

An Evaluation of
A Forest for Every Classroom:
Learning to make choices for the future of
Vermont's forests



Prepared for
Shelburne Farms
The Marsh-Billings-Rockefeller National Historical Park
The Conservation Study Institute
The Northeast Natural Resource Center of the
National Wildlife Federation
The United States Forest Service
and the Place-based Education Evaluation Collaborative

by
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The partners in A Forest for Every Classroom are also part of the Place-based Education Evaluation Collaborative (PEEC), a unique partnership of organizations whose aim is to strengthen and deepen the practice and evaluation of place-based education initiatives. PEEC programs (and organizations) include the CO-SEED Project (Antioch New England Institute); the Community Mapping Program (the Orton Family Foundation, Vermont Institute of Natural Science.); the Sustainable Schools Project (Shelburne Farms and the Vermont Education for Sustainability Project); and A Forest for Every Classroom Project (Shelburne Farms, National Wildlife Federation, National Park Service, and US Forest Service). In addition, the Upper Valley Community Foundation provides funding and support for several of these programs through its Wellborn Ecology Fund, as well as financial, administrative and staff support for collaborative evaluation and research efforts.

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EXECUTIVE SUMMARY

A Forest for Every Classroom Program Overview

A Forest for Every Classroom (FFEC) is a professional development program for educators developed by a unique partnership of public land management agencies and nonprofit organizations. In particular, FFEC's focus has been working with teachers and school districts adjacent to the Green Mountain National Forest and Marsh-Billings-Rockefeller National Historical Park. The partners have worked together to provide two cohorts of teachers¹ with a year-long workshop series in which they are exposed to new content for their teaching; discuss new ideas about how to link subjects to the local community through field experience with resource specialists; and support in curriculum development. Critical components of the FFEC model include an emphasis on place-based education, service-learning, educational use of community resources, and civic participation.

Formed in 2000, the partnership consists of Shelburne Farms, The National Park Service's Marsh-Billings-Rockefeller National Historical Park and the Conservation Study Institute, The Northeast Natural Resource Center of the National Wildlife Federation (NWF) and The Green Mountain National Forest. As with many partnerships, roles and responsibilities of the various partners have evolved over the course of their first two years together.

FFEC Common Vision and Project Goals

FFEC Common Vision: If today's students are to become responsible environmental decision makers, they must understand the local ecosystems in which they live and they must have educational opportunities based on real life issues that encourage them to practice citizenship in their own communities.

FFEC's goals are to:

- Cultivate an understanding of place by working with teachers and their students to experience and understand local forests as complex and dynamic systems of natural and cultural resources and increasing interaction between the school and community, building a stronger sense of place and stewardship of public lands;

¹ The teachers who participated in FFEC during 2001-2002 are referred to in this report as FFEC 1 teachers and those who participated in 2002-2003 are referred to as FFEC 2 teachers.

- Provide resources for educators to meet state and national education standards while effectively integrating stewardship, citizenship and a sense of place into their curricula;
- Foster a strong network of teachers, partners, community members and natural and cultural resource specialists that will ensure an ongoing relationship of sharing of information, materials, and resources.
- Promote a balanced view of forest stewardship that not only teaches about the forest ecosystem, but also includes the spectrum of stewardship challenges faced by land management agencies (federal, state, local) and private forest landowners
- Build a strong partnership that helps to increase institutional capacity and further program needs.

FFEC Evaluation Methods 2002-2003

Evaluation of the Forest for Every Classroom program began at its inception in 2000. Project partners sought a comprehensive evaluation of their first two years of programming in order to better understand the successes and challenges of FFEC's process of program development and implementation, and to measure the degree to which its projected outcomes were attained. Additionally, the evaluation was understood as a tool to better document the process and outcomes of the developing model, providing information for FFEC project partners and funders to assist with program development, justification and refinement. The evaluation process was participatory, encouraging input and reflective practice by teachers and amongst FFEC staff.

Evaluation questions were designed by looking at the goals, objectives and expected outcomes outlined by FFEC partners in their Logic Model and by meeting with program stakeholders. FFEC staff reviewed the questions and upon approval, appropriate research instruments were designed.

The evaluation questions focused on:

1. process effectiveness: major strengths and challenges of the program
2. teacher outcomes: results and impacts of the program on teachers
3. student outcomes: results and impacts of the program and teachers' students

The following table lists the types of evaluation instruments used and participants involved in the evaluation:

Evaluation instruments and data collection methods

Instrument	Type, Number, Brief Description of People Involved
<i>Focus Group Interviews</i>	6 FFEC 1 teachers 11 FFEC 2 teachers 9 FFEC partners from 5 organizations Students (informal)
<i>Class/Field Observations (including interviews with teachers and informal interviews with students)</i>	6 teachers on-site: <ul style="list-style-type: none"> • 1st grade integrated² • 3rd grade integrated (2 teachers at 2 different schools) • 3/4 grade integrated • 7th grade math • elementary school enrichment teacher
<i>Teacher Written Surveys</i>	16 PRE (94%); 12 POST (71%) (FFEC 1) 10 PRE (77%); 8 POST (62%) (FFEC 2)
<i>Student Written Surveys</i>	Insufficient data returned for reporting
<i>Individual interviews</i>	2 people who had experience with another comparable professional development program (7/8 science teacher and one project partner)
<i>Institute Evaluations</i>	Written and verbal from both FFEC 1 and 2 sessions
<i>Institute Observations</i>	2 days of FFEC 2 summer institute
<i>Document Review</i>	Project fliers and brochures, grant proposals, logic model, participant correspondence, workshop materials, participant products such as interpretive trail guide, teacher-developed curricula and teaching materials, student work samples.

Findings and Discussion

Findings in terms of both process and outcomes were exceptionally positive overall and shed light on the unique and successful elements of the FFEC model in addition to a range of impacts experienced by participants. Furthermore, candid feedback on challenges experienced by participants are presented in the report in the hopes that they will inform the refinement of the model.

Process Strengths

A consistent theme conveyed by teachers during focus groups and in written surveys was unequivocal praise for the quality of the FFEC program. Comments such as, “this has been the best professional development I have done in my 20

² Integrated refers to an elementary level classroom in which all academic subjects are taught by the classroom teacher.

years teaching” were common, and participants were able to easily substantiate their praise with descriptions of the most significant strengths of the program. Data gathered from teachers were augmented by evaluator observations and data gleaned from FFEC partners. The most salient themes that emerged are:

- Role modeling sound teaching practice
- Offering diverse and balanced perspectives
- Respecting and nurturing teachers as professionals
- Offering an organized, well-crafted program
- Commitment to long-term support

Process challenges

As with any evolving model, process challenges are inherent. To aid the partners in developing and refining the model, process challenges were documented. These challenges are divided into three general categories: those that pertain to the broader project or model, specific reservations about program content, and pressures faced by teachers that originate external to FFEC but impact its outcomes.

The process challenges that emerged were:

- Program implementation costs
- Follow-up visits underutilized
- Service-learning challenges
- Program areas to improve
 - Defining central terms
 - Help teachers understand “the How”
 - Offer options for pursuing more depth
 - Curriculum development expectations
- Teachers’ other pressures
- Clarity of partner roles

Project- and program-level recommendations provided in the last section of the full report are based on aggregated input from participants and the evaluator’s analysis of the program. Many of the recommendations are specifically linked to the process challenges noted and are intended to help FFEC partners refine the program as it continues to grow and expand its reach.

Teacher Outcomes

There was ample evidence that teachers gained *new* content, resources and inspiration from their participation in the FFEC series. The outcomes most consistently noted by or observed in teachers include:

- A change in teaching practice
- Using FFEC resources

- Building relationships with local natural and human resources, including public lands
- Creating a network of support
- Developing into teacher leaders
- Personal changes: knowledge, inspiration and rejuvenation

Student Outcomes

The student outcomes discussed are primarily a product of teacher reports and observation data. Though an attempt was made to survey students before and after their teachers implemented FFEC-related curricula, the response rate was so low that data can not be used. Teachers readily reported their observations of the effect of place-based education on their students, with seven themes emerging as the most commonly seen outcomes for students. They are:

- A growing relationship to local resources, both people and places, what might be thought of as an “attachment to place”
- Building community in the classroom itself
- Student engagement in outdoor learning
- A positive influence on academic performance
- Positive influences and outcomes for students with special needs
- Evidence of civic engagement in students

Teacher Survey Results

Pre- and post-surveys administered before FFEC intervention and after the series ended asked teachers to report on:

1. their familiarity with forestry knowledge and skills;
2. their understanding of other FFEC content areas; and
3. their curriculum and teaching practice.

The questions in these areas were designed to measure change over time, and survey data were compared using t-tests. In all 22 areas surveyed, teachers showed improvements in their knowledge or practice. Areas that reached statistical significance at the $p < .05$ level were the following:

Forestry knowledge and skills

- conducting a forest inventory
- Current logging techniques and practices
- Use of Biltmore stick (greatest gains)
- Global forces in the wood product industry
- Sustainably forestry certification (greatest gains)
- “Multiple Use” issues

Content knowledge:

- Soil science
- Forest ecology
- Forest fragmentation
- Land use history

Curriculum and teaching practice:

- Teaching standards-based curricula
- Creating standards-based curricula
- Using hands-on science activities in the classroom
- Teaching students outdoors
- Promoting service learning opportunities for students

These consistent gains are a very strong confirmation of program success in these content and practice areas. Furthermore, perhaps the greatest testament to the successful execution of a program is the degree to which it meets its goals. In post-surveys, participants were asked to rate eight program goals:

- Link teachers to resource specialists
- Link teachers to local resources and places
- Provide teachers with useful printed resources or other media
- Assist teachers in meeting educational standards
- Increase teachers' environmental awareness
- Increase teachers' knowledge about forests
- Assist teachers in incorporating service learning into their curriculum
- Increase respect and caring for local forestry resources in students

For both FFEC 1 and FFEC 2 groups, mean scores showed that participants rated all eight goals as attained or nearly attained, the top categories available, another meaningful testament to the program's success.

Conclusions and Recommendations

From a multi-year commitment to teachers to its individualized curriculum development focus, many features of the FFEC model distinguish it from a standard professional development program. But perhaps what truly sets FFEC apart from even the most innovative programs is the fact that it is the creation of a diverse partnership of public sector and non-profit organizations who bring a balance of skills, personalities and resources to the professional development series.

For change to come to schools, teachers must change the way they teach. And for teachers to change what and how they teach, they must have models, resources and the motivation to change. The nurturing and respect FFEC provides teachers

motivates them to be fully engaged in the FFEC program, to utilize new resources—public lands, publications, people—and, ultimately, to change how they teach students.

On another level, one could argue that teachers must also experience a level of personal transformation in order to bring change to their teaching, and to most effectively convey their passion to students. FFEC provides teachers with the stimulation and challenge that encourages personal growth. Teachers reported becoming less judgmental, more respectful of others' viewpoints, more knowledgeable of a diversity of issues behind what they teach and more connected to others in their profession and in some cases, more personally engaged as citizens in their own towns.

Enhancing a community's understanding of and respect for its local heritage—both natural and cultural—is a large goal. By exposing teachers to public spaces, training them to access local resources, and offering them the skills to offer these to their students in meaningful ways, FFEC increases students' understanding of and participation in their communities, a positive step toward a greater appreciation of public resources and enhanced civic engagement.

INTRODUCTION

A Forest for Every Classroom Program Overview

A Forest for Every Classroom (FFEC) is a professional development program for educators developed by a unique partnership of public land management agencies and nonprofit organizations. In particular, FFEC's focus has been working with teachers and school districts adjacent to the Green Mountain National Forest and Marsh-Billings-Rockefeller National Historical Park. The partners work together to provide teachers with a year-long workshop series in which they are exposed to new content for their teaching;

discuss new ideas about how to link subjects to the local community through field experience with resource specialists; and support in curriculum development. Critical components of the FFEC model include an emphasis on place-based education, service-learning, educational use of community resources, and civic participation.

Formed in 2000, the partnership consists of Shelburne Farms, The National Park Service's Marsh-Billings-Rockefeller National Historical Park and the Conservation Study Institute, The Northeast Natural Resource Center of the

National Wildlife Federation (NWF) and The Green Mountain National Forest. As with many partnerships, roles and responsibilities of the various partners have evolved over the course of their first two years together.

While all partners are active participants in developing the project, the National Park Service and the US Forest Service were critical natural resource links for participating teachers providing outdoor classrooms and a context for Place-based education. Shelburne Farms and NWF took the lead in developing the logistics and pedagogy of the professional development series and in training teachers in curriculum development.

The FFEC program has been explicitly participatory from the start. Early in the projects' development, the partners hosted focus groups in which community

Features of the FFEC model:

- Year long multiple contact workshops
- Team-teaching – embedded professional development
- Providing tangible resources – stipend, book \$ and mini-grants to support teaching
- On-going relationship with local agency
- Introducing teachers to people/ places/public lands
- Partnership
- Teams of teachers local to resources
- Building network
- Civic dialogue
- Learning about service learning

**compiled at December 2003 partnership meeting*

members—including teachers, foresters, loggers, woodworkers, etc.-- around Vermont were invited to offer input about what tools, knowledge, and experiences students need today to become responsible citizens and active stewards of forested lands. This public input was used as the context for creating a program that is authentic and appropriate for the concerns, needs and values of the targeted community. Based on these premises, and on best current practices in the field of professional development, the FFEC program was developed, and the following vision and goals evolved.

