lakes region to get involved with invasive species issues. Because the topic is considered a National Priority Area of Sea Grant the project coordinators were able to combine their understanding of teacher needs in science and technology along with their backgrounds in education and communications to develop an award winning interactive, science-based education website.

Both of these cases worked well because the topics of the programs were closely tied to the mission of the agency. However, many programs fail to ensure a close and ongoing tie between the outcomes of the educational effort and the purposes of the agency. Sometimes the individual charged with developing or implementing an educational program thinks of direct delivery to school groups as the only approach. In many cases, the agency or division may not have an education mission, or its education mandate could be to reach the larger public and not a particular school grade. Such a mismatch can lead to "mission creep" and an inability to explain why a program is worthy of ongoing internal support, even if there is evidence that the program is good. When budgets are tight, mission-focused educational programs are even more important. An idea based on an individual's passion can be great, but the outcomes of the program must also closely relate to the outcomes of the agency and division's missions, or the program will be hard to defend.

Sometimes, general trends, environmental phenomena, or public policy priorities such as climate change or the implementation of the No Child Left Behind Act, may suggest that an educational need exists.

In this first step, those who are initiating the needs assessment should:

- Specify the scope of the social, economic, or environmental (SEE) issues that need to be addressed ("What is").
- Identify the desired SEE conditions ("What should be").
- Ensure that the selected issue(s) flow directly from the agency mission and program priorities.
- Establish the purpose and direction of the needs assessment.

Why bother with stakeholders?

"We would never have known about…" is a common response when education coordinators are asked what they learned from their stakeholders during planning. Regardless of how well educators think they know their audience, listening to stakeholders is an important task during the planning and needs assessment stage.

In one program, the overlooked stakeholder was the office director. That program ran into real problems when the office director revealed concerns over the focus of the program. In another example, the educator forgot to ask the teachers who the program had planned to train, how or if the topic might fit into the science standards of that grade level. Needless to say, teachers weren't as excited about the program as the planner thought they'd be!

Stakeholder involvement in planning can vary greatly. In some cases, a whole group of stakeholder representatives might be brought together to talk with the program planners. For example, the Coastal Training Program (CTP) Coordinator for the Padilla Bay National Estuarine Research Reserve (NERR) in Washington's Puget Sound brought together a technical advisory group consisting of stakeholders representing the Padilla Bay Reserve, Washington State's Department of Ecology, Puget Sound Action Team, Washington Sea Grant, and local planning departments. The CTP Coordinator views her advisory group as a "think tank" that works together to identify, design, and distribute programs to local environmental planning and permitting professionals. In most situations, however, individual stakeholders are called on the phone or spoken to in casual conversation about the pending program in order to get their informal feedback. Given the limited amount of time and staff needed to conduct a needs assessment, some project coordinators use this method to gauge interest and solicit feedback from stakeholders about potential projects.

And what are stakeholders asked? Some are asked questions as simple as, "What do you think about this idea?" For major projects, however, stakeholder input is much more vital and therefore more formalized. The bottom line is, as one educator put it, "We'd have made a lot more mistakes if we hadn't talked with the people who have a reason to care about the program."

- Define the scope of the needs assessment by reviewing agency documents, reports from previous projects, census statistics, and research results.
- Identify key stakeholders.
- Set up an overall plan for the needs assessment (e.g., timeline, budget).
- Secure permission to conduct the needs assessment.

Step 2. Establish the planning team

A basic principle behind conducting a needs assessment is recognizing that no matter how knowledgeable and skilled, an education coordinator does not and cannot walk into the project with a complete and accurate picture of the situation. Other agency staff members, community members, volunteers, partners – all stakeholders in the process – possess critical understandings that will help focus the needs assessment. Importantly, some of these stakeholders may also help to build credibility inside and outside the agency and assist the team in gaining access to target audiences. In this step:

- Form a broad, yet manageable, planning team.
- Establish expectations and responsibilities early on for planning team members.
- Recognize that planning team members each represent specific stakeholder groups and therefore, bring a different set of assumptions and priorities to the table.
- Establish a common purpose for the needs assessment to develop ownership in the process.

Step 3. Draft a plan for carrying out the needs assessment

As with any other project, the planning of a needs assessment can easily spin out of control. The desire to be all inclusive, both in terms of issues and audiences, can become overwhelming. Some suggested steps to follow are:

- Develop a plan for how the needs assessment will be carried out.
- Determine the scope of the needs assessment (type, breadth, and depth of information to be gathered).
- Specify what data are to be collected during the needs assessment.
- Identify who should participate in the needs assessment.
- Establish a time line for data collection and a budget for carrying out the needs assessment.

Step 4. Use the TOP model to direct data collection efforts

With the scope of the needs assessment established, the planning committee turns its attention to the TOP model. Data collection for a needs assessment occurs at the upper three levels of the TOP program development staircase. Compare the:

- Desired or envisioned social, economic, and environmental (SEE) conditions with current or baseline conditions to establish the problem or issue.
- Baseline practices or behaviors that gave rise to the SEE conditions with desired practices or behaviors.
- Baseline knowledge, attitudes, skills, and aspirations (KASA) that inform people's behaviors to the desired KASA levels.

The discrepancy or gap between the desired and baseline conditions is where project ideas stem from.

Once the project idea is established it is time to start collecting data.

- Baseline data should be gathered from existing sources, such as previous Program Baseline Assessments, literature review, project documents, and performance measures.
- If viable, valid, and reliable data already exist for an aspect of the needs assessment, it may not make sense to spend valuable resources to collect new data.
- If existing data sources are not available, the project will be best served by collecting data from a range of stakeholders.

Using TOP to collect data for a needs assessment

Project development

Social, economic, & environmental conditions

How do current social, economic, and environmental conditions compare to the desired conditions?

Practices & behaviors

What practices or behaviors must be adopted to have an affect on the desired SEE conditions? How do the desired practices compare with current practices?

Knowledge, attitudes, skills, & aspirations

What KASA levels are needed to change practices? How do desired KASA levels compare with current KASA levels?

Source: Bennett, C. and Rockwell, K. (2004). *Targeting Outcomes of Programs (TOP): A hierarchy for targeting outcomes and evaluating their achievement.* Retrieved January 2009, from University of Nebraska-Lincoln website: http://citnews.unl.edu/TOP/index.html

Step 5. Gauge the likelihood of project success through opportunity assessment

While the needs assessment helps identify and determine the scope of specific conditions or issues, opportunity assessment gauges the probability that an agency can ameliorate the issues identified at the SEE, practices, and KASA levels. Opportunity assessment:

- Occurs at the lower four levels of TOP's project development staircase:
    - reactions,
    - participation,
    - activities, and
    - resources.
- Enables an agency or organization to assess the likelihood of project success.
- Entails estimating the:
    - reactions required from the target audience,
    - scope of participation needed in various activities, and
    - resources required to achieve desired outcomes at the KASA, practice, and SEE levels.

Using TOP to assess project alternatives and agency capabilities

Project development

Reactions — How is the intended audience likely to react to program activities? What kind of promotional strategies are needed to attract the target audience?

Participation — Who are the intended program participants? What is their current involvement with the issue compared to the desired involvement?

Activities — What activities are currently available to the audience? How do these activities compare with what is needed? What delivery methods are currently used to convey content? What methods are desirable?

Resources — What resources (time, staff, expertise, money) are needed to support the activities? What resources are currently available?

Source: Bennett, C. and Rockwell, K. (2004). *Targeting Outcomes of Programs (TOP): A hierarchy for targeting outcomes and evaluating their achievement.* Retrieved January 2009, from University of Nebraska-Lincoln website: http://citnews.unl.edu/TOP/index.html

This is also a good time to inventory existing education programs and resources that relate to the topic or issue under consideration. Other agencies or organizations may have already developed an education project that can be adopted or adapted.

Step 6. Define participants in the needs assessment

In Step #2, key stakeholders inside and outside the agency were identified. Now that a plan for the needs assessment has been developed, it is time to revisit and refine the list of stakeholders and potential participant groups. Depending on the purpose of the needs assessment, the list of key stakeholders may need to be expanded or reduced substantially. Decisions must be made about whom should be targeted for participation in the needs assessment – what type of data needs to be collected and from whom.

It is reasonable to assume that data will be collected from groups whose characteristics are well known by the planning team. It is also reasonable to assume that data will be collected from groups of individuals whose make-up may be less familiar to the project planning team. Learning about each of the stakeholder groups is essential to the success of future steps in the needs assessment process. Some ways to do this are:

- Determine the best methods for reaching needs assessment participants (e.g., phone, mail, on-line survey, during community meetings).
- Estimate the size of each target group. (This information will be essential for determining the sample size later.)
- Determine whether data collection methods must be adapted to meet the needs of a particular group (e.g., literacy rates, language).

The more that is known about the characteristics of each participant group, the greater the chance that data collection will run smoothly and wasted efforts will be minimized.

Step 7. Design data collection strategies

By this point in the process, the planning team has identified the proposed participants in the needs assessment and why each group has been selected. Reflecting back on the purpose of the needs assessment, key questions should be developed for each participant group that delineates the information to be gathered at each level of the TOP programming staircase. From here the best data collection methods are identified. This process matches participant groups with key questions and appropriate instruments (see Part IV), while keeping budget, personnel, and time constraints in mind.

The planning team must:

- Determine the best data collection method given the specific situation.
- Assess whether approvals are needed or desired, e.g., because of Paperwork Reduction Act regulations.
- Realize that collecting data often makes the project public thus requiring additional commitments of funds and other resources.

Data Collection

Step 8. Determine sampling scheme

Although it might be possible (and desirable) to collect data from all members of the target population, in all probability it will not be realistic to do so. Unless a participant group is small and well-defined, collecting information from the entire group is typically not practical. Therefore, it is usually necessary to develop a process for identifying which members of the audience will be sampled. In determining the sampling scheme, be sure to:

- Carefully design the data collection process to limit bias.
- Use random sampling procedures to draw a sample that accurately reflects or is representative of the population as a whole.
- Reduce sampling errors by setting an appropriate sample size.

ⓘ **A sample is considered representative of the population if every person in the population has an equal chance of being selected.**

Step 9. Design and pilot data collection instrument(s)

Using the key questions developed in Steps 4 and 5 as a guide, the data collection instruments are designed. Whether individuals will be asked to participate in a focus group or to complete a survey, decisions need to be made about what questions should be asked and how best to ask those questions. Similarly, if the decision has been made to observe a set of behaviors (such as how visitors interact with a hands-on exhibit), the specific behaviors of interest must be delineated. In this step:

- Articulate the data collection protocol.
- Design and pilot test the data collection instrument(s).
- Determine the validity and reliability of data collection instruments (see Part IV, Validity and Reliability of Evaluation Instruments).

Step 10. Gather and record data

Orchestrating the data gathering process requires substantial planning and day-to-day management. Tasks include:

- Develop a master calendar that plots each point in the process.
- Print needed materials (e.g., interview schedules, surveys, return envelopes).
- Schedule focus group meetings and interviews.
- Determine who will collect the data.
- If needed, provide training to those who will collect the data.
- Arrange to have data entered into the appropriate format for analysis.
- Ensure that the rights of study participants will be guaranteed and confidentiality preserved.

