(Towards) Developing an Evaluation System for NOAA B-WET GOM

Anita Kraemer, MS
Senior Research Associate
Institute for Learning Innovation
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(Towards) Developing an Evaluation System for NOAA B-WET GOM

- Your experience with program evaluation
- Review program evaluation steps
- A few evaluation resources
- B-WET Chesapeake and California evaluation approaches
- Strategies for developing an evaluation system

Program Evaluation Steps

- Take stock of evaluation context
- Engage stakeholders
- Define evaluation purpose
- Describe program
- Prioritize evaluation questions
- Create indicators
- Collect and analyze data
- Use results!

Program Evaluation Steps

- Take stock of evaluation context:
  - How much money?
  - Who is going to do it?
  - Is there a deadline?
  - Will you need to get IRB approval and/or participant consent?
  - Etc.

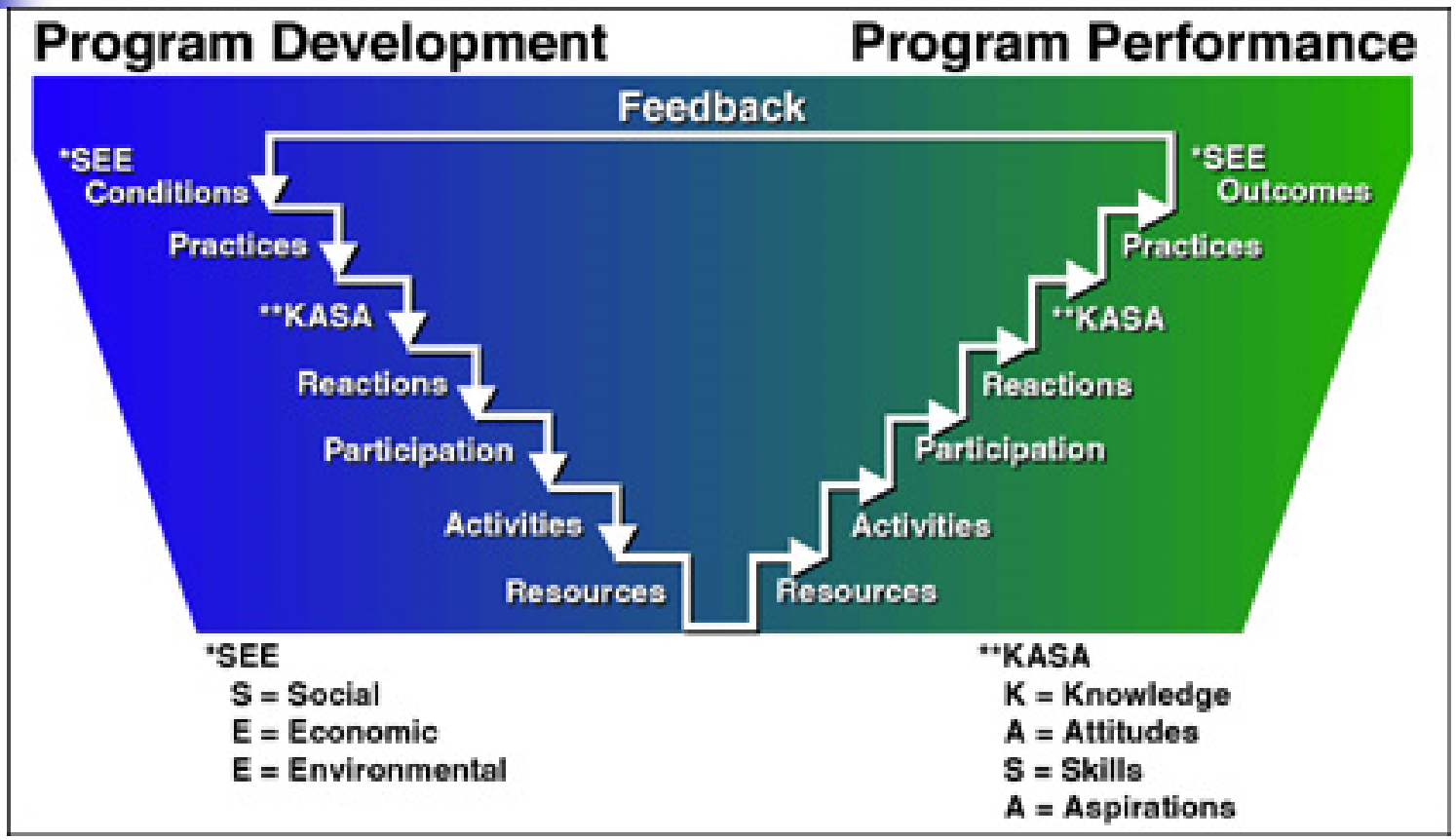
Program Evaluation Steps

- Engage stakeholders: Decide who needs to be part of the design and implementation of the evaluation
  - Those served or affected by the program
  - Those involved in program operation
  - Primary intended users of the evaluation findings

Program Evaluation Steps

- Describe the program in detail
  - What does your program try to achieve?
  - Who participates in your program?
  - What do the participants do?
  - Why do you think those activities will lead to your intended program outcomes?
- Logic models are a useful tool

Program Evaluation Steps



Bennett's Hierarchy for Targeting Outcomes of Programs (TOP)
http://citnews.unl.edu/TOP/english/index.html

Program Evaluation Steps

Characteristics Associated with Environmentally Responsible Behavior (Hungerford & Volk 1990)

ENTRY-LEVEL

Major variable

- Environmental sensitivity

Minor variables

- Knowledge of ecology
- Androgyny
- Attitudes toward pollution, technology, and economics

OWNERSHIP

Major variable

- In-depth knowledge about issues

Minor variables

- Knowledge of the consequences of behavior – both positive and negative
- A personal commitment to issue resolution

EMPOWERMENT

Major variables

- Knowledge of and skills in using environmental action strategies
- Locus of control (expectancy of reinforcement)