FFEC Common Vision and Project Goals

FFEC Common Vision: If today's students are to become responsible environmental decision makers, they must understand the local ecosystems in which they live and they must have educational opportunities based on real life issues that encourage them to practice citizenship in their own communities.

Accordingly, FFEC's goals are to:

- Cultivate an understanding of place by working with teachers and their students to experience and understand local forests as complex and dynamic systems of natural and cultural resources and increasing interaction between the school and community, building a stronger sense of place and stewardship of public lands;
- Provide resources for educators to meet state and national education standards while effectively integrating stewardship, citizenship and a sense of place into their curricula;
- Foster a strong network of teachers, partners, community members and natural and cultural resource specialists that will ensure an ongoing relationship of sharing of information, materials, and resources.
- Promote a balanced view of forest stewardship that not only teaches about the forest ecosystem, but also includes the spectrum of stewardship challenges faced by land management agencies (federal, state, local) and private forest landowners
- Build a strong partnership that helps to increase institutional capacity and further program needs.

The FFEC Project and the FFEC Program

A distinction is made between the FFEC program and the FFEC project, the former being a piece of the latter. The program refers to the place-based education model that is currently being piloted with teachers in Vermont. Seventeen teachers

participated in the first year of FFEC (FFEC 1) and 13 teachers in FFEC's second year program (FFEC 2). Unlike the majority of professional development programs offered to teachers, FFEC's structure is such that teachers meet periodically for a year, rather than a day, weekend or week-long course. Teachers have the chance to practice what they are learning in the classroom and then come back to ask questions, receive feedback, and learn new things. This year-long intensive program allows teachers to form a valued network of professionals, and to absorb complex concepts and new approaches to teaching over a realistic timeframe.

The project, on the other hand, is broader than the program and includes the convening and refinement of the partnership, and the evaluation of desired outcomes (such as dissemination goals.) This year the process and outcomes of the *program* itself were evaluated in an effort to help the project partners develop a sound model on which to advance place-based education through their dissemination efforts. As well, pieces of the overall *project*--such as how the partnership currently functions and contributes to program delivery--have been evaluated and are reported herein. The larger project, however, is to be evaluated over time as its course evolves and dissemination of the model unfolds.

FFEC in Context

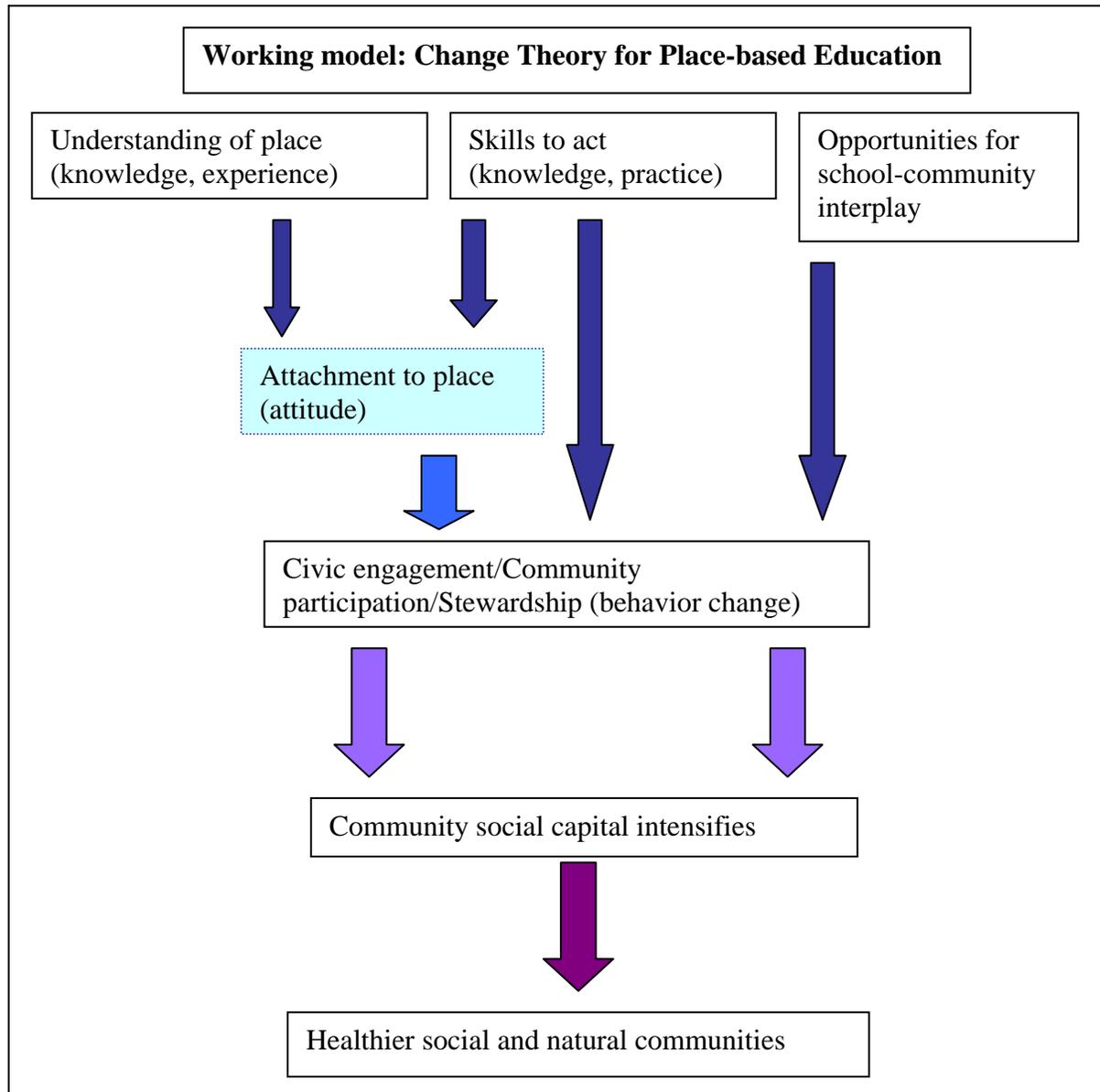
Theories of Change in Place-based Education

The overarching aim of the FFEC program is to help teachers understand for themselves the meaning of forest stewardship and then to assist individual teachers in transforming these new ideas into meaningful, place-based curricula.

The term place-based education is often entangled with a number of other, similar terms: community-based learning, service-learning, education for sustainability and project-based learning. In each of these there is intended to be, for the learner, an explicit connection between the school and the community—both natural and cultural--in which the school resides. A broader hope is to “tear down school walls” such that the community becomes integral to all facets of student learning—the school is open and inviting to the community and the community welcomes student learning to occur in many dimensions. Place-based education roots learning about abstract systems in the concrete experiences of the schoolyard and community.

In theory, when one has developed an attachment to one's place—and has the skills to proceed—an individual will become a more active participant in his or her community. This is sometimes referred to as civic engagement. When levels of civic engagement and participation increase in a community, social capital--the invisible web of relationship--is said to broaden and deepen. An intensification of social

capital then leads, in the long run, to healthier, more sustainable communities, both natural and cultural. This working construct is an essential part of the theory of change behind FFEC’s educational endeavors. See Figure below.



Place-based education in the research context

Though research into the effectiveness of place-based education in particular has been slim, existing documentation and evaluation of place-based programming show strong promise, and closely related research has demonstrated that students who are engaged in real-world learning are more likely to succeed than those who learn the same type of material from more abstract text books.

A program evaluation conducted by the Harvard Graduate School of Education for the Rural Trust (1999) provides case studies of schools and communities throughout rural America that have been transformed by grounding students' education in the local community and intentionally moving away from didactic approaches to standardized schooling. The evaluation concludes that as schools and communities work together to design curricular goals and strategies, students' academic achievement improves, their interest in their community increases, teachers' are more satisfied with their profession, and community members are more connected to the schools and to students.

Another study demonstrates the broad reaching positive effects of locally based curricula in over 40 schools nationwide. This 2002 study by the State Environmental Education Roundtable demonstrated that when the environment is used as an integrating context (EIC), student achievement and in-school behaviors improve (Lieberman and Hoody, 2002).

Further, many studies of the effectiveness of service-learning have been conducted, in large part by the Corporation for National Service, and these demonstrate powerful linkages between grounding the learning experience in the local context, enhanced student participation in community matters and increased student engagement in their academic studies. (See Appendix for an overview of best practices in service-learning.) In particular, service-learning experiences have been shown to promote a "pro-social, active conception of citizenship" in students (Chi, p. vi) when implemented consistently and intensively including opportunities for analysis of and reflection on the service experience and regular opportunities for teachers and students to engage in dialogue.

Another service-learning focused study found that "rural students develop significantly more favorable relations with adult civic leaders and community organizations when their service-learning experiences pertain to high priority community issues." (Hennessey, p. v-vi) This study emphasizes the significance of engaging students in real projects that are truly valued, and demonstrated that when projects of real value to the community are tackled by students, there are positive results: improved perceptions of youth and adults toward each other, closer relationships between schools and government, lowered project costs, and increased community demand for student involvement.

Equally integral to place-based education is a deepening of the sense of place people feel and their level of attachment to that place. Mueller and Abrams (2001) suggest that a sense of place is comprised of four primary components: 1) Knowledge, 2) Awareness, 3) Skills and 4) Disposition to care. These four variables become the task of the program developer to thoroughly include in the program design.

Because place-based education permits a wide range of learning approaches, it is well suited for students at all grade levels. In a model place-based education program, students at the K-2 level, for instance, might study green plants and begin a small schoolyard garden with the help of a local farmer or school groundskeeper, while high school students are using Geographic Information Systems and Global Positioning Systems to assist a town planner in updating the community's wetlands maps. Both of these examples—disparate as they may be—embody the essences of place-based education: they are clearly academic in nature, and they are naturally grounded in the local setting.

Educational strategies: schools and communities

If fostering a sense of place and conveying action skills are the first steps toward the desired change, then programmatically it is the job of organizations such as the FFEC partners to find the most appropriate leverage points in a system (or community) for fostering a sense of place at the ground level. As educational organizations, their missions hold that educational intervention is an essential way to make change at the community level. Meanwhile, the prevailing environmental education literature advises that a conservation ethic and responsible behavior must begin with early, sustained exposure coupled with action strategies and behavioral practice. (Hungerford and Volk, 1990)

Excerpt from: The Generally Accepted Principles of Teaching and Learning and their Implications for Local Education Support Systems

- All children do not learn in the same ways or at the same pace. (Good instruction provides students instructional choices and multiple ways to engage with content to help them take ownership of their learning and demonstrate competence.)
- Learning is active. It requires effort and resilience on the part of the student as well as interaction (Good instruction promotes this interaction by maximizing opportunities for students to engage in their learning, rather than passively absorb information with teachers, texts, materials, and/or other learners.)
- Learning depends on a foundation of factual knowledge, the understanding of concepts in context, and the organization of facts and concepts so that they can be retrieved and applied.
- Learning is not limited to school. It can happen anywhere. (Good instruction incorporates children's out-of-school experiences in school with lessons that have value beyond school and is connected as much as possible to settings in the community that enhance learning for children and adults both inside and outside of school.)

**Created by School Communities that Work: A National Task Force on the Future of Urban Districts (June 2002)*

As such, the school system is a natural point of entry for making change in communities. And, given the prevalent criticism of the effectiveness of the schooling system in the United States there is a clear call to propose educational strategies that more effectively meet the academic needs of learners. The promise of

place-based education is to rise to both of these challenges: enhance community health through increased social participation, and strengthen the school system with more effective academic strategies and enhanced support from the community.

Best Practices in Professional Development

If schools are natural partners for these projects, then teachers are a natural beginning audience. In FFEC's logic model (see Appendix) school educators serve as the first level of change. It is from this point that students might be reached. FFEC seeks to meet its goals through working with teachers in a sustained professional development setting. The educational theory behind the program design is aligned with best practices for teaching and learning. Side bar provides one example of best practices.

The evaluation attempts to understand, first and foremost, whether because of the involvement of FFEC in a teachers' career, teachers acquire and utilize new teaching strategies, resources and even philosophies. The ultimate audience however, is the students and communities with whom and within which these teachers work. As such, researchers and practitioners seek to understand in very preliminary ways whether this change in practice leads to acquisition of new knowledge and attitudes (and in some cases behaviors) in students, the secondary audience. Finally, as a long-range outcome, we look at what kinds of impacts the teachers' and students' work has on the community.

"And it may be that it will take a concerted, cooperative effort among educational institutions to meet the challenge of changing learner behavior. Certainly, an articulated implementation across grade levels and the cooperation of non-formal educational agencies as well as local and regional educational resources would maximize the opportunity for success." (Hungerford & Volk, 1990, p. 13).

The FFEC partners built their program on the idea that for a change in teacher practice to occur, curriculum development needs to be personalized and context-specific. Attention is given to individual teachers, and an emphasis is placed on developing curricula that is not only place-specific but integrates well into existing school, district, state and national standards. Unlike pre-developed curriculum packages that are offered to teachers in many professional development workshops, FFEC offers teachers concepts, tools and on-going professional support that can be integrated into existing modes of teaching.

For an overview of best practices for professional development in place-based education, see Appendix.