Data Analysis, Data Reporting, and Priority Setting

Step 11. Perform data analysis

The type of data analysis will depend on both the instruments used and the study questions being answered. Some portion of the data analysis may involve a simple tallying of responses – numbers or percentages of those indicating yes or no. In most cases, however, far more sophisticated statistical analyses that examine the relationships or patterns among responses may be appropriate. For qualitative data, collected most often through interviews and focus groups, categories and recurring themes will need to be extracted from recordings or transcripts.

Step 12. Determine priorities and identify potential solutions

Once the data analysis is completed, the planning team is finally in the position to articulate the results in terms of needs. Now they can systematically describe the discrepancy between what is and what should be. In all probability, a large number of needs will be identified in this process. The team must:

- Sort through and list the identified needs.

Designing Needs-Based Action Plans

After sorting through priorities and determining potential solutions or strategies, the planning team will have considered numerous alternatives. Now, carefully take a second look at potential solution strategies.

Revisit the most likely solution strategy and compare it to its strongest competitors. Ask the following key questions:

- What features of the preferred solution strategy are its strongest assets?
- What are some of its less strong and even weak features?
- Were some of the competing strategies stronger in these areas?
- Would it be possible to combine features of solution strategies without compromising the integrity of the top solution?
- What is the scope of the solution in terms of location within the organization (i.e., will it reside in one unit or subsystem, or will it cut across many units)?
- How much time will the solution require – that is, from a relatively short time frame to develop and implement (less than 6 months) to intermediate and long-range time frames (2-5 years or even longer)?
- What is the scope of the solution in terms of focus – from narrow and fairly easy to implement to broad and complex to implement?
- Is it possible to divide a large solution strategy into smaller increments for implementation?

Source: Altschuld, J.W. and Witkin, B.R. (2000). *From needs assessment to action: Transforming needs into solution strategies.* Thousand Oaks, CA: Sage Publishing, Inc. p. 175.

- Establish decision making criteria (e.g., importance vs feasibility).
- Prioritize identified needs.
- Determine if an education project is the appropriate intervention.

Step 13. Synthesize information and create a report

By this stage in the process, the planning team has designed and implemented a significant endeavor. Coalitions are being built, stakeholders have been brought into the planning process, data has been collected, priorities have been set, and strategies proposed. It might be tempting to truncate this step and jump directly to project design, but the importance of creating a record of the needs assessment and its results is essential. Therefore, write the report because:

- A report is needed before the onset of the design phase of the project.
- Documenting the needs assessment process and results is needed by those who will implement the project.
- The results of the needs assessment provide a valuable foundation for future project planning efforts.

Should a Consultant be Hired?

Much of the expertise needed to conduct a needs assessment will be found within the planning team. If the team has been carefully crafted, members represent many of the stakeholder groups and can provide valuable information and insight. However, if the team does not include someone with significant educational research and evaluation experience, it may be necessary to hire a consultant. Determining a sampling scheme, designing data collection instruments, and analyzing the data all require specific knowledge and skills that cannot be substituted. Additionally, an argument can be made that an external consultant provides distance and objectivity that may not be possible for members of the planning team with vested interests in the project. The situation should be assessed to determine if a consultant should be hired to maintain credibility. The box below provides guidance on working with consultants.

Hiring a Consultant

As with most projects, deciding to hire a consultant is only the first step. The following should help guide the team as they work through the process:

- Define the scope of work. Be as specific as possible. Determine what is to be accomplished and what aspects of the needs assessment can be conducted by the project team.
- Determine the budget.
- Identify consultants with experience conducting needs assessments and evaluations.
- Interview at least two consultants who seem most qualified. During the interview try to assess:
  - **Relevance** of previous evaluation experience to the specific needs of the project. Has the consultant worked on similar projects?
  - **Workload –** how likely is the consultant to be able to meet timelines? Will there be other members of the consulting team? If so, how will they divide the work?
  - **Work style –** Will the consultant work with the project team as a partner, while maintaining objectivity? Will the consultant customize the needs assessment strategy to the project or merely adapt an existing one? Is the consultant willing to share his/her expertise with the project team so that the team learns from the experience?
- Request a written proposal that details process, timeline, responsibilities, and budget.
- Ask the consultant for a recent client list. Select names from this list rather than asking the consultant to supply two or three names of references. Use references to try to gauge the consultant's ability to meet deadlines and to adapt to unforeseen circumstances.
- Select a consultant based on qualifications and "match."
- Develop a written agreement. Spell out, in writing, expectations, deliverables, timeline, and budget. Make sure that the contract meets any applicable regulations or policies.
- Be open and willing to change. To design and implement a useful needs assessment or evaluation, the consultant must understand fully the situation and any problems that the project team is facing.

Part I Wrap-Up

A needs assessment helps education coordinators understand more fully the gap between what is and what should be. By conducting a needs assessment before the project is designed, assumptions integral to the development of the project (e.g., audience characteristics, current level of knowledge) can be confirmed or negated, avoiding costly missteps. The data gathered during a needs assessment can also help project designers define goals and objectives, and identify stakeholders and potential collaborators. This information will be essential as the project team turns to the next phase of the planning process: project design and implementation.

Part II.
Project Planning and Implementation

2

Introduction

Once the need for a project is understood and authorization to proceed is secured, the planning team faces the task of designing a specific education project that addresses that need. Project planning requires an attention to what might at times seem like minuscule detail, while always keeping the big picture in mind. In the end, effort spent in planning an education project well will pay off in its ultimate effectiveness. This portion of the manual has been developed to help managers anticipate some of the detail and define the project's desired outcomes – ultimately, what we hope participants will learn.

Planning and Implementing an Education Project

Just as conducting a successful needs assessment depended on taking a systematic approach, project design benefits from careful attention to the planning process. The time involved in planning an education project usually depends on the project's complexity and the number of stakeholders involved.

The following 12 steps of planning and implementing an education project break down a complex process into manageable steps. As with each of the major sections in this document, please recognize that much of the detail has been left out. The 12 steps simply provide a generalized overview. For instance, the need to establish a budget and a schedule are only briefly mentioned; certainly each requires considerable effort to develop. At each step, determining how extensive a process should be undertaken depends on the nature of the project. Obviously, a project that involves the development of materials for others to use will be very different from one that involves training individuals to make presentations to civic groups or teach school children.

The steps outlined below should be adapted to meet the specific needs and resources of the project. As mentioned previously, the examples in this section can provide an indication of how others have planned education projects in similar situations.

The Project Planning and Implementation Process

Step 1. (Re)assess need and capability
Step 2. Establish the project planning team
Step 3. Develop project goals and objectives
Step 4. Develop a logic model
Step 5. Select and characterize the audience
Step 6. Establish program format and delivery system
Step 7. Ensure quality instructional staff
Step 8. Ensure quality instructional materials and strategies
Step 9. Assemble materials, resources, and facilities
Step 10. Plan for emergencies
Step 11. Promote, market, and disseminate project
Step 12. Implement project

Step 1. (Re)assess agency need and capability

During the needs assessment phase the project team used the Targeting Outcomes of Programs (TOP) model to prioritize needs and assess opportunities. The needs assessment highlighted the gap between the current and desired social, economic, and environmental (SEE) condition as well as the practices that gave rise to the condition and the knowledge, attitudes, skills, and aspirations (KASA) that inform practice. With the needs assessment recommendations in hand, project managers should revisit the issue to determine if the proposed project is consistent with NOAA's mission and priorities.

Now that the project need and potential strategies have been articulated further, this is an appropriate time to:

- Ensure that the proposed project is consistent with NOAA's mission and priorities.
- Inventory existing projects both inside and outside NOAA to determine areas of potential duplication.
- Assess existing resources (human, financial, physical, and material resources) available to NOAA to ensure that sufficient support for the project exists.

Spotlight on Hazardous Weather Awareness Week (HWAW)

Each year, Florida's HWAW strives to promote hazardous weather preparedness across the state. The HWAW program encourages youth and adults to develop an emergency plan, restock emergency supplies, purchase a NOAA Alert Radio, and to act safely when threatening weather approaches their community. Below is an abbreviated list of the targets education coordinators plan for during HAWA.

Long-term outcome (SEE conditions) Intermediate outcomes (practice) Short-term outcomes (KASA) Reactions	Outcomes	• Improve quality of hazardous weather preparedness and responses • Increase number of families equipped to handle hazardous weather events • Increase knowledge of safety rules in severe weather • Teachers incorporate HWAW activities into their curricula
Participation Activities	Outputs	• Maintain and update HWAW website • Distribute weather guides to elementary teachers • Organize and promote middle school HWAW poster contest • Organize and promote high school HWAW essay contest
Resources	Inputs	• Funding • Staff time • Partners • Materials

Long-Term Outcomes: Describe the intended ultimate impacts of the project on the issue. These might be social, economic, or environmental conditions. These consequences are expected to occur after a certain number of behavioral changes have been made.

Intermediate Outcomes: Describe expected impacts on the audience's behavior because of the project. What behavioral changes are individuals expected to make because of the project? These outcomes tend to occur after there has been an earlier change of knowledge, attitudes, skills, or aspirations.

Short-Term Outcomes: Describe the expected immediate impacts of the project (e.g., audience reactions and changes in knowledge, attitudes, skills, or aspirations immediately following participation in the project).

Outputs: Describe the activities, events, products, and services that reach people targeted by the project.

Inputs: List the time, money, human resources, office space, utilities, equipment, supplies, management and partner support, etc. needed to accomplish the project.

Source: Florida Division of Emergency Management (2009). *Hazardous Weather: A Florida Guide.* Retrieved January 2009, from Florida Division of Emergency Management website: http://www.floridadisaster.org/KIDS/index2.htm

Step 2. Establish the project planning team

In all likelihood, a number of potential partnerships and collaborative arrangements were identified and built during the needs assessment phase. Stakeholders from both inside and outside of NOAA were identified. Establishing a broad-based project planning team is one way of tapping expertise and continuing the process of developing partnerships and collaborations. In this step:

- Evaluate how well the needs assessment planning team functioned and consider asking some or all of its members to participate in the project planning process.
- Consider adding individuals to the planning team with an understanding of the NOAA science related to the specific issue as well as those with experience designing instructional activities.
- Delineate and communicate roles and expectations.
- Establish an evaluation planning team (see Part III, Step 2).

Step 3. Develop project goals and objectives[2]

As with any activity, it is important to know where the project is are going. While the needs assessment provided a purpose and direction for the project, planning helps fill in the details for how the goals and objectives are going to be accomplished.

It is now time to revisit the project goals and objectives or targets identified at each level of the TOP programming staircase as these will steer much of the team's future work. At the SEE level, **goals** provide the "big picture" of what is to be accomplished by undertaking this project. Although project goals are typically not measurable, they describe the desired impact of the project in broad terms. The reason a goal is difficult or impossible to measure is because it is often not specific in its end point. For example, the goal of the Padilla Bay National Estuarine Research Reserve's Coastal Training Program (CTP) is to help coastal managers gain a better understanding of environmental issues and regulations. The CTP accomplishes this through a series of hands-on, science-based trainings for professionals who make decisions about coastal management in Washington State.

Objectives, on the other hand, provide specific end points or measurable outcomes and should be developed for each level of the TOP programming staircase. One objective for the CTP training course "How to determine the ordinary high water mark?" is for shoreline planners, responsible for implementing the Washington State Shoreline Management Act (SMA), to follow the proper protocol used in determining the Ordinary High Water Mark (OHWM) when approving shoreline development permits. Consequently, well-articulated goals and objectives are both essential at this stage in the planning process. Tasks in this step include:

[2] Note that objectives and outcomes are both statements of the impacts of the project on the audience and, in the longer term, on the issue. Objectives are statements of the intended impacts before the project is initiated (in planning the project). Outcomes are these same impacts during or after the project is complete.