- Intention to act

Minor variable

- In-depth knowledge about issues

Program Evaluation Steps

- Example: NOAA B-WET Cross-regional grantee logic model

Program Evaluation Steps

- What is the purpose of the evaluation?
  - Accountability
  - Program improvement
- How does the purpose influence the evaluation design?
  - Non-experimental (descriptive)/Quasi-experimental/ Experimental

Program Evaluation Steps

- Prioritize evaluation questions
  - Implementation (Process): Is program in place as intended?
  - Effectiveness (Outcomes): Is program achieving its intended short-, mid, and/or long-term effects/outcomes?
  - Efficiency: How much “product” is produced for given level of inputs/resources?
  - Causal Attribution: Is progress on outcomes due to your program?

Program Evaluation Steps

- Create indicators for each question
  - What evidence do you need to answer the question? What does success look like?
- Decide on collection method(s) that will provide data to match the indicators

Data Collection Methods

		Types of Outcomes			
		Knowledge (of facts, processes, actions, etc.)	**Affect** (attitudes, emotions, intentions, etc.)	**Skill** (ability)	**Behavior** (actions)
Types of Evidence	**Written**	▪Questionnaire (direct, self-report, other-report) ▪Standardized test (direct) ▪Concept maps (direct) ▪Journal (direct, self-report) ▪Student work (direct)	▪Questionnaire (self-report, other-report) ▪Journal (self-report)	▪Questionnaire (self-report, other-report) ▪Journal (self-report)	▪Questionnaire (self-report, other-report) ▪Journal (self-report)
	Verbal	▪Individual interview (direct, self-report, other-report) ▪Focus group (self-report, other-report)	▪Individual interview (self-report, other-report) ▪Focus group (self-report, other-report)	▪Individual interview (self-report, other-report) ▪Focus group (self-report, other-report)	▪Individual interview (self-report, other-report) ▪Focus group (self-report, other-report)
	Physical		▪Observe expression, body language (other-report)	▪Observe skilled action (other-report) ▪Observe results of skilled action (other-report)	▪Observe behavior (direct) ▪Observe results of behavior (direct)

Program Evaluation Steps

- Analyze data
- Use the results!

