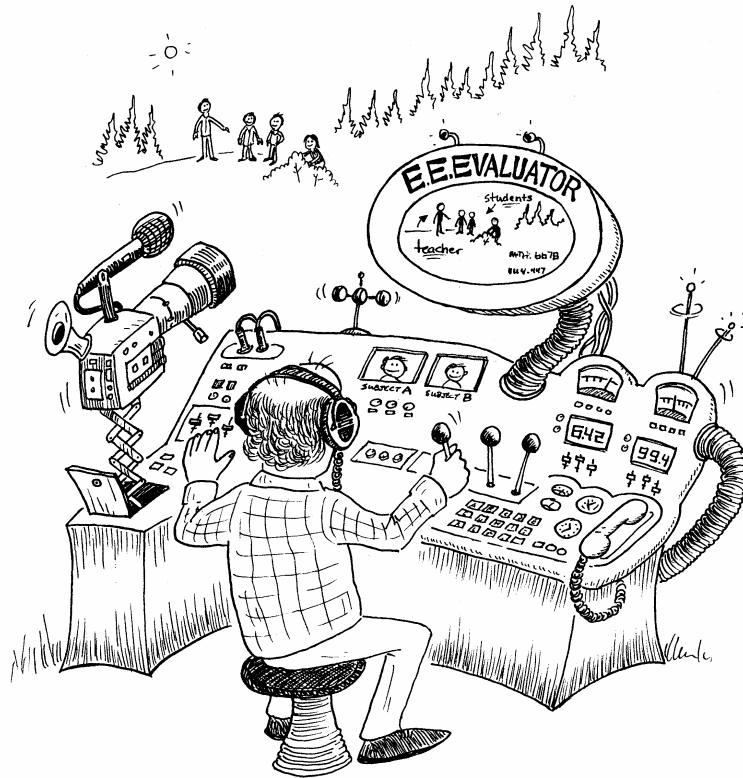# Measuring the Success of Environmental Education Programs

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CANADIAN PARKS AND WILDERNESS SOCIETY

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Executive Summary

Today more than ever, society needs high-quality environmental education programs that succeed in moving values and changing behaviours in the direction of sustainability and environmental conservation. Effective, relevant evaluation offers a very powerful way to improve these education programs and enables them to succeed in accomplishing more of their objectives and goals.

Funders and programmers alike strive for better techniques to evaluate the success of environmental education. Methods of evaluation are often poorly understood, particularly among professionals who deliver environmental education programs. A survey of both these professionals and academics found a scarcity of techniques to measure the more challenging outcomes such as values shift, behaviour change, and benefits to the environment. This document is an attempt at outlining and describing pertinent educational evaluation methodologies and tools. Its purpose is not to reinvent the wheel, but rather to connect environmental educators with solid, practical evaluation strategies, methods and advice.

Outcome-Based Evaluation is rapidly growing in popularity and use among both funding and the non-governmental community, and the authors describe a program logic model and an evaluation scheme that flows from this model, using illustrative examples from existing environmental education programs. Finally, some outcome indicators are suggested that can be used to assess the 'hard to measure' long-term outcomes that pertain to values, behaviour, and environmental benefits. This report also briefly reviews the basic tenets of environmental education, reports on ten principles of excellent environmental education, and includes a glossary and written and on-line resources to assist the reader.

Acknowledgements

Also, throughout this document we have cited the works of several individuals and organizations that have published a great deal on materials on evaluation. Some individuals, such as Carter McNamara, have done extensive work on Outcomes-Based Evaluation. We gratefully acknowledge our debt to these workers especially those that we have referenced. For more information, please refer to the **Resources** section at the end of this document.
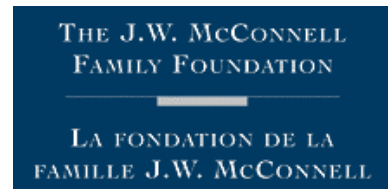
A Note About This Document

This is a living document, and the authors welcome any constructive feedback or suggestions that would help improve subsequent drafts. Contact the BC Chapter's Jenn Hoffman (education@sierraclub.bc.ca) or Canadian Parks and Wilderness's (CPAWS) Gareth Thomson (gthomson@cpawscalgary.org) with your feedback.

Introduction

We live in an age in which environmental educators are increasingly being challenged by their funders and their audiences to demonstrate their results, and where accountability and performance measurement techniques are increasingly being emphasized. A good evaluation program can satisfy this need – **and** it can do more. Careful reflection about and attention to the results of a good program evaluation can provide environmental education professionals with concrete ideas on how to improve the management and ultimate performance of their programs. That is, a good evaluation program can improve the education that students receive.

This report is aimed at two audiences: professionals working in the field of environmental education who strive to improve their programs and achieve their goals and objectives; and the funding community, who wrestle with issues of accountability and results when faced with environmental education proposals. The intent of this document is to provide program designers and funders with a succinct set of recommendations on the best instruments that can be used to measure the success of education programs, all the while keeping the learner at the centre of any evaluation. One of our goals is to make a document that allows environmental education programmers of any level and organizational size to overcome their 'fear' of evaluation, and to plan for and carry out evaluations of their programs. We have tried to create a 'one-stop shopping centre' complete with discussions and examples of tools, planning strategies, and a solid example of one particular evaluation strategy that works well for programs. We hope that environmental education professionals will come to see an evaluation plan as a critical part of their program, as important as the provision of services, classroom presentations or the creation of teacher activity guides.

About Environmental Education and Evaluation

1. What is 'Good' Environmental Education?

> Environmental education has been defined and redefined over the last twenty-five years. Definitional issues are inherent in a field this broad and encompassing. It is generally agreed that environmental education is a process that creates awareness and understanding of the relationship between humans and their many environments – natural, man-made, cultural, and technological. Environmental education is concerned with knowledge, values, and attitudes, and has as its aim responsible environmental behaviour.
>
> NEEAC, 1996

Appreciation of, and concern for our environment is nothing new. Since the early writings of John Muir, Aldo Leopold and Henry David Thoreau, amongst others, concern over humankind's impact on the environment has been well discussed and documented. In 1962, Rachel Carson's release of *Silent Spring*, a seminal work documenting the effects of pesticides in the environment, brought about a new sense of urgency in how humankind interacted with their environment. As Daniel Einstein notes, "a new educational movement was born" (1995). *Silent Spring* quickly became a catalyst for the environmental movement. From this movement, a different emphasis began to emerge, one of awareness of human complicity in environmental decline and the involvement of public values that stressed the quality of the human experience and hence of the human environment (NEEAC, 1996). Public concern over our effects on the world around us began to mount. Events that both celebrated the environment as well as called to attention the issues affecting it became increasingly popular. Earth Day was born. Those that taught about the environment called for a new type of curriculum that included an examination of the values and attitudes people used to make decisions regarding the environment (Einstein, 1995). And environmental educators began work towards a common definition for environmental education.

Much of the work on environmental education within the last quarter century has been guided by the *Belgrade Charter* (UNESCO-UNEP, 1975) and the *Tbilisi Declaration* (UNESCO, 1978). These two documents furnish an internationally accepted foundation for environmental education.

Belgrade Charter, 1975

The Belgrade Charter was developed in 1975 at the United Nations Educational, Scientific, and Cultural Organization Conference in Yugoslavia, and provides a widely accepted goal statement for environmental education:

> The goal of environmental education is to develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.
>
> (UNESCO, 1976)

Tbilisi Declaration, 1977

Following Belgrade, the world's first Intergovernmental Conference on Environmental Education was held in Tbilisi, Georgia. Building on the Belgrade Charter, representatives at the Tbilisi Conference adopted the Tbilisi Declaration, which challenged environmental education to create awareness and values amongst humankind in order to improve the qualities of life and the environment.

A major outcome of Tbilisi was detailed descriptions of the **objectives** of environmental education. Most environmental educators have since universally adopted these objectives.

- **Awareness**– to help social groups and individuals acquire an awareness and sensitivity to the total environment and its allied problems.
- **Knowledge**– to help social groups and individuals gain a variety of experience in, and acquire a basic understanding of, the environment and its associated problems.
- **Attitudes**– to help social groups and individuals acquire a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection.
- **Skills**– to help social groups and individuals acquire the skills for identifying and solving environmental problems.
- **Participation**– to provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems.

(UNESCO, 1978)

Characteristics of Environmental Education

The outcomes of Tbilisi and Belgrade have, in many ways, provided the basis for many environmental education programs. Certainly, having both a commonly accepted goal statement and associated set of objectives has allowed many educators to better address the desired outcomes of their programs. Equal to the need to identify both a common goal and set of objectives is the need to consider the characteristics of environmental education.

In *Environmental Education Materials: Guidelines for Excellence* (1996) the North American Association for Environmental Education (NAAEE) identify a number of specific characteristics of environmental education. According to NAAEE, environmental education:

- is learner-centred, providing students with opportunities to construct their own understandings through hands-on, minds-on investigations
- involves engaging learners in direct experiences and challenges them to use higher-order thinking skills
- is supportive of the development of an active learning community where learners share ideas and expertise, and prompt continued inquiry
- provides real-world contexts and issues from which concepts and skills can be used

(NAAEE, 1996)

These characteristics, when applied in conjunction with the above-mentioned goal and objectives for environmental education, have allowed environmental educators to develop programs that lend to the formation of positive beliefs, attitudes and values concerning the environment as a basis for assuming a wise stewardship role towards the earth (Caduto, 1985).

As a program planner or environmental educator, however, it's a lot to take in. Goals, objectives, characteristics…the question quickly arises: how do we attempt to develop a program that meets all of these components, without losing sight of what we originally set out to do? One such framework, offers a clear approach:

> Environmental education has long been defined to include three critical components: *awareness*, leading to *understanding* which in turn creates the potential and capacity for *appropriate actions*. More specifically, environmental education includes
>
> - developing personal awareness of the environment and one's connections to it;

- developing an understanding of environmental concepts and knowledge of ecological, scientific, social, political and economic systems;
- the capacity to act responsibly upon what a person feels and knows, in order to implement the best solutions to environmental problems.

(Staniforth & Fawcett, 1994)

Ultimately, environmental education as it is practiced in the 21st century is largely based on a rich legacy of existing environmental education declarations, frameworks, definitions, and models as a foundation. The field as a whole owes a great deal to those who have worked to create these documents. Each document is based on a different set of assumptions and priorities, yet the commonalities are considerable.

A detailed backgrounder that summarizes these frameworks, entitled "*What Is Good Environmental Education?*" can also be downloaded from the Canadian Parks and Wilderness Society (CPAWS) website (see **Resources** for more information). And to further explore the diversity of this area visit also "*Excellence in Environmental Education Guidelines for Learning (K-12)*" by the North American Association for Environmental Education (see **Resources**).

2. Elements of Excellent Environmental Education Programs

What constitutes an excellent environmental education program? A rigorous definition would be very difficult to give, and beyond the scope of this document. Notwithstanding this, it is useful for practitioners and funders of environmental education to consider the answer to this question.

As an example, the following ten principles of excellent environmental education programs were drafted by a group of experienced environmental educators involved in the Green Street initiative, as part of a visioning and capacity-building exercise. Green Street is a standard of excellence for quality environmental education programs provided by prominent Canadian environmental education organizations. (See **Resources** for more).

The intention of these principles is not to be prescriptive or exclusionary, nor are they necessarily a checklist (indeed, no programs can claim to exhibit 100% of these principles!).

Excellent environmental education programs…

- Are credible, reputable, and based on solid facts, traditional knowledge, or on science. Values, biases, and assumptions are made explicit.

- Create knowledge and understanding about ecological, social, economic, and political concepts, and demonstrate the interdependence between a healthy environment, human well-being, and a sound economy.

- Involve a cycle of continual improvement that includes the processes of design, delivery, evaluation, and redesign.

- Are grounded in a real-world context that is specific to age, curriculum, and place, and encourage a personal affinity with the earth through practical experiences out-of-doors and through the practice of an ethic of care. Like the environment itself, programs transcend curricular boundaries, striving to integrate traditional subject areas and disciplines.

- Provide creative learning experiences that are hands-on and learner-centred, where students teach each other and educators are mentors and facilitators. These experiences promote higher order thinking and provide a cooperative context for learning and evaluation.

- Create exciting and enjoyable learning situations that teach to all learning styles, promote life-long learning, and celebrate the beauty of nature.

- Examine environmental problems and issues in a all-inclusive manner that includes social, moral, and ethical dimensions, promotes values clarification, and is respectful of the diversity of values that exist in our society.

- Motivate and empower students through the provision of specific action skills, allowing students to develop strategies for responsible citizenship through the application of their knowledge and skills as they work cooperatively toward the resolution of an environmental problem or issue.

- Engage the learner in a long-term mentoring relationship, transforming them as they examine their personal values, attitudes, feelings and behaviours.

- Promote an understanding of the past, a sense of the present, and a positive vision for the future, developing a sense of commitment in the learner to help create a healthier environment and a sustainable home, community, and planet.