Place-based Education Evaluation Collaborative (PEEC)

Aside from framing FFEC in the context of the larger place-based education movement, it is appropriate to describe FFEC's active participation in a regional effort to develop and better understand best practices in place-based education. In the early phases of the project's development, the FFEC partners joined forces with several other New England foundations and educational organizations to develop stronger program evaluation practices for

place-based environmental education programs. Feeling that their organizations should be doing more comprehensive evaluations of their programs, the group decided to jointly hire an independent consultant to evaluate their individual programs and to lay the groundwork for broader research into the effectiveness of these models in attaining mutual objectives.

Four programs being evaluated

- Community-based Environmental Education (CO-SEED) Project
- Community Mapping Program
- Forest for Every Classroom Program
- Sustainable Schools Project

The collaborative has three main purposes. First, it serves as a learning organization for program developers, fueling internal growth and program development for the individual organizations. PEEC also aims to develop, identify and disseminate evaluation techniques, tools and approaches that can be applied to other place-based education providers, thereby promoting better evaluation practice in the

field. Finally, as a long-range goal, the collaborative intends to contribute to the research base underlying the field of place-based education and school change.

Collaborating Organizations

- Antioch New England Institute, Keene, NH
- The Orton Family Foundation, Rutland, VT
- The Upper Valley Community Foundation, Hanover, NH
- Shelburne Farms, Shelburne, VT
- Vermont Education for Sustainability Project, Shelburne, VT
- Marsh-Billings-Rockefeller National Historical Park and Conservation Study Institute, Woodstock, VT

The goals of the four place-based programs vary somewhat but common themes are:

- enhanced community/school connections
- increased understanding of and connection to the local place
- increased understanding of ecological concepts
- enhanced stewardship behavior
- improvement of the local environment
- improvement of school yard habitat and use as teaching space

- increased civic participation

These goals are compatible with the definition of place-based learning provided in The Rural Challenge and Evaluation Program of the Harvard Graduate School of Education's recent report, *Living and Learning in Rural Schools and Communities*:

In its most simple form, pedagogy/curriculum of place is an expression of the growing recognition of context and locale and their unique contributions to the educational project. Using what is local and immediate, as a source of curriculum tends to deepen knowledge through the larger understandings of the familiar and accessible. It clearly increases student understanding and often gives a stronger impetus to apply problem-solving skills. (p. 11)

What the four programs have in common is a focus on linking the school curriculum to the local community. Two programs work with whole schools (e.g. in-service days, staff meeting integration, etc.) and with community components (community/school forums, etc.), and two—including FFEC-work primarily with individual teachers through institutes, curriculum development and follow-up support. All four are programs that work with teachers and communities over the course of at least 12 months, and in some cases for over three years.

Collaborative members

- David Sobel, Antioch New England Graduate School
- Delia Clark, Antioch New England Institute
- Megan Camp, Shelburne Farms
- Kevin Peterson, New Hampshire Charitable Foundation
- Bill Roper, Orton Family Foundation
- Ned Swanberg, Vermont Institute of Natural Science
- Bo Hoppin, Antioch New England Institute
- Erica Zimmerman, Vermont Education for Sustainability Project
- Liz Soper, Forest for Every Classroom Program
- Nora Mitchell, Conservation Study Institute

EVALUATION METHODS

Evaluation of the Forest for Every Classroom program began at its inception in 2000. Project partners sought a comprehensive evaluation of their first two years of programming in order to better understand the successes and challenges of FFEC’s process of program development and implementation, and to measure the degree to which its projected outcomes were attained. Additionally, the evaluation was understood as a tool to better document the process and outcomes of the developing model, providing information for FFEC project partners and funders to assist with program development, justification and refinement. The evaluation process was participatory, encouraging input and reflective practice by teachers and amongst FFEC staff.

Evaluation Questions

Evaluation questions were designed by looking at the goals, objectives and expected outcomes outlined by FFEC partners in their Logic Model (see Appendix) and by meeting with program stakeholders. FFEC staff reviewed the questions and upon approval, appropriate research instruments were designed. (See Appendix for Evaluation Overview 2002-2003 and Instrument templates.) The guiding questions addressed in this evaluation are listed in the table below.

Evaluation Questions for A Forest for Every Classroom Evaluation 2002-2003

<i>Evaluation themes</i>	Evaluation questions
<i>Process Effectiveness</i>	<ul style="list-style-type: none"> • Which aspects of the FFEC professional development model are most effective? • What barriers have existed for teachers or FFEC project partners? • How could costs be reduced without compromising the effectiveness of the program?
<i>Teacher outcomes</i>	<ul style="list-style-type: none"> • How does involvement with FFEC affect a teacher’s utilization of local natural and human resources in their curriculum? • Did the teachers continue to use FFEC concepts/tools/curriculum units after year one, and/or do they intend to do so in future years? • Is the citizenship/service-learning element effectively incorporated and utilized in the teachers’ curriculums? Is this perceived as an important educational method by teachers and students? • What kinds of relationships are being established between community resources and teachers? (This question is

<i>Evaluation themes</i>	Evaluation questions
	<p>addressed peripherally, and is considered the beginning of a longer-term study.)</p> <ul style="list-style-type: none"> • How does participation in one of these place-based education programs change teachers' teaching practices? (This question is being addressed across the four programs that are evaluated under the Place-based Education Evaluation Collaborative and will be further discussed in an addendum to all four reports.)
<i>Student Outcomes</i>	<ul style="list-style-type: none"> • How does involvement with FFEC change students' perception of and relationship to their local community? • How does participation in one of these place-based education programs affect students' level of civic engagement? (Again, this question is being addressed across the four programs that are evaluated under the Place-based Education Evaluation Collaborative and will be further discussed in an addendum to all four reports.)
<i>Needs Assessment</i>	<p><i>We also set out to conduct a needs assessment for on-going evaluation of this program and the FFEC partnership and to provide the partners with additional photo documentation of the program in action. Photos are enclosed in the report and additional photos are available on CD.</i></p>

Process and Instruments

The evaluation is primarily qualitative though it relies on mixed-method procedures to bring better understanding of the program. Data collection instruments for this evaluation consisted of educator written surveys (pre and post), student written surveys (pre and post), on-site observation reports and focus group interviews with teachers and project partners. Two individual interviews were also conducted as well as a review of key program documents and photo documentation. Multiple methods help to triangulate the analysis of the FFEC process and outcomes. The following table lists the types of evaluation instruments used and participants involved in the evaluation:

Evaluation instruments and data collection methods

Instrument	Type, Number, Brief Description of People Involved
<i>Focus Group Interviews</i>	6 “FFEC 1” teachers 11 “FFEC 2” teachers 9 FFEC partners from 5 organizations Students (informal)
<i>Class/Field Observations (including interviews with teachers and informal interviews with students)</i>	6 teachers on-site: <ul style="list-style-type: none"> • 1st grade integrated³ • 3rd grade integrated (2 teachers at 2 different schools) • 3/4 grade integrated • 7th grade math • elementary school enrichment teacher
<i>Teacher Written Surveys</i>	16 PRE (94%); 12 POST (71%) (FFEC 1) 10 PRE (77%); 8 POST (62%) (FFEC 2)
<i>Student Written Surveys</i>	Insufficient data returned for reporting
<i>Individual interviews</i>	2 people who had experience with another comparable professional development program: <ul style="list-style-type: none"> • 7/8 science teacher • project partner
<i>Institute Evaluations</i>	Written and verbal from both FFEC 1 and 2 sessions
<i>Institute Observations</i>	2 days of FFEC 2 summer institute
<i>Document Review</i>	Project fliers and brochures, grant proposals, logic model, participant correspondence, workshop materials, participant products such as interpretive trail guide, teacher-developed curricula and teaching materials, student work samples.

Interviews and focus groups were semi-structured, a method that is particularly useful in program evaluation because it encourages interactions that help us understand both the process and the outcomes of a program, including what participants know and like about the program, how they have been affected by the program, and what they think should be different (Monroe, 2002).

Written surveys consisted of both open-ended questions and four-point Likert scale items and focus group interviews were semi-structured. (See Appendix for survey and focus group guide.) The focus group with six Year One (FFEC 1) teachers took place one year after the conclusion of their participation in the FFEC series. The focus group with eleven Year 2 (FFEC 2) teachers took place at the conclusion of

³ Integrated refers to an elementary level classroom in which all academic subjects are taught by the classroom teacher.

their final gathering of the current FFEC series. Similarly, pre-surveys for both cohorts of teachers were administered immediately prior to their first FFEC session, but post-series surveys were administered to FFEC 1 participants *one year* after their participation and to FFEC 2 participants *one month* after their series concluded. As such, the structure of the interviews and surveys for these two groups was quite similar but the responses hail from different temporal perspectives on the process. This means that in some cases, it was appropriate to aggregate data from both cohorts, and in other cases, it is more descriptive to understand the differences in perception between the two cohorts. Focus group guides were developed to be specific enough to adequately encompass the evaluation questions but flexible enough to meet the stakeholders' level of involvement with SSP.

Data Analysis

Focus group and interview data were taped and transcribed or transcribed during the interview. After fieldwork was complete, descriptive observation data and transcribed interviews were coded to illuminate key emergent issues and answer the evaluation questions (Miles & Huberman, 1994). The most prevalent themes emerging from the data were analyzed and are synthesized into this report.

Likert-scale-type survey data were entered into a spreadsheet and analyzed using t-tests. Documents were reviewed to provide context and to establish consistency with the themes that emerged from the interview and survey data. This report presents findings from both the quantitative and qualitative data sets.

FINDINGS AND DISCUSSION

Evaluation of the FFEC model focused on both process and outcome questions. In both cases findings were, exceptionally positive overall and shed light on the unique and successful elements of the model in addition to a range of impacts experienced by participants. Furthermore, candid feedback on challenges and ways to improve the model lead to what will hopefully prove to be useful recommendations. In this section, process strengths and challenges are presented, followed by a discussion of the outcomes generated for teachers and students. For greater readability, discussion of the findings is woven into the presentation of the data rather than appearing as a separate section.

Process Strengths

A consistent theme conveyed by teachers during focus groups and in written surveys was unequivocal praise for the quality of the FFEC program. Comments such as, “this has been the best professional development I have done in my 20 years teaching” were common, and participants were able to easily substantiate their praise with descriptions of the most significant strengths of the program. Data gathered from teachers was augmented by evaluator observations and data gleaned from FFEC partners. The most salient themes that emerged are reported, with exemplary quotes to better describe and support the findings. In particular, the following strengths are discussed in this section:

- Role modeling sound teaching practice
- Offering diverse and balanced perspectives
- Respecting and nurturing teachers as professionals
- Offering an organized, well-crafted program
- Commitment to long-term support

Role modeling sound teaching practice

“It has been very invigorating to be with professionals in the field and have them be model teachers in the area of their professional passion.” (elementary school teacher)

An often-cited strength of the FFEC program was how skillfully partners not only taught content but modeled how to utilize resources and how to present information or activities.

It was a wonderful model for us as teachers. [FFEC partners] were the teachers, and they brought in the resource folks and the experts, and those folks taught us stuff that the partners could have taught us, but they were the experts. So in the FFEC partners I had this nurturing person who knows

when to ask in the resource person. I am not used to doing that in my classroom. That was a nice model for us. (seventh grade teacher)

In each teaching observation conducted, there was evidence of teachers utilizing activities and practices that had been modeled by FFEC partners and invited guests during the training. Of six teaching observations conducted, eight different FFEC-modeled activities—such as conducting forest transects in the National Park, or journaling in “power spots” in a school forest--were being directly transferred to children.

In addition to these concrete activities, FFEC is modeling sound teaching practice in terms of interdisciplinary studies, inviting resource specialists to the classroom, and using local public lands and school grounds. Examples include:

- using interdisciplinary methods (5 of 6 observed classes were doing interdisciplinary lessons. Two of these made explicit connections between math and forestry.)
- using the nearby National Park (1 observation was at the Marsh Billings Rockefeller National Historical Park)
- inviting local human resources to assist with teaching (3 of 6 had guests to the school during the observation)
- using school forest areas, a form of public lands (4 of 6 were using school forest lands)

Though FFEC does not explicitly model for teachers how to conduct service-learning projects, it does provide teachers with examples of existing service-learning ventures by inviting other educators (including former FFEC participants) to present project examples. During observations of FFEC teachers with their students, it was very clear that many teachers are making an effort to incorporate service-learning into their teaching. Four of six lessons observed had some connection to service-learning. In one



observation, students were presenting research to the conservation commission; in two instances students were utilizing a student-built trail system at their school; in a

third, students were gathering data at the National Park to be used for a future service-learning project.

Offering diverse and balanced perspectives

In a climate where environmental education is often labeled as overly political or activist in its agenda, FFEC has attempted to bring a balanced perspective to the field. Teachers noticed this. A majority of the teachers interviewed for this study commented on the varied and diverse perspective offered as one of FFEC's strengths.

It gave me another perspective. I know about conservation and value the environment. But now you understand the value of managing the forest, there's reasons and purposes and its important to understand the challenges that the lumber company faces, too. I would not have sought out the perspective of those types of sources on my own. They exposed us to the whole gamut. (third grade teacher)

One essential thing about the partnership, I think, was that they were able to develop a balance. I think it was at the National Park when the superintendent spoke to us. We asked him some very hard questions. I remember being kind of upset talking about logging roads in the national forest. It was not the most pleasant discussion because there was disagreement but yet it was based in reality and what is happening in the country. Having that many partners makes it true and gives it that balance. (middle school teacher)

One focus group discussion captured well the level of impact the exposure to diverse perspectives had on participants. In the following exchange, four teachers were discussing a panel of people representing many aspects of forest culture, including an environmental studies scholar, national forest rangers, loggers and mill workers:

Teacher 1: I got the feeling that the partners all knew different ones to invite and they had to decide who can we bring with all those different mindsets. You could feel the shift in the panelists thinking during the panel because their perspectives were so different. (middle school teacher)

Teacher 2: I think back about that panel a lot too. I have so much more respect and empathy for different points of view since that panel discussion. Having that breadth there is so critical, so that we don't have preaching to the converted. And it also puts us in better touch with where our students are coming from.