EE Program Evaluation Resources

- Workbook
  - *Evaluating Your EE Programs.* 2009. Ernst, Monroe & Simmons, NAAEE.

- NOAA Education Evaluation Websites
  - NOAA B-WET California, National Marine Sanctuaries.
  - NOAA B-WET Chesapeake, Chesapeake Bay Office.

Consult *My Environmental Education Evaluation Resource Assistant* (MEERA)

Free web-based evaluation resource designed to support the evaluation efforts of environmental educators

www.meera.snre.umich.edu

Project Leader:
Dr. Zint

Partners:
Environmental Protection Agency
Forest Service

MEERA's Evaluation Steps

1: Before You Get Started

2: Clarify Program Logic

3: Set Goals and Indicators

4: Choose Design and Tools

5: Collect Data

6: Analyze Data

7: Report Results

8: Improve Program

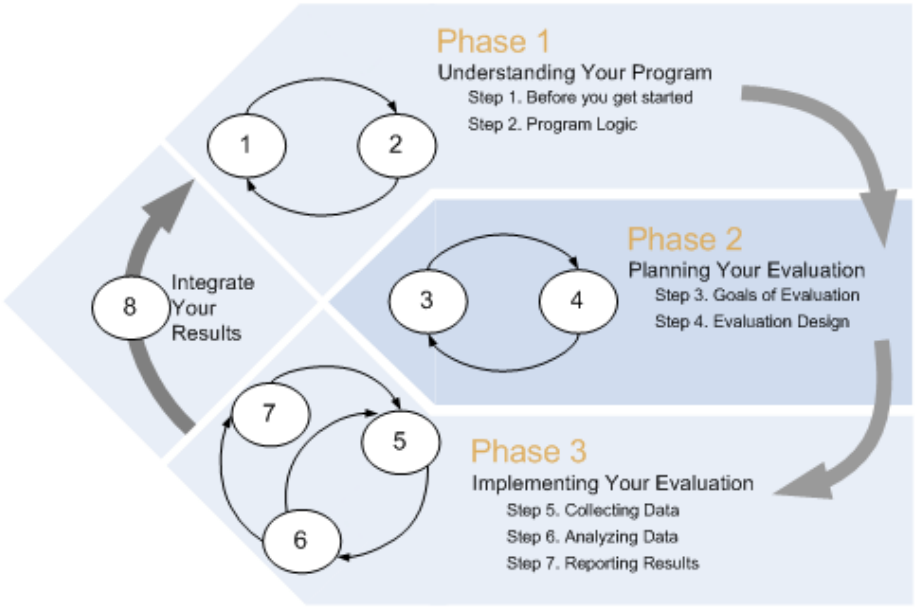


Figure: Phases of Evaluation

From: http://meera.snre.umich.edu/plan-an-evaluation/plonearticlemultipage.2007-10-30.4643560864/welcome-to-the-process-of-evaluation

Step 1: Before You Get Started

e.g., How do I find and work with an internal or external evaluator?

Where do I find external evaluators?

While there are many ways to find external evaluators, the process typically involves either advertising a request for proposals or identifying and approaching specific evaluators. In addition to local, national, and online sources of potential evaluators, you may want to browse the sample MEERA evaluations and contact authors of evaluations that are similar to what you are looking for.

WANTED **Sample Requests for Proposals**

Please contact Dr. Michaela Zint with your sample requests for proposals.

The Program Manager's Guide to Evaluation, Chapter 4: How do you Hire and Manage an Outside Evaluator?

US Department of Health and Human Services, Administration for Children and Families

Beginner Intermediate

This document outlines the basic steps for finding an evaluator and lists resources for finding evaluators.