Another approach, recently launched by NAAEE in November of 2002 is the publishing of the draft document: "*Guidelines for Excellence in Nonformal Environmental Education Program Development and Implementation.*" These guidelines point out six key characteristics of high quality environmental education programs:

1. They support their parent organizations' mission, purpose, and goals.
2. They're designed to fill specific needs and produce tangible benefits.
3. They function within a well-defined scope and structure.
4. They require careful planning and well-trained staff.
5. They are built on a foundation of quality instructional materials and thorough planning.
6. They define and measure results in order to improve current programs, ensure accountability, and maximize the success of future efforts.

<div align="right">(NAAEE, 2002)</div>

Astute readers will note that this current document is directly aimed at helping organizations achieve Characteristic #6!

3. What is Evaluation?

> Evaluation is a scary word. My experience has been that as soon as you use that word, people get their backs up and feel like **they** are going to be evaluated, and hence judged. It gets personal very easily.
>
> Margaret Floyd, Sparks Strategies, 2002

We as humans evaluate all the time. Listen in on conversations and you'll hear: "I loved that movie last night". "He is a terrible cook!" "That car isn't worth the price they're charging." In more formal terms, most of us have **been** evaluated by teachers through the school system or by employers in the work place – often leaving us with negative connotations about both the process and the end results.

Evaluation is a term that is used to represent judgments of many kinds. What all evaluations have in common is the notion of judging merit. Someone is examining and weighing something against an explicit or implicit yardstick. The yardsticks can vary widely, and include criteria such as aesthetics, effectiveness, economics, and justice or equity issues.

One useful definition of program evaluation is provided below, with an analysis of its components:

> Evaluation is the **systematic assessment** of the **operation and/or the outcomes** of a program or policy, compared to a set of explicit or implicit **standards,** as a means of contributing to the **improvement** of the program or policy.
>
> (Weiss, 1998)

Dr. Weiss breaks the definition down into several key elements, which serve to highlight the specific nature of evaluation:

Systematic assessment: this emphasizes the *research* nature of evaluation, stressing that it should be conducted with rigor and formality, according to accepted research canons. Therefore, an evaluation of an environmental education program should follow specific, well-planned research strategies, whether qualitative or quantitative in nature. Scientific rigor can take more time and be more costly than informal methods, yet it is an essential component of successful evaluations. This is especially so in education, where outcomes are complex, hard to observe, and made up of many elements that react in diverse ways.

The **activities and outcomes** of a program are the *actual focus* of the evaluation – some evaluations study process while others examine outcomes and effects. An educational program evaluation would usually look at both the activities of the program (how it's delivered, by whom, etc.) and its outcomes for participants (skills, knowledge, attitudes, values change, etc.).

Standards for comparison: this is a set of expectations or *criteria* to which a program is compared. Sometimes it comes from the program's own goals or mission statement, as well as from the objectives of program sponsors, managers and practitioners.

Improvement of the program: the evaluation should be done not to point fingers or assign blame but to provide a positive contribution that helps make programs work better and allocates resources to better programs.

A. Evaluation Planning: A Background

> One does not plan and then try to make circumstances fit those
> plans. One tries to make plans fit the circumstances.
> > General George S. Patton, 1947

> "Begin at the beginning," the King said gravely, "and go on till you
> come to the end: then stop."
> > Lewis Carroll, 1865

Evaluation has become very popular over the past two decades, as an important tool for program funding and decision-making, organizational learning, accountability and program management and improvement. How do we as environmental educators go about developing evaluation programs that work for us?

Evaluation planning can be a complex and cyclical process. One must identify the key questions for a study, decide on the best measurements and techniques to answer the questions, figure out the best way to collect the data, develop an appropriate research design, implement it and promote appropriate use of the results. Here are some evaluation definitions and descriptions to provide some background.

Formative and Summative Evaluation

Michael Scriven introduced these two terms, formative and summative, in 1967, to describe the evaluation of educational curriculum. **Formative evaluation** produces information that is fed back during the course of a program to improve it. **Summative evaluation** is done after the program is finished, and provides information about its effectiveness. Scriven later simplified this distinction, as follows: "When the cook tastes the soup, that's formative evaluation; when the guest tastes it, that's summative evaluation." (In Weiss, 1998, p. 31)

Programs are seldom "finished;" they continue to adapt and modify over time, in response to internal and external conditions. Therefore, the need for "formative" information continues – to be fed back to program staff to improve the program.

Outcome and Process-Based Evaluation

Focusing on the results of a program or its outcomes is still a major aspect of most evaluations. **Outcomes** refer to the end results of a program for the people it was intended to serve – students, teachers, and volunteers – whoever your audience is. The term **outcome** is often used interchangeably with *result* and *effect*. Some outcomes of a program are the results the program planners anticipated. Other outcomes however are effects that nobody expected – and sometimes that nobody wanted – yet are important information for program improvement. Change is a key word here – what is the *change* that results from a particular program? Is it an increase in something, such as knowledge? Or a decrease in something, such as environmentally detrimental behaviour?

The *process* of a program is also important to evaluators – a systematic assessment of *what is going on*. Evaluators need to know what the program actually does – what is actually happening on the ground. Sometimes process is the key element of success or failure of a program – how is it delivered, what services does it provide, is there follow-up, do students like it? Studying program process also helps one to understand outcome data.

Initially, there seems to be a lot of similarity between formative-summative and process-outcome evaluations. However, the two sets of terms have quite different implications. Formative and summative refer to the *intentions* of the evaluator in doing the study – to help improve the program or judge it. Process and outcome have nothing to do with the evaluator's role, but relate to the *phase* of the program studied. Often there is a combination of evaluations going on – the study of a program's process or what goes on during a program, in a formative sense, combined with a look at outcomes – the consequences for participants at the end.

B. Conditions Unfavourable for Evaluation

There are four circumstances where evaluation may not be worthwhile: review your program with these in mind before beginning.

1. **When the program has few routines and little stability.**
    This might be the case with a new program that needs to be piloted and established before any systematic evaluation can occur. It can also occur if the program has no consistent activities, delivery methods, or theories behind it. However, a formative evaluation done through a pilot phase may help identify these gaps more clearly.

2. **When those involved in the program can't agree as to what it is trying to achieve.**
    If there are big discrepancies in perceived goals, staff are probably working at cross-purposes. Again, the coherence of the program is in doubt, and while a process-based evaluation might be helpful, an Outcomes-Based Evaluation would have no criteria to use.

3. **When the sponsor or program manager sets limits as to what the evaluation can study, putting many important issues off limits.**
    This occurs rarely, when the sponsor or manager wants a "whitewash" job from an evaluation. Avoid at all costs!

4. **When there is not enough funds, resources, or staff expertise to conduct the evaluation.**
    Evaluations call for time, money, energy, planning and skill: it is important to ensure these are in place for a successful product. This is beyond a doubt the single most prevalent reason that program evaluations are either not done or are not adequate.

4. The Benefits of an Evaluation Program

> Now that I've written my logic model for my Education Program,
> I've got a single table that captures all the activities and the outputs,
> outcomes, and impacts that I hope to achieve. Now whenever a
> board member or teacher asks me 'What do you do?' I can show
> them my plan on one sheet of paper.
>
> Jenn Hoffman, Sierra Club of Canada, BC Chapter, 2002

Many environmental education professionals would identify one primary reason to evaluate their programs: to satisfy one or more of their funders and audiences. While it is true that a sound evaluation can strengthen accountability for the use of resources, evaluating your program can do more than just satisfying the reporting requirements of a funding agency.

Plan:Net Limited reminds us that evaluation can help organizations make wise planning and management decisions. It will help organizations:

- Know what to expect from project activities
- Identify who will benefit from the expected results
- Gather just the right information to know whether the project is achieving what you want
- Know how to improve project activities based on this information
- Know how to maximize positive influences (referred to as Enablers), and to avoid or overcome negative influences (referred to as Constraints)
- Communicate plans and achievements more clearly to people and other organizations
- Gain from the knowledge, experience and ideas of the people involved
- Provide accurate and convincing information to support applications for funding.

<div align="right">(Plan:Net Limited, 2002)</div>

Seen as part of the larger process of continual improvement of environmental education programs, good evaluation has the potential to improve program quality over the long term. As such, a good evaluation program can improve program quality, improve student learning, and ultimately assist the program to achieve its goals, which may include such things as higher degree of student involvement and benefits to the environment.

The Nuts and Bolts of Evaluating Environmental Education

5. Choosing an Evaluation Model

Choosing a way of evaluating your environmental education program can be intimidating or even bewildering for those whom have never done so before. Evaluation models come with various names: Needs Assessments, Cost/Benefit Analysis, Effectiveness, Goal-Based, Process-Based – the list goes on and on. A bewildering array of over 35 different types of evaluation is described in the literature – too many to list in this document!

At its core, program evaluation is really all about collecting information about a program or some aspect of a program in order to make necessary decisions about the program. It's not rocket science and is entirely possible to do, even for the novice evaluator with limited resources, experience and skills. Carter McNamara, author of several program evaluation-related resources, offers the following advice:

> It's better to do what might turn out to be an average effort at evaluation than to do no evaluation at all. The type of evaluation you undertake to improve your program depends on what you are doing – worry about what you need to know to make the program decisions you need to make, and worry about how you can accurately collect and understand that information.
>
> (McNamara, 1999)

Regardless of the type of model you use, there is a common set of steps that can be used to complete program evaluation. Consider this as a suggested framework that you can expand upon if necessary

1. Decide what you want to assess.
2. Select an evaluation design to fit your program.
3. Choose methods of measurement.
4. Decide whom you will assess.
5. Determine when you will conduct the assessment.
6. Gather, analyze, and interpret the data.

(SAMHSA-CSAP-NCAP, 2000)

Obviously, there will be many questions that you will need to consider when designing your program evaluation. For example, why are you doing the evaluation? From who will you gather information? How will you get this information? And who will be reading this evaluation in the end?

Another good resource to reference when designing an educational program evaluation is *The Program Evaluation Standards* by the Joint Committee on Standards for Educational Evaluation (1994). Thirty standards were developed by several international panels of researchers, as a tool to improve the practice of educational program evaluation and consequently improve educational practice. The standards themselves are organized around the four important attributes of an evaluation: utility, feasibility, propriety, and accuracy. Each standard helps define one of these four attributes, and they can be used to focus, define and assess your evaluation plan. For example,

> The first *Utility Standard* is as follows:
> > **Stakeholder Identification** – Persons involved in or affected by the evaluation should be identified, so that their needs can be addressed.

> The first *Feasibility Standard* is:
> > **Practical Procedures** – The evaluation procedures should be practical, to keep disruption to a minimum while needed information is obtained.
> > > (Sanders, 1994)

The 30 standards can be used as a useful and well-referenced checklist to help you design an evaluation, collect information, analyze information and report, manage and/or staff an evaluation. Refer to the **Resources** section for more information on these standards.

And finally, to assist you in answering many important evaluation questions, we've included a copy of Carter McNamara's *Checklist for Program Evaluation Planning* in **Appendix Two**.

6. Outcome-Based Evaluation

In this document we have focused on one particular model of evaluation – Outcomes-Based Evaluation – that is quite effective in evaluating environmental education programs, especially amongst non-profit groups. This technique is rapidly growing in popularity amongst the funding community and among non-profit groups. It should be noted that this technique is also known by other names, among them results-based management (popular with the Government of Canada), outcome or performance measurement, or even performance mapping!

As McNamara points out, Outcomes-Based Evaluation has proven particularly effective in assisting non-profits in answering whether "their organization is really doing the right program activities to bring about the outcomes they believe to be needed by their clients" (1999). As McNamara notes, outcomes are usually in terms of enhanced learning such as increased knowledge or improvements in perception, attitudes or skills, or improved conditions, such as increased ecological literacy.

A. What is Outcomes-Based Evaluation?

> Outcomes-Based Evaluation is quickly becoming one of the more important means of program evaluation being used by non-profit organizations. Is your program really doing the right activities to bring about the outcomes you want? Or are you just engaging in busy activities that seem reasonable at the time? Funders are increasingly questioning whether non-profit programs are really making a difference.
>
> <div align="right">(McNamara, 1999)</div>

Outcomes-Based Evaluation looks at the impacts, benefits, or changes to your clients – students, teachers, etc.– as a result of your efforts during and/or after their participation in your program. It helps you find out if you're really doing the right program activities to achieve some pre-specified outcomes. Outcome-Based Evaluation is a method of evaluation that is based on a program logic model; the measurement of the success of a program relies on the measurement of several components of the logic model system.