Teacher 1: And as you understand other people, your sermons change.

Teacher 3: Yes, and it comes down to respecting other people's point of view. It lessens the judgmental part of myself.

Teacher 4: I remember when the conversation almost got to a conflict when we were meeting the loggers and the skidders. So in a sense they're modeling reality, conflict resolution, interdisciplinary learning. And it took a conversation about how are we using land.

Others commented that the partners were good about presenting teachers with varying ideas and allowing them to "do what [we] will with it, not preaching. To me that's the sign of a good leader. Respect for difference is key." In FFEC 1 and FFEC 2 workshop surveys, this type of sentiment was already clear to teachers:

- I think I have a better grasp of the complexities of meeting or addressing conflicting demands.
- This made me aware of how complex forest-related issues are, and how different interests don't have to be competing.
- I always think it's useful to get a broad spectrum of interests to talk...a safe environment was modeled.
- These are real world perspectives.
- This made the issue of forestry feel balanced...very enlightening.

Pre- and post surveys administered before FFEC intervention and after the series ended asked teachers to report on their familiarity with forestry knowledge and skills. Teachers responded to the categories on a four-point Likert scale. Pre and post means from these questions were compared using a "one-tailed" t-test. This test was chosen because the assumption is that the treatment (exposure to FFEC) would not cause scores to decline. These data revealed that teachers experienced very significant improvements in their knowledge and skills in *all six* areas surveyed. As confirmed by other data collection methods, it seems likely that this was due to repeated and thorough exposure to the subject areas, although the low familiarity with some content areas at baseline can not be ruled out as another contributor to the large increases in knowledge. The six areas surveyed—all of which show statistically significant increases--include:

- Conducting a forest inventory
- Current logging techniques and practices
- Use of Biltmore stick (greatest gains)
- Global forces in the wood product industry
- Sustainably forestry certification (greatest gains)
- "Multiple Use" issues

See Appendix for graphic representation of the data and the survey template.

Respecting and nurturing teachers as professionals

“...it is the people, their personalities, the freshness and fun was like a recharge, a validation of me as a teacher. You realize that you are not alone. I don't get that in my daily work, my administrators don't understand what I do, but I always felt that the FFEC partners understand where I'm coming from and welcome us to share where we were coming from.” (middle school science teacher)

It is apparent that the essence of what makes the FFEC model work is less tangible than providing teachers with printed matter or inviting intriguing guests to make presentations, although those these elements were highly regarded. Again and again, in focus groups, surveys, interviews and during observations, teachers emphasized the phenomenal degree to which they felt respected and cared for while engaged in FFEC.

A selection of representative comments (both written and verbal) help to illuminate the nature and importance of this strength:

- “A really essential part was the feeling that they really respect us as teachers on many levels, different aspects of teaching and what it involves. We have a lot of different pressures...and the reality hits that you have to look at your class and decide what you can and can't implement. Their patience and understanding was really important.” (fourth grade teacher)
- “When we realized where we were [at Blueberry Hill] I'll tell you....it's part of the respect piece. It's saying 'we value you.' And for me that's what drew me back. Those days were busy, but they said we deserved to be treated well. Just because we're teachers doesn't mean we only deserve a cup of coffee and a Danish and a dark classroom for a week-long course. It shows that they take us seriously.” (middle school teacher)

During one focus group, teachers came back to praising the sensitivity, respect and love provided by FFEC so frequently that the conversation needed to be redirected several times to discuss other areas.

- “The reason it worked was because we all love to be taken care of and we all felt loved and cared for. It made you want to come back. I think it was the most important thing. You don't turn away from that.... And it makes you open [the FFEC partner's] email first, even with all the other demands we have.” (middle school teacher)

The importance of creating this climate of respect and nurturing lies in the fact that these feelings motivate teachers to not only be part of such an initiative, but to implement the lessons they've learned and created, and to continue to use them.

Offering an organized, well-crafted program

"This has been the best professional development I've done in my 20 years of teaching. The seriousness and dedication they put into it, the thoughtfulness to come up with those ideas and to actually provide it." (fourth grade teacher)

Many teachers were impressed with the level of planning and detail that was apparent in the workshop format. Others mentioned appreciating the structure of the summer institute as having a weekend break in between two sessions. Teachers appreciated the varied locations for workshops, noting that this structure introduces them to many different sites that they could potentially use with their classes. Some suggested that this was probably the product of being a partnership project: "On your own you can fly by the seat of your pants more. Instead they seemed highly organized and well thought-out."

Perhaps the greatest testament to the successful execution of a program is the degree to which it meets its goals. In post-surveys, FFEC 1 and FFEC 2 teachers were asked to report their opinions on the degree to which FFEC met each of eight goals, using a four-point Likert scale. The eight goals participants rated were:

- Link teachers to resource specialists
- Link teachers to local resources and places
- Provide teachers with useful printed resources or other media
- Assist teachers in meeting educational standards
- Increase teachers' environmental awareness
- Increase teachers' knowledge about forests
- Assist teachers in incorporating service learning into their curriculum
- Increase respect and caring for local forestry resources in students

Means were calculated and compared. For both FFEC 1 and FFEC 2 groups, mean scores showed that participants rated all eight goals as attained or nearly attained, the top categories available, a meaningful testament to the program's success. None of the participants rated the program as not having attained its goals at least partially.

See Appendix for graphic representation of the data and the survey template.

Commitment to long term support

I think that doing this over the course of a year is very important. When you're creating a unit you need time to first come and get oriented, see what it's about, then have time to think about the unit and come back and discuss it with other people. Doing it in the different seasons was nice for getting the content areas and people we were exposed to. (middle school teacher)

Because teachers have the chance to practice what they are learning in the classroom and then come back to ask questions, receive feedback, and learn new things throughout the year-long intensive program many benefits emerge. Teachers formed a valued network of professionals, and were able to absorb complex concepts and new approaches to teaching over a realistic timeframe. The benefits of making a long-term commitment to teachers are many, but perhaps the most significant is the idea that “you get out what you put in”; FFEC teachers’ past and present experience demonstrates that sustained support and guidance leads to a sustained change in practice.

An elementary school teacher captured the spirit of many participants’ reflections on the value of sustained contact:

It provides reflective time over a year period as opposed to a few hours or days, and for teaching it's very important to stop and look at what you're doing to decide what's effective and what's not effective. That reflective piece. I thought the presenters were outstanding, but seeing how they would use what they presented in my own situation and having the time to work through that on my own was essential.” (sixth grade teacher)

Another teacher articulated his appreciation of the course structure: “At first I was nervous about committing to all these weekends, but then once I went to the first one I realized, this is how I function best. It's much better than doing an intensive, week-long [university-based] course. I mean, I look forward to this.”

Moreover, teachers across the board expressed enthusiasm for the idea that FFEC intends to offer continued support offered after year one. Many FFEC 1 and FFEC 2 teachers are eagerly awaiting continued professional development opportunities that are being offered in Summer 2003. They see it both as an opportunity to reconnect with a supportive group and to absorb new content and inspiration for continuing their work. During the “one-year-later” reunion with FFEC 1 participants, a fourth grade teacher commented:

To [implement what we create in FFEC] well you need a three to five year period with on-going support, meetings—like coming here. It doesn't have

to be constant, but ongoing, like once a year. We're so used to having a day-long workshop or weekend workshop and then no follow up. Things get dropped too quickly.

Even though FFEC 1 teachers reported not extensively utilizing follow-up classroom visits from FFEC partners after their year with FFEC, they were heartened by the reunion after one year, and by the summer 2003 offerings for teachers.

The partnership

"Working in partnership gave the project much more strength and credibility, and attracted a wider audience." (FFEC partner)

An especially unique aspect of the FFEC model is the partnership of non-profit and public agencies that created it. Benefits of this partnership can be divided into two categories—those that impact the program and its participants directly and those that benefit the partner organizations themselves.

Benefits to the program: Many teachers took note of the diverse array of skill and perspective brought by partners. The "behind the scenes" work of the partnership was clear to most teachers. Said one sixth grade teacher, "I think that all the partners fed off of each other when they were planning from their own worlds. I don't see how you could do it well without all those minds and places."

Teachers also expressed that the partnership's very existence was affirming.

To see such large organizations come together to do something for teachers was wonderful...what I really like is it feels like I'm part of something bigger. It's rejuvenating to see that there's a world out there that's working on similar things. And another thing is feeling that they all care, that we're not just renting space, but that each organization is really part of this. It's a power surge to be connected to people rather than working in isolation.
(middle school science teacher)

Partners themselves reflected on the diversity of their strengths, noting that each organization involved has much to offer. The whole project benefits from the "reach" of various partners; fundraising and project promotion can be more widespread with a greater variety and numbers of partners. The biggest benefit brought to the program by the partnership is the balance of perspectives and opinions that are incorporated throughout the program.

Benefits to the partners: While teachers were articulate about how the partnership program benefited the program structure and they themselves, they also observed benefits the partners receive from being part of this project. Observations and a focus group with partners expanded upon those ideas. The primary benefit to the partners seems to be magnifying their reach and credibility by teaming with others.

One organization's representative expressed that her agency would not offer a program of such magnitude if they were working alone, but in partnership they are able to create something larger. Another remarked, "We each have our own constituencies and so the audience for this project becomes vast." This, he adds, enhances both the agencies' and the program's visibility and credibility.

Another benefit is developing their own skills personally and organizationally. One partner remarked that she had not been well-versed in educational strategies, and now, with extensive exposure to place-based education and the educational system in general, she "gets it" and sees clearly how her organization can apply it to their other endeavors. Likewise, a representative from a non-governmental



educational organization reflected on the personal and professional growth she has experienced as part of the partnership: "I have learned about a huge part of our society—governmental organizations—and how they work. We need that crossover, the exchange."

Partners have also benefited from the capacity building that working on the FFEC project has afforded them. They have been able to "get extra mileage" from the partnership by spreading FFEC concepts into other initiatives, including adding place-based and civic engagement components to other organizational endeavors. They also remarked that partnering on this project "opens doors for further collaboration" with one another.

The tremendous benefits of working as a diverse team don't come easily. There are challenges to working together as a large group with different priorities. These challenges are discussed in the next section, but one partner representing a non-profit organization summarized the significance of this challenge:

In a way our partnership models what we want to see happening in society. If we can't get the private and public sectors working together then we can't expect the world to function that way. We have to walk the talk.

This modeling was not lost on the program participants, one of whom captured the sentiment this way: "They demonstrated a collaborative model, showing that we all have areas of expertise. That was subtly presented through their actions and in itself is an important component of place-based education." (elementary school teacher)
Apart from skillful modeling of teaching skills, partners were able to model the type of cooperation and respect for diversity that are needed to create a more sustainable society.

Process Challenges

Resounding praise for and satisfaction with the first two years of the FFEC model clearly indicates that the project was born of a strong foundation and has met with considerable success. Along with the previous process strengths, the outcomes described in subsequent sections are excellent testimony of that success. One could argue that another testament to a projects' success is its flexibility, and openness to critique and evolution. Particularly in the first phases of a project, seeking feedback on challenges and barriers to success is critical.

Less specific critical feedback was forthcoming from teachers from the FFEC 1 cohort, who were some distance away from completion of the course. FFEC 2 participants, whose focus group was conducted on the last day of their program when they were still "in the thick" of program requirements and commitments, were more ready with specific program critique. Both cohorts, however, were able to offer constructive feedback based on their vantage points and experience of the program. Project partners were also candid in their discussion of areas for improvement.

Challenges are divided into three general categories: those that pertain to the broader project or model, specific reservations about program content, and pressures faced by teachers that originate external to FFEC but impact its outcomes. Many of these challenges are addressed again in the form of a specific project recommendation at the end of this report. Contained in this section is a discussion of these process challenges:

- Program implementation costs
- Follow-up visits underutilized
- Service-learning challenges
- Program areas to improve
 - Defining central terms
 - Help teachers understand "the How"
 - Offer options for pursuing more depth
 - Curriculum development expectations
- Teachers' other pressures
- Clarity of partner roles

Program implementation costs

The model was so highly praised that very few suggestions were made for ways in which the program offerings could be reduced to lower costs. Only two teachers interviewed felt it was a viable option to limit the aspect of the program (such as camping or a non-residential set-up). Every other teacher felt strongly that this

component, though costly, was essential to developing the sense of community and networking that makes this program unique and lasting. Only one other possible means of reducing costs was suggested, that of limiting the number of partners involved in the project or at least those present at the trainings. Again, the vast majority of respondents articulated the sentiment that, for reasons delineated above, limiting the partnership aspect would be too great a loss.

*“Without the residential portion your time in the day is limited. And it’s critical for creating a sense of community.”
(middle school teacher)*

Though the question of cost reduction was investigated as part of this evaluation, no clear recommendations have emerged. Instead, evidence that the present (and evolving) model’s impact is great enough that removing elements would only cause detriment. One *could* opt for a reduction in costs such as a shorter series, stripped down facilities or limited resources provided to teachers. However, this evaluation’s findings suggest that these features are among those key to creating lasting change for educators, and ultimately, students.