Evaluator Directories

Several organizations maintain online, searchable directories of evaluators. Please note that MEERA does not endorse any specific evaluator; it is your responsibility to contact the consultants or firms to decide whether or not they will meet your needs.

The Registry of Outcome Evaluators

U.S. Department of Education, What Works Clearinghouse

Search by geographic region, individual/organization, target populations, or content area (including EE).

Find an Evaluator

American Evaluation Association

Browse all listings or search by name, keyword, or geographic area.

TIP **Contact Evaluators at Local Universities**

Many universities have faculty members who specialize in program evaluation and/or an extension office with an evaluation specialist on staff. These experts may be available for contract work or may be able to recommend other evaluators in the area. Alternatively, if the time frame for completing your evaluation is flexible, you might consider hiring a graduate student to conduct your evaluation as his or her thesis project. This option is typically less expensive than hiring a professional. If you go this route, be sure to ask about

Step 4: Choose Design & Tools

e.g., Which method should I use to collect data?

More Resources on Specific Types of Tools:

Questionnaires

- Collecting Evaluation Data: Surveys (.pdf), *University of Wisconsin Extension - Program Development and Evaluation Unit*
- Questionnaire Design: Asking questions with a purpose (.pdf), *University of Wisconsin Extension - Program Development and Evaluation Unit*

Observations

- Collecting Evaluation Data: Direct Observation (.pdf), *University of Wisconsin Extension - Program Development and Evaluation Unit*

Focus Groups

- Quick Tips: Focus Group Interviews (.pdf), *University of Wisconsin Extension - Program Development and Evaluation Unit*

Interviews

- Conducting Key Informant Interviews (.pdf), *USAID Center for Development Information and Evaluation*

Don't put all of your eggs in one basket!

Relying on one single tool to collect all your data can be limiting. There may be an unforeseen glitch in administering your data collection process or in analyzing its results. Or after collecting the data, you may realize that your tool did not portray the situation objectively. For example, environmental educators often rely on participants to self-report their knowledge, commitment, or behaviors versus relying on direct testing of participants' knowledge and/or direct observation of their behaviors. Though self-reports are useful (and the only option in some cases), such results tend to be more biased. If at all possible, build in ways to cross-check the consistency of information, and administer several complementary tools to help ensure your findings are complete, valid, and reliable (NSF Education and Human Resources, 2005).

How big should my sample be?

Quantitative Data

The ideal sample size depends on how you plan to analyze the data you collect and the size of the overall population (e.g., the total number of participants, visitors, etc.). Many evaluators use descriptive statistics to analyze and report data (See Step 6). For example, if you ask teachers to rate how likely they are to implement a new EE curriculum on a scale of 1 to 7 ("extremely unlikely" to "extremely likely"), you might report the mean response and the percent of respondents who are "likely" to "extremely likely" to implement it. If this is similar to how you plan to report your evaluation results, then your primary concern is to choose a sample that is *roughly* large enough to accurately represent your population. The table below provides rules of thumb for choosing an appropriate sample size.

population	sample size	percent required
10	10	100
20	19	95
50	44	88
100	80	80
250	152	61
500	217	43
1,000	278	28
2,500	333	13
5,000	350	7
10,000	370	4

From Krejcie, R.V., and Morgan, D. E. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30(3)*: 607-610.

Choosing a big enough sample is more critical if you want to use inferential statistics. This type of statistics allows you to test whether there are significant differences either between groups (e.g., does your program have a different impact on girls versus boys) or within individuals (e.g., do participants have more pro-environment attitudes after completing your program than before they started). If you choose a sample that is too small, you increase the likelihood that the differences identified by the analysis are due to chance -- and did not occur as a result of your program! For additional guidance on determining a sample size, see the extended discussion on power analysis.

Step 5: Collect Data

e.g., How big should my sample be?

What software can I use to analyze quantitative data?