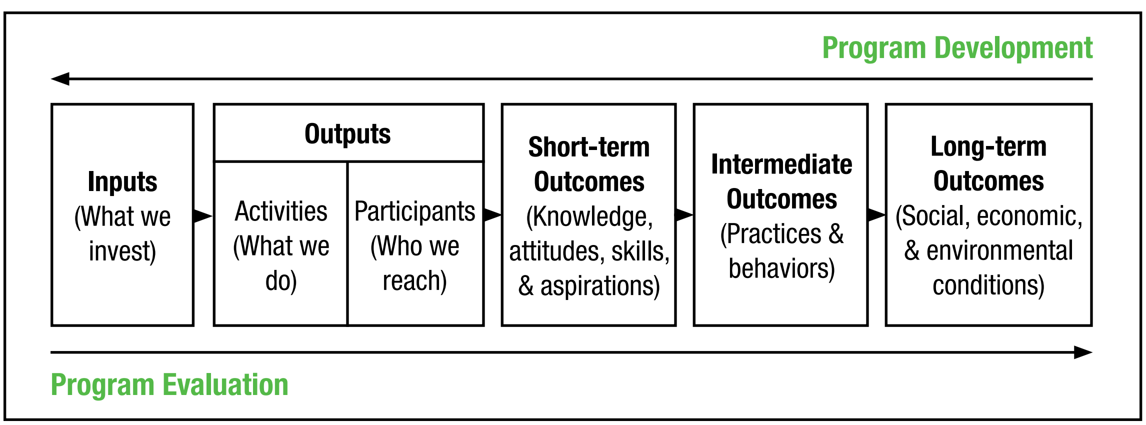
- Articulate project goals that align with NOAA's mission.
- Write SMART objectives that specify what the audience will be able to do, or what the specific change will be to the resource/issue after the project.
- Develop a clear conception of how NOAA science will be used and promoted throughout the project.

Step 4. Develop a logic model

Once the goals and objectives have been agreed upon, it is time to draft the rest of the project. At this stage, developing a project's logic model is particularly helpful. Whereas the TOP model provided the framework by which objectives or targets were specified, a logic model will convey the detail needed to carry out the program. The logic model can also serve as a guide for evaluation (see Appendix B for an example). A logic model is a schematic of how the project will work, linking project outcomes (short-term, intermediate, and long-term) with project outputs, and inputs (resources).[3] Logic models:

- Provide a road map, showing how the project is expected to work, the logical order of activities, and how the desired outcomes will be achieved.
- Force a "backward" design of the project by determining the ultimate or desired long-, intermediate-, and short-term outcomes (based on the project goals and objectives).
- Begin to identify appropriate project activities, resource needs, and a time line.

Project Logic Model



[3] Inputs and outputs in a logic model are referred to as "capacities" in NOAA's Planning, Programming, Budgeting and Execution System. Input capacities may be funding, personnel, or other resources needed to do the project. Output capacities could be numbers of workshops held, number of target audience members in attendance, numbers of teacher resource kits produced, etc.

How logical is a program?

Educational programs in many agencies have traditionally been designed based on the intuition and experience of the agency educator in charge. This does not mean the programs are guaranteed to either succeed or fail. It is interesting, however, to ask various educators about the steps they went through to design their program. In talking through how they developed the program, they often realize that there were gaps in their thinking.

One purpose of program logic is to ensure that no important steps are skipped when planning a program. Some agencies have used logic modeling for many years and are proficient in their use – although, as one educator said, "we should be proficient, but we often use [logic models] to rationalize rather than plan a program." Other agencies and organizations are just beginning to think through how program outcomes are tied to program inputs and resources.

One educator who uses logic models describes the process as "taking a look at the components of your program [resources, activities, audiences, outcomes] and seeing how it's organized." Another said that doing a logic model creates "a visualization of the process. It's something tangible that you can see." One agency-based educator observed that logic models were good for "accountability—you have something tangible to take to supervisors, funders, taxpayers, etc" to show exactly how and why a program will work.

Perhaps program logic can be best understood, in the words of one educator, as "the process of thinking through everything. It breaks the mold, stimulates new ideas, and helps clarify and crystallize thinking."

Step 5. Select and characterize the audience

Each audience is distinct. Not only do audiences vary in terms of background and cultural characteristics, personal experiences, and prior knowledge, but they also vary in terms of age and developmental level. Audiences vary in their motivations for learning—depending on whether they are participating as students in a mandated, formal classroom, as members of a family outing, or as employees. To select the appropriate audience:

- Examine the stated outcomes and weigh them against the feasibility of reaching particular audiences effectively.
- Conduct a specific, targeted assessment of each audience (if necessary), including factors such as:
    - knowledge and interests,
    - prior educational experiences,
    - extrinsic and intrinsic motivations,

- attitudes and preconceptions,
- constraints related to attending an education activity, and
- cultural characteristics.

- Decide how the project can be customized to meet the audience's interests and learning styles.

Who should the program's audience be?

Most NOAA education and outreach programs are targeted either to schools or to community groups. Yet there are many other potential audiences for programs. The decision about who the audience of a program is should be based in part on the needs assessment and in part on the needs of the agency.

By far, most educational programs focus on what we call "intact groups." These are usually school groups, but can also include other youth groups – Scouts, 4-H, Boys and Girls Clubs, church groups – and community groups; service, fraternal, professional, and interest groups. Even within intact groups, the vast majority of educational programs conducted by agencies are for formal education audiences.

A mistake made by many managers and staff during development is to forget that the program is really for the audience and not for the agency. There are plenty of examples of programs that were created for school groups; then, when budgets got tight, the school groups no longer made the trip to the site. As long as there was funding, teachers would bring their classes, but with funding cuts, teachers selected the field trips that most closely aligned with their curriculum. Because managers had not taken the audience into account when building the program or considering the curriculum needs of a particular grade, the program was easily cut since teachers viewed it as an "add on" rather than as "core."

For many programs, school groups are an appropriate target audience, but the real audience is the teachers, not the students. Developing teacher-training programs can be a resource-effective way to ultimately reach more students. To reach students in grades 4 through 10, Nab the Aquatic Invader! (a project of the National Sea Grant College Program) trained a cadre of some 200 teachers about aquatic invasive species topics and how to use the Nab the Aquatic Invader! interactive website in their classrooms. In turn, it is estimated that these teachers reach upwards of 30,000 students each year. But unless the program is designed in partnership with the targeted teachers (topic and grade level), participation and continued use of a program are limited.

Some education coordinators have looked for new and different audiences in order to broaden the reach of their agency or division. Some have targeted intact groups in different neighborhoods, while others have created partnerships with agencies and organizations that directly serve the audiences they're trying to reach. Regardless of the program, though, the most successful educational efforts are those where the agency's mission drives the educational program, the program is tied to an important audience of the agency or division, and it meets the needs of the target audience(s).

Culturally Competent Informal Learning

Each culture has a shared set of meanings and beliefs, and distinguishes itself from others by the approaches it takes toward basic issues of interpersonal and intergroup relations, time, and nature. Cultures typically fall in different places along the spectrum for each issue. For example:

Interpersonal Relationships

- Universalism versus Particularism – the importance of rules, codes, and laws versus exceptions, special circumstances, and personal relationships.
- Individualism versus Collectivism – the importance of the individual and personal freedom versus the importance of the group and cooperative and harmonious relations.
- Neutral versus Emotional – the range of feelings expressed, whether interactions are detached or express emotion.
- Specific versus Diffuse – the degree of personal involvement in transactions between people, i.e., whether limited to the specific aspect of a transaction or requiring a relationship with the whole person.
- Achievement versus Ascription – whether status is accorded by what a person has achieved or by who the person is and the person's family or social connections.

Attitudes about Time

- Sequential or Synchronic – how the past, present, and future relate to each other, and which has greatest importance; whether time is considered as a sequence passing in a straight line or more as moving in a circle. Standards of punctuality can range from minutes to a day or more.

Attitudes about the Natural Environment

- Whether the world is considered as more powerful than the individual or the individual is the source of vice and virtue; whether society should be considered subordinate to, in harmony with, or having mastery over, nature.

Source: White, R. (2002). The importance of cultural competence to informal learning attractions. *The Informal Learning Review*, (52), 18-20.

Step 6. Establish program format and delivery system

Given the range of alternatives available, the planning team must determine what type of educational activity best meets the needs of the audience and addresses the ultimate outcomes, budget, schedule, etc. That is, what types of activities are most appropriate – workshop, demonstration area, community forum, field day, course, guest speaker, etc.? Keep in mind that a needs assessment can provide information regarding the types of delivery systems the audience will accept and respond to and what content they are interested in. For example, a needs assessment conducted by North Carolina Sea Grant of the teaching needs of elementary teachers in North Carolina revealed the topics these teachers were most interested in learning more about, the barriers to teaching ocean literacy principles, and the kinds of training and materials teachers prefer when deciding among a variety of professional development opportunities. Tasks in this step include:

- Match the ultimate impact or outcomes of the project with the educational activities.
- Determine what type of educational activity best meets the needs of the audience and addresses the ultimate outcomes, budget, schedule, etc.
- Determine how meaningful partnerships and collaborations can enhance the project; maybe a more effective and efficient long-term educational strategy will emerge from a partnership with a community organization rather than developing a stand-alone event.

Step 7. Ensure quality instructional staff

No matter what the ultimate format (course, field day, or workshop) or length of time (one hour, one week, or two years), someone (staff members or volunteers) will need to deliver the educational content through instruction. Although the educational materials or activity guide may give instructors direction, teaching requires skill and conscious effort. To ensure quality instructional staff:

- Develop instructor training materials.
- Train instructors how to deliver the activities to the specific audience; this may include appropriate education theory, instructional practices, and use of different instructional settings.

Step 8. Ensure quality instructional materials and strategies

Depending on the topic, audience, format, and time frame, project planners will need to adopt or adapt existing education materials for their particular use, or design new materials and strategies. In either case, the quality and appropriateness of the instructional materials are critical to the success of the project. To ensure quality instructional materials and strategies are used:

- Inventory existing instructional materials for possible adaptation or adoption.
- Create new materials, if necessary, using established instructional design processes.
- Make sure instructional materials:
    - Are accurate, balanced, and fair,
    - Reflect good pedagogy (e.g., relevant to learners, encourage hands-on learning, accommodate different learning styles, appropriate for the age and audience),
    - Are aligned with local, state, and national standards and professional guidelines, and
    - Have been field tested with representatives of the target audience.

How do we staff the program?

It's the best of all possible problems: What happens if your program is a success? In one case, a new program was so successful and popular that the demand quickly grew beyond the ability of the staff to provide access to all groups wanting to participate. In several cases, educators realized that quality control suffered when a program grew, and they had to hire seasonal educators to implement the program.

Making good staffing decisions is part of the reason for doing a needs assessment. One educator commented that through asking the potential audience about the demand for a program, "We knew it would be popular, and that's why we limited our promotion of the program." Many others reflected that they hadn't planned on the time it would take to train and oversee volunteers to ensure that the program was conducted the way it was designed. Some programs only allow certain staff to do certain types of educational programs, such as public speaking programs, in order to guarantee that the program is conducted correctly. All these are staffing decisions that need to be considered in planning and implementation.