Follow-up visits underutilized

The least utilized element of the model noted by FFEC 1 teachers was the provision of on-going support in the form of classroom visits by FFEC partners. Teachers noted several concrete reasons why this was the case:

- Teachers and project partners are located in diverse parts of the state, so they were more likely to call on local experts or support people rather than “bother” the more distant FFEC partners.
- The offer to visit classes was not structured enough for teachers to feel comfortable calling on FFEC partners. Since they perceived the offered visits as “open-ended invitations” teachers were unsure whether partners were available to assist them in teaching, meet to plan curriculum, observe them, etc.
- Everyone is very busy. Teachers themselves often feel over-committed and sensed the same from partners; in many cases teachers did not feel they needed support in the specific skill areas of many of the partners, but instead could call specific resources (such as the state entomologist). Some teachers felt that, since partners were not directly involved in the implementation of their curriculum units, it would take more time to bring helpers up to speed than to do it themselves.
- A few teachers emphasized that scheduling visits with partners in advance did not mesh with the more “spontaneous” way in which the school schedule and planning tend to happen.
- Several teachers reported not knowing what questions to ask, a factor that may be tied to the idea that the offer of support was not entirely clear.

There was, however, very little concern or disappointment expressed by teachers about the limited follow-up interaction. In fact, they felt that the model's structure was more encouraging of them to establish local, personal contacts for on-going support within their communities.

It should also be noted that those teachers who teach in schools located near the Marsh-Billings-Rockefeller National Historical Park (MABI), did regularly call upon FFEC partners who work at MABI (or their associates) for on-going contact, much as more distant teachers called upon their local resources. And there was ample evidence that teachers were very likely to call upon many of the experts to whom they'd been introduced by FFEC partners during the professional development series. Teachers noted that the requirement to create a local resource directory as part of their unit development provided them with ample contacts for on-going support.

Service-learning challenges

"I want to know how I can integrate service-learning without dropping anything else. It requires a lot of collaboration both within your school and with the town and that takes a lot of time, and administrative support so what I would need is to flesh out all the different factors that control how successful a community service project would be." (elementary school teacher)

While the FFEC series did not expose teachers directly to service-learning curricula through participation in a project, the program does promote and expect service-learning as part of teachers' curriculum development. Several excellent examples of service-learning emerged and are discussed in greater detail in the teacher outcomes section, below. Many teachers, however, expressed anxiety or confusion about this element of the course, which is notable both because most teacher reactions to the program were so positive, and because the ability to lead students toward meaningful civic engagement is an important goal of FFEC.

Many teachers seemed confused about the definition of service-learning, were not easily able to articulate what service-learning constitutes and were overwhelmed by the magnitude of the example provided.

Several teachers felt that, while the service-learning component of FFEC is "critical", the expectation to have it in process during their year-long participation in the FFEC program--in addition to getting their units off the ground--was too overwhelming. It was clear that particularly the FFEC 1 cohort viewed the service-learning component as a piece that was extricable from their unit.

Teachers suggested that it be a concept that is introduced and discussed but that expectations should be more lenient. For teachers for whom the basics of place-based learning and forest ecology are new, just implementing those changes are a big first step. If indeed FFEC partners do not wish to de-emphasize the importance of service-learning, several suggestions were offered:

- in the year following their FFEC training teachers could receive on-going training and assistance from FFEC partners in getting the service-learning component off the ground.
- Since modeling and experiencing the other types of activities is what really allowed other forms of change in practice to sink in, teachers should actually be immersed in the process of developing and conducting a service-learning project during the FFEC training. Participants indicated that a more precise step by step experience of service-learning might make it seem more manageable.

Apart from their level of training in service-learning, teachers at both elementary and middle school levels alluded to school structures that prevented them from implementing service-learning projects. These challenges varied from short periods of contact with students (as in middle school), competing interests or expectations (as in the emphasis on more standard math and literacy work) and a lack of understanding, support or collegiality with other teachers and administrators when it comes to learning-learning. One participant who had experienced another, similar professional development model as well, made an apt comparison:

Because we had to enroll as a team of teachers, it gave us more leverage for getting out of the school. With FFEC my participation has been invisible so it's more difficult to justify special scheduling. With FFEC it's me or nothing.
(middle school teacher)

This suggests that, without administrative backing, or the leverage of other teachers' support and collaboration, more complex projects are difficult and the base of stability is weaker.

Still, teachers conveyed many visions and hopeful prospects for future service-learning endeavors. Moreover, a discussion of those projects that did get off the ground in the first two years follows in the teacher outcomes section of this report.

Program areas to improve

On the whole, the content of the workshops and institutes that comprised the year-long FFEC series were given unequivocal accolades. There were four areas of

discussion that emerged, however, as points of challenge for some teachers or suggestions for improving the program.

Define the most common terms: Teachers were aware of being part of an evolving model, and attributed several of their concerns to this factor. Both partners and teachers noted that agreeing upon clear operating definitions of terms such as place-based education, service-learning, civic engagement at the project level would help participants at all levels.

Help teachers understand the how: Several teachers reflected on the need for more emphasis to be placed on how to integrate this new type of curricula into existing school structures. This concern spoke both to the need to more effectively integrate school administrators into the program's learning, and the greater difficulty that comes with implementing complex projects and off-site learning for non-block scheduling—primarily that of older grades. One middle school teacher said:

When I realized that most of the teachers involved do not have 80 students and 40 minute periods, I thought I was in over my head. No one was talking to us about how to deal with this. It was geared toward elementary school teachers. It was overwhelming not to have guidance on the how. If middle school teachers are to be included in this program there needs to be support provided for the kind of scheduling we deal with.

Several other teachers at the middle school level had great determination to implement their newly developed curricula but were foiled by an unsupportive administration or the inability to control schedules enough to make time for out-of-school learning.

Offer options for pursuing more depth: Several participants suggested that by lengthening each workshop segment and cutting the number of “expert presenters” in half, more depth would be brought to the program. However, others feared that the offerings would be too slim for diverse tastes. Accordingly, suggestions were made about offering options at certain times during the workshops so that if a teacher is unlikely to ever teach geology—or already feels she has mastered that area--she could choose a different “track” that day.

Curriculum development expectations: In-depth discussions emerged in both FFEC 1 and FFEC 2 focus groups regarding the usefulness and appropriateness of the required unit structure. Several people felt strongly that the requirements were too rigid, not allowing for teachers to create the product that would be most useful to them, and therefore the best investment of their time. “The assessment being a checklist was terrible. It shouldn't be that structured. That's modeling exactly what you shouldn't do with kids. Expectations should be high but it should also be based

on what is going to most benefit the kids in our classrooms not what you checked of the list or how the unit looks.” (sixth grade teacher) Similarly, several teachers voiced strong views about the rigidity of the Vermont Framework of Standards and contested the requirement that the unit be standards driven “rather than kid driven”.

However, far more teachers—after also detailing what an overwhelming amount of work they had to do to comply with the expectations—concurred that the guidelines prompted them to grow professionally and ultimately to create a product that was more useful than it otherwise would have been. One curriculum development tool that was taught to and utilized by all teachers was the Five-column Chart. After initial skepticism about this tool, the majority of teachers reported that it gave them added credibility to have produced a standards-based unit using that tool. “The administration needs to see that we’re doing standards. It teaches us how to maneuver through this complex system,” reported a middle school teacher.

Apart from simply viewing it as a tool of the unfortunate reality of the system, an impressive number of teachers also reported (in tones that conveyed that even they themselves were surprised), “I’m really using that five column chart!” One non-formal educator relayed that he had become a local resource for other teachers in curriculum planning because of his newfound experience using this tool. Participants noted that they would have liked to have had more time to plan their curriculum, particularly working one on one with FFEC partners or curriculum specialists for guidance. One participant highlighted the idea that using this format had “forced [her] to evaluate criteria, assignments and assessment,” suggesting a comprehensive approach to curriculum planning rather than one that was simply activity-driven.

Even though many considered this a challenge, ultimately, there was widespread agreement that high expectations are part of “getting good” at anything. They further stated that, whether they agree philosophically or not about being standards-based, it is the reality of the system within which they work. Having the tools to navigate that system is essential.

What begins as a challenge for teachers turns out in the end to be a strength of the program. Nonetheless, it is worth noting how much grief teachers experience from the existing guidelines throughout much of the program and considering alternative means to an end.

Teachers’ other pressures

Some of the barriers that teachers and partners referenced are a product not of FFEC’s design but of the school context in which teachers work. Though FFEC

cannot change these circumstances directly, it is important to understand the key barriers that exist so that the model can evolve to more soundly account for them.

Elementary school teachers lamented that at their level, the science curriculum is often de-prioritized in favor of math and literacy, more heavily tested subjects. Though the place-based learning that FFEC promotes is inherently interdisciplinary, studies such as forest ecology do fit most neatly in the science curriculum. Others noted that a high emphasis on testing, or “teaching to the test” limit their ability to be creative and implement new, diverse or interdisciplinary curricula. Other teachers were explicit that, particularly at the upper levels, school schedules are prohibitive for taking students outside, especially on field trips. A final challenge for teachers is that of finding funding for buses if off-site field trips and service-learning endeavors are part of their curriculum.

Clarity of partner roles

Both participants and partners noted that greater clarity on what roles each partner plays would be useful to the functioning of the project. Partners noted that communication issues were the biggest challenge of working together. Both because of a large group and because of varying roles (e.g. some more desk-oriented than others for returning email messages; others traveling frequently) the process was sometimes stalled and there was some redundancy in communications. And, because some partner organizations prioritized their staff members’ involvement in FFEC to varying degrees, levels of commitment inevitably varied.

A separate challenge is making sure that each partner retains its own identity within the partnership, and receives recognition and credit for their participation. A lead organization was, by necessity, assigned, and all agreed that this organization did well at taking the lead on program logistics and delivery. However, it is important that all partners remain visible and receive credit for their involvement since many organizations’ future viability depends on the recognition they receive for successful work. Participants also commented on the disparity in visibility amongst partners, and their organizations in particular. “I think of the people more than the organizations, really. Maybe they should have put that out there more, which organization they’re with. I know who the sponsors are but it has been low-key,” said a middle school teacher. However, another teacher offered an explanation for why the organizations were not necessarily highly visible, “They were united in purpose which was FFEC, not to get out the agenda of the partners. The purpose of the partnership was financial and using their expertise to plan a common goal.”

A final partnership concern came in the form of clarity about what kinds of public lands were being promoted. One seeming miscommunication with participants was that teachers were expected to use *national* public lands (national park or national

forest) as part of their curricula. In some cases, teachers were not actually located near these resources, and instead made use of local, regional and state public resources instead. To a large extent these include town forests and schoolyard forest habitat due to their accessibility. Several of these teachers expressed concern that they were not complying with FFEC expectations because the land was not nationally held. One teacher suggested that a remedy for this would be to include a state-level public servant as a partner as well, to emphasize the variety of public lands that can be—and currently are--utilized by FFEC teachers.⁴

As with any evolving model, process challenges are inherent. Project- and program-level recommendations provided in the last section of this report are based on aggregated input from participants and the evaluator's analysis of the program. Many of the recommendations are specifically linked to the process challenges noted and are intended to help FFEC partners refine the program as it continues to grow and expand its reach.

⁴ If it is indeed the case that using national public lands is an expectation then program coordinators need to be careful about *only* selecting participants with ready access to such lands or they are setting teachers up for perceived failure.

Teacher Outcomes

As with many elective professional development courses, teachers who opt to participate are often those who already have a passion for the subject or focus of the series. This was a fairly common characteristic of both the FFEC 1 and 2 teachers. Despite a predisposition to both the type of inquiry-based, hands-on teaching that FFEC promotes and an existing interest in the content area on the part of many teachers, there was ample evidence that teachers gained *new* content, resources and inspiration from their participation in the series. Teacher outcomes described in this section include:

- A change in teaching practice
- Using FFEC resources
- Building relationships with local natural and human resources, including public lands
- Creating a network of support
- Developing into teacher leaders
- Personal changes: knowledge, inspiration and rejuvenation



A change in teaching practice

There were five key areas in which teachers have begun changing the way they teach students and build curricula. These are described below:

- Use of local places

- Teaching place-based and forestry education
- Better curriculum planning
- Citizenship and service-learning in the curriculum
- Interdisciplinary teaching

In some cases, teachers changed in all of these ways, in others teachers



changed in one or more. For example, one teacher summarized her own growth as a result of FFEC in four points:

- connections to (and the impetus to connect on her own) human resources
- activities such as journaling, searches, power spots
- teaching and assessment methods like culminating projects
- confidence about letting kids roam farther in the woods and confidence to try new things because she had tried them herself.

Pre- and post surveys administered before FFEC intervention and after the series ended asked teachers to report on the degree to which they utilized nine different teaching and curriculum development strategies. Teachers responded to the categories on a four-point Likert scale. Pre and post means from these questions were compared using a “one-tailed” t-test. These data revealed that teachers made changes to their curriculum and teaching practice in all nine areas assessed, five of which reached statistical significance ($p < .05$), a very strong confirmation of the impact of the program in this area.