Program Logic Model
A logic model is an approach to planning and managing projects that helps us to be clear both about what our projects are *doing* and what they are *changing*. The word 'logic' is used because of the logical link between the system components: inputs are a necessary precondition to activities; activities need to take place before

outputs are possible, etc. Think of your program as a system that has inputs, activities, outputs and outcomes:

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┌──────────────────────────────────────────────────────────────────────────────┐
│                                                                                │
│  ┌────────┐    ┌──────────┐    ┌─────────┐    ┌──────────┐    ┌──────────┐     │
│  │ Inputs │ →  │Activities│ →  │ Outputs │ →  │ Outcomes │ →  │  Impact  │     │
│  └────────┘    └──────────┘    └─────────┘    │  (a.k.a. │    │  (a.k.a  │     │
│                                               │'Objectives')│ │ 'Goals') │     │
│                                               └──────────┘    └──────────┘     │
│                                                                                │
│      (Note: Indicators are not part of the logic model – but they are a        │
│       critical part of the evaluation process. See text below for more         │
│                             information.)                                       │
└──────────────────────────────────────────────────────────────────────────────┘
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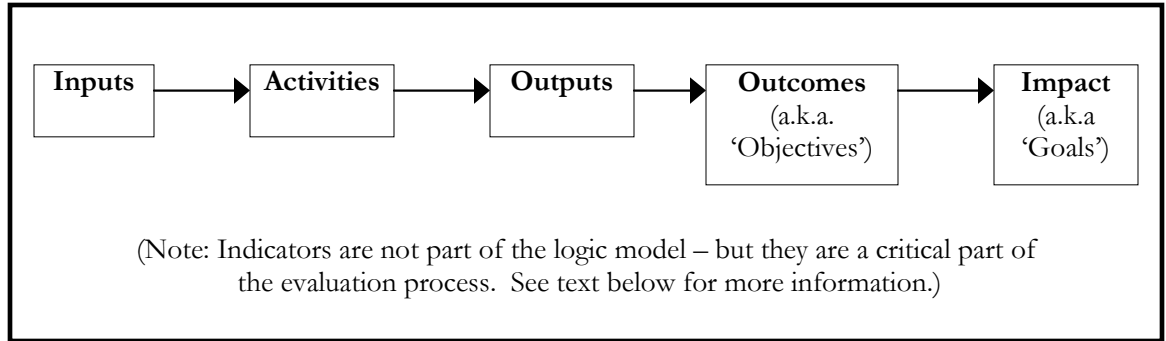
Input: The materials and resources that the program uses in its activities. These are often easy to identify, and are common to many organizations and programs. For example: equipment, staff, facilities, etc. These are the resources you need to get the resources you seek.

Activities: Activities are what you do to create the change you seek; they are what you do with the inputs you have. Under the headings promotion, networking, advocacy, or training, you describe what the project is doing.

Outputs: Outputs are the most immediate results of your project, and each relates directly to your activities. More importantly, outputs create the potential for desired results; they create potential for your outcomes to occur. Outputs are usually measured as are statistics, and indicate hardly anything about the changes in clients. (Example: 61 students attended our Ecology Camp).

Outcomes: Outcomes describe the true changes that occur to people, organizations and communities as a result of your program. These are the actual impacts, benefits, or changes for participants during or after your program, expressed in terms of knowledge, skills, values or behaviours.

Outcomes may be expressed in terms of enhanced learning, such as increased knowledge, a positive change in perceptions or attitudes, or enhanced skills. For example, an objective of your program might be to "demonstrated increase awareness of the causes and prevention measures of climate change".
Outcomes many also be expressed in terms of physical conditions, such as the development of school-grounds garden.

Impact: This describes your vision of a preferred future and underlines why the project is important. It refers to the longer-term change that you hope your project will help create.

Measuring Outcomes

The success of a program is measured using indicators that measure any or all of the three logic model components of output, outcome, or impact.

Outcome Indicators: These are what you can see, hear, read, etc. and suggest that you're making progress toward your outcome target or not. Indicators can be established for outputs, outcomes, and impacts. Indicators are measured using 'instruments' such as questionnaires or surveys, and may be either quantitative or qualitative. Indicators can be envisioned as the "flags" that let us know we're on the correct path. They answer the question, "How will you know when you've achieved the outcome?" They are the measurable, observable ways of defining your outcomes. They define what the outcome looks like.

Outcome Targets: These specify how much of your outcome you hope to achieve.

Splash and Ripple

Here is one image to help people understand and use outcome measurement. The rock is like a material **Input**; the person holding the rock is like a human resource **Input**. The act of dropping the rock is like an **Activity**. When the rock reaches the water, it creates a Splash – these are your **Outputs**. The ripples spreading out from the splash are like your **Outcome**s, then later your **Impacts**. The edge of the pond represents the geographic and population boundaries of your project.

(Plan: Net Limited, 2002)

Impacts

Outcomes

Outputs
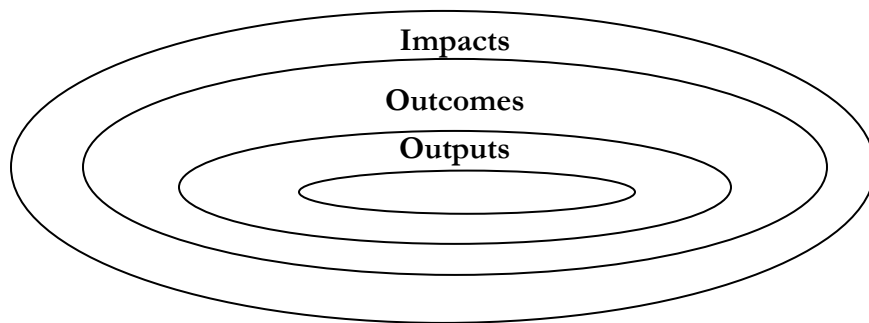
B. General Steps to Outcomes-Based Evaluation

With a basic understanding of the process and language of Outcomes-Based Evaluation, we can start to think about how one would set about conducting it. Carter McNamara has produced many handy resources on how to understand and conduct Outcomes-Based Evaluation. The following is adapted from his *Basic Guide to Outcomes-Based Evaluation in Nonprofit Organizations with Very Limited Resources (1999)* and provides a very succinct set of steps that environmental education organizations can easily follow.

Step 1. Get Ready!

- Start smart! Pick a program to evaluate. Choose one that has a reasonably clear group of clients and clear methods to provide services to them.
- If you have a mission statement, a strategic plan or a goal(s) statement for this program, haul it out of the filing cabinet you've jammed it into, and consider it.
- Ask for some money. Consider getting a grant to support developing your evaluation plan – while this is not vital to the process, evaluation expertise to review your plans can be extremely beneficial and insightful. Many grantors will consider assigning up to 15% of total budget amount to an external evaluation; make sure you ask about this.

Step 2. Choose Your Outcomes.

- Choose the outcomes that you want to examine. Make a 'priority list' for these outcomes, and if your time and resources are limited, pick the top two to four most important outcomes for now.
- It can be quite a challenge to identify outcomes for some types of programs. Remember, an outcome is the benefit that your client receives from participating in your program (not a statistic). McNamara suggests using words such as "enhanced", "increased", "more", "new", or "altered" to identify outcomes.
- Consider your timeframe and what you can evaluate within it. McNamara suggest that within 0-6 months, knowledge and skills can be evaluated; within 3-9 months, behaviours; and within 6-12 months values and attitudes. Try linking these short-term outcomes (0-3) months, with long-term outcomes (6-12 months).

Step 3. Selecting Indicators

- Specify an indicator for each outcome.
- Choose indicators based on asking questions like: What would I see, hear, read about clients that means progress toward the outcome? For example: "30 of the 200 students who participate in CPAWS Grizzly Bear Forever! Program will demonstrate one new environmental stewardship activity within two months of the program".
- If this is your first outcomes plan that you've ever done or the program is just getting started, don't spend a lot of time trying to find the perfect numbers and percentages for your indicators.

Step 4. Gathering Data and Information

- For each indicator, identify what information you will need to collect or measure to assess that indicator. Consider the practicality of collecting data, when to collect data and the tools/instruments available to collected data. Basically, you're trying to determine how the information you're going to need can be efficiently and realistically gathered.
- Data collection instruments could include, but are not limited to: surveys, questionnaires, focus groups, checklists, and observations. See **Appendix One** for more information on the pro's and con's of each survey method.

Step 5. Piloting/Testing

- Most likely you don't have the resources to pilot test your complete outcomes evaluation process. Instead, think of the first year of applying your outcomes process as your pilot process. During this first year, identify any problems and improvements, etc. and document these. Then apply them to your program evaluation the following year for a new and improved process (see Step 6).

Step 6. Analyzing and Reporting

- Analyze your data. You may have collected quantitative (i.e. numerical) or qualitative (i.e. comments) data. To analyze comments, etc. (that is, data that is not numerical in nature): read through all the data, organize comments into similar categories, e.g., concerns, suggestions, strengths, etc; label the categories or themes, e.g., concerns, suggestions, etc; and identify patterns, or associations and causal relationships in the themes.

- Report your evaluation results. The level and scope of information in report depends for whom the report is intended, e.g., funders, board, staff, clients, etc.
- Remember that the most important part of an evaluation is thinking through how you're going to incorporate what you learned from it into the next round of programming. That's the real value, beyond reports to funders, accountability, etc.: its the learning that comes through looking at what worked and what didn't and applying that learning

A Note About Getting Outside Evaluation Expertise

If you have the resources to do so, bringing in an outside consultant to assist you in your evaluation process can be extremely beneficial. They can help you avoid costly mistakes, and their external role helps them challenge your assumptions and bring a valuable perspective to what you are trying to achieve.

7. Program Planning – Building A Program Plan That Includes Evaluation

> The best time to plant a tree was a decade ago; the next best time
> to plant a tree is – today.
>
> <div align="right">Author Unknown</div>

Just like planting a tree, the most logical time to build evaluation into your program plan is at the outset of your program, when you are still in the planning stages. Why? Because you'll know ahead of time what sort of data you need to collect in order to evaluate your program the way you want.

However, if you are in the midst of a program – but wish to create a better evaluation plan – don't despair. A tree planted today still provides benefits, and so will your evaluation plan.

To help you visualize this process, refer to the example below, from the CPAWS Education program called *Grizzly Bears Forever! (GBF!)*, in which CPAWS staff visit junior high students in their classroom to teach about ecosystems, using the grizzly bears as an entry point. They took the following table, which summarizes a logic model, and tried to "fill in the blanks".

Table One

Component	CPAWS Planning and Evaluation Strategy
ACTIVITIES	What you do to create the change you seek.
INPUTS	Materials and resources used.
OUTPUTS	The most immediate results of your project. Each relates directly to your activities.
OUTCOMES	Actual benefits/impacts/changes for participants.
IMPACTS	The longer-term change you hope your project will help create.

To help themselves, CPAWS asked the following questions:

- **What activities do we propose to do in this program?** This was the easy part – they had already thought out what they wanted to do (including program marketing and delivery mechanisms).

- **What will our program outputs be?** Each activity has a corresponding output. These easy-to-measure items, such as 'number of students contacted' were all CPAWS had ever successfully measured before they adopted an Outcome-Based planning approach. Until recently, this level of measurement was all that funders had ever asked for!

- **What will our program inputs be?** This is a list of things they will need to carry out their project. This information includes human and material resources: staffing, budget, etc

- **What outcomes do we hope to achieve with this program?** These are the desirable changes resulting from the outputs. Some of these statements were gleaned from the objectives they had generated in their proposal. It is important to note that objectives are generally fewer in number than the outputs that create them (CPAWS decided to bend this rule, however).

- **What impact do we hope to have with this program?** To create this statement, they reminded themselves why CPAWS invests its resources in education – and ended up using the goal statement they had generated in the proposal to funders.

When they had answered all of these questions and filled in the table, CPAWS had an Outcome-Based Plan for their education program (**Table Two: Outcomes-Based Planning Table For CPAWS GBF! School Visit Program**).

A couple of observations about their work. All inputs and activities tend to focus on the CPAWS program, whereas outcomes and impacts tend to centre on changes to the learner. This is as it should be; CPAWS has attempted to keep the learner in the centre of this process, as far as important outcomes are concerned.

Also, the outcomes identified display an interesting range. Outcomes pertaining to knowledge, skills, and attitudes can generally be expected to be achieved in the days or weeks immediately following a presentation; the inculcation of values, and the occurrence of desired behaviours, will take longer (perhaps several months). Their evaluation plan must take this into consideration.

What they did not have – yet – was any idea on how to measure these things they hope to achieve. They needed to create an **evaluation plan**. To do this, they assigned numbers to all the measurable items on this table (outputs, outcomes, and impact). They then came up with a variety of quantitative and qualitative indicators for each of these items – and to make sure that these were reasonable and feasible indicators, they identified how these indicators would be measured, and by whom. **Table Three: Evaluation Table for CPAWS GBF! School Visit Program** shows these details (for brevity, only a few of the outcomes are shown.)

The next step for CPAWS will be taking all these measurement techniques that need to be done (usually by CPAWS' School Programs Specialist) and inserting these into her work plan so that they occur. A student from the local university assisted with the details of conducting this survey, in the process receiving credit for an independent study. The creation of measurement instruments, such as the pre and post surveys of students, will take some time (see **Implications**).

Once the results are in and compiled, a report can be produced summarizing results and 'lessons learned.' Such a report can be used by CPAWS as an accountability exercise, demonstrating to a funder the legitimacy of the program. The true potential of this process, though, is to enhance the future performance and management of the program – but CPAWS will have to take the time to process this information and permit the fruits of the evaluation process to be 'ploughed back in,' and used to improve the effectiveness and impact of the education program.