Another lesson many educators learned is that the amount of time needed for a program must include preparation and follow-up. A couple of typical realizations were, "We didn't build in the time it took to gather up the materials before each program," and "We didn't build in time for doing a careful evaluation." Several programs included some data collection for evaluation, but failed to consider the time needed to enter the data for analysis. There are other programs where analysis means quickly looking through the feedback forms, but never really analyzing the data or examining data across programs. The reason? "We didn't think about how much time it would take…"

Again, not all programs are created equal; different types of programs require different amounts of time and dedication. One lesson several educators shared is that if consistency in a particular program is a goal, then training and oversight are important and should be built into the program. Another lesson from a program suggests that the educator needs to consider the knowledge of the audience when making decisions about staff time. When asked why, the response was that if the audience knows a lot about the subject, "the educator needs to be better prepared and needs to spend more time staying current."

Ensuring quality instructional staff turns out to be more complex than it first appears!

Step 9. Assemble materials, resources, and facilities

Deficiencies in logistical planning – facilities, materials, and equipment – can sink even the best instructional design delivered by the best educator. More often than not, miscommunication and assumptions lead to logistical difficulties during project implementation. Project planners must think ahead to the actual implementation of the project and make sure to:

- Anticipate needs for materials, equipment and facilities.

- Ensure needed amenities are comfortable and suit participant needs.
- Coordinate schedules with collaborators and partners.
- Double-check participant lists.
- Confirm participation of honored guests.
- Clearly delineate roles and responsibilities among planning team members.

Spotlight on Nab the Aquatic Invader! Be a Sea Grant Super Sleuth

The goal of Nab the Aquatic Invader! (NAI) is to prevent new introductions and the further spread of aquatic invasive species by providing information to students and teachers in grades 4-10. Through an online educational experience, NAI allows them to better understand aquatic invasive species biology, impacts, and control measures so they can make wise decisions and take appropriate actions.

Developing NAI was no small task! Education coordinators from Indiana-Illinois, New York, Oregon, Louisiana, and Connecticut Sea Grant recruited teachers to help develop online curriculum materials and serve as mentors to other educators. Part of the teachers' time was spent becoming familiar with regional aquatic invasive species that were then used as their foci for writing new descriptions and online activities. Teachers were responsible for aligning the activities to both state and national content standards and were encouraged to include activities that cut across science, math, language arts, geography, and social studies. The teachers' field tested the activities in their own classrooms and evaluated their success.

In evaluating the design, development, and implementation of the NAI materials education coordinators were interested in the following questions:

- Are the new activities effective in conveying concepts about introduced species?
- Is the format and design of each activity practical for classroom instruction?
- Are the online activities effective in encouraging a new sense of responsibility and stewardship?
- Do the teachers plan to continue networking with one another beyond the project's duration?
- What types of stewardship activities were conducted by the students after participating in NAI?

Once the evaluation was complete, teachers then served as Sea Grant education ambassadors by sharing their new knowledge and messages for preventing the spread of aquatic invasive species at in-service teacher workshops and state and national professional education conferences. The workshops serve two purposes: 1) to introduce and show how the aquatic invasive species materials and activities available through the NAI website can be incorporated into the classroom and 2) to demonstrate how teachers can help their students develop community stewardship projects focused on some aspect of the aquatic invasive issues.

Source: Goettel and Domske. Nab the *Aquatic Invader! Be a Sea Grant Super Sleuth.* Retrieved January 2009, from Sea Grant Nonindigenous Species Site (SGNIS) website: http://www.sgnis.org

Step 10. Plan for emergencies

The old adage, "What can go wrong, will go wrong," is just as applicable when designing an education project as with any other activity. Emergency plans should be developed in advance of implementing the project and include:

- What to do in the case of severe weather or injuries,
- Whom to contact for medical assistance,
- How to report an emergency such as fire,
- A system to warn leaders of severe weather or other emergency situations, and
- Ways of addressing liability concerns and applicable regulations.

Even though the worst rarely happens, planning for it will provide those involved with a plan that was devised during calmer times and will prevent the emergency from becoming worse.

Step 11. Promote, market, and disseminate the project

Although some projects flow into regularly scheduled activities with a "captured" audience, most projects depend on some form of promotion or recruitment for participation. To promote the project:

- Plan a marketing program that reaches the target audience and motivates the audience to participate.
- Hire a consultant with promotion and marketing expertise, if necessary.
- Secure sufficient resources to implement the plan.
- Consider how to disseminate project products.

Step 12. Implement the project

The day will come when the project is actually implemented. All of the planning effort is finally realized. Each type of event (e.g., workshop, class meeting, community forum, field day) requires a unique set of actions, materials, and equipment. Project planners will need to:

- Create check lists and a detailed agenda.
- Focus on the participants, their needs and the educational experience.
- Ensure that project facilitators know what they need to do and when.

If you build it, will they come?

One very surprising finding from interviews of agency educators is their sense that if a program is created, there will be an audience. Some managers base this assumption on their needs assessment, but in general, there was a belief that people would naturally be interested in the program and would show up. Very little attention was paid to how these people would find out about the program. In other words, there wasn't much thought given to promotion. And as one educator noted: "Sometimes we make a product and don't go to the intended audience to see if it's what they need."

In some situations, the educator used a newsletter to inform people about the program. In one such situation, the program was designed to reach a new audience. However, no one had thought in advance about the fact that a newsletter sent to previous participants would not reach a new audience.

Similarly, new on-site programs advertised by signs and handouts will not reach a different audience than the ones that already come. Several educators believe "word of mouth" is the most effective way of reaching their desired audience, but others have discovered the need to "reach some of the desired audience first in order to get the word-of-mouth going." Many educators who focus on teacher training used word-of-mouth effectively because they were able to reach their core teachers, who did pass on the word to their colleagues. Attempts to reach new audiences posed the biggest challenges.

A few educators mentioned that they changed their programs once they were implemented, based on who was attending. Rather than marketing toward their original audience, they decided that those attending were an appropriate audience for their programs. This was often the case for programs with small resource bases. In a couple of situations, a concerted effort was made to "create bridges to the community" in order to reach the desired audience after the program was already in place.

It turns out that building and implementing a thoughtful plan for marketing or promotion is an important and often overlooked step.

Part II Wrap Up

Project design and implementation are the heart of an education program. As this section has underscored, careful attention to the details of planning will pay off in program results. Use of a logic model can be invaluable in setting clear expectations and seeing how all components of the program work together. Attention to the details of implementation is also essential, including planning for emergencies and contingencies. Finally, promotion and marketing of an education project should receive systematic attention in the planning phase. All of the key elements of the program should be monitored during the implementation phase to ensure that they are running smoothly and to undertake mid-course corrections as needed.

Part III.
Project Evaluation

3

Introduction

To get to this point in the project design process, a considerable amount of time, effort, and other resources have been expended. Quite obviously, the goal is to create effective education projects that can serve as models of excellence. But how do we know if the project is successful? Project evaluation is the answer.

This portion of the manual walks through the basics of evaluation, outlining everything from types of evaluations and ways of collecting information to the use of outside evaluators and ethical considerations in gathering data from program participants. This information is intended to answer questions about project evaluation and provide guidance in using evaluation as a project improvement tool.

What is Project Evaluation?

In the course of implementing a project various types of information are gathered. Education coordinators often want to know how many individuals participated in an event, whether participants were satisfied with the logistics, or whether staff members and volunteers feel confident in their ability to deliver a particular educational experience. Answers to these questions provide useful information. They help education coordinators monitor specific aspects of the project. However, in practice, this type of information gathering tends to be more sporadic and patchy than methodical and comprehensive.

Evaluation is the *systematic* collection of information about activities, characteristics, and outcomes of projects in order to make judgments about the project, improve effectiveness, and/or inform decisions about future programming (adapted from Patton, 2002).

Importantly, evaluation provides project coordinators with well-documented and considered evidence to support the decision-making process. Evaluation is not merely the accumulation and summary of data and information about a project.

Project evaluation helps determine a project's merit (does it work?) and its worth (do we need it?). Evaluation helps decision-makers determine if a project should be continued and, if so, suggests ways to improve it. Additionally, evaluation documents project (and program) accomplishments. If the project has been designed properly with well-articulated objectives, the evaluation can gather information as to the reasons why a project is or is not meeting its objectives.

Why is Evaluation Important to Project Design and Implementation?

Spotlight on B-WET (Bay Watershed Education & Training)

NOAA B-WET is an environmental education program that supports experiential learning through local competitive grants. Currently B-WET Programs are implemented in the Chesapeake Bay (MD, VA, and DE), California, and the Hawaiian Islands. The goal of B-WET is to support existing programs, foster new programs, and encourage partnerships in providing "meaningful watershed environmental experiences" (MWEEs) to students as well as professional development opportunities for teachers in utilizing MWEEs in their own classrooms.

In 2006, NOAA contracted with an external team of evaluators to learn how Chesapeake B-WET programs implement MWEEs and what outcomes were achieved. They were specifically interested in knowing if professional development workshops increased teachers' confidence in implementing MWEEs in the classroom and to what extent B-WET has improved students' stewardship and academic achievement. The results were used by B-WET coordinators to document the effects of currently-funded programs, to inform future funding decisions, and to share findings with national education communities.

Post-program questionnaires showed that teachers' confidence in their ability to implement MWEEs increased as a result of their participation in professional development. Almost all of the teachers reported that they taught about the watershed or the Chesapeake Bay after participating in the professional development trainings, including the large majority of those who had not taught about the watershed or Bay in the past. In addition, most teachers who participated in MWEE professional development believed that their students were better prepared for their state's standardized tests as a result of adding MWEEs to their curriculum. Almost all teachers believed their students' engagement in learning increased, a factor associated with student achievement.

Pre/post tests showed that students improved in three of eight stewardship characteristics as a result of participating in B-WET-funded MWEEs. More importantly, students increased in the characteristic most closely associated with future behavior, their intention to act to protect the Chesapeake Bay watershed. Students' knowledge of issues confronting the watershed or Bay and actions in which they can engage to protect the watershed or Bay increased. Students' sense of responsibility to protect the environment and their feeling that they can make a difference appeared to be most positively influenced by collecting and analyzing data, conducting action projects, and reading about issues that impact the Bay.

Source: Kraemer, A., Zint, M., and Kirwan, J. (2007). *An Evaluation of NOAA Chesapeake B-WET and Training Program Meaningful Watershed Educational Experiences*. Retrieved January 2009, from NOAA Chesapeake Bay Office website: http://noaa.chesapeakebay.net/FormalEducation.aspx

The reasons for conducting a project evaluation vary as dramatically as do the projects and their contexts. Perhaps the most common reason revolves around the desire to understand, in a systematic way, what is and is not working in a project. All too often, how projects work (or don't work) is understood primarily through a combination of instincts, anecdotes, and numbers on a balance sheet. A series of anecdotes, although informative and even satisfying, cannot serve as the basis for generalizations. Evaluation provides perspective. It provides evidence. It provides the types of information necessary for sound decision-making. The following outlines additional benefits of conducting project evaluations.