The nine areas participants reported on were:

- Teaching standards-based curricula*
- Creating standards-based curricula*
- Teaching about environmental citizenship
- Using hands-on science activities in the classroom*
- Using the surrounding community in their teaching
- Teaching students outdoors*
- Taking students on field trips
- Promoting service learning opportunities for students*
- Inviting community specialists to the classroom

**indicates statistical significance at the $p < .05$ level*

See Appendix for graphic representation of the data and the survey templates.

Use of local places

“Basically a big shift for me since FFEC is a shift to being more in-depth by having the local context as a focus. I was spread too thin, and this works much better for the kids learning and for me too.” (third grade teacher)

There was a clear increase in the amount of time teachers spend teaching students outdoors using public lands. For teachers whose schools are not located near the National Park or National Forest, the use of their own town forests and publicly-held schoolyard habitat increased.

A middle school teacher who has participated in other professional development workshops and has a natural predisposition toward this work, reported that all of the aspects of his teaching practice had been affected since FFEC (see sidebar for the teaching practices teachers were asked to evaluate.) He said:

I used the outdoors before but this has empowered me to do it more and better. Even a year later, I still feel it kicking in. I used [all of the amphibians resources] last summer in this ecology camp I taught in my own town. We did a lot of the activities and used a lot of the FFEC resources, and now I'm gearing up to do it in school with my 8th graders." He described his students engaged in a survey of the local frogs. "They're all wearing rubber gloves. Why? Because I told them that amphibians are sensitive to oils and salts on your hands. I learned that when Jim Andrews came to FFEC."

Aspects of teaching practice about which teacher were asked to evaluate themselves in focus groups:

- Content/Subject
- Use of outdoors
- Collaboration with other teachers
- Inquiry-based learning
- Use of community places/spaces
- Use of community people
- Teaching philosophy
- Other

A sixth grade teacher reported that his goal for participating in the course was to "force" himself outside with the kids:

I used to teach outdoors all the time, but for years I've only been teaching indoors. I kept saying, it's time to get out there and FFEC had an effect. I use the outdoors consistently now and am back to my earlier philosophy. I've come full circle. Now making the time in the day for that is just a given.

Several teachers described the impact of participating in the series as intensifying, enriching and deepening the type of outdoor teaching to which they were already committed. One elementary level teacher explains:

I've always tried to incorporate the outdoors into my teaching, but after our year with FFEC I have a huge



box of resources that has helped me in learning about the resources, tools and concepts I never would have otherwise. It really enriched and deepened what I teach. At this grade level we're required to teach about the plant kingdom, so the FFEC experiences have brought the plant kingdom home.

In an observation of this teacher leading her students in a study of tree parts and function, she led her students in an interactive role-playing activity known as "Heartwood Sapwood" which she picked up from one of the resources provided by FFEC. She said, "They modeled doing this activity during one of the workshops so now I've done it for two years in a row. I really try to teach to multiple intelligences, so this get the kids up and moving around experiencing the parts of a tree."

Teaching place-based and forestry education

"Chances are they aren't going to have those 'a-has' while they're in the classroom. So it's making it our mission to get them out of the classroom and into apple orchards and forests...that's where the 'a-has' will happen." (elementary school teacher)

Some teachers' practice changed quite dramatically. One changed her curriculum to a *Reading the Landscape* focus after working with the book's author, Tom Wessels, during FFEC. She also started to teach geology for the first time, mentioning using a "pieces, patterns and processes" method of teaching modeled by FFEC. She described a transformation in the level of engagement her students had with the materials, one that was even reflected back to her by students' parents:

Once you start looking at geology you start talking about Genesis, which is exciting with fourth graders. Kids have come back after journal writing because we got into bigger questions about whether there is a god. We were really clear that there are many points of view, but they loved those big questions and parents have said that they were so happy that kids are talking about big questions when they are young and free to explore them openly. That geology piece is really critical and it came directly from FFEC. I'd never taught geology and it has really tapped into their imaginations.
(fourth grade teacher)

One elementary level teacher remarked about transforming the way she teaches about the state of Vermont to include native Americans, since "what better example of stewards can you think of than the Indians." In other cases, more general studies became Vermont focused:

We've always taught geology in third grade, but now we're shifting to a focus on Vermont geology. This way the kids can wonder why rocks are in the river by our school, and why Mount Abe is there. It also hooks them

right into the fourth grade unit on the Northern Forest and VT history. They become a sequence linked by the local focus. (third grade teacher)

In the two years since her participation in FFEC, one teacher has not only become a teacher leader in her school, but has set up an outdoor classroom with student help, received a grant to pay for outdoor exploration tools such as 40 pairs of snowshoes, backpacks, and field research equipment. She says, "I hadn't done much about the place concept before FFEC. I had a personal interest before but not a lot of knowledge. I did use an outdoor classroom sometimes, but not as a totally integrated part of the curriculum like it is now."

She now is in her second year of having "a major focus of the kids' school work be observation and exploration based, using questioning and hypothesizing." Observing her interact with the class, inquiry-based teaching techniques were prominent. Her students are obviously accustomed to coming outdoors, even in winter, and are well-equipped and sit themselves right down on the snowy ground in a circle. Their teacher facilitates a discussion about winter and freezing in which the students pose questions and speculate on answers and ultimately design an experiment to test what they hypothesize. She allows their conversation to flow.

The inquiry part of teaching was something I did in the past, but I didn't give it as much time as before. It takes time, because their questions generate more questions. The big thing I learned is being comfortable with letting their questions hang out there and letting them form their own hypothesis. My comfort with doing that has really increased.

Better curriculum planning

Teachers discussed several ways in which the curriculum planning techniques they acquired through FFEC participation affected them. On one level, it increased their legitimacy in convincing other teachers, parents or administrators of the value of what they were doing. A first grade teacher who has been teaching a forest unit for many years found herself confronted with new district requirements based on standards. She stated that FFEC gave her the tools to translate what she has been doing with forestry into a standards-based unit, and thus meet district requirements. Otherwise, she would have had to drop what she had been teaching. Additionally she felt that the unit had improved considerably because her own content knowledge had increased as well. A classroom aid who has been teaching alongside her for five years reported that she noticed that this year the unit had added depth, and more content and resources going into it.

On another level, it increased teachers' own degree of reflection on what they teach. They shared comments such as, "I had to think more about why I was doing this, whether each piece was just for fun or whether it continues to the students' learning

because the course required me to do so.” (first grade teacher) In several cases, such as this first grade teacher, teachers attributed participation in FFEC to their doing better assessment of student work, “Another thing I’m doing differently is using journals for assessment more. Now I give them a guided topic rather than just write what you want.” Similarly, a third grade teacher now utilizes new assessment methods: “I had never done culminating projects before. This year they created posters and books at the end. It helps me really see all they’ve learned.”

A fourth grade teacher talked about how FFEC inspired her to re-arrange the sequence of her teaching to make it meaningful for students:

I started thinking about pre-teaching, like doing a field trip at the beginning so that when kids get going on doing a project they’re not just pulling out a book, but they’ve been there and seen it and heard it. It’s another direct example of how FFEC helped me shape the curriculum so it’s more meaningful. (fourth grade teacher)

Citizenship and service-learning in the curriculum

“Because of FFEC I’ve moved from environmental education to teaching citizenship skills and teachers see another layer to what I’m doing. It makes the education that much richer and it increases the value of what I do.” (enrichment teacher)

Example one: School-wide service-learning projects

Service-learning has been largely discussed in educational circles in recent years and has been defined extensively. (See Appendix for one set of guidelines used by service-learning professionals.) Several truly impressive examples of service-learning projects have emerged from the FFEC 1 and FFEC 2 teachers. In other cases, teachers implemented some piece of a service-learning project, or a modified project. In still others, teachers included a description of a service-learning project in their curriculum write-up but did not (yet) implement it. Challenges to implementation of service-learning projects are discussed in the program challenges section of this report.

One observation conducted was during the culminating activity for a service-learning project. The entire fifth grade class at an Upper Valley elementary school conducted a study of benthic macroinvertebrates in a local brook and a team of five representative students presented their methods, finding and recommendations to the town conservation commission. By way of welcoming students to the meeting, the conservation commission chair said, “We’ve been very interested in what goes on in Blood Brook, what kinds of pollution levels we see there, so we thank you students for taking the time to investigate.” He later stated that this study would be valuable to their future data collection efforts, noting that the students’ findings

would serve as “baseline data for future studies of this kind.” He remarked that the conservation commission has had a desire to do more research, and this will be the motivation to continue the study on an annual basis.

The FFEC teacher who led this group of students is an environmental educator working as an enrichment teacher in the public school. Unlike the majority of other participants, she stated that the biggest influence of FFEC on her was the stewardship or service-learning aspect. “That’s what really pushed me into initiating these kinds of projects with kids. FFEC was the impetus for doing a big, real project with all different players and a real result.” In addition to the above project, she initiated several other service-learning projects with students:

- Third grade students conducted a wildlife inventory of a nature area while learning tracking in winter skills. They set up a computer database, graphed the animal signs found and determine what animals use the natural area most. The students put on a slide show for the local Special Places Committee, educating them about the wildlife inhabiting the area this committee had worked hard to preserve.
- Part of this project included a bird inventory in which volunteer adults from the town helped students to identify and record 60-70 bird species.
- The group also completed a large, semi-permanent mural exhibit for the Montshire Museum.
- The fourth grade conducted an extensive vernal pool study. The students located the pool on a town trail, studied the amphibians and other creatures, took photographs, and created a display in the post office to educate people about these “special critters”. Consequently the conservation commission asked the fourth grade to be involved in an on-going vernal pools mapping project to delineate all the vernal pools in the town.

While, unlike other FFEC participants, this teachers’ job is to do environmental education in the school, she attributes her own initiative toward these town-oriented, “real-world” projects to her participation in FFEC.

The most valuable thing I got out of FFEC was the idea of making environmental education place-based. It reinforced what I was doing, and at the same time I made all these community contacts and really made a commitment to being involved in a local study makes the project more real and serious.

She described a further benefit of doing service-learning projects as part of her curriculum.

The teachers take it more seriously. In many cases I'm just 'fit in' to the schedule, but if we're involved in a real town study then I have leverage because the teachers really see the value. They see that the students are making a contribution and that they develop self-esteem. So these projects make for a stronger partnership between me and the classroom teachers.

Furthermore, she notices a difference in students when they are engaged in real-world learning. "The difference is unbelievable. They go out to a study site and they know why they're there. They behave appropriately, keep the focus, handle equipment responsibly. They act professionally," she reported. She predicts that these types of projects will be sustained, saying "the idea is that we're going to repeat things that work" to create a learning cycle K-5.

Example two: Interpretive trail on the school grounds

In another case, a third grade classroom teacher enlisted her third graders and aggregated the expertise of 20-30 local sources to complete one large project for the school, building a nature trail. The conservation commission assisted students in mapping out an appropriate area to turn into a trail, an eagle scout candidate helped build the trail itself, a local forester assisted students in identifying the trees for the field guide/interpretive trail they created and a parent helped to build shelves for a planting element of their habitat study. Also involved were several other organizations: Morse Tree company donated bark chips, the school grounds committee and administration of the school supported the effort and the town administration provided information to create maps associated with the trail. The conservation commission was heavily involved. Students laid out the trail with a Marsh-Billings-Rockefeller National Historical Park Ranger, using town maps and developing their own, and they worked with a local naturalist to identify the trees and wildlife in the ecosystem to incorporate into an interpretive trail guide.

The student-developed field guide was made available in the school office and at the town library. Since its completion in Fall 2002, five other classes (as well as numerous parents, students and community members) have used the trail as well as the FFEC participant's class. At a town level, one of the most exciting contributions of this real-world project was that, as a result of participating in the school's endeavor, the town manager became aware of the particular boundary between the school and the adjacent land. One area was identified as undevelopable, so the land owner offered to donate it to the town who in turn passed the title over to the school. The hemlock ravine makes an excellent opportunity for extending the interpretive trail in to new and different habitat. The trail above is now slated to just be the "entry way" to a more extensive school-grounds nature trail to be developed on the new parcel of adjacent land.

Other service-learning endeavors:

Several other service-learning projects were described or observed during the data collection process. This is a snapshot of two of them:

- Two elementary school teachers who were interviewed reported that a fellow program participant and high school teacher had brought her older students to their classrooms to teach the younger students about insects. This kind of endeavor demonstrates the power of networking teachers together, valuable content knowledge for young students and a tangible service-learning project for the older students.
- Another teacher's class constructed a trail and outdoor classroom for their own and the school's use. Students worked with a local stone mason to make a boundary for the outdoor classroom and others worked with a carpenter to choose logs and create benches. Still others planted trees along the river for erosion control so that the outdoor classroom would be protected if the river were to flood. In addition, the third grade teacher added, "There was a reflective piece, verbal and written, because the kids needed to present it to the rest of the school and they had to be clear." Students led groups – including every student and every adult in the school-- through the project area.

Interdisciplinary teaching

"I wanted to prove forestry could be taught without sacrificing math. Now my kids believe you can't learn about the forest without math." (seventh grade teacher)

Through FFEC's modeling and their growing understanding of place-based education and service-learning, more teachers reported using interdisciplinary teaching methods, whether it was within their own classroom or by collaborating more with other teachers.

During one observation, a math teacher using the national park for a forestry/math lesson quizzed her students before they met the National Park Ranger and began the day's work: "For what trees do we have evidence that Mr. Billings planted them, but no evidence that they're still here?" "Alder!" replied the students. She interspersed historical questions with math/science questions: "And what is the meaning of diameter at breast height? Basal area? What is the diameter of a saw log?" The students answered quite readily, seemingly at home in the national park setting and at ease with the mathematics and terminology of a forester.