Table Two:
Outcomes-Based Planning Table
For CPAWS GBF! School visit program

ACTIVITIES	• Develop presentation kit – slides, graphics, visuals, game-pieces • Development of an illustrated 80 page teacher activity guide • E-mail and posters are distributed to market the program • In-class presentations (80 minutes in length) by CPAWS staff
INPUTS	• Staff 0.4 FTE (full time equivalent) to deal with administration (marketing, phone calling, bookings) and presentations • Budget of $20,000 to cover staff time and expenses, office space
OUTPUTS	1. Presentation kit and activity guides are completed. 2. E-mail sent to 200 addressees, and 125 posters are delivered to Calgary-area schools. 3. Deliver presentations to 50 classes (2500 students).
OUTCOMES	4. Students know more about grizzly bear ecology and conservation. 5. Teachers enjoy the presentation and believe it to be a high-quality product. 6. Through the grizzly bear, students will learn to value and appreciate the importance of ecosystem processes and ecosystem services. 7. Student's behaviours change as a result of the education program (e.g. less consumerism, increased wilderness experiences, more political/extracurricular involvement). 8. Students will develop a sense of responsibility and a personal commitment towards grizzly bear and environmental conservation. 9. Teachers incorporate lessons on the grizzly bear in future years.
IMPACTS	10. CPAWS Education Team creates a community of knowledgeable, empowered citizens who engage in positive environmental action to protect ecosystems, wilderness and protected areas.

Table Three:
Evaluation Table for
CPAWS GBF! School Visit Program

Output or Outcome #	Measurement Indicator	Data collection method	Data Source	Collected by whom?	Collected when?
OUTPUTS					
1	Compare completed kit to original materials list	Comparison of kits	Kits	CPAWS staff	June 2003
2	Check records from e-mails and mail	Review records	E-mails, mail	University student	June 2003
3	Collate statistics from database	Simple stats review	Database	CPAWS staff	July 2003
OUTCOMES					
4, 6, 7, 8	Teachers will distribute Pre and Post Program Student Questionnaire, which asks values-related and behaviours-related questions using a Likert scale	CPAWS will mail and analyze pre and post surveys; students fill out and return questionnaires	Surveys	CPAWS staff	By June 2003 – analysis by Aug 2003
9	Teachers develop and implement lesson plans and activities incorporating grizzly bear conservation	CPAWS will mail and analyze surveys; teachers fill out and return questionnaires. Selected teachers will participate in interviews.	Surveys, Interview	CPAWS staff	By June 2004 – analysis by Aug 2004

8. Trying to Evaluate the 'Tough Stuff'

A. How Learners (Sometimes) Get to Action

The goal of this section is to remind the reader of how 'education leading to action' actually works, and provides an explanation for why environmental education programs sometimes do not achieve the results they hope for.

As an illustrative example consider Mary, a student in a Calgary Junior high school who learns about grizzly bears through a program offered by CPAWS. This program was offered because CPAWS has the goal of "creating a community of knowledgeable empowered citizens who engage in positive environmental action to protect ecosystems, wilderness and protected areas" (taken from the *Impact* section of CPAWS **Evaluation Plan** for this program).

Anyway, back to Mary. On October 23rd she sits through an interesting, curriculum-oriented classroom presentation by a CPAWS staff member, and in the following days receives several subsequent lessons from her teacher. Through this program she becomes **aware** of – and **understands** something about – grizzly bear ecology and behaviour, and some of the conservation issues that surround this animal.

Up to this point, CPAWS and her teacher have a fairly high degree of control over what goes through Mary's mind. Notice how the locus of control starts to decrease through the following…

At age thirteen Mary has developed a fairly widespread system of **beliefs** about how the world works. (Two of these beliefs are that grizzly bears exist in the mountains to the west of Calgary, and that these bears are 'neat'). These beliefs, once lumped and grouped and combined with some emotional tendencies, comprise **attitudes** (for example, Mary has the attitude that bears should be allowed to exist in the mountains). Attitudes come to light most frequently as **opinions**, which Mary - like most 13 year olds – has no trouble expressing. Caduto (1985) can help us here: "Values are in turn formed by a meld of closely aligned attitudes. A value is an enduring conviction that a specific mode of conduct is… preferable to an opposite mode of conduct (p.7)." For example, Mary values the wild areas found in the mountains, and the intrinsic right of animals to live there. Furthermore, when all of Mary's values are considered, they form a **value** system. As it happens, in this case CPAWS is fortunate: for the most part, Mary's values are consistent with CPAWS,' and the program actually helped confirm, validate, and in a small way perhaps even shift Mary's values.

This is necessary for CPAWS to achieve its goal, but unfortunately it is not sufficient. CPAWS' next hurdle is a huge one: that of persuading Mary to make her **behaviour** consistent with her **values**. Mary may value wild nature, but she

may do nothing to protect it – worse, her consumer habits and failure to act to protect nature may unintentionally harm nature. Of course, this gap between values and behaviour is not unique to Mary – she lives in a society where acceptance of this gap has reached epidemic proportions. Environmentalists and psychologists alike talk about the 'cognitive dissonance' that results when people lead lives in which their behaviour does not mirror their values.

But again, lets get back to Mary. By a stroke of luck, it turns out that in Mary's case her values are coupled with a strong sense of **motivation** to make things better. She has been raised to believe that her actions can make a difference in the world, and her resolve is strengthened by a sympathetic teacher who has fuelled her generally proactive nature, two classmates that will support her, and a case history (provided, as it happens, by CPAWS) of another classes' successful campaign to protect bear habitat in the Bow Valley.

It is now December 20, and Mary decides to do some things. Some of the changes to her behaviour were unanticipated and decidedly peripheral to CPAWS goals (she buys a pair of bear slippers for her mother for Christmas). Her New Year's Resolution to eat only vegetarian meals and use less electricity is a small but significant gain to the environment and, it can be argued, to CPAWS' goal.

But the truly exciting thing for CPAWS is that on January 4th, the day before she heads back to school, Mary watches a show on TV about the plight of the Panda bear in China – something that CPAWS had nothing to do with. At this point, Mary becomes convinced that she must get involved. In her science class the next day she makes an announcement, inviting fellow students to a lunchtime meeting to discuss ways in which they can help the grizzly bears of the Kananaskis Valley through helping protect the bear habitat in this area.

Will Mary and her newly formed action club help CPAWS achieve its goal? Perhaps. As any environmental advocate will tell you, it is hard to be truly effective. Many hurdles lie in the way of this group: other demands on students' time, burnout, attrition, and simple ineffectiveness (for example, they may launch a letter-writing campaign, but send letters to the wrong Minister).

B. Why Are Environmental Education Programs So Difficult to Evaluate?

Clayoquot Sound is a forested watershed on the west coast of Vancouver Island in British Columbia, Canada. In 1993, Clayoquot Sound was the site of the largest civil disobedience protests in Canadian history, with almost 900 arrested and jailed for protesting logging within this area.

> As you know, what usually happens [in the evaluation of environmental education] is that we can only measure simple things, and then because that is what we can measure, we say that those simple things are the only real things. So we count numbers, do simple pre-post treatment surveys, look for short-term changes, measure things, and then write our report.

> The real things, the ways in which environmental education can change someone's life, are much more subtle and difficult to measure. You can ask questions about meaning, about influence, about impacts, and look at things that aren't visible necessarily over a short time, but become apparent over the long term. **This** is what we have to consider as we look at effectiveness of environmental education.

> You know, when the Clayoquot trials were going on, and they took place right outside my office, my boss – the director of public affairs from our Ministry- asked me if 'all of that' was my fault. IS people going to trial or jail a good indicator of our success?

> Dr. Rick Kool, Environmental Educator, 2000

Rick Kool said it best: *"The real things, the ways in which environmental education can change someone's life, are much more subtle and difficult to measure."*

Why is this? For one thing, many of those in the environmental education field are talented teachers with a passion for the environment and a gift for interpreting nature to students. Evaluation is not something they have received training in, nor is it something they are necessarily drawn to – frankly, they would rather be in the classroom or in the field!

Despite this, evaluation of their programs is something that – eventually – most environmental educators deal with, either because of the reporting requirements attached to a received grant, or because they and their program recipients have legitimate questions about the efficacy of their programs. Most programs have the ambition of – among other things - creating some changes to students' behaviours, and/or causing net benefits to the environment – and there they hit a significant stumbling block. What measurement instruments are best used to measure behavioural change? How does one avoid such pitfalls as test wisdom and interviewer bias, which threaten to render results meaningless? And if, a decade

after receiving an education program, a student becomes an environmental advocate, or sponsors environmental legislation in parliament (or, to use Dr. Kool's example above, is arrested in a peaceful blockade) – can any reasonable claim be made that the education program contributed to this outcome? To relate this discussion to the Outcomes-Based schema described above – we are attempting to measure relatively complex outcomes and impacts – always trickier to measure than mere outputs.

A widespread survey of environmental education professionals asked them to suggest detailed indicators or instruments that they have used to measure such things as values shift, behavioural change, environmental action, or even discrete benefits to the environment that result from an environmental education program. The results were revealing. Not one respondent could suggest such an indicator, and all agreed that work in this field is sadly lacking.

That said, this area has been discussed briefly in some places, usually in a context that does necessarily fit into any particular evaluation schema. The text box below summarizes suggestions for evaluating action projects developed to compliment a widely used and well-designed program known as *Project Wild*.

**Ideas for Measuring Success of
Taking Action (p. 19) / Project WILD 1995.**

Taking time to evaluate an action project helps students understand what they've accomplished and allows recognition of how their project facilitated their personal growth.

Assessing Student Knowledge, Values, and Behaviours:
- Keep a video or photo log of project highlights.
- Collect memorabilia (articles about the project, photos, planning schedules, and so on) to create an action project scrapbook that students can sign and write comments in.
- Have students write essays and /or keep a journal about any changes in their thinking or behaviours as a result of the project.
- Have students evaluate other members of their group, as well as themselves. Give students pointers on positive constructive feedback and focus the session on specific points, such as contribution to the project, effort, conflict resolution approach, etc.
- Have community members involved in the project assess student performances.

Assessing Project Success:
- Have students describe how well they think their project accomplished the objectives they outlined at the start.
- Have students conduct surveys, field studies, or interviews to assess the success of their completed project. What worked? What didn't and why?
- Evaluate how students planned for ongoing maintenance and sustainability of it.
- Have community members and others involved in the project assess project outcome.

The writers of this document have taken two approaches. Section **F: An Alternative Approach** is a less direct approach that acknowledges that some of the outcomes of environmental education are very difficult or perhaps even impossible to measure. This approach simply describes good environmental education, creating a sort of checklist of program elements. The more features of positive environmental education that are present in a program, the higher the likelihood of behaviour change and positive action.

Our principal approach, though, is to review the process through which learners can sometimes get to action, and suggest some ways in which outcomes pertaining to values, behaviours, and benefits to the environment may be measured, using some of the measurement instruments described in **Appendix One**.

Those using the following sections to develop an evaluation plan should keep in mind the notion of triangulation: the use of two or more techniques to measure outcomes. Two independent measurements that 'triangulate,' or point to the same result, are mutually complementary and strengthen the case that change occurred.

It is important to note that with all the following areas we are interested in change that has occurred (change in values, a change in behaviour, etc.) by far the best way to measure change is to use testing instruments that examine the subject at two different times, both before and after a learning experience. This is referred to as **pre/post testing**. Any techniques used to make claims about change that do not rely on pre/post testing must instead rely reconstruction, in which subjects make claims about 'the way things used to be'. Often, these claims tend to remain unsubstantiated. Although we refer to both techniques below, those that rely on reconstruction tend to be of lesser validity than those based on pre/post testing.

C. Measuring Values Shift

> People may hold thousands of beliefs, which combine to form attitude orientations toward responding to an object or set of circumstances in a certain way, and attitudes are the building blocks of values. By adulthood, a person will hold hundreds, if not thousands of beliefs, a smaller number of attitudes and only dozens of values.
>
> (Caduto, 1985)

Why measure values and value shifts? As described above, beliefs about how the world works, once lumped and grouped and combined with emotional tendencies comprise attitudes. And attitudes in turn combine to form a set of values, or a value system. As a larger category, values subsume the 'sub-concepts' of attitudes and beliefs: by measuring values we can make inferences about beliefs and attitudes.

Should we strive to measure attitudes or values? Opinions vary: some workers in the field of evaluation feel more that making statements about attitudes, rather than values, might be more realistic. This section concerns itself with the measurement of changes in values or value shifts that may take place as a result of an environmental education program or experience. Given the somewhat subjective distinction between attitudes and values, the authors believe that these techniques can be used to measure both attitudes and values.

Is it important to measure value shifts? Some might argue to instead focus on behaviours (see next section), and try to measure action that attempts to help the environment – surely, this argument goes, these new behaviours come about as a result of a values shift. The advantage of measuring value shifts is that in some cases this might be all that changes: there are many good reasons why thought does not always translate into action (**Section 8A**). Table Four summarize some of the instruments and associated outcome indicators for measuring a values shift. **Appendix One** discusses the strengths and weaknesses of each instrument.