Software programs are invaluable in carrying out most quantitative statistical procedures. In fact, many of the procedures would be impossible for most individuals to carry out without such software. Fortunately there are many software programs to choose from including inexpensive or free ones:

- **Using Excel for Analyzing Survey Questionnaires (.pdf)**
  Beginner
  This guide provides step-by-step instructions on using Microsoft Excel to:
  - Create a database of responses
  - Code data
  - Display frequencies and percentages
  - Calculate an average (mean), range, standard deviation, etc.
  - Create cross-tabulations and pivot tables
- **Statpages.org**
  Beginner Intermediate Advanced
  This online clearinghouse offers links to hundreds of free resources for statistical analysis, including downloadable software packages, online statistics books, tutorials, and hundreds of pages that perform statistical calculations. This is a good place to go once you have a basic understanding of quantitative analysis and an idea of what you need for your own analysis.
- **Open Stat**
  Intermediate Advanced
  Open Stat is a free software package for performing statistical analyses. It is relatively simple to use and you can paste data into it from Microsoft Excel. There are some unique aspects to how it works, but it supports a variety of simple to complex analysis procedures, including frequencies, t-test, ANOVA, multiple regression, factor analysis, etc.
- **SPSS**
  Intermediate Advanced
  SPSS is one of the most popular software packages for statistical analysis and data management, though it is not free. It includes tools to help you organize, prepare, and understand your data, perform statistical analyses including basic descriptive statistics, regression, and many advanced procedures. It also helps you prepare results for presentation and reporting.

Step 6: Analyze Data

e.g., What software can I use?

Step 7: Report Results

e.g., How should I organize my report?

How should I organize my report?

Evaluation reports are often quite similar in what they include and how they are organized. The format and details, however, will vary depending on the audience and purpose of the report. The following resources should help you determine what to include in the report, and how best to organize its content.

- **Reporting Evaluation Results of Extension Programs (.pdf)**
  University of Florida, IFAS Extension
  Beginner | Intermediate
  This five page PDF fact sheet offers a list and brief description of the elements that should be included in an evaluation report. It suggests that there should be a cover, title page and table of contents as well as purpose, methods, results and conclusion sections. For each of these, additional suggestions are offered. There are also sections with suggestions for presenting evaluation results orally and for sharing them with reporters.

- **Developing Evaluation Reports**
  National Science Foundation Directorate for Education and Human Resources
  Beginner | Intermediate
  This resource identifies and describes the basic components of an evaluation report. It suggests that the following be covered 1) What the project was about, 2) What questions were addressed in the evaluation, 3) What outcomes were studied and why they were selected, 4) How those outcomes were measured and the quality of the measurement instruments, 5) Who was included in the study sample, 6) How the data were analyzed, 7) What you found, and, 8) What you have concluded.

- **Evaluation Report Checklist (.xls)**
  Miron, G. The Evaluation Center, Western Michigan University
  Advanced
  This resource consists of a detailed checklist of what to include in an evaluation report. Because the information is presented in an Excel spreadsheet, it can be used to delegate, coordinate, and monitor progress among report contributors.

Unique Resource

Check out the **evaluation report template (.pdf)** used by the Environmental Education & Training Partnership (EETAP). Courtesy of EETAP.

Learn from examples – MEERA has ….

Searchable database

Search EE Evaluation Profiles

This page enables you to find MEERA's environmental education evaluation profiles. You can browse all evaluation profiles by clicking the "browse" button. You can also search for specific text or by selecting specific program or evaluation search terms.

Browse

Search Text
For a text search, enter your search term(s) here. Combine multiple search terms with AND or OR. The text in this field will be matched with the evaluation's title, comments, authors, journal and publisher.

WANTED **Evaluation Reports**
MEERA currently offers a few sample evaluation profiles. Help us add more by sharing your evaluation reports. As additional examples and funding become available, more reports and profiles will be added.