- **Participants:** Participants are core to the success of the project. In the long run, project sustainability will depend on the degree to which participants benefit directly, short-term and long-term, from the experiences or services. The evaluation will provide evidence of the ways in which participant learning is impacted.
- **Project Improvement:** Project strengths and weaknesses can be identified through an evaluation. An evaluation can also map out the relationships among project components (how the various parts of a project work together). This information can be used to re-design the project and increase both efficiency and effectiveness.
- **Public Relations:** Data generated by an evaluation can be used to promote the products and services of the project within and outside of the agency. Statements based on evaluation results will be viewed as more substantial and justifiable.
- **Funding:** More and more education funding entities require a comprehensive, outcomes-based evaluation. An evaluation can provide evidence of project effectiveness. Such evidence may be important when limited resources are being distributed internally. Evaluation results are often used in the process of determining if a project should be continued, scaled backed, discontinued, or enhanced.
- **Improved Delivery:** Projects evolve over time. What was once a coherent, discrete set of activities may have grown into a jumbled set of loosely related events. An evaluation can help clarify the purposes of the project, allowing decision-makers to examine project components against well-thought out criteria.
- **Capacity Building:** Engaging staff members, volunteers, and other stakeholders in the design and implementation of an evaluation will provide opportunities for skill-building and learning. As the project or program is examined, those involved will also develop insights into the workings of the project and perhaps even the workings of the organization. These insights can be used to inform a strategic examination of projects and programs by identifying priorities, overlap, gaps, and model programs.
- **Clarifying Project Theory:** When the project was designed initially, it was built either explicitly or implicitly on a project theory that explained how things work, how people learn, or even how organizations change. The evaluation provides an opportunity to revisit the theory behind the project. Staff members and volunteers who understand why a particular set of teaching methods was selected or why the project activities were sequenced the way they were will be more likely to follow the plan. They will also feel more ownership in the project if they understand the theory behind the project more fully.

- **Taking Stock:** Engaging in evaluation provides a precious opportunity to reflect on the project, to consider where the project is going, and what has been accomplished compared to expectations. Taking stock is more than accumulating information about the project – it is learning through the project.

Steps in Planning a Project Evaluation

PLANNING
Step 1. Reexamine the issue, audience, and project objectives
Step 2. Establish the planning team (including stakeholders, audience, and evaluators)
Step 3. Identify a purpose for the evaluation
Step 4. Focus on project improvement
Step 5. Assess project outcomes and impacts
Step 6. Clarify the time frame in which the activities and impacts (outcomes) are expected to occur
Step 7. Perform a literature search
Step 8. Select data collection methods and develop questions based on the evaluation goals and objectives
DATA COLLECTION
Step 9. Determine the audience sample
Step 10. Design and pilot the data collection instrument
Step 11. Gather and record data
DATA ANALYSIS AND REPORTING
Step 12. Perform data analysis
Step 13. Manage data
Step 14. Synthesize information and create a report

Planning an Evaluation

Great care must be taken when planning any evaluation effort. Fourteen steps in conducting a project evaluation are outlined below. The outline is intended to breakdown a complex process into manageable steps. Please recognize, however, that in providing an overview of the process, nuances and detail are necessarily omitted.

Planning

Step 1. Reexamine the issue, audience, and project objectives

Before a project evaluation can be designed, it is essential to fully understand the project – its components, the relationships among the components, the audience(s), and the intended outcomes (short-term, intermediate, and long-term). From this foundation, the rest of the evaluation design will follow. One important step:

- Reexamine the project objectives and logic model; use them as a road map for planning the evaluation.

Step 2. Establish the planning team (including stakeholders, audience, and evaluators)

The project, in all likelihood, involves a variety of players. Project managers, resource managers, staff members, volunteers, participants, and community members all have a stake in the overall success of the project. Each plays a different role and sees the project through a different lens. These perspectives should be tapped when planning an evaluation. Therefore:

- Invite members of stakeholder groups to participate in an evaluation planning team.
- In order to clarify everyone's role, articulate expectations of the evaluation planning team members early in the process.

Step 3. Identify a purpose for the evaluation

The evaluation team will need to determine the scope of the evaluation – that is, define the purpose of the evaluation, what is going to be evaluated, and who will use the evaluation. Keep in mind that:

- A *process or implementation evaluation* assesses the extent to which a project is operating as planned or the progress toward the outcomes identified in the TOP model.
- An *outcomes or summative evaluation* judges whether the goals of the project have been reached.
- It may not be realistic to expect that all aspects of the project will be evaluated.
- The project team must set specific goals and objectives that are used to focus evaluation planning and design.

Step 4. Focus on project improvement

The purpose of process or implementation evaluation (types of formative evaluation) is generally for project improvement. This type of evaluation focuses on what services are provided and to whom and how. The intent is to strengthen the program by providing feedback on its implementation, progress, and success. The important task is to:

- Collect useful information early in the program so that changes intended to enhance program effectiveness can be made rather than waiting until the program is over.

What evaluation steps do people really do?

This manual aims to provide you with a good picture of how programs should be planned, implemented, and evaluated. But when it comes to evaluation, what do people really do?

Well, some really do everything! For example, the Multicultural Education for Resource Issues Threatening Oceans (MERITO) program of the Monterey Bay National Marine Sanctuary (MBNMS) conducted a needs assessment with representatives and community leaders to identify ways to expand marine conservation education and outreach efforts to local Hispanic communities. The project team at MBNMS then used logic modeling with stakeholders to develop, implement, and evaluate bilingual ocean and conservation-related outreach programs to Hispanic students, teachers, adults, and families living near the MBNMS.

On the other hand, some programs do very little on a formal basis. But even in these programs, when asked how they know the program is successful, the educators are able to cite examples. Thus, data are being gathered, even if informally.

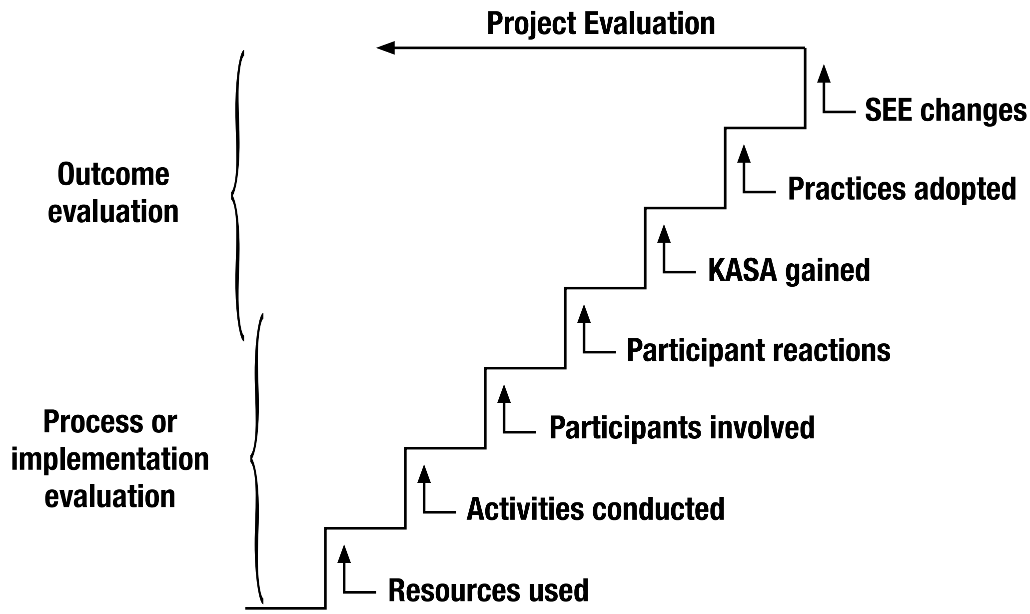
Most programs fall somewhere in the middle. Education coordinators do pieces of several of the steps listed, but may not do all of them, or they do some of them cursorily. For example, Step 7, performing a literature review, works for both planning and evaluating the program. One educator knew she didn't have the educational background to develop a program and so spent several weeks looking at what others had done with similar content programming. She felt that time spent on Step 7 made a tremendous difference in the success of her program since she "was able to pick from the best of what's out there already," and she had clear insight into what she needed to measure in order to be sure her program was meeting its goals. Others hoped to avoid "re-inventing the wheel" and used listserves and correspondence with colleagues and friends to locate existing resources. A few educators also conducted Internet searches for resources, research, and reports, including visiting educational clearinghouses to locate well-reviewed materials and "best practices." In some cases, they were able to find evaluation instruments that could be adapted to their own programs.

Therefore, process evaluation generally occurs at the lower four levels of the project evaluation staircase: resources, activities, participation, and reactions.

At its best, process evaluation is an essential decision making tool that can transform the project. Process evaluation can be used to:

- Gather information/data about an audience's reaction to project activities or products/materials. Changes may be made as a result of the positive or negative feedback to project activities or learning experiences.
- Gather information/data about problems with project delivery and assess progress towards outcomes of a project during implementation.
- Help provide information that can be used in making decisions about modifications, continuation, or explanation of the project. Results may be used to decide how to move forward with an existing project.

Ascending TOP's Project Performance Staircase



Process/Implementation evaluation. At startup, documenting the materials cost and staff time helps project coordinators explain the scope of the programming effort in terms of resources expended. Monitoring whether the targeted activities are implemented as planned and participation levels are adequate provide evidence of program implementation. The education coordinator assesses whether the intended target audience is being reached and whether they are satisfied with the project as it was being implemented.

Outcome evaluation. After the project is delivered, short-term outcomes focus on knowledge retained, attitudes changed, skills acquired, and aspirations changed. Intermediate outcomes at the practices level focus on the extent to which practices are implemented. Typically, these outcomes are measured a few months after the project. Intermediate outcomes lead to longer term social, economic, and environmental changes (impacts).

Step 5. Assess project outcomes and impacts

During project development, objectives or targets were set at some or all levels of the TOP programing staircase based on need or opportunity assessment. Outcome evaluation assesses the extent to which those project targets are reached. While outcome evaluation generally occurs at the upper three levels of the programming staircase (knowledge, attitudes, skills, and aspirations (KASA), behaviors or practices, and social, economic and environmental (SEE) conditions), it can focus on project outputs if the purpose of the evaluation is to understand how outcomes are produced. Keep in mind that:

- Each level of the TOP model provides different information about the outcomes of a project.
- Ascending TOP's project evaluation staircase provides increasingly stronger evidence of project accomplishments relative to the desired conditions.
- The levels of evaluation should be selected based on the type of information needed to evaluate the project accurately.
- Outcome evaluation informs decision-makers about the value or worth of the project.
- Results of an outcome evaluation provide the information necessary to make decisions about the continuation, revision, or expansion of the project.

Step 6. Clarify the time frame in which the activities and impacts (outcomes) are expected to occur

The relationships between overall project design, implementation, and project evaluation cannot be overestimated. Planning and implementing an evaluation can take several months. Sufficient care must be given to the development of the evaluation timeline to ensure effectiveness. Be sure to:

- Integrate the evaluation timeline into the project implementation timeline and vice versa.

Sample Evaluation Timeline for the Development and Analysis of a Survey

Month 1	Form evaluation team; set expectations; conduct background research (literature review, gather existing data, review logic model)
Month 2	Determine survey method; determine sampling method; develop draft survey
Month 3	Pilot test survey and revise
Months 4-5	Administer survey (mail, phone, in person)
Month 6	Code and enter data; analyze data
Month 7	Write evaluation report and send results to stakeholders

Step 7. Perform a literature search

Evaluation, like overall project planning, rarely takes place in a vacuum. As mentioned previously, projects are developed based on explicit or implicit theories of how the world works. To accomplish this step:

- Identify the related literature and use this literature as a touchstone.