Table Four: Measuring A Shift In Values

Measurement Instrument	Pre/Post Test? [1]	Outcome Indicator [2]
Questionnaires (Likert scale or multiple choice)	✓	Quantitative shift in individuals/group for questions pertaining to values.
Interview		Student responses reveal a higher appreciation of natural values.
Focus Group		Unprompted, at least 15% of students will comment that their values are more supportive of the environment.
Review of Peers		Students comment on changes in the values of their peers through formal and informal interviews and assignments at both the individual and team level.
Journals	✓	Students make written reference to changes they feel have occurred in their own beliefs, attitudes, or values.
Student art work	✓	Students' drawings of their schoolyard give more emphasis (using colour and perspective) to natural objects.
Feedback form (ex. an unsolicited email or letter to your organization)		Unsolicited, students comment on how the program influenced/changed how they feel about an aspect of nature.

1. Pre/Post. Often, an objective measurement of a change in values requires a baseline, pre-program measurement as well as a post-program measurement. A check mark is used to indicate if this is necessary.
2. Outcome Indicators: These are quantitative or qualitative statements that result in the desired results we get after using the relevant measurement instrument.

Sample Activity:
Values Shift Measurement using 'Take a Stand'

'Take a Stand' is a common activity in which students take a stand on a controversial statement by physically standing beside a sign that best reflects their opinion (signs says one of the following: strongly disagree, somewhat disagree, can't decide, somewhat agree, or strongly agree).

Repetition of an identical statement before and after a program, and keeping track of the number of students that stand beside these signs, can be used to measure both values clarification and values shift. The outcome indicator for this activity might be a target indicator: "At least 20% of students shift their position on the strongly disagree-strongly agree' spectrum, towards a position that shows a greater support of the protection of nature."

*To download a CPAWS version of this activity, visit the CPAWS website (listed in the **Resources** section of this document).

D. Measuring Behaviour Change

It is a common ambition of education programs that some new behaviour arises as a result of activities. In the case of Mary described above, not only did the program act on her value system but it also helped her 'make the jump' across the very significant divide between thought and action.

It is important to remember that not all new behaviour can be classified as environmental action (for example, Mary bought bear slippers for her mother – a new behaviour, certainly, but not one that helped the environment). Environmental action involves students in tackling an environmental issue or problem, or working to improve an environmental setting. Actions can be as simple as making and maintaining a community notice board of environmental events or as complex as developing and implementing a plan for walking school buses. Environmental action is behaviour that intentionally tries to do something to help the environment, and is a subset of other behaviour change. Note that actual benefits to the environment do not necessarily follow; the next section deals with environmental benefits and how to evaluate them.

So which types of behaviour can be classified as environmental action? R.J. Wilke summarizes the primary methods through which a person may engage in action.

- Persuasion: educating or lobbying other members of the public.
- Consumerism: either changing one's own consumer habits or encouraging others to do so.
- Political Action: action that is aimed at influencing a decision-maker.
- Ecomanagement: actions to restore, remediate, or improve a natural area.
- Legal Action: action taken through legal avenues.

(In Hammond, 1997)

The authors suggest that any behaviour change focusing on the environment that falls into one of these five categories can be classified as "environmental action."

A new difficulty presents itself when measuring behavioural outcomes: time. Whereas changes in values tend to occur during or shortly after a program, it may take longer for behaviours to manifest themselves. This not only calls for a long-term approach to evaluation that spans a number of years, but also opens the door to the possibility that some influence other than the program caused the behaviour.

Table Five:
Measuring Behaviour Change

Measurement instrument	Pre/Post? [1]	Outcome Indicator [2]
Questionnaires	✓	Respondents list behaviours that they began after the program.
Interviews		Open-ended questions prompt interviewees to remark on changes to their behaviour.
Observations	✓	Observer tests for the presence or absence of a number of behavioural criteria (i.e. classroom recycling program.
Focus Group		Over a quarter of students agree that their behaviour has changed in a specific way.
Student art work		Student artwork created in response to assignment identifies specific behavioural changes (i.e. human interaction with ecosystems mural).
Feedback form		Students describe and document action projects/ changes they have made/ special events: in the form of postcards, photographs, videos, journals, and web page entries.

1. **Pre/Post.** In many cases, an objective measurement of a change in values requires a baseline, pre-program measurement as well as a post-program measurement. If this is necessary, a check mark is placed in the table below.
2. **Outcome Indicators:** These are quantitative or qualitative statements that result in the desired results we get after using the relevant measurement instrument.

E. Measuring Benefits to the Environment

Many funders' application forms ask the following question:

"Please describe in concrete terms how your project will benefit the environment."

Those who have read this far will understand why environmental educators have a difficult time answering this question! Even those students who have values sympathetic to the environment and whose new behaviours can be categorized as a kind of environmental action may not ever do anything that directly benefits the environment – or at least not within the time period that we have capacity to measure!

The following table provides a discussion of the five kinds of action and their evaluation.

Table Six:
Types and Benefits of Environmental Action

Type of Environmental Action	Ease of Evaluating Benefits to the Environment
Persuasion: educating or lobbying other members of the public.	Benefits may never be demonstrable, and/or may not exist. The possibility exists that this persuasion may not in fact change anyone's behaviour.
Consumerism: either changing one's own consumer habits or encouraging others to do so.	Several measurement instruments can be used to identify changes in consumerism, and resources documenting the relationship between consumer habits and environmental impact are readily available*
Political Action: action that is aimed at influencing a decision-maker.	Decision-makers may never respond to pressure – or a pro-environmental decision they make may be due to other factors. Interviews of decision-makers can be helpful in determining this.
Ecomanagement: action to restore, remediate, or improve a natural area.	This is easily documented and measured using a "before and after" scenario. Funders who emphasize easy accountability, such as EcoAction, place high emphasis on activities of this sort.
Legal Action: action taken through legal avenues.	Action of this sort can be easily documented, through such things as judicial decisions.

* For example, the Union of Concerned Scientists recently published the *Consumer's Guide to Effective Environmental Choices*. See the **Resources** section for more information.

But what does 'benefits to the environment' mean, you might ask? Some funding bodies come at this topic from a restoration or anti-pollution perspective, and want to know how the project will improve the environment or 'help it get better'. Others come from a point of view that assumes the environment is healthy, (e.g. intact ecosystems) and want applicants to demonstrate how higher protection of the environment will result from the project. Both these outcomes can produce benefits to the environment.

F. An Alternative Approach: What We Know About Good EE

The following approach has been validated through conversations with professionals in both funding and environmental education organizations. This approach acknowledges that some of the benefits and outcomes of environmental education are either so difficult to measure that they are impractical, or truly intangible. For these cases, our approach is to simply describe what good environmental education is. An extensive analysis of the relevant peer-reviewed professional papers is beyond the scope of this document however; what we can rely on is the best judgment of practitioners. Recently, a number of environmental educators used their best professional judgment to identify elements of environmental education programs that help lead learners towards action. This work is summarized in *"How to Get Action in Your Environmental Education Program"* which can be downloaded from the CPAWS website. See the **Resources** section for more information.

Using this approach, those trying to either design a sound environmental education program or make decisions about funding such a program need only examine the proposed program, look for elements that contribute towards behaviour change and positive action, and make a subjective decision about the likelihood of the proposed program ever achieving these goals. It is worth reiterating, however, that a sound evaluation plan is superior in a number of ways, as it allows a far more empirical assessment of success than the theoretical approach described in this section.

9. Conclusion: Implications of Conducting Evaluations

The authors would like to mention several trends that are relevant here. We feel that today, more than ever, society needs high-quality environmental education programs that succeed in moving values and changing behaviours in the direction of sustainability and environmental conservation. We also believe that effective, relevant evaluation offers a very powerful way to improve these education programs and enable them to succeed in accomplishing more of their objectives and goals.

For a variety of reasons, funders and environmental education professionals alike feel increased pressure to conduct better program evaluations. Further, there is a lot of support in these communities for Outcome-Based Evaluation. That said, the reader should refer to the sidebar, *Concerns About Outcome-Based Evaluation*, that summarizes some of the concerns felt by organizations.

The following implications arise from these concerns:

- There is a real need within the environmental education community for training in the area of evaluation. Environmental education professionals are experts in program design and delivery, but not necessarily in conducting evaluations of these activities.

Concerns About Outcome-Based Evaluation

Most organizations (that recently encountered Outcome-Based evaluation) over the past few years harbour concerns about it. Commonly emerging themes are:

- Questioning and confusion about what exactly is being asked of recipient organizations by funding bodies.
- Frustration with perceived lack of coordination among funding bodies with regard to the introduction of these schemas.
- Concerns about definitions of key terms ('output', 'outcome').
- Doubts about the capacity of results-based performance management schemas to capture the so-called 'soft' results that are intrinsic to social development initiatives.
- Recognition that it is important to keep track and learn from the work, but concern that expectations around information gathering and reporting exceed previous expectations and require funds, time, skills and information systems that the organization does not have.
- Expectation that funding bodies should recognize that if they desire higher levels of accountability and performance management, they should assist with capacity building support.

(Cox, Plan:Net)

- Evaluation is an expensive and time-consuming activity. Practitioners need to recognize this in their budgeting and fundraising activities, and funders need to be prepared to fund good evaluation activities. Many responsible funders now will provide funds for evaluation; up to 15% of the total budget of the program.

- Practitioners and funders alike should recognize the importance and validity of external evaluators, despite the increased cost. "If a thing is worth doing, it is worth doing well!"

- Funders who deal with numerous education programs should consider efficiencies. This might range from giving workshops to all grantees, to keeping an external evaluator on retainer who could engage in a participatory way with grantees. Such a person or group could provide invaluable advice to groups setting up and implementing their evaluation plans, as well as being the external evaluator at the end of the process.

- It may take months or years for participant behaviours to change as a result of an education program. Given this, discerning whether or not behaviour change occurs requires long-term study. Practitioners need to acknowledge this in their evaluation design, and funders need to recognize this reality when considering funding requests.

- The creation of measurement instruments, such as the pre and post surveys of students, takes considerable time and expertise. Funders should be aware of this, perhaps providing groups with templates developed by those with backgrounds in the psychological sciences, or at the very least referring groups to models that have been developed by others.

Appendixes

Appendix One: An Environmental Education Took Kit

> If the only tool one has is a hammer, then one tends to treat
> everything as if it is a nail.
>
> Mark Twain

A. What Are the Instruments Available?

So now what? Well, you've picked a method for evaluating your data, but how exactly are you going to go about gathering the information necessary for doing the actual evaluation? What tools ('instruments') will you use? From whom are you going to obtain information? And how will you gather it? Through a survey? An interview? A focus group meeting? There is a wide array of data collection instruments for you to choose from, which can be used to evaluate outputs and outcomes. The purpose of this section is to help you determine appropriate means of data collection for your evaluation.

Four Quick Hints Before You Begin*:*
- Obtain necessary clearances and permission before you begin.
- Consider the needs and sensitivities of the respondents.
- Make sure your data collectors are adequately trained and will operate in an objective, unbiased style.
- Cause as little disruption as possible to the ongoing effort.

---

1. Questionnaires and Surveys

Questionnaires and surveys are popular tools in conducting environmental education program evaluation. They are useful for obtaining information about opinions and attitudes of participants, and for collecting descriptive data. They are particularly useful when quick and easy information is needed. They can be applied in the following ways:

- **Self-Administered**: a questionnaire is distributed in person or by mail. Examples: *Teacher Written Questionnaire*, used to determine teacher satisfaction, post-program; *Student Written Questionnaire*.

- **Telephone:** best when answers are more numerous and more complex questions are needed. Examples: *Teacher Verbal Questionnaire* – for telephone interviews, to investigate changes in attitudes, values, or behaviours of students; *Student Verbal Questionnaire* – for pre/post survey of attitudes and values

- **Face-to-Face:** best for when answers are more numerous and more complex questions are needed. A face-to-face questionnaire (where a series of precisely worded questions are asked) is different from an interview (usually a more open-ended discussion).

Questionnaires and surveys can readily become quantitative measurement instruments. For example, a Likert scale (in which respondents circle a number between one and five) can be used to measure agreement with certain statements. A multiple-choice questionnaire can likewise be used in a quantitative manner. Quantitative tools lend themselves to such things as making general statements about an individual or class of students, or measuring changes to an individual or class as a result of an educational program.

Design Tips

Before designing your questionnaire, clearly articulate what you'll use the data for: what problem or need is to be addressed using the information gathered by the questions. Remember to include/consider:

- Directions to respondents (purpose, explanation of how to complete the questionnaire, issue of confidentiality).
- Questions Content – ask what you need to know and consider whether respondents will be able (or want) to answer.
- Wording of the questions – not too technical, use appropriate language levels for your audience, ask one question at a time, avoid biased wording or using 'not' questions/double negatives.
- Order of questions – watch the length; start with fact-based and go on to opinion-based questions.