Program Search Terms

Setting:
- ☐ Formal
- ☐ Nonformal
- ☐ Informal

Type:
- ☐ Lesson/Unit/Curriculum
- ☐ Issue Investigation/Service Learning
- ☐ Field Trip/Guided Tour
- ☐ Interpretive Exhibits
- ☐ Club/Interest Group
- ☐ Camp/Residential Program
- ☐ Workshop/Course
- ☐ Outdoor Adventure/Recreation
- ☐ Out of School/After School
- ☐ Mass Media Campaigns

Topic:
- ☐ Agriculture/Gardening
- ☐ Animals/Plants/Wildlife
- ☐ Biodiversity
- ☐ Career Choices
- ☐ Climate Change
- ☐ Ecology/Ecosystems
- ☐ Energy
- ☐ Earth Sciences
- ☐ Human Health
- ☐ Pollution
- ☐ Recycling/Waste Reduction
- ☐ Sustainability

Audience:
- ☐ Preschool
- ☐ Primary School
- ☐ Secondary School
- ☐ College/Continuing Education
- ☐ Teachers
- ☐ Nonformal Educators
- ☐ Other Professionals
- ☐ Youth/Community Groups
- ☐ Adult/Community Groups
- ☐ Other Groups/Individuals
- ☐ Underserved/Minority Groups

Evaluation Search Terms

Type:
- ☐ Evaluation Plan
- ☐ Needs Assessment
- ☐ Process/Implementation
- ☐ Outcome
- ☐ Impact

Evaluator:
- ☐ Internal
- ☐ External

Outputs:
- ☐ Participants
- ☐ Activity Implementation
- ☐ Satisfaction

Outcomes:
- ☐ Knowledge
- ☐ Attitudes/Values
- ☐ Skills
- ☐ Behaviors

Impacts:
- ☐ Environment
- ☐ Education
- ☐ Health

Approach:
- ☐ Quantitative
- ☐ Qualitative

Data Collection:
- ☐ Existing Data/Documents
- ☐ Focus Groups
- ☐ Interviews
- ☐ Logs/Journals/Student Work
- ☐ Observations/Visitor Tracking
- ☐ Standardized Tests
- ☐ Questionnaires/Surveys

Design:
- ☐ Pretest
- ☐ Posttest
- ☐ Retrospective Pretest
- ☐ Retention/Follow-up Test
- ☐ Comparison/Control Groups
- ☐ Multiple Treatment Groups
- ☐ Random Assignment

Analysis:

Quantitative Data
- ☐ Descriptive Statistics
- ☐ Inferential Statistics

Qualitative Data
- ☐ Key Incident Analysis
- ☐ Content Analysis w/ Categorization of Responses
- ☐ Content Analysis w/ Descriptive Statistics
- ☐ Content Analysis w/ Inferential Statistics

search

NOTE: This search was modeled after the Harvard Family Research Project's Out-of-School Time Program Research and Evaluation Database

Evaluation Summaries

Evaluation of the Chesapeake Bay Foundation's Conservation Education Programs

Summary
The Chesapeake Bay Foundation (CBF) asked the authors to conduct an evaluation of five youth and two teacher education programs. The main goal of the evaluation was to determine to what extent these programs influence participants' level of environmentally responsible behaviors. In light of this goal, data were collected on variables that have been linked to environmentally responsible behaviors. These variables included participants' environmental sensitivity, perceived knowledge of ecology/issues/action strategies, personal responsibility, perceived skill, and intention to act. Information about teachers' perceived barriers to teaching about the Bay was also obtained. Based on the evaluation's results, CBF decided to adapt each program to target a smaller number of specific ERB characteristics instead of attempting to influence all ERB characteristics through each one of its programs. CBF also focused on encouraging teachers to use multiple activities and programs which build on one another. Last, more effort was put into helping teachers implement the curriculum as intended and reducing their barriers to teaching about the Bay.

Detailed Profile Available.