- Review research into evaluation processes, practices and standards.
- Tap existing sources of information (previous evaluations, census data, reports, budgets, etc.).

Step 8. Select data collection methods and develop questions based on the evaluation goals and objectives

By this point in the process, the evaluation team has determined why an evaluation is being conducted, who will conduct it, what will be evaluated, who will be evaluated, and when the evaluation will take place. Tasks in this step include:

- Define the type of evaluation (e.g., process, outcome) to be conducted.
- Determine what data collection instruments (e.g., surveys, interviews, case studies, focus groups) are most appropriate.

Data Collection

Step 9. Determine the audience sample

Except in rare cases when a project is very small and affects only a few participants, evaluations will be limited to a subset of the total anticipated audience. The preferred method for selecting a subset is random sampling – a procedure that reduces sample bias by selecting a sample that accurately reflects the population (see Appendix A). Tasks involve:

- Develop sampling procedures.
- Determine audience sample size.

Step 10. Design and pilot the data collection instrument

Just as the initial design of the project required careful design and pilot testing of instructional materials to see how they worked, the data collection methods and instruments (e.g., interview, focus group, survey, observation) need to be crafted and pilot tested. The evaluator will need to consider a series of questions in order to design the data collection instrument, such as:

- How important is statistical precision?
- How important is in-depth information about one or more aspect of the project?
- How will data collection be standardized?
- Is contact information on target audience(s) available?
- What method of data collection would the audience be most receptive to?

There are many examples of instrument formats and styles. The project evaluators should make every effort to design an instrument that will collect the desired data. Part IV of this manual provides additional information on common data gathering instruments and Appendix C provides examples of questions asked at each level of the TOP program evaluation staircase. Instruments must be designed, pilot tested, and revised before they can be used to gather data on project implementation and outcomes.

Step 11. Gather and record data

Again, just as the design of a project requires the consideration of various logistics (e.g., staff schedules, availability of facilities), the data collection process for an evaluation must be thoroughly scoped. The evaluation team will need to:

- Determine how data will be collected, and recorded, and by whom.
- Devise a system of coding and recording the data to ensure easy and accurate data analysis.
- Train interviewers, focus group facilitators, and/or observers if necessary.
- Design a system that assures anonymity and that conforms to all aspects of ethical standards.

Data Analysis and Reporting

Step 12. Perform data analysis

Analyzing quantitative and qualitative data is often the topic of advanced research and evaluation. It is always a good idea to include a planning team member with survey and statistical analysis and/or qualitative data analysis expertise on the evaluation team. When that isn't possible, there are a few basics that can help in making sense of the data:

- Have a plan in place for how to analyze, synthesize, store, and manage the data *before* starting the data collection.
- Develop a plan to guarantee an unbiased analysis and reporting of the data.
- Review the purpose of the evaluation *before* starting data analysis
- Make copies of all data; store a master copy of the original data in a safe place.
- For qualitative data, anticipate responses and have a plan for categorizing and coding the data.

Step 13. Manage data

After the data are collected and even after the data have been analyzed, a plan must be put in place to continue the effective and ethical management of the data. In most cases, data remain viable for some period of time. After reading the evaluation report, decision-makers, other stakeholders, and other evaluators may generate questions that can be answered by revisiting the data. It is important to:

- Develop a plan for continued access to uncorrupted data.
- Ensure that the confidentiality and anonymity of respondents is maintained.

- Define intellectual property rights – including the question of who "owns" the data.

Step 14. Synthesize information and create a report

After the data have been collected and analyzed, an evaluation report must be written and submitted within the required timeframe. Although the nature of the evaluation report (e.g., length, style of writing) is determined to some extent by its intended audience, there are standard components to any evaluation report. They include:

- Description of the evaluation purpose,
- Description of data collection methods,
- Analysis of data; results,
- Implications of results,
- Discussion of any limitations or problems encountered with the design and implementation of data collection instruments, and
- Recommendations for program improvement.

Who Should Conduct the Evaluation?

Early on in the evaluation planning process, the decision will need to be made whether or not to hire an outside evaluator. In some cases, the decision may have been made for the team. Many managers require that an outside evaluator be contracted. An outside evaluator is seen as an objective third-party who may be able to bring a fresh perspective to the project. In addition, a professional evaluator has expertise that may not exist in-house. Many funding agencies require external evaluators to conduct evaluations to minimize bias and provide credible evidence of project achievements. If evaluation expertise does exist and an outside evaluator is not required, it is possible to run major components of the evaluation in-house. However, managers should proceed with caution. Those with strong ties to the project (i.e., project manager, staff members, volunteers, advisory committee members) may find it difficult to shed their biases, particularly if evaluation results are to be used in decision-making. Project staff members, volunteers, and other stakeholders should be involved in determining the focus and objectives of the evaluation. However, at a minimum, an outside evaluator should be responsible for data analysis and interpretation.

Evaluation Costs

Depending on the size and complexity of the project, it is typically recommended that 5 to 15% of project costs be set aside for evaluation. Costs may be lower if some or even most of the evaluation is conducted in-house. (Remember, that even though a check may not be written to an outside evaluator, staff time still involves costs.) It should also be remembered that a great deal of data may already exist – for example, in annual reports or participant exit interviews. Obviously, building an evaluation around existing data has its pitfalls, but a critical examination of quality sources of existing information that can help answer the evaluation questions should not be overlooked.

Guidelines for Conducting a Successful Evaluation

1. Invest heavily in planning.
2. Integrate the evaluation into ongoing activities of the program.
3. Participate in the evaluation and show program staff that you think it is important.
4. Involve as many of the program staff as much as possible and as early as possible.
5. Be realistic about the burden on you and your staff.
6. Be aware of the ethical and cultural issues in an evaluation.

From: U.S. Department of Health and Human Services. *The Program manager's guide to evaluation.*

Ethics

Virtually all evaluations involve collecting some information, directly or indirectly, from individuals. In designing the evaluation, the project team must ensure that the individuals involved are treated with respect and sensitivity. This requires:

- Placing a high priority on maintenance of confidentiality and/or anonymity,
- Respecting the time and effort expended by evaluation participants i.e., it is not appropriate to collect data from individuals when there is no specific plan to use that data,
- Assuring respondents' physical and psychological well-being throughout the data collection process by:
  - designing instruments in such a way that participants are not embarrassed or asked to do something that might put them in jeopardy,
  - treating each respondent with the utmost respect and sensitivity, and
  - refraining from using deception unless absolutely necessary.
- An understanding, by the respondents, that they are participating in an evaluation and give their consent to participate (with minors, a parent or guardian must provide informed consent).

Part III Wrap-Up

Evaluation is not a frill or luxury for education programs to be conducted if there are sufficient funds remaining. Rather, an evaluation should be built into the plans for a project from the start. A well-crafted project evaluation helps decision-makers make decisions by determining if the project works and whether or not it is worth the investment of time and resources. Evaluation results help justify worthwhile projects in future funding cycles and help discontinue projects that have outlived their usefulness. Equally important, the data from a well-conducted evaluation can also help shape future efforts so as to provide more effective, better targeted, and more widely used programs to the public.

The next section of this manual provides an overview of some of the most commonly-used data collection instruments and guidance for using them appropriately.

Part IV.
Data Collection Instruments

4

Introduction

Managers, project coordinators, and evaluators have an array of data collection instruments available to them. Although selecting the most appropriate instrument requires thought and careful consideration, the selection process is also shaped by a number of decisions that have already been made. The type of evaluation being considered (i.e., needs assessment, process, or outcome) will determine, to some extent, the most appropriate data collection instrument(s). Likewise, the level of evaluation being conducted (i.e., KASA changes, practices, SEE conditions), the audience involved (e.g., children vs. adults, casual visitors vs. organized groups), and the amount of resources available (e.g., time, money) will all help determine which data collection instruments should be used. Each data collection strategy comes with strengths and weaknesses.

Matching Data Collection Instruments to What is Being Assessed

It is often the case that an evaluation would be designed to address the degree to which participants increased their level of understanding, developed a particular set of skills, or further considered their attitudes on a topic. Some data collection instruments are particularly adept at assessing knowledge gain. Others are appropriate for documenting skill or attitude development. The following chart provides some ideas of the appropriateness of using specific kinds of data collection instruments to assess knowledge, skills, attitudes, and behavior.

Data Collection Instruments	Knowledge	Skills	Attitude	Behavior
Interview	X		X	(X)
Focus group	(X)		X	
Questionnaire and survey	X	X	X	(X)
Observation		X		X
Literature review*	X	X	X	X
Test	X	X		
Concept maps	X		(X)	
Document or product review	X	X	(X)	
Case study	X	X	X	X

Notes:
(X) Indicates that this technique may be, but is not always, appropriate to evaluate the indicated type of learning.
* For comparison from past to initial condition.
Source: American Society for Training and Development (1989). *Evaluation tool use.* Alexandria, VA: Author.

Validity and Reliability of Evaluation Instruments

Before data is collected for project evaluation, the instruments or tools to be used have to be validated. Anytime instruments are developed to collect data, whether it is for a needs assessment, a process, or an outcome evaluation, steps should be taken to ensure the instruments are valid and reliable. Two factors that should be considered when validating evaluation instruments are validity and reliability.

ⓘ **The *validity* of an instrument is the extent to which it measures what it purports to measure.**

ⓘ **The *reliability* of an instrument is the extent to which it yields consistent responses each time it is administered.**

Below are some things to consider doing when determining the validity or reliability of an instrument:

- Field or pilot testing instruments before using them to collect data for an evaluation is likely to result in more valid and reliable data being collected.
- If expertise in statistical analysis for education projects is not present in the planning team, work with someone who has this expertise.

Mixed Methods

Mixed methods, in evaluation, refers to the practice of using some combination of both quantitative and qualitative data gathering.

Quantitative methods allow us to count events or number of participants, determine cost per participant, perform statistical analyses (mean, median, mode, standard deviation), and complete other calculations. When sample sizes are large enough and representative of the population being sampled, quantitative methods allow generalizing findings beyond the sample to the relevant population.

Qualitative methods allow data collectors to record explanations, perceptions, and descriptions of experiences – often in the participants' own words. Typically, a small number of individuals participate in a qualitative evaluation. Consequently, the results of this small number of participants cannot be generalized to the population.

Using quantitative or qualitative methods in isolation limits what can be learned from the evaluation, what can be reported, and what can be recommended, with any confidence, as a result of the evaluation. Used in combination, however, the individual strengths of quantitative and qualitative methods can be maximized and the weaknesses minimized. More importantly, a synergy can be generated when using mixed methods. Results from more than one method of data collection can be "triangulated," providing greater validity and enhanced understanding.

Types of Data Collection Instruments

The table on the following two pages summarizes the purpose, advantages, and challenges of using different data collection instruments. Remember that since data gathering instruments are developed for a specific purpose and project, they rarely represent a pure form. For example, a survey or interview may include test items. A case study often incorporates observation, document review, and in-depth interviews.