Another teacher began seeing the inherent connections between subjects as she teaches all angles of her curriculum:

I've discovered how science and math can just be on-going in a casual way. So I incorporate it into everything now. The next thing we'll do today is connected to this year's math study—we'll measure the circumference of the trees in our outdoor classroom. It also gives them a foundation for next year's forestry unit (with another FFEC participant). (third grade teacher)

Using FFEC resources

There was no question as to whether the printed resources distributed by FFEC are being put to good use. During all aspects of the evaluation process, teachers expressed gratitude and the utility of these resources. In particular, Tom Wessels' book *Reading the Forested Landscape* was widely mentioned, the Project Seasons curriculum guide used often and printed matter given to teachers by a local forester and the arbor day association were referenced.

On the day of an observation, a fourth grade teacher reported:

Another great thing about FFEC is the abundance of resources they gave us. Like just last night I was getting ready for today's lesson and I just brought home the stack of materials they'd give me. I don't have to go looking all over the place anymore. And on top of all the other stuff I have the 25 lessons that I created.

A sixth grade teacher reported frequently using the Joseph Cornell book *Journey to the Heart of Nature* with his students as one of the main tools for getting his students outside the classroom's four walls.

Yet another teacher remarked about how both she and her class were impacted by a journaling resource: "One of the books they gave us to read was about journaling and sketching. I tried it out myself and noticed things I'd never seen by taking time to observe closely. And I've been very impressed with the students' thoughts and drawings this year." (third grade teacher)

Teachers unequivocally praised the usefulness of having resources at arm's length. Not only could they plan lessons more easily and verify their own content information, they were able to share these resources with others in their schools. Given the good use the printed matter is put to, it would seem an investment worth making on the part of FFEC.

Building relationships with local natural and human resources

“One of my goals throughout the project was getting kids to understand that they own land. That this is public land, not just privately owned and they don’t really have a sense of that. So part of my unit is that I’m setting up a lot of field trips, more than I’ve ever done in the past, into the local state parks. We’ve chosen all those that are not more than an hour away. I want them to be able to see that state parks are so different, each with their own qualities and attributes. They have to be out there to understand that, and this class has forced me to get out there even though it takes time. I’ve prioritized it.” (fourth grade teacher)

Many teachers reported that they had contacted multiple new resource people in the community or region since their involvement with FFEC. Types of human resources solicited included:

- National Park Service or United States Forest Service employees (several cases reported)
- state entomologist
- other participants in the FFEC series (several cases reported)
- a parent who “comes regularly to walk the brook with kids helping them learn the macroinvertebrates and stream ecology” or “helped students build shelves for their greenhouse” (several cases reported)
- a grandparent who was retired forester
- county forester
- arbor day society ranger
- conservation commissions (several cases reported)
- eagle scouts
- tree company donated trail building materials



In some cases, these resource people served as guest speakers or hike leaders at the school, in others they hosted the students on a field trip. In still others the resource people did not interact with the students directly, but instead provided teachers with information and resources. In one case, a math teacher corresponded regularly via email with a state biologist who had access to data that the teachers’ students could then use to do graphing and other

mathematics work using regional, meaningful data rather than textbook creations.

She also got data for her students to work with from the Department of Natural Resources and the Green Mountain National Forest. These contacts were provided directly by FFEC.

The same teacher began regularly using the Marsh-Billings-Rockefeller National Historical Park as part of her mathematics curriculum. A park ranger commented, "I think FFEC has gone beyond expectations. The relationships with the park are on-going. Teachers see so much more potential for future collaboration." Likewise, several teachers located near the park confirmed that they are definitely using the park's resources more than ever before.

Several teachers invited other FFEC participants to work with their students. One FFEC participant is the director of a non-profit organization, and was called upon by several other participants to lead "quests" with their students, while another who teaches high school brought her students to several elementary-level classrooms so that the older students could teach the younger students about insects and spiders.

"The state biologist we've been working with has been very helpful and thoughtful. She writes lengthy emails with information and ideas. She's even open to kids emailing her. She's a great connection provided by FFEC." The same teacher has also contacted a former student's grandfather who was a retired forester, and a parent who has a lot of knowledge about insects. Even when the resource people were not directly introduced to teachers through FFEC, they noted that it was FFEC that gave them the inspiration to pursue the expertise of local people, opening their mind to new kinds of contacts.

Teachers noted that the stipend/reimbursement provided by FFEC was both incentive to do this and facilitated the process of inviting a guest or hiring a bus for a field trip. In numerous cases, the teacher claimed that contact with the human resources would not have occurred without these funds. However, once it has been done once, there is more motivation to try and garner funds to do it a second year. In several cases, the teacher did continue to invite an expert in or take students on the field trip in the second year, without FFEC funds.

Teachers agreed that creating a directory of contacts as part of the FFEC course was valuable and encouraged them to contact experts and resources more frequently because of the ease of having a list of contact information handy.

Creating a network of support

"Getting together is a very valuable thing. Reuniting, reconnecting, hearing stories, giving hugs, trying to solve problems together. It's very rejuvenating. It's like a booster shot, it helps me carry on." (middle school teacher)

Several participant comments captured the value of the network of teachers that was created by FEC.

- “As a new teacher I could see how other teachers were doing things in this group. The presenter might tell us the name of a tree, but then I could learn from the other teachers what they would do with kids, things I never would have thought of.” (middle school teacher)
- “The residential aspect of the summer institute helped to create a sense of community in which teachers felt free to open up with one another. “There’s something about being together in the evenings, the conversations and the bonding. It was really nice. That’s what makes this group so special.” (fourth grade teacher)
- “Since many of the teachers in my school who I had originally collaborated with and had some teaching philosophies in common with left the school. So another great thing about the course was that it was nice to meet with others doing the same thing and to realize it *is* a good way to teach and it *does* work and there’s research to support it.” (first grade teacher)
- “It started to allow you to take the risks of putting yourself out there with what is working and what is not working, contributing to the whole networking piece which, down the road, is exponentially important.” (middle school teacher)

Other examples of benefits the network has offered FFEC teachers include:

- Visiting one another’s classrooms to offer their expertise (such as, in one case, mushroom identification) to students
- Visiting one another’s classrooms with older students who can help teach younger students (high schoolers teaching fourth graders about insects, for instance)
- “Hearing that other teachers are dreaming of doing more with their teaching”
- Having a colleague to call for problem-solving
- Learning from each other
- Loaning each other printed resources

Developing into teacher leaders

“They come to me as a community connector and I help make the links. I have a lot more stuff to offer my own community because FFEC has given me so much more access to resources, tangible or people to call.” (middle school teacher, talking about how he has become a resource not only for teachers in his own school, but teachers in his home community as well)

As a result of their involvement with FFEC, teachers are beginning to act as resources for others. This was more commonly reported by FFEC 1 respondents because two years have passed since their first contact with FFEC, but there was also evidence that FFEC 2 are taking on that role as well. Most directly, FFEC promotes this within its own model. Four FFEC 1 teachers presented to the next cohort during FFEC2 series, and throughout the series teachers are encouraged to assist one another more informally when their area of interest or expertise arises:

[The FFEC partners] were flexible so if tree identification was something I was already knowledgeable with I had the chance to help other teachers learn during the FFEC session. That was really meaningful for me. The opportunity I had to help teach extends my reach as an educator. (middle school teacher)

The same teacher brings back all of the FFEC resources to his teaching teammates. Even so, he emphasized again the concept that being trained as a team helps to facilitate a greater magnitude of change in a school: “ Even though I bring back the resources—I share books and posters and maps that FFEC gives me—[my teammates] don’t know much about it and it’s hard for me to diffuse what I get to of FFEC thought my school.” It is important to keep in mind that being a teacher leader in a school is a great deal of work, particularly when one is alone in one’s philosophy and training.

Other teachers were able to capitalize on skills gained as FFEC participants:

Perhaps the biggest change for me is that I’ve become a five-column chart resource! People use my unit because it is there, and two schools actually hired me to sit for a day and write curriculum with teachers as a part of a summer in-service for teachers. The principal wrote me an email saying this was the most successful summer program he had seen. It’s really opened doors for me.

Teachers also become leaders within their own teams of grade-level teachers. This spread-of-effect to other teachers happens when a team works together regularly and one has participated in FFEC. One teacher described the spread of effect to her

fellow teachers in the middle school in this way: “They had no choice. We do things interdisciplinarily and I was really excited about using the forest and real data to teach.” During an observation of this team, about 80 students and five teachers spent the day at the national park, on the fourth of a series of visits. The science teacher was leading one group in tree identification, the math teacher doing circle sweeps for a tree inventory lesson, the English teacher had a group working on journaling in their special places or “power spots”. Only the math teacher had participated in FFEC.

Spread of Effect

There are several highly notable examples of FFEC taking hold in a school, or at least beyond the classroom of the one or two teachers who participated. On one level, several teachers were pleased at the opportunity to present what they had learned to the rest of the faculty. One established a “lending library” with the “gigantic box” of resources she had gleaned through FFEC. Teachers regularly sign out the resources.

In two more elaborate cases, one or two teachers’ participation with FFEC led to quite dramatic changes in the position of place-based education on a school wide level. In both cases, the whole elementary school became interested and has begun to revise its science curriculum to be place-based. In one example, two teachers participated as part of the FFEC 1 cohort. Two more teachers the following year joined FFEC 2. Together these teachers represented grades 3-4-5-6 and reading. “As a result of our participation in FFEC I’d say the whole school is moving toward being more place-based and using the outdoors,” reported one. Another later agreed, unequivocally. She stated that the small, rural school is redoing its social studies and science curriculum: “the first grade is going to study the river all year, the second grade is focusing on agriculture and food connections in our area...it’s at every grade level.”

In the meantime, the science curriculum committee took their input and began updating the school wide cycle to utilize local studies.

In the second case, a FFEC 2 teacher has been very motivated to get her school “on board” with reforming their program, and the school has responded enthusiastically. In the Summer of 2003, one year after the teacher’s participation in FFEC, her entire school will participate in a professional development course combining place-based education techniques and standards-based curriculum development skills. This workshop will be presented by several of the FFEC partners.

Personal changes: knowledge, inspiration, rejuvenation

“I am a changed woman, teacher, woods wanderer. Thank you.” (workshop survey response)

As with anything in life, the ability to “walk the talk” is important. Many teachers reported personal changes that complement their teaching practices. The types of changes included being a more vocal citizen on a local level, gaining new knowledge, or feeling rejuvenated and affirmed in their life choices. Furthermore, pre- and post-survey data demonstrated that both FFEC 1 and FFEC 2 cohorts demonstrated an increase in all of the content areas measured: geology, soil science, forest ecology, bird identification, tree identification, forest fragmentation and land-use history. (See Appendix for graphic representation of this data.) Of the seven content areas, statistically significant increases were seen in four areas. The most significant increases, not surprisingly, were in teachers’ knowledge of forest ecology and forest fragmentation. Understandings about land use history and soil science showed the next highest pre-post gains.

The significance of a growth in teachers’ knowledge is the benefit it can bring to students. One teacher spoke of his own growth because of new knowledge and exposure to other teachers:

I have much more content knowledge because of the year with FFEC and that transfers to students. I also got to witness a lot of teaching styles as we all presented our lessons and that made me a better teacher. I use a lot of that in my teaching now. (non-formal educator)

An example of growth as a citizen:

My whole person was strengthened from this program. It enabled me to go speak out at a public town meeting about the outdoors. I proposed and interim by-law for no building over 1500 feet in our town. It ended up being a big debate, but it was good for getting people to think about that issue. I felt like I know more about fragmentation, and felt more confident in what I was doing. (middle school teacher)

The balance of perspectives offered by FFEC (and described in the process strengths section) lent itself to personal changes. After a field trip to a logging operation and conversations with loggers, one teacher captured the sentiment that many later shared, “I considered the many, many variables faced by loggers/foresters in a way that really made a lasting impression on me.”

A FFEC partner eloquently summarized the program’s core strategy:

- “The key sequence for our teachers is this:
- first, they feel comfortable teaching outside
 - second, their content element is elevated

- third, we grab their heart and instill a passion.”

The evidence points squarely toward successful progression through these steps.



Student Outcomes

Student outcomes reported in this section are primarily a product of teacher reports and observation data. Though an attempt was made to survey students before and after their teachers implemented FFEC-related curricula, the response rate was so low⁵ that data can not be used.

Teachers readily reported their observations of the effect of place-based education on their students, with seven themes emerging as the most commonly seen outcomes for students. They are:



- A growing relationship to local resources, both people and places, what might be thought of as an “attachment to place”
- Building community in the classroom itself
- Student engagement in outdoor learning
- A positive influence on academic performance
- Positive influences and outcomes for students with special needs
- Evidence of civic engagement in students

Relationship to local community resources; Attachment to place

*“90% of what I teach them they’ll forget, but they’re not going to forget the enduring concepts, the sense of place, the caring and desire to have places like this exist. I can accept they probably won’t remember the specific facts, but what we want is for them to truly become lifelong learners, to love learning. And at this age it’s all about a sense of place.”
(third grade teacher)*

Five seventh grade students working on a forest inventory were asked informally whether they had been to the national park before and whether they planned to come back when the school work was finished. All five replied that they would like to come back more often now, bringing family, showing them “plot 39” and the area where they did their inventory work.