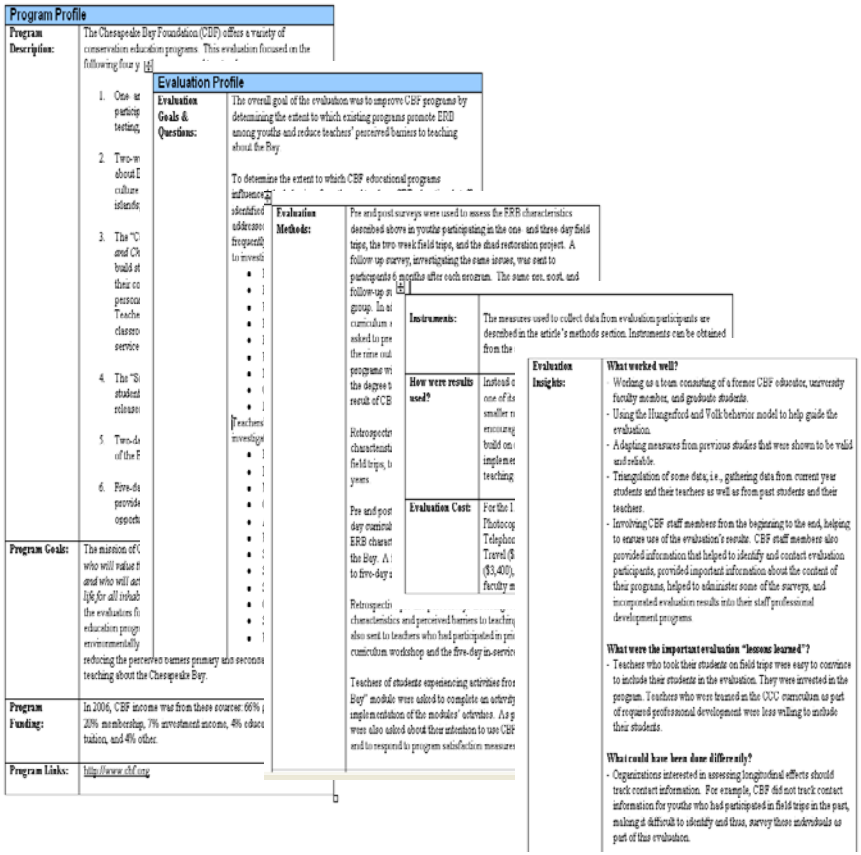
Full Report The citation for this published evaluation is:
Zint, M., Kraemer, A., Northway, H., & Lim, M. (2002). Evaluation of the Chesapeake Bay Foundation's conservation education programs. *Conservation Biology*, 16(3): 641-649.

Instruments Questions used to collect evaluation data are described in the article.

Program Search Terms		Evaluation Search Terms	
Setting:	Formal Nonformal	**Type:**	Process/Implementation Outcome
Type:	Lesson/Unit/Curriculum Issue Investigation/Service Learning Field Trip/Guided Tour Workshop/Course	**Evaluator:**	External
Topic:	Animals/Plants/Wildlife Biodiversity Ecology/Ecosystems Earth Sciences Pollution	**Outputs:**	Activity Implementation Satisfaction
Audience:	Secondary School Teachers	**Outcomes:**	Knowledge Attitudes/Values Skills Behaviors
		Impacts:	
		Approach:	Quantitative
		Data Collection:	Logs/Journals/Student Work Questionnaires/Surveys
		Design:	Pretest Posttest Retrospective Pretest Retention/Follow-up Test Comparison/Control Group
		Analysis:	Descriptive Statistics Inferential Statistics

Learn from examples – MEERA has ….

Evaluation Profiles



<u>Program</u>

- What was evaluated?

<u>Evaluation</u>

- How were results used?

- What did it cost?

- What were evaluation "lessons learned"?

NOAA B-WET Evaluation Approaches

- Chesapeake (2007)
  - Summative
  - External (stellar) evaluators
- California (ongoing)
  - Formative
  - Contracted, “on call” evaluator (she’s also stellar)
- National Evaluation System (in development)

NOAA B-WET Evaluation Approaches

Gulf of Mexico?

Anita Kraemer: kraemer@ilinet.org

Some materials in this presentation from
Evaluation 101: An Overview for New Eval Practitioners, Thomas Chapel, CDC.