2. Interviews

Interviews are particularly useful for getting the story behind a participant's experiences. The interviewer can pursue in-depth information around a topic. Interviews may be useful as follow-up to certain respondents to questionnaires, e.g., to further investigate their responses. Usually open-ended questions are asked during interviews.

(McNamara, 1999)

Interviews themselves can range in style from informal, casual conversations to standardized, open-ended questions, to a closed, fixed-response style.

Design Tips
Regardless of the format used, there are several design tips that can be applied to all, to ensure both the quality of data you are gathering as well as the quality of the experience for both the interviewer and the interviewee remains high.

- Choose a setting with little distraction.
- Explain the purpose of the interview.
- Address terms of confidentiality.
- Explain the format of the interview.
- Indicate how long the interview usually takes.
- Tell them how to get in touch with you later if they want to.
- Don't count on your memory to recall their answers.

<div align="right">(McNamara, 1999)</div>

Remember to ask your questions one at a time, in order to give the interviewee sufficient time to think and respond. Keep the wording of the questions as neutral as possible, and remain as neutral as possible. When closing, ask the interviewee if he/she has anything they'd like to ask you.

3. Focus groups
Commonly, focus groups involve bringing together a number of persons from the population to be surveyed to discuss, with the help of a leader, topics that are relevant to the evaluation. Essentially, focus groups are interviews, but of a larger number of people at the same time, in the same group. Focus groups can allow you to explore many different aspects of your program. For example, student focus groups can allow you to ask questions that let you look for change in attitudes and values, plus any action that may have ensued. Focus groups also enable a deeper exploration of issues through creating a venue for the sharing of experiences: in a successful focus group session, a synergy or catalyst effect occurs, where participants build upon each others' responses to paint a rich context of your program.

Design Tips
- The usefulness of your focus group will depends on skills of the moderator and on your method of participant selection.
- It's important to understand that focus groups are essentially an exercise in-group dynamics.
- When preparing for your focus group session, clearly identify the objective of your meeting, and develop a set number of questions (six is a good target number).
- Keep it short but sweet – one to 1.5 hours is long enough. Hold it in a stress-free environment and provide refreshments. Pay attention to room set-up: have chairs arranged well, provide paper/pens, etc.

- At the beginning set out ground rules, remember to introduce (or better yet, let them introduce themselves) all participants, and clarify the agenda. At the end, thank everyone for coming.
- After the group has answered each question, summarize what you think their answer was, and repeat it back to them. This is to ensure that you have a correct interpretation of their answer.
- Don't forget to keep minutes! Tape-recording focus group sessions may be the best way to capture the often rapid discussions, comments and ideas.
- Explore a topic in depth through group discussion, e.g., about reactions to an experience or suggestion, challenges and successes of a program, understanding common complaints, marketing needs.

4. Tests

Many feel that improvements in test scores are the best indicators of a project's success. Test scores are often considered 'hard data' and therefore (presumably) **objective** data, more valid than other types of measurements such as opinion and attitude data. (EHR/NSF Evaluation Handbook)

Various Type and Their Applications

- **Norm-referenced**: Measuring how a given student performed compared to a previously tested population
- **Criterion-reference**: Measuring if a student has mastered specific instructional objectives and thus acquired specific knowledge and skills
- **Performance assessment tests**: Designed to measure problem solving behaviours rather than factual knowledge; asked to solve more complex problems and to explain how they go about arriving at answers and solving these problems; may involve group as well as individual activities, and may appear more like a project than a traditional test.

(EHR/NSF)

When considering using tests as part of your data gathering strategy, there are a few fundamental questions that must first be addressed: Is there a match between what the test measures and what the project intends to teach i.e. if a science curriculum is oriented toward teaching process skills, does the test measure these skills or only the more concrete scientific facts)? Has the program been in place long enough for there to be an impact on test scores? (EHR/NSF)

Design Tips

Evaluators may be tempted to develop their own test instruments rather than relying on ones that exist. While this may at times be the best choice, it is not an option to be undertaken lightly. Test development is more than writing down a series of questions, and there are some strict standards formulated by the American Psychological Association that need to be met in developing instruments that will be credible in an evaluation. If at all possible, use of a reliable, validated, test is best.

5. Observations

The basic goal behind conducting observations is for the researcher to gather accurate information about how a program actually operates, particularly about processes involved. Observations involve watching others while systematically recording the frequency of their behaviours, usually according to pre-set definitions. (SAMHSA – CAP – NCAP, 2000)

Many researchers employ "Participant Observation' strategies, whereby the researcher joins in the process that is being observed, in order to provide more of an "insider's" perspective. (SAMHSA – CAP – NCAP, 2000)

6. Document and Record Review

Often, researchers want to obtain an impression of how a program operates without actually interrupting the program itself. A review of secondary data such as applications, journals, memos, minutes, and other such forms of data provides one means of doing so.

7. Case Studies

Case studies are used to organize a wide range of information about a case and then analyze the contents by seeking patterns and themes in the data, and by further analysis through cross comparison with other cases. A case can describe any unit, such as individuals, groups, programs, or projects, depending on what the program evaluators want to examine. (McNamara, 1999)

Design Tips

McNamara has identified five steps towards developing a case study:

1. All data about the case is gathered.
2. Data is organized into an approach to highlight the focus of the study.
3. A case study narrative is developed.
4. The narrative can be validated by review from program participants.
5. Case studies can be cross-compared to isolate any themes or patterns.

(McNamara , 1999)

B. Table Seven: Pro's and Con's of Evaluation Instruments

The following table is a summary of the advantages and disadvantages of the evaluation instruments mentioned above.

Instrument	Advantages	Disadvantages
1. Questionnaires and Surveys Types include: 1. Self-administered. 2. Interview administered by telephone.	✔ Inexpensive. ✔ Easy to analyze. ✔ Easy to ensure anonymity. ✔ Can be quickly administered to many people. ✔ Can provide a lot of data ✔ Easy to model after existing samples.	✘ Wording of questions might bias responses. ✘ No control for misunderstood questions, missing data, or untruthful responses. ✘ Not suitable for examining complex issues. ✘ Can be impersonal. ✘ By telephone: respondents may lack privacy.
2. Interviews Types include: 1. Informal, conversational interview. 2. Standardized, open-ended interview. **3.** Closed, fixed-response interview.	✔ Can allow researcher to get a full range and depth of information. ✔ Develops relationship with client. ✔ Can be flexible with client. ✔ Can allow you to clarify responses. ✔ Interviewer controls situation, can probe irrelevant or evasive answers. ✔ With good rapport, may obtain useful open-ended comments. ✔ Usually yields richest data, details, and new insights. ✔ Best if in-depth information is wanted.	✘ As a rule not suitable for younger children, older people, and non-English speaking persons. ✘ Not suitable for sensitive topics. ✘ Respondents may lack privacy. ✘ Can be expensive. ✘ May present logistics problems (time, place, privacy, access, safety). ✘ Often requires lengthy data collection period unless project employs large interviewer staff. ✘ Can take much time. ✘ Can be hard to analyze and compare. ✘ Interviewer can bias client's responses.

Table Seven: Pro's and Con's of Evaluation Instruments (cont'd)

3. Focus groups	✔ Useful to gather ideas, different viewpoints, new insights, and for improving question design. ✔ Researcher can quickly and reliably obtain common impressions and key information about programs from group. ✔ Can be efficient way to get much range and depth of information in short time. ✔ Information obtained can be used to generate survey questions.	✘ Not suited for generalizations about population being studied. ✘ It can often be difficult to analyze responses. ✘ A good facilitator is required to ensure safety and closure. ✘ It can be difficult to schedule people together.
4. Tests Types include 1. Norm-referenced. 2. Criterion-referenced. 3. Performance assessment tests.	✔ Test can provide the "hard" data that administrators and funding agencies often prefer. ✔ Generally they are relatively easy to administer. ✔ Good instruments may be available as models.	✘ Available instruments may be unsuitable. ✘ Developing and validating new, project-specific tests may be expensive and time consuming. ✘ Objections may be raised because of test unfairness or bias.
5. Observations Types include 1. Observations. 2. Participant observations.	✔ If done well, can be best for obtaining data about behaviour of individuals and groups. ✔ You can view operations of a program as they are actually occurring. ✔ Observations can be adapted to events as they occur.	✘ Can be expensive and time-consuming to conduct. ✘ Needs well-qualified staff to conduct. ✘ Observation may affect behaviour of program participants and deliverers. ✘ Can be difficult to interpret and categorize observed behaviours. ✘ Can be complex to categorize observations.

Table Seven : Pro's and Con's of Evaluation Instruments (cont'd)

6. Documentation and Record Review	✔ Can be objective. ✔ Can be quick (depending on amount of data involved). ✔ Get comprehensive and historical information. ✔ Doesn't interrupt program or client's routine in program. ✔ Information already exists. ✔ Few biases about information.	✘ Can also take much time, depending on data involved. ✘ Data may be difficult to organize. ✘ Can be difficult to interpret/compare data. ✘ Data may be incomplete or restricted. ✘ Need to be quite clear about what looking for. ✘ Not a flexible means to get data.
7. Case Studies	✔ Fully depicts client's experience in program input, process and results. ✔ Can be a powerful means to portray program to outsiders.	✘ Usually quite time-consuming to collect, organize and describe. ✘ Represents depth of information, rather than breadth.

The above table is a compilation of information take from the following documents and sources: Carter McNamara's *Basic Guide to Program Evaluation*; EHR/NSF's *User-Friendly Handbook for Project Evaluation*; and SAMHSA – CSAP – NCAP's *Getting to Outcomes*. See the **References** section for more information.

Appendix Two: Checklist for Program Evaluation Planning

The following checklist is adapted from Carter McNamara's *Checklist for Program Evaluation Planning.* A full checklist, in addition to many other useful evaluation tools, documents and materials, can be found on McNamara's excellent website. See the **Resources** section of this document for more information.

Name of Organization _____

Name of Program _____

Purpose of Evaluation?
What do you want to be able to decide as a result of the evaluation? For example:
__ Understand, verify or increase impact of products or services on customers/ clients (e.g., outcomes evaluation)
__ Improve delivery mechanisms to be more efficient and less costly (e.g., process evaluation)
__ Verify that we're doing what we think we're doing (e.g., process evaluation)
__ Clarify program goals, processes and outcomes for management planning
__ Public relations
__ Program comparisons, e.g., to decide which should be retained
__ Fully examine and describe effective programs for duplication elsewhere
__ Other reason(s)

Audience(s) for the Evaluation?
Who are the audiences for the information from the evaluation, for example:
__ Clients/customers
__ Funders/Investors
__ Board members
__ Management
__ Staff/employees
__ Other(s) _____

What Kinds of Information Are Needed?
What kinds of information are needed to make the decision you need to make and/or enlighten your intended audiences, for example, information to understand:
__ The process of the product or service delivery (its inputs, activities & outputs)
__ The customers/clients who experience the product or service
__ Strengths and weaknesses of the product or service
__ Benefits to customers/clients (outcomes)
__ How the product or service failed and why, etc.
__ Other type(s) of information?

Type of Evaluation?
Based on the purpose of the evaluation and the kinds of information needed, what
types of evaluation are being planned?
__ Goal-Based?
__ Process-Based?
__ Outcomes-Based?
__ Other(s)? _____

Where Should Information Be Collected From?
__ Staff/employees
__ Clients/customers
__ Program documentation
__ Funders/Investors
__ Other(s) _____

How Can Information Be Collected in Reasonable and Realistic Fashion?
__ questionnaires
__ interviews
__ documentation
__ observing clients/customers
__ observing staff/employees
__ conducting focus groups among_____
__ other(s)

When is the Information Needed?
_____

_____

_____

_____

What Resources Are Available to Collect the Information?
_____

_____

_____

_____

Appendix Three: Tips for Conducting an Evaluation

I. Develop Evaluation Questions
1. Clarify goals and objectives of the evaluation
2. Identify and involve key stakeholders and audiences.
3. Describe the intervention to be evaluated.
4. Formulate potential evaluation questions of interest to all stakeholders and audiences.
5. Determine resources available.
6. Prioritize and eliminate questions.

II. Match Questions with Appropriate Information-Gathering Techniques
1. Select a general methodological approach.
2. Determine what sources of data would provide the information needed.
3. Select data collection techniques that would gather the desired information from the identified sources.

III. Collect Data
1. Obtain the necessary clearances and permission.
2. Consider the needs and sensitivities of the respondents.
3. Make sure data collectors are adequately trained and will operate in an objective, unbiased manner.
4. Cause as little disruption as possible to the ongoing effort.

IV. Analyze Data
1. Check raw data and prepare date for analysis.
2. Conduct initial analysis based on the evaluation plan.
3. Conduct additional analyses based on the initial results.
4. Integrate and synthesize findings.

V. Provide Information to Interested Audiences
1. Provide information to the targeted audiences
2. Deliver reports and other presentations in time to be useful.
3. Customize reports and other presentations.

<div align="right">(EHR/NSF)</div>

*From the HER/NSF *The User Friendly Handbook for Project Evaluation*. See the **References** section for more information.