The kids did come to a deeper understanding that the world around you is a resource, like walking out the doors of the school is like walking into a library. It’s not just the backdrop of your life, it’s much more. It’s not their

⁵ Only two teachers returned student post-surveys.

status of ownership change, but their investment in external phenomena changed. (non-formal educator)

A review of third graders' forest journals were revealing. Silent solo ventures into the forest produced statements like, "I feel alone, but I feel comforted" indicating a high level of ease and connection with the forest.

Snapshot: The small students are itching with anticipation as they walk silently across the soccer field toward the forest that they visit on a weekly basis. These first graders are awaiting the mysterious "Green Man".

Suddenly there is flute music coming from the woods, and the students' walking steps increase to a nervous but excited jog. Once they meet the mystery man--dressed in flowing green robes and decked out in feathers and face paint--they become completely enthralled by his persona and rapt with attention to his stories. He asks them to listen to the music of the trees, to the voices of the animals and to have respect and consideration for all the beings of the forest. This stewardship message is taken in with solemn nods. As an observer, I can not imagine a more age-appropriate role for a community resource to play while interacting with six and seven-year-olds. As the Green Man disappears back into his forest home, the students are all but running to catch the last glimpse. (Convinced as the students were by his character, I was surprised to learn that the Green Man is not just a wood sprite, but a National Park Ranger—with an especially creative flair.)



Students watch as the Green Man disappears back into his forest home.

Student engagement in outdoor learning

During all observations, students were very excited to get outdoors, and had been looking forward to that part of the school day. The kids, across the board, seemed very comfortable in the woods, and needed very little explanation of the difference between recess and learning outdoors. In most cases the students were also impressively independent in their outdoor work, reflecting that this was part of their routine.

Asked whether she had been in an "outdoor classroom" before working with this year's teacher, a third grader responded that she had not spent much time outdoors

at all, either at home or at school. She volunteered, “Now I do it all the time at home, too. I like to learn outside better. It’s more comfortable.”

One indication of their engagement in learning outdoors was the type of questions asked while working in the field. One middle school student asked a forest ranger, “when you’re counting trees, do you just count them all equally or does the presence of disease factor in?” The depth and specificity of such a question, one could surmise, emerges from the learning experience being so direct and applied. Since the student himself was conducting an inventory, such a question became of utmost importance.

Students were evidently making new connections. “I never thought about wood before. My house has all maple floors and stuff, and we have maple trees all over our area. But I never made that connection between outside and inside our house.” (seventh grader)

Influence on student learning

Many teachers reported that students begin asking higher order questions as a result of experiential learning and engagement in the tangible world around them. One third grade teacher reported that they had been talking earlier as a class about current events, about big forest fires that had been in the news that day. A student asked quite a profound question, relating the current events discussion to their integrated science study focused on insects, soil and decomposition.



“What happens to all the insects? If all the insects die, the forest won’t be able to make new soil.”

At the beginning of an observation of a third grade class, students shared facts about insects and their behaviors. When the group got outside, students--instantly on-task--clustered themselves around a sapling tree with curled up leaves.” Leaf rollers!” the students exclaimed. When asked casually about why they come outside to learn rather than learning about insects from books, the third grade students replied:

- It’s more fun and interesting to learn outside.
- It’s fun to adventure in the woods.
- I learn just as much out here.

- I learn more outside because if you see it you now what it looks like in real life. Instead of something being, like, flat in a book, you can see if it's round or long or something.

Students were also asked what they were studying this fall. They replied, “decomposition, insects and soil.” When asked whether those things were separate topics or all related, they replied, “they’re connected, because well insects cause decomposition and that’s what makes soil.” Accordingly, their teacher had earlier reported that, for this year for the first time, she had realized that she could bring all the separate things she teaches together, as well as move from a reading-based unit to an experiential one. “Making connections between the concepts for the kids has made a real difference in their understanding. I had taught soil before but now we’re tying it into the forest and they’re beginning to understand how the health of soil is related to the health of the forest.”

Most importantly, perhaps, is what students do with knowledge they acquire. In the best case scenario, we see a translation of knowledge or skills into attitudes and, eventually, behaviors. An early indicator of this type of transfer was observed in a conversation between three third grade students working cooperatively in the forest on a Fall afternoon. The boy in the group is running up and down a small, steep, loose hillside where the girls are sitting quietly observing nature.

Girl 1: “Stop it, Billy⁶, look at the hill!”
 Girl 2: “Billy, think about what you’re doing.”
 Billy: *stops running, gives girls a quizzical look*
 Girl 1: (*rolls eyes*) “It starts with an E!” (erosion)

Not only had the girls internalized the concept and vocabulary associated with erosion, they had translated that knowledge into a deeper understanding of how human behavior can affect nature.

Student vocabulary while working in the forest was impressive. As they worked, they spoke casually with each other about “merchantable logs”, “transects” and “DBH” (diameter at breast height.)

One student reported, “It’s important that we do this out here because it’s real. I like learning outside better because I learn better if I’m moving around more than if I’m sitting in a desk listening to someone talking” (seventh grader)

Other student outcomes

Three other outcomes were commonly cited as significant impacts on students: the contribution FFEC-inspired studies have on building community in the classroom;

⁶ Name changed for student’s confidentiality.

effects of place-based learning on students with special needs; and reflections on students' levels of civic engagement.

***Building community in the classroom:** Several teachers noted that the most remarkable result they had seen after changing their classroom practices was an increased sense of community and cooperation amongst students. In several cases, teachers reported that the classroom community became more cohesive after working together in the field regularly, bonding with the school's natural areas, and developing teamwork and problem-solving skills.

***Effects on special needs students:** Unprompted, a handful of teachers talked about the value of place-based education for integrating students with special needs into the activities of the class. During one observation of a class working at the National Park, a child with an attention disorder and personal aid remained so fully engaged in the class work that his aid was virtually without a role to play. The aid expressed that she has seen the impacts of place-based education on this child very clearly: when he is working outdoors, engaged in hands-on tasks, and with adult role models on hand he is able to work more independently. Another teacher told of a student who was often excluded by other students because he was not seen as a strong student in the classroom. His home environment did not emphasize reading and writing, but he spent a lot of time exploring the outdoors on his own. Once the class began regularly going out for lessons in the schoolyard habitat, this boy's strength as a naturalist became clear to all the other students, and they no longer considered him "stupid". The teacher reported that other students now go to him for information about nature study, and the classroom community has benefited by bringing an outsider "into the fold."

***Students' levels of civic engagement:** In cases where service-learning projects were implemented with students, their levels of civic engagement clearly improved. Whether presenting information to the conservation commission, teaching younger students in the community or removing invasive species from a local area, students had the chance to practice the skills of community participation. Students expressed interest in working with real-world information toward concrete ends: "It's good to know it's true data, and why you're working with it. I like learning about the real stuff because it's not like making something up. It's like in a job, a reality thing." (seventh grader) Whether the skills learned during school-time service-learning extend their reach into students' choices and actions outside the classroom was not within the scope of this evaluation project.

Student survey results

Because return rates for student pre and post surveys was so low, an analysis of these data will not be reflected in this report.

CONCLUSIONS

From a multi-year commitment to teachers to its individualized curriculum development focus, many features of the FFEC model distinguish it from a standard professional development program. But perhaps what truly sets FFEC apart from even the most innovative programs is the fact that it is the creation of a diverse partnership of public sector and non-profit organizations who bring a balance of skills, personalities and resources to the professional development series.

For change to come to schools, teachers must change the way they teach. And for teachers to change what and how they teach, they must have models, resources and the motivation to change. The nurturing and respect FFEC provides teachers motivates them to be fully engaged in the FFEC program, to utilize new resources—public lands, publications, people—and, ultimately, to change how they teach students.

On another level, one could argue that teachers must also experience a level of personal transformation in order to bring change to their teaching, and to most effectively convey their passion to students. FFEC provides teachers with the stimulation and challenge that encourages personal growth. Teachers reported becoming less judgmental, more respectful of others' viewpoints, more knowledgeable of a diversity of issues behind what they teach and more connected to others in their profession and in some cases, more personally engaged as citizens in their own towns. Finally, it may be that another precursor to personal or professional change is inspiration. There is ample evidence that--largely by respecting and honoring teachers for their efforts--FFEC provided teachers with the inspiration to change their practice of teaching students.

Enhancing a community's understanding of and respect for its local heritage—both natural and cultural—is a large goal. By effectively exposing teachers to public spaces, training them to access local resources, and offering them the skills to offer these to their students in meaningful ways, FFEC increases students' understanding of and participation in their communities, a positive step toward a greater appreciation of public resources and enhanced civic engagement.

RECOMMENDATIONS

The following recommendations are intended to help FFEC partners refine their program and project as it continues to grow and expand its reach. Many of the recommendations are specifically linked to the process challenges noted in a section above, and all are based on aggregated input from participants and the evaluator's analysis of the total program.

Program-level recommendations:

- There was strong evidence that the networking component of FFEC served to 1. connect teachers with valuable resources; and 2. inspire teachers to continue their energy and momentum for new ways of teaching. A valuable investment on the part of FFEC might be to distribute a periodic **newsletter** (either in print or via email) to keep teachers in communication with one another and keep them updated about ways to continue growing in their newfound learning.
- Because several of the barriers teachers face are related to a lack of internal support or collegiality in their own schools, it is recommended that FFEC require or heavily encourage teachers to **apply for the professional development series as a team** of two or more teachers from a particular school. An effort to **educate administrators** about the work that teachers are doing might also be worth the effort to promote the likelihood that teachers with grand new ideas are received in a welcoming fashion within their home arenas.
- Clarify for participants **what type of public lands** teachers are encouraged to use, whether this includes state and regional parks and agencies as well as national forests and parks.
- Since this program exposes teachers both to new curriculum planning method and to new content and strategy approaches, it is important to include a thorough discussion and modeling of how teachers can conduct **student assessment** of this type of work.
- Invite past teachers to present not only the curriculum unit they produced, but to help new participants to understand **the process they used for integrating** it into existing school schedules, past curriculum practices and other potential barriers. Consider allowing teachers to critique the models presented to them in order to better understand their content and work toward overcoming potential logistical barriers.

- In order to **promote service-learning more comprehensively**, look to a program strategy that has been successful so far: modeling. Have teachers design and conduct a small-scale service-learning project so that they actually experience each of the elements of such a project, developing familiarity and comfort with it. While best practices for service-learning indicate that students should originate the ideas for projects, a starting place for teachers new to the topic might be for partner agencies to generate a list of ideas for possible projects.
- If on-going contact between teachers and partners is desired, provide teachers with a **checklist of available services**. From the start, be clear about the **length of commitment** teachers can expect from FFEC partners along with the types of interactions that might be offered after year one.
- When teachers are making use of the public resources, those agencies could make an effort to provide opportunities for students to gather **meaningful data** from forest and park lands. In one case students were gathering data regularly from MABI but it was not yet part of a system of being put to use.
- Very laudable outcomes were attained by two of the participants who were not formal classroom teachers. One implemented a very successful service-learning initiative in her school; and the other became a curriculum-development resource for many schools regionally. A recommendation is **to continue to include non-traditional or non-formal educators** as participants in FFEC programs. It may well be that teachers with a foundation of a background in environmental education or similar content areas are one of the best audiences for making and spreading lasting change.
- **Plan for diffusion** from one teacher to the next. Since there is a relatively large investment in a small number of teachers it is wise to consider the most likely ways that a spread-of-effect will occur. Teachers participating as teams seemed to encourage this within schools, as did offering tangible resources that teachers could share with others. More communication with administrators and greater visibility of the FFEC program can help with diffusion as well. One partner suggested that alumni events could include school administrators and other teachers in participants' schools.
- Communicate to participants about expectations for **involvement in program evaluation** activities from the start of the relationship. Completion of evaluation forms, interviews or student surveys, for instance, could be considered a required part of participation in the program, and/or could be encouraged by incentives. Either way, if teachers know what is expected of

them from the start, and know that the partners consider this part of their participation, they may be more cooperative with evaluation endeavors.

Project-level recommendations:

- **Clarify partner roles** from the start of the partnership. Inventory what strengths and assets each partner brings, and where gaps might exist. As the FFEC partnership progressed, creating an A team and a B team to tackle separate levels of program functioning was a successful strategy for managing the workload and sorting through some of the communication challenges inherent in working as a large group. Partners suggested that a retreat for partners early on in the process could help individuals to get to know one another's backgrounds and strengths.
- **Choose partners wisely** so that all bases are covered, including those with:
 - the skills needed to create a broad vision for the project
 - the skill to organize program logistics
 - a strong natural resources background
 - charisma for conducting programs
 - strong curriculum and education foundations
 - connections to key resources, contacts and financial support.
- **Define terminology** to be used in the program and during partnership meetings so that individuals from varying organizations are all on the same page. This will also facilitate accurate publicity and program growth by conveying a consistent message. Participants will benefit directly from this level of clarity about vocabulary and key concepts as well.
- Much like many youth-focused organizations include youth on their steering committees, it was suggested that having a **practicing teacher as a partner** member so that input can be given on the every day realities of the teaching climate.
- Partners felt that since this is a new and innovative program, and is steadily evolving, more attention to **documenting the strategic thinking** that occurs as the project develops is warranted.

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Appendix A: FFEC Logic Model

Draft: 5/02

HYPOTHESES: If we implement comprehensive educator professional development on place-based and citizenship education, people (including youth) will contribute to the stewardship of public lands and communities

<u>RESOURCES / INPUTS</u