Uses, Benefits, and Limitations of Various Data Collection Instruments			
Instruments	**Overall Purpose**	**Advantages**	**Challenges**
Interviews	To fully understand someone's impressions or experiences, or learn more about their answers to questionnaires.	• Provides full range and depth of information • Develops relationship with respondent • Allows for follow-up questions	• Can take much time • Can be hard to analyze and compare • Can be costly • Interviewers can bias responses • Generalization is limited
Focus Groups	To explore a topic in depth through group discussion, e.g., about reactions to an experience or suggestion, understanding common complaints. Useful in evaluation and marketing.	• Quickly and reliably obtain common impressions • Can be efficient way to gather range and depth of information in short time • Can convey key information about projects	• Can be hard to analyze responses • Need a good moderator to steer the discussion and provide closure • Difficult to schedule 6-8 people together • Strong individuals may influence others' responses
Questionnaires and surveys	To quickly and/or easily obtain a lot of information from people in a non-threatening way.	• Can complete anonymously • Inexpensive to administer • Easy to compare and analyze • Can administer to many people • Can obtain lots of data • Many sample questionnaires already exist	• Might not get careful feedback • Wording can bias client's responses • Impersonal • In surveys, may need sampling and statistical expertise • Doesn't yield full story
Observation	To gather accurate information about how a project actually operates, particularly about processes.	• Can view operations of a project as they are actually occurring • Can adapt to events as they occur	• Can be difficult to interpret behaviors • Observations can be difficult to categorize • Can influence participant's behaviors • Can be expensive
Literature Review	To gather information on the audience and/or the issue. Identify what previous investigations have found about the knowledge, skills, behaviors, or attitudes of the intended audience with relation to the issue.	• Can provide much information in relatively little time • Makes use of already gathered information • Helps to sort changes over time • Provides evidence about the problem • Minimum effort or interruption of audience	• Can be out-of-date (e.g., technology needs) • Data synthesis can be difficult • May not address specific questions of concern • Not a flexible means to get data; data restricted to what already exists • Statistical data may not address perceptions of the problem, or may not address causes of the problem • Reports may be incomplete

Uses, Benefits, and Limitations of Various Data Collection Instruments (cont.)			
Instruments	**Overall Purpose**	**Advantages**	**Challenges**
Tests	To determine the audience's current state of knowledge or skill regarding the issue.	• Helps identify a problem or a deficiency in knowledge or skills • Results are easily quantified • Individual performances can be easily compared	• Limited availability of validated test for specific situations • Language or vocabulary can be an issue • People may be concerned about how results will be used • Adults may resent taking tests
Concept Maps	To gather information about someone's understanding of, and attitudes towards, a complex subject or topic.	• Can offer a more comprehensive and complex view of someone's thinking than a test does • Could be a better tool for visual learners or test-phobic people • Produces qualitative and quantitative data	• Takes training to complete properly • Takes training to administer • Can be challenging and time consuming to score • Can be difficult to analyze and interpret
Document or Product Review	To gather information on how the project operates without interrupting the project; comes from review of applications, finances, memos, minutes, etc.	• Yields historical information • Doesn't interrupt project or client's routine in project • Information already exists • Few biases about information	• Often takes much time • Information may be incomplete • Need to be quite clear about what one is looking for • Not a flexible means to obtain data; data restricted to what already exists
Case Studies or Peer Review	To fully understand or depict client's experiences in a project; to conduct comprehensive examination through cross comparison of cases.	• Fully depicts client's experience in project input, process, and results • Powerful means to portray project to outsiders	• Usually quite time consuming to collect, organize, and describe • Represents depth of information, rather than breadth • Information gathered represents a single individual or event; cannot be generalized

Source: McNamara, C. (1997-2008). *Basic guide to program evaluation.* Retrieved December 2003, from Free Management Library website: http://managementhelp.org/evaluatn/fnl_eval.htm

Selecting the Right Data Collection Instrument

The tables below provide a convenient reference for the selection of appropriate evaluation data collection instruments for different types of projects and activities. These tables provide general observations about the types of data gathering instruments. The specific design and use of any particular method will be dependent on the particular context and the types of information needed.

A. Instrument versus Audience

Evaluation Instruments* ***Audience***	**Interview**	**Focus Group**	**Survey**	**Observation**	**Test**	**Concept Maps**	**Case Study**
Adults/who know you or your organization	Good	Good	Good	Good	Good	Fair	Good
Adults/who don't know you or your organization	Good	Good	Good	Good	Fair to Poor	Fair	Fair
Decision-makers/ policy makers/ community leaders	Good	Fair	Good	Good to Fair	Fair	Poor	Good
Cultural groups (other than your own)	Fair to Poor	Good to Fair	Fair to Poor	Good to Fair	Poor	Poor	Fair to Poor
Teachers	Good	Good	Good	Good	Good	Good	Good
Teens	Good	Fair	Fair	Good	Good	Good	Good
Eight to twelve year olds	Fair	Fair	Fair	Good	Good	Good	Fair
Three to seven year olds	Poor	Poor	N/A	Good	N/A	N/A	Fair to Poor

* Literature review and document review utilize existing sources of information that are not dependent on audience type.

B. Instrument versus Activity/Project

Evaluation Instrument*	**Interview**	**Focus Group**	**Survey**	**Test**	**Observation**	**Concept Map**
Project/Activity						
Talk/lecture (short, single event)	Poor	Poor	Fair	Good to Fair	Poor	Fair
Workshop (single event)	Fair	Fair	Good	Good	Poor	Fair
Series (multiple meetings)	Good	Fair	Good	Good	Fair	Fair
Training (skill building)	Good	Good	Fair	Fair	Good	Fair
Tour (adults)	Good	Fair	Fair	Fair	Fair	Poor
Tour (3-16 year olds)	Fair	Fair	Poor	Poor	Fair to Poor	Poor
Event/festival	Good	Fair	Good	N/A	Fair	N/A
Interpretive sign(s)	Good	Fair	Fair	Fair	Good	N/A
Exhibit	Good	Good	Good	Fair	Good	Good
Curriculum packet/materials	Good	Fair	Good	Fair	Fair	Fair
Kits/activities	Good	Fair	Good	Fair	Good	Fair
Publications	Good	Fair	Fair	Fair	Poor	Poor
Media (e.g., video)	Good	Good	Good to Fair	Poor	N/A	Fair
Interactive media (e.g., CD)	Good	Good	Good to Fair	Fair	Good	Good
Website	Good	Fair	Good to Fair	Fair	Good	Good

*Literature review and document review utilize existing sources of information that are not dependent on the type of activity. Case study involves creating a detailed description of a project or a participant's experiences with a project. Data for a case study can be collected through a combination of methods. The appropriateness depends, consequently, on the combination of methods used.

Part IV Wrap Up

A wide variety of data collection instruments have been described here. Each has specific uses with both benefits and limitations. Additionally, some instruments are better suited to assessing knowledge, skills, attitudes, or behaviors. The type of activity being assessed and/or the audience targeted for data collection has bearing on which instrument types will work best. Referring to the tables in this section will help in making these important decisions.

In the Appendices that follow, information about determining sample size, logic models and performance measures, and the levels of evaluation is provided for reference.

Appendices

Appendix A.
Determining Sample Size

A

The size of the sample is not nearly as important as the adequacy of the data collection design. Collecting large amounts of data from undefined sources is not recommended. If there is a bias in the data, it is unlikely to go away with more data collection. In conducting a survey, it is more important to obtain a representative sample than a large sample. Identify the groups to be sampled and put more effort into obtaining a high response rate (e.g., by phoning or sending reminders) rather than sending out large numbers of questionnaires and having a few undefined volunteers return them.

If time and resources permit, a more rigorous sampling scheme should be used. Identify a resource person who can assist the planning team with determining statistics such as sampling error, level of confidence or risk, the number of variables to be examined, and the degree of variability in the attributes being measured. With pilot data in hand, a resource person can work out the total sample size needed for the kind of accuracy desired.

If time or expertise is a constraint, use the following common sense guidelines:

- The size of sample needed depends upon two things: 1) how accurate the summary data needs to be (for example, for no sampling error at all, the entire population would need to be measured), and 2) how variable the data are. If the evaluator started measuring a variable and found that every measure was the same, there would be little need to continue repeating the measurements to increase accuracy. On the other hand, the more the data vary, the more data must be collected to get a reasonably accurate measure of the mean.
- Another consideration is acceptability to participants and audiences. For example, in collecting the views of staff, it might not be acceptable to take a sample, even though a sample would appear to be statistically adequate. Every staff member might need to be heard so that no one feels left out and there is no suspicion of bias.
- Sampling may also be unacceptable if it causes more disturbance than would measuring everybody. For example, it may disrupt a lesson more to withdraw six students than to the test the entire class.

Determining Sample Size – Rules of Thumb

Population	Sample
50 or less	50 or less
500 or less	approx. 200
1,000 or less	approx. 275
10,000+	approx. 350
U.S. population	2,000 to 4,000

Source: Fitz-Gibbon & Morris. (1987).

Minimizing Possible Errors in Random Sampling

Type	Cause	Remedies
Sampling error	Using a sample, not the entire population to be studied. Error that can occur from sampling individuals that do not estimate the population.	Larger samples reduce but do not eliminate sampling error.
Sample bias	Some of those selected to participate did not do so or provided incomplete information.	Repeated attempts to reach non-respondents. Comparison of characteristics of non-respondents to determine if any systematic differences exist.
Response bias	Responses do not reflect "true" opinions or behaviors because questions were misunderstood or respondents chose not to tell the truth.	Careful pre-testing of instruments to revise misunderstood, leading, or threatening questions. No remedy exists for deliberate equivocation in self-administered interviews, but it can be spotted by careful editing. In personal interviews, this bias can be reduced by a skilled interviewer.

Appendix B
Logic Models and Performance Measures

B

Logic models provide an easy starting point for the selection of meaningful and realistic measures of performance. How the overall project "works" must be understood in order to identify what needs to be measured. Logic models show how the project operates.

Performance measures (or indicators) relate to how well a project performs, particularly with regard to the delivery of services (outputs) and achievement of results (outcomes). Indicators are used to represent the targets specified at each level of the TOP model. They are measurable characteristics of how well the targets are achieved and how well the project is performing.

Logic models "flesh out" projects and allow planners to select what should be measured directly from the model. Using the logic model allows project planners to:

- Select meaningful measures of performance.
- Select performance measures from all levels of inputs, outputs, and outcomes.
- Recognize how individual projects can contribute to the larger scale (program) goals.

Common Types of Performance Measures (Indicators)

Outcomes:

- SEE Conditions: indices of water quality, public satisfaction, economic status
- Practices: adoption of practices, use of recommendations
- KASA: test scores, self-assessments, scale ratings
- Reactions: participant ratings of project activities, level of satisfaction with subject matter

Outputs:

- Participation: attendance, volunteer leadership in project activities, engagement
- Activities: frequency, duration, type of delivery, and content of activities

Inputs:

- Resources: amount of staff time, expenditures, and materials relative to project activities.

Logic Models as a Tool for Program Development and Evaluation

The logic model provides a visual representation of the program and its evaluation. The logic model illustrates the relationships among the various program components: initial situation (e.g., degraded coastal areas with declining numbers of species), identified priorities (e.g., restoring coastal areas, increasing species diversity); inputs (i.e., resources needed to accomplish a set of activities); outputs (i.e., activities designed to accomplish the program goal, as well as the audiences that participate in those activities); and short-term (immediate), medium-term (2-3 years), and long-term (4-10 years) outcomes-impacts. The logic model can help guide program planning, implementation, and evaluation. It can serve as a tool for clarifying program elements, identifying evaluation questions and indicators, and conducting ongoing self-evaluation.