Appendix Four: Evaluation Samples

A. Teacher Written Questionnaire

The following questionnaire is used by the Sierra Club of Canada – BC Chapter to determine teacher satisfaction, post-program delivery. It is designed to be short, simple to fill out and trouble-free to return.

Sierra Club Education Program
Evaluation Form

The Sierra Club strives towards the delivery of fair, balanced & interesting educational programs. Your feedback is important to us. Please take a moment to comment.

Please indicate which presentation your class received:

❑ Journey through the Temperate Rainforest   ❑ Fish, Forests and Fungi
❑ Trees and Fishes, Needs and Wishes   ❑ All Aboard the Stewardship
❑ Weaving Wildlife Webs   ❑ Stewardship Superheroes
❑ You, Me and the Trees   ❑ ESP Investigator

Program Goal: Please indicate if the program received met the goals (as outlined in the Pre-Program Booking Package and the Program Flyer sent to the school)?
Yes _____   No _____

Why or why not:_____

Program Content: Please evaluate this program based on the following themes:
Messaging: Were messages:
• clearly defined: Yes _____   No _____
• balanced, fair and educational: Yes _____   No _____

If no, why not: _____

Activities: Were activities:
• engaging/interesting: Yes _____   No _____
• provoking of critical thought: Yes _____   No _____
• suitable for information delivery: Yes _____   No _____

Information Amount: Was suitable information on the following provided:
Temperate Rainforest ecology: Yes _____   No _____   N/A _____
Stewardship (ideas and solutions):   Yes _____   No _____   N/A _____
Did the program fit your curriculum: Yes _____   No _____   N/A _____

Program changes: Check any that apply:
- Group size: smaller _____   fine _____   larger _____
- Program length: shorter _____   fine _____   longer ____(hrs)
- Amount of audience interaction: more _____   fine _____   less _____
- Age appropriateness: appropriate _____   not appropriate _____
- What grade level would you consider this program appropriate for?   _____

How did you find out about this program? _____

Are you familiar with the Sierra Club of Canada, BC Chapter?   Yes _____   No_____
Would you be interested in having us visit you again?   Yes _____   No _____

Any other comments?

_____

_____

*We welcome any student feedback you would like to forward to us

Please sign and return this form to the Sierra Club of Canada – BC Chapter.
School Name: _____ Your Name: _____

Your Signature: _____

Return to:
The Sierra Club of Canada, BC Chapter, Johnson St., Victoria, BC, V8W 2M3.
Ph: (250) 386-5255   F: (250) 386-4453

Thank you!

B. Teacher Interview/Focus Group Questions

The following set of interview questions was used by the Green Street Initiative to evaluate their program. The questions were delivered by an independent evaluator who met with teacher focus groups in order gain a better understanding of the impact and effectiveness of the program.

Teacher Focus Group Questions and Interview Guide

Part One: Quantitative Data: Information to obtain *before* focus group/interview session.

How many students were involved?   Males_____   Females _____
How many classrooms:
Grade(s):   Subject area(s):
Name of GS Program: Number of visits to class:
Program deliverer(s):

Part Two: Introductions, Outline Purpose and Review Focus Group Guidelines

Discussion Starter: Past experience with EE
1. Can you talk a little about your past experiences with environmental education?
2. Probes: – any background training, any other environmental education programming you may have done in your classroom or with outside groups?
3. What about your best evaluation experience?
4. What made it so?
5. How you first heard about the program?

Theme 1: Promotion/Communications
5. How did you first hear about Green Street?
   Probes: Anyone hear about it thorough a student? Did anyone hear about Green Street first, and then contact the Provider for the program?
6. Did anyone review the Green Street web site? Did you review and learn about other providers/ programs through the site?
7. What would be the best way to learn about a program like this? How do you usually find out about programs like these?
   (Probes: principals, posters, list-serves, emails, other teachers, conferences, newsletters, staff meeting…)
8. What made you choose this program?

Theme 2: Registration Process

9. I'd like to hear about some of your experiences with registering for the program – how did it go for you?
   Probe: What did you like / not like about the process? Was it simple or complicated?
10. Were students involved in the registration process? Can you talk about this?

Theme 3: Program Reach

Let's talk a bit about Green Street itself now – Green Street's main function was to be set up as a brokering function, where a pre-screened "roster" of EE programs was available to choose from, based on a set of criteria such as curriculum alignment and teacher support. **(Have list of criteria available to show teachers, post it visibly and discuss)**

11. Was this evident to you? Did GS provide any added value to you?
12. Did you choose a program with more confidence, knowing that it was aligned with curriculum? Knowing that it would provide you with support?
13. Did you feel the program was in line with the prescribed curriculum?
14. Did you use the program as part of any extra-curricular activities – i.e. environment club?

Theme 4: Experience with the Program

I'd like to turn now to your actual experience with the program and hear about things like the quality of the program, your expectations, and student learning.

15. Quality of the program: Were you happy with the quality of the program? Why? Why not?
16. What are your opinions regarding the value of offering a field trip or in-class component, versus sending out a resource package?
17. What about your expectations: Did the program provide for you what you expected or were there surprises (good and/ or bad)?
18. What do you think students gained from participating in the program?
    Probe: level of knowledge increased, practical skills, applied learning
19. Do you feel your students were engaged with the program? Does the program have elements that make it transformative for students? Compel them to take action?

Theme 5: Support

20. What can you tell us about this aspect of the program?
    Probe: Did the Providers provide you with support in a timely efficient manner? Were the necessary pieces in place to provide you with support? I.e. before, during and after the program? Suggestions?

21. What types of support would be most useful for you?
22. Did you have the support of your Principal? Did you <u>need</u> the support of your Principal?

Theme 6: Future Directions
23. Would you do this again?
24. Would you recommend the program to another teacher?
25. What are other programs / topics you would like to see?

Key points:
To close, I'd like to hear from each of you what you feel the most important elements of the discussion have been. If you like, you can take a minute or two to write them down, to help summarize/synthesize your thoughts.

End Notes:
Thank attendees for participation.
Offer to send summary of final report.
Provide contact information in event of further thoughts or ideas to be passed on.

C. Student Questionnaire

CPAWS recently developed a questionnaire designed to measure changes in students' knowledge, attitudes, and behaviours that occur after their school presentations. The questionnaire was administered by CPAWS before and then again immediately following the classroom presentation.

Grizzly Bears Forever!

Student Survey

Part One: Knowledge

This section of the survey is designed to determine knowledge about Grizzly bears and related things. **CIRCLE** the letter that reflects what you think is a correct response to the statement or question. This is not a test! Don't worry if you can't answer many of these. Very few people can. If you don't know the answer, guess.

1. Grizzly bears are:

   (a) Carnivores (they eat only meat)
   (b) Herbivores (they eat only plants)
   (c) Omnivores (they eat both plants and animals)
   (d) Vegans (they eat no milk products)

2. Grizzly bears are known as umbrella species. This means that:

   (a) They protect other species from rain
   (b) Their presence in an ecosystem means that many other animals will also be found there
   (c) On a graph, the curve of their population is shaped like an umbrella
   (d) Grizzlies hide in dense brush to avoid rain or snow

3. Which of the following statements is true?

   (a) Grizzly bears still live in all the same places they did 200 years ago
   (b) Grizzly bears once lived in Eastern Canada as well, but are no longer there
   (c) Grizzly bears once lived throughout Western North America, but can no longer be found in much of this area
   (d) Grizzly bears can now only be found in the Yukon and Alaska

4. Grizzly bears prefer not to cross busy roads like the Trans-Canada Highway. This is a problem because:

   (a) This means that the genetic diversity of the population will decrease
   (b) Bears typically need to cross the road to get to rich food sources
   (c) It is important for tourists to see bears crossing the highway
   (d) This interrupts the flow of animals as they migrate south for the winter

5. The biggest threat to large animals like Grizzlies and wolves is
    (a) Hunting and other forms of direct mortality such as being hit by cars
    (b) Pollution of air and water that contaminates their food sources
    (c) Global warming and climate change
    (d) Habitat loss and habitat fragmentation

6. In Alberta, Grizzly bears are
    (a) Hunted north of the Bow River
    (b) Listed as Endangered in the Provincial Wildlife Act
    (c) Listed as Threatened in the Provincial Wildlife Act
    (d) Found mainly in the Calgary Zoo

Part Two: Environmental Attitudes

This part of the survey is designed to determine environmental attitudes. There are no right or wrong answers, only differences of opinion. **CIRCLE** the letter that reflects your true feelings.

1. I am in favour of saving remote wilderness areas, even if few people ever get a chance to go there.

A	B	C	D	E
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

2. Poisonous snakes that pose a threat to people should be killed.

A	B	C	D	E
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

3. If a plant or animal is of no use to humans, then we don't need to waste our time trying to protect it.

A	B	C	D	E
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

4. If I had to choose between protecting a natural area and creating homes for humans, I would choose to protect the area.

A	B	C	D	E
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

5. Government should pass laws to make recycling mandatory, so that everyone is forced to recycle.

A	B	C	D	E
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

6. Preserving wild areas isn't important because we're good at managing wildlife.

A	B	C	D	E
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

7. Industries should have to pay for any pollution they cause.

A	B	C	D	E
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

8. There is no point in getting involved in environmental issues, since governments and industries have all the power and can do whatever they want to.

A	B	C	D	E
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

9. I am interested in spending time working to help the environment, even though I realize this will cut into my free time.

A	B	C	D	E
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

Part Three: Environmental Behaviours

This section of the survey is designed to find out what things you do about the environment. There are no right or wrong answers, so don't worry if you have never done any these things, and don't worry if all your tick marks end up in the 'N' column. We ask only that you be truthful as you answer these questions.

Mark the answer that is closest to the right answer for you:

N - stands for never or no
R – stands for rarely (three or four times a year)
S – stands for sometimes (three or four times a month)
U – stands for usually, or yes (most of the time you have the chance)

	N	R	S	U
I bring all my lunch to school in reusable containers				
I walk or bike to places instead of asking for a ride				
I turn off the tap water while I brush my teeth				
At home, I try to recycle as much as I can				
I talk to others about helping the environment				
I pick up litter when I see it in a park or a natural area				
I am a member of an environmental club or group				
I write to politicians about things that concern me				
I work on outdoor projects to improve the environment				
I have helped raise money to support an environmental cause				
I read about the environment for fun				

You are finished! Thank you for your participation.

D. Student Focus Group Questions

The following set of interview questions was used by the Green Street Initiative to evaluate their program. An independent evaluator met with student focus groups in order gain a better understanding of the impact and effectiveness of the program.

Student Focus Group Questions

Part One: Quantitative data:
Number and gender of students   Males_____   Females _____
Classes / schools represented:
GS Programs represented:

Part Two: Introductions, Outline Purpose and Review Focus Group Guidelines

Discussion Starter: Past experience:
1. Can you talk about the best experiences you may have had with environmental education, either in or out of school?
   Probe: projects, camps, environmental issues. Why were they the best?
2. What are your feelings about them? Do you feel environmental issues are relevant to your lives?

Theme 1: Experience with the Program
Now I want to hear about the program you just completed: I want this to be an open discussion, but I'll throw in some questions about things like program registration and program choices, to keep us on track.

All of you participated in the _____ program, right?

3. What did you learn about?
4. What did you think?
   Probe: Was the program what you expected, or were there surprises (good or bad)?
5. What did you like the most? What was your least favorite part?
6. On a scale of 1-10 related to your other schoolwork, how would you rate this program? Why?
7. Would you want to do a program like this again?

Theme 2: Student Engagement/ Learning
8. Do you think you'll do anything different as a result of the program?
   Probe: Did it inspire you in any way - to do more for the environment?
   Did you bring any of what you learned home?)

Theme 3: Promotion / Communications
9. Did you get any choice in what kind of EE program your class was going to get? *If yes – go to question #13*
10. Do any of you know what Green Street is? (Branding question). (Tell them if they don't know).
11. If yes - How did you hear about Green Street? (Probe: teacher, web, poster)?
12. Did anyone ever visit the Green Street web site? If so, what did you think of it? Should there be environmental content on the site? Any other ideas for the site?

Theme 4: Registration Process
13. Were any of you involved with registering for the program? If so, what did you think of the process? Easy? Complicated?
14. Has anyone looked at the registration site on the web site? If so – what did you think of it?

The Green Street program was actually set up to be student-driven – so you can go in, look at EE programs, and choose what you'd like to do with your school, then bring it to your teacher and apply together.

15. What do you think of this idea?
    Probe: Do you think you'd do this? Would it work in your class /school? Why or why not?

Theme 5: Future Directions
16. I want to hear about your preferences here - If you had your choice, what kinds of EE programs would you like to see in schools?

Green Street is looking at other ways to get students involved in environmental programs/ events: like on-line chat rooms, student conferences, chances to travel, work with environmental groups.

17. What do you think? Would you participate in these things if they were available? Why/when would you use the on-line chat rooms / go to student conferences? Any other ideas?

Key points:
To close, I'd like to hear from each of you what you feel the most important elements of the discussion have been. If you like, you can take a minute or two to write them down, to help summarize/synthesize your thoughts.