Logic Model, Evaluation Questions and Indicators

SITUATION / PRIORITIES	INPUTS	OUTPUTS		OUTCOMES-IMPACTS		
		Activities	*Participants*	*Short-term*	*Medium-term*	*Long-term*
	Staff Money Time Materials Partners Research	Workshops Publications Services Events Products	Teachers Youths Community members	Increased knowledge Increased levels of skills	Increased knowledge and skills used in appropriate settings	Goal is reached and sustained
Example	Facilitator for workshop Field equipment Workshop materials and supplies	Workshops focusing on coastal restoration	Community members living in coastal areas	Community members who participate in workshops understand basics of coastal restoration	Ongoing participation in restoration activities by community members	Species diversity in restored areas increased

Evaluation Questions: What do you want to know?

Were the inputs sufficient and timely? Did they meet the program goals?	Did all activities occur as intended? What was the quality of the intervention? Was the content appropriate?	Did targeted community members participate? Who did not participate? Who else was researched?	Did knowledge increase? Did understanding of coastal restoration techniques increase? What else happened?	Are community members continuing to participate in restoration activities? Are they participating in other activities?	To what extent has the biodiversity of the targeted coastal area been increased? In what other ways has ecosystem quality increased?

Indicators: How will you know it?

Number of staff; Funds invested; Delivery timetable	Number of workshops scheduled; Publications printed; Number of events	Number of community members participating; Number of teachers attending workshops	Number, percent with increased knowledge of coastal restoration; Additional outcomes: +, -	Number, percent using new knowledge and skills to monitor progress of restoration activities; Additional outcomes: +, -	Number of species recovered; Other positive environmental benefits; Additional outcomes: +, -

Source: Powell, E ., Jones, L . and Henert, E. (2002). *Enhancing Program Performance with Logic Models*. Retrieved December 2003, from the University of Wisconsin-Extension web site: http://www.uwex.edu/ces/lmcourse

Appendix C
Levels of Evaluation

As we know from the TOP model there are a number of levels on which to evaluate projects. Each level provides different information about the processes and outcomes of a project. The project team should select the level of evaluation based on the type of information needed to evaluate the project accurately. The levels are discussed in more detail below:

Scaling the program evaluation staircase

SEE Conditions: Have targeted social, economic, or environmental conditions changed as a result of targeted changes in behavior? How have the participants been affected?

Practices: Did participants' behavior change as a result of the knowledge, attitudes, skills, or aspirations learned during project?

KASA: What did the participants learn? Did participants improve skill or abilities?

Reactions: What were the participants' responses to the project or activity? Were participants satisfied with the project activities?

Participation: How many of the targeted audience attended the project? Were participants engaged in the activities?

Activities: Were activities implemented as planned? What promotional strategies worked or failed?

Resources: Were targeted resources expended on the program (staff, time, money)?

Source: Bennett, C. and Rockwell, K. (2004). *Targeting Outcomes of Programs (TOP): A hierarchy for targeting outcomes and evaluating their achievement.* Retrieved January 2009, from University of Nebraska-Lincoln website: http://citnews.unl.edu/TOP/index.html

Level 1: Resources

Evaluation at the resources level generally includes monitoring activities to explain the scope of the project in terms of dollars expended and staff time used. The most common way of doing this is to keep careful records so reporting this information is accurate.

Level 2: Activities

Monitoring project activities (outputs) requires monitoring the amount of services, products, or activities delivered during a specified period of time. Keeping track of the amount of activities conducted, products developed, or services rendered is good management. Common examples include the number of professional development trainings delivered, the number classroom visits conducted, and the number education kits given away. Recall that process or implementation evaluation assesses the quality and quantity of activities planned with what was actually done.

Level 3: Participation

Participation is considered the active involvement by the targeted participants in education projects. Although recording attendance is certainly one method of monitoring the amount of time spent in an activity or project it is does not convey how "active" the participants were. Studies suggest that higher levels of participation can lead to desired outcomes. The more engaged or active the participants are in the project, the more likely they will be to make needed changes.

Keeping records of intensity, duration, and breath of participation are all part of monitoring at the participation level. Intensity is the amount of time participants spend in a project or activity over a given period of time. Intensity is measured in terms of hours per day, days per week, and weeks per year. Duration summarizes the history of attendance, whether the participant is new to the project or has been attending for some time. Breath refers to the variety of activities participants attend within and across projects. Participants that are active in multiple projects may be more apt to achieve desired project outcomes.

Level 4: Reactions

Reactions measure the audiences' immediate positive or negative response to the project or learning experience. This is the most common level of outcome evaluation. Often referred to as "smile sheets," these evaluations ask participants to rate their perceptions about the quality and impact of the specific project or activity. Smile sheets can range from a handful of questions regarding the project delivery, facility, and/or usefulness, to forms that ask participants to rate all aspects of the activity. Reaction evaluations are an important tool to measure participants' satisfaction. They are relatively easy to administer, tabulate, and summarize in a results report

Example questions to assess reactions:

> **Attending the workshop was a:**
> Poor use of my time 1……2……3……4……5 Good use of my time
>
> **Length of workshop in relationship to the materials presented was:**
> Too long 1……2……3 (just right) ……4……5 Too short

Workshop facilities were:
Inadequate 1……2……3 (adequate) ……4……5 Great

What were the strengths and weaknesses of the workshop?

Level 5. KASA

Evaluation at the KASA level measures whether participating in the project increases the audience's knowledge, attitudes, skills, and aspirations toward the issues.

A number of different instruments or tools can be designed to measure what project participants have learned. Before and after tests, simulations or demonstrations, or other in-class methods allow instructors or project designers to determine if the knowledge or skills identified in the objectives were learned. It is important to remember that regardless of the method used to determine project outcomes at the KASA level, the "test" must relate directly to the course objectives.

KASA level instruments are customized for every instructional activity or project and must reflect the conditions of the specific job or real-world application of the learning. It is also important to remember that KASA evaluations measure the level of knowledge or skills of participants at the time the test is administered. Unless the instruments are administered as part of a longitudinal evaluation design, they do not measure long-term knowledge or skill retention, nor are they an indication of how these will be applied to a real-world situation.

Example questions to assess KASA:

What was the most important thing you learned by participating in the workshop?

List three benefits of an estuary:
1.
2.
3.

True or False: An estuary is the same as a bay.

Level 6. Practice or Behavior Change

Questions at the behavior or practices level measure whether the participant has been able to *use* the new knowledge learned and skills aquired during a specific education project.

Determining behavior changes is more complex than assessing at the reaction and KASA levels in that it requires contacting participants after they have had time to apply the new knowledge and skills. As with other evaluation levels, many different instruments can be used to collect the data. Each instrument has different strengths and limitations.

Instruments include surveys, interviews, focus groups, observations, and written document review. Regardless of the instrument, the questions should target specific skill and knowledge areas and ask participants if and how they have applied what they learned during the education project to these situations. Questions should focus on relevance of the program, whether participants have used the materials provided during the learning experience, how new knowledge has been applied, and examples of ways new skills have been applied.

Measuring the application of the new knowledge and skills learned is becoming more accepted as an aspect of evaluation. It is important to know not only that participants understood the material during the learning experience, but that they were then able to go back to their homes, communities, or jobs and apply it. This level of evaluation provides evidence of whether transfer of learning has occurred. It is much more powerful to justify a project by demonstrating that participants used the information than by reporting the number of participants that "liked" the project. Many decision makers are now demanding this level of evaluation to account for the resources spent educating the target audience.

Example questions to assess practice or behavior change:

Have you applied the skills you learned at the workshop to your current projects?
Not at all 1……2……3……4……5 Extensively

Have you implemented the action plan you developed at the workshop?
Not at all 1……2……3……4……5 Extensively

Please describe one way you have used the materials in the past 6 months:

Describe one component of your action plan that you have implemented fully:

Have there been barriers in applying the information learned during the workshop?
☐ No
☐ Yes
If yes, please explain your answer:

Level 7. SEE Conditions

Evaluating the impacts of the project on social, economic, or environmental conditions means measuring the degree to which KASA and behavior changes have affected the environment or the audience's lives.

There is constant pressure within agencies to demonstrate the efficiency and effectiveness of their projects. In order to actually conclude that a project has had its desired effect, the participants have to "successfully" apply the new skills or knowledge. That is, the application of new skills and knowledge leads to the desired result or impact on an audience or the environment. This level of long-term feedback is becoming increasingly important, particularly when priorities are being set or when decisions to continue or discontinue the project are being made.

Measuring SEE conditions is typically feasible only for large-scale projects designed to produce specific results for a specific audience. For example, if the goal was to measure the *results* of teaching participants how to be a facilitator, the evaluator would need to focus on the people who experienced facilitation conducted by the project participants. This requires that data collection be at least one step removed from the initial participants in the project. Because it can be quite difficult to isolate the effect of the project, this level of evaluation can be complex and is not very common.

Example questions to assess practice or behavior change:

> After training on estuary restoration:
> **How many acres of estuary have been successfully restored?**
>
> After a train-the-teacher workshop:
> **To what extent have you incorporated ocean literacy principles into your curriculum?**
> Not at all 1……2……3……4……5 Extensively
>
> **Have student tests scores increased as a result of incorporating ocean literacy principles into your curriculum?**
> Not at all 1……2……3……4……5 Extensively

Glossary

Assessment involves gathering data (either formally or informally) to be used in forming judgments (adapted from Mehrens and Lehman, 1991).

Baseline data are collected at the beginning of the project prior to any services or activities being conducted.

Capability (PPBES definition) is the ability to do something. It is a combination of activities, processes, and skills.

Capacity (PPBES definition) is the amount of resources needed to undertake a project (input capacity) or the amount of products created as a result of the project (output capacity).

Evaluation is the systematic collection of information about activities, characteristics, and outcomes of projects to make judgments about the project, improve effectiveness, and/or inform decisions about future programming (adapted from Patton, 2002).

Goal of a project is the ultimate, "big picture" impact desired. Goals are often difficult, if not impossible, to quantify.

Items are individual questions on an instrument.

Needs Assessment is a systematic investigation of an audience(s) to identify aspects of individual knowledge, skill, interest, attitude and/or abilities relevant to a particular issue, organization goal, or objective.

Objective of a project is a specific measurable outcome desired.

Population is the entire collection of individuals about whom one is trying to make accurate statements.

Program represents a coordinated and systematic effort to address a part of the agency's mission.

Project is an effort or activity focused on specific issues and audiences. A set of projects, taken together, supports a program.

Qualitative Data are descriptive rather than enumerative. They are usually provided in the form of words, such as descriptions of events, transcripts of interviews, and written documents. Qualitative data can be transformed into quantitative data through coding procedures.

Quantitative Data are numeric data. Analysis of quantitative data involves looking at relationships between quantities.

Reliability is the extent to which a data gathering instrument measures a variable consistently time after time.

Response rates are the percentage of a selected sample from which data were collected (responses actually received). A further calculation can sometimes be made of the fractions of the population requested in the sample.

Sample is a subset of the population from which information is collected.

Survey Instruments are any consistent method or tool by which information is systematically gathered.

Validity of an instrument is the extent to which it measures what it purports to measure. A test may be valid for one purpose, but not another.

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