End Notes:
Thank attendees for participation
Offer to send summary of final report
Provide contact information in event of further thoughts or ideas to be passed on.

F. Student Class Action Plans Feedback Forms

The following table summarizes the tools used by the Sierra Club of Canada, BC Chapter to gather information on what students retained after participating in one of their environmental education programs. Each specific Class Action Plan (CAP) is tailored to particular age/grade learner levels, and is designed to measure knowledge of key learning outcomes introduced (younger grades) and/or stewardship/ environmental actions taken (older grades). Each handout is printed on tree-free (kenaf) paper and includes a self-address envelope, to ensure a higher return rate.

Class Action Plans

Built In Mechanisms For Evaluating
TREE Team/ESP! School Programs

PROGRAM	GRADE	CAP EVALUATION
Journey Through the Temperate Rainforest	K-2	**Title: Rainforest Report** **Tool:** Handout with room for youth to draw and/or write one thing they learned from the program. **Method**: Introduced at end of program, left with self-address envelope to be mailed back by teacher.
Weaving Wildlife Webs	2-4	**Title: Create a Rainforest Creature Report** **Tool:** Handout with room for youth to draw and write about a TRF animal, noting it's (one or all): (a) predator/prey relationship (b) habitat (c) adaptations for living in the TRF **Method:** Introduced at end of program, left with self-address envelope to be mailed back by teacher.
Trees and Fishes, Needs and Wishes	2-4	**Title: Eco-Detective: Special Species Sheet** **Tool:** Handout with room for youth to draw and/or write about one of the Endangered Species in the program (Kermode bear, Orca whale, Marbled Murrelet, Phantom Orchid, and or Tailed Frog). Questions include (one or all): 1) What are the species' habitat requirements? 2) Why is the species is endangered/ threatened. 3) What can students do to help the species (environmental stewardship)? 4) Name the components of a temperate rainforest that you can remember (plant, animal, etc.) **Method:** Introduced at end of program, left with self-address envelope to be mailed back by teacher. For classes that respond, a certificate will be sent.

You, Me, and the Trees	5-7	**Title: The Great Tree Challenge.** **Tool:** The Great Tree Challenge is introduced. A cut out outline of a tree is put up. Handouts of pinecones are given to each student. After a class brainstorm on stewardship actions and goals, each student writes an individual stewardship action idea on their pinecone and posts it on the tree. After they've implemented their action idea they return a Feedback Form to Sierra Club. **Method:** Teachers keep the tree and the pinecones, and mail back the feedback form.
Fish, Forests, and Fungi	5-7	**Title: The Great Salmon Challenge** **Tool:** The Great Salmon Challenge is introduced. An outline of a tree is put up and handouts of salmon are given to each student. After a class brainstorm on rainforest connections and stewardship actions, students writes individual action idea on their salmon and then posts it on the tree. After they've implemented their action idea they return a Feedback Form to Sierra Club. **Method:** Class keeps the tree and the salmon, and mail back the Feedback Form.
All Aboard the Steward-Ship	K-2	**Title: Steward-Ship Trip Report** **Tool:** Students will draw a picture of their voyage on their handout, and will list (grade-dependent) 3 ways in which they can be environmental stewards. **Method:** Introduced at end of program, to be mailed back by teacher.
Stewardship Superheroes!	2-4	**Title: Stewardship Superhero Logo** **Tool:** Students develop a Stewardship Superhero logo on a blank handout given to them. Each logo will be pinned up on a giant Superhero Sheet. They also write what action they will take in their lives or classroom to fulfill their role as stewardship superheroes. They then submit a Feedback Form to Sierra Club. **Method:** Teachers mail back the Feedback Form
ESP! Investigators (Environmental Stewardship Powers!)	5-7	**Title: The Mystery Case of Sick Planet Earth** **Tool:** Students will draw/write about one stewardship action idea that they learned about. They will also report on one stewardship action that they have implemented in their lives. **Method:** Teachers mail back the feedback.

End Notes

Glossary

Action research: Applied research that engages practitioners with researchers in the study of organizations or activities. Emphasis is on the ongoing improvement of practice by the practitioners themselves.

Assessment: Process of or instrument for measuring, quantifying, and/or describing aspects of teaching related to the attributes covered by the evaluation.

Case Study: A research strategy that documents and investigates a phenomenon in its natural setting using multiple sources of evidence.

Control group: A group chosen randomly from the same population as the program group but that does not receive the program. It is a stand-in for what the program group would have looked like if it hadn't received the program.

Correlation: The extent to which two or more variables are related to each other.

Empirical research: Research that relies on quantitative or qualitative data drawn from observation or experience.

Evaluation: The systematic process of determining the merit, value, and worth of someone (the evaluee, such as a teacher, student, or employee) or something (the evaluand, such as a product, program, policy, or process). (See *Assessment*.)

Experiment: A study in which the evaluator has control over some of the conditions in which the study takes place and some aspects of the independent variables being studied. The criterion of a true experiment is random assignment of participants to experimental and control groups.

Formative evaluation: A type of evaluation done during the course of program implementation whose main purpose is to provide information to improve the program under study. (*See Summative Evaluation*).

Focus groups: A method of data collection in which 6 – 12 respondents are brought together to discuss and provide data on a particular issue(s).

Goal: A program's desired outcome.

Impact: The net effects of a program. Impact may also refer to program effects for the larger community. Generally it is a synonym for outcome.

Indicator: A measure that consists of hierarchically ordered categories arranged in ascending or descending order of desirability.

Objectives: The specific, desired program outcomes.

Outcome: The end results of the program. Outcomes may be intended or unintended, and be positive or negative.

Outcome evaluation: Study of whether or not the program produced the intended program effects; relates to the phase of the program studied – in this case the end result of the program (compare *Process Evaluation*).

Peer review: An assessment, often of a proposal, report or program, conducted by people with expertise in the author's field. Can also refer to peer evaluations done by program participants at a team or individual level.

Post-test: A measure taken after a program ends.

Pre-test: A measure taken before a program begins.

Process evaluation: Study of what goes on while a program is in progress; it relates to the program phase studied – e.g., program implementation (compare *Outcome Evaluation*).

Qualitative research: Research that examines phenomena primarily through words and tends to focus on dynamics, meaning and context. Qualitative research usually uses observation, interviewing and document reviews to collect data.

Quantitative research: Research that examines phenomena that can be expressed numerically and analyzed statistically.

Randomization: Selection according to the laws of chance. A sample can be randomly selected from a population to represent the population. Randomization is a rigorous process that seeks to avoid human bias.

Reliability: The consistency or stability of a measure over repeated use. An instrument is reliable if repeated efforts to measure the same phenomenon produce the same result.

Results-based accountability: Holding programs accountable not only for the performance of activities but also for the results they achieve.

Self-evaluation: Self-assessment of program processes and/or outcomes by those conducting the program.

Stakeholders: Those with a direct or indirect interest (stake) in a program or its evaluation; can be people who conduct, participate in, fund or manage a program, or who may otherwise be affected by decisions about the program/ evaluation.

Summative evaluation: Study conducted at the end of a program (or phase of the program) to determine the extent to which anticipated outcomes were produced. It is intended to provide information about the worth of the program. (*See Formative*)

Validity: In measurement, validity refers to the extent to which a measure captures the dimension of interest. In analysis, validity refers to the close approximation of study conclusions to the "true" situation.

Variable: A measured characteristic, usually expressed quantitatively, that varies across members of a population. In evaluation, variables may represent inputs, processes, interim progress markers, longer-term outcomes, and unintended consequences.

Note: Several of the above definitions drawn from multiple sources, including Weiss (1998), Cohen & Manion, 1994, and Gall, Borg and Gall (1996).

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Resources

A. On the Web: Resources on Program Evaluation and Outcome-Based Measurement

Carter McNamara
McNamara is author of several excellent websites on evaluation and evaluation-related information, which have been cited extensively throughout this document.
> *Basic Guide to Program Evaluation*
> http://www.mapnp.org/library/evaluatn/fnl_eval.htm
> *Basic Guide to Program Evaluation*
> www.mapnp.org/library/evaluatn/fnl_eval.htm
> *General Planning and Management for Organizations*
> www.mapnp.org/library/plan_dec/plan_dec.htm
> *Evaluation Activities in Organizations*
> http://www.mapnp.org/library/evaluatn/evaluatn.htm

Evaluation Assistance Centre
> *Evaluation Handbook* (1995), by Judith Wilde, PhD and Suzanne Sockey, PhD.
> http://www.ncela.gwu.edu/miscpubs/eacwest/evalhbk.htm

Joint Committee on Standards for Environmental Education
> *Program Evaluation Standards* by the Joint Committee on Standards for EE.
> For a standards overview: http://www.wmich.edu/evalctr/jc/JC-OverviewNet.htm
> To see the standards: http://www.eval.org/EvaluationDocuments/progeval.html

National Science Foundation (NSF)
> *User-Friendly Handbook for Project Evaluation* developed by NSF.
> http://www.ehr.nsf.gov/EHR/RED/EVAL/handbook/intro.pdf

University of Ottawa, School of Medicine
> Home to *A Program Evaluation Tool Kit*, and includes examples of Logic Models.
> www.uottawa.ca/academic/med/epid/toolkit.htm

United Cerebral Palsy, Greater Utica (NY) Area
> Outcomes Focused Evaluation. A terrific list of Internet Resources for Nonprofits.
> www.ucp-utica.org/uwlinks/outcomes.html

United Way of America
> The United Way of America *Outcome Measurement Resource Network* site provides many excellent outcome measurement resources and learnings.
> www.unitedway.org and http://national.unitedway.org/outcomes/

W.K. Kellogg Foundation
> Home to several key resources, including the *W.K Kellogg Foundation Logic Model Development Guide* and the *W.K. Kellogg Foundation Evaluation Handbook*.
> www.wkkf.org

B. Website Resources on Environmental Education

The Association Québécoise pour la Promotion de L'éducation Relative à L'environnement (AQPERE)
AQPERE is a non-profit organization that brings together mainly individuals and organizations in Quebec working in the field of education and training in environment and sustainable development.
http://ecoroute.uqcn.qc.ca/educ/aqpere/index.html

Canadian Journal of Environmental Education
The Canadian Journal of Environmental Education is a refereed journal published once a year that seeks to further the study and practice of environmental education.
http://www.yukoncollege.yk.ca/programs/cjee.htm

Canadian Network for Environmental Education (EECOM)
EECOM is a national ENGO whose mission is to engage Canadians in learning about their environment by enabling teachers and others to 1) work together in ways that nurture environmentally informed and responsible individuals, organizations and communities, and to 2) improve the quality and effectiveness of their services.
http://www.eecom.org/

Canadian Parks and Wilderness Society. (CPAWS)
CPAWS Education Program helps teachers and students take informed action on important conservation issues such as endangered species, or the protection of Alberta's threatened ecosystems – as the culmination of a curriculum-based education process.
http://www.cpawscalgary.org/education/index.html

In addition, CPAWS provides several excellent environmental education documents online, including:
   How to Get Action in Your Environmental Education Program document; and
   What is Good Environmental Education document, both at
   www.cpawscalgary.org/education/network-environmental-education/capacity-building.html

Numerous activity guides and lesson modules, written to help teachers teach about and integrate environmental concepts in their lessons can be found at:
http://www.cpawscalgary.org/education/free-resources/lessons.html

The *Take a Stand! Activity* can be found at:
www.cpawscalgary.org/education/free-resources/why-y2y.html.

FEESA
FEESA, An Environmental Education Society, is a private, non-profit education organization established in 1985 to promote, co-ordinate and support bias-balanced environmental education across Alberta.
http://www.feesa.ab.ca

Global Environmental and Outdoor Education Council (GEOEC)
The GEOEC of the Alberta Teachers' Association is a group of educators who are interested in outdoor education and teaching about the environment.
http://www.rockies.ca/geoec

Green Street
Green Street is a Canadian-wide initiative designed to link teachers with quality environmental education programs provided by environmental organizations. Green Street's mission is to offer high quality programs that actively engage Canadian elementary and secondary school students in learning about the environment, promoting environmental stewardship, and taking further action.
www.green-street.ca

Green Teacher
Green Teacher is a magazine by and for educators to enhance environmental education across the curriculum at all grade levels. An excellent resource!
http://www.greenteacher.com

North American Association for Environmental Education (NAAEE)
NAAEE is a network of environmental educators throughout North America & in over 55 countries around the world.
http://naaee.org/.

Downloadable versions of the *Excellence in Environmental Education* series, including *Guidelines for Learning (K-12)* and *Environmental Education Materials: Guidelines for Excellence* can be found at:
http://naaee.org/npeee/

and *Guidelines for Excellence in Nonformal Environmental Education Program Development and Implementation* at:
http://naaee.org/npeee/nonformalguidelines.php/ .

Sierra Club of Canada – BC Chapter
The Sierra Club of Canada's BC Chapter is committed to protecting BC's wild lands and wildlife. Our learning resources and school programs are designed to foster appreciation and understanding of the many different value systems and perspectives surrounding environmental issues and solutions.
http://www.sierraclub.ca/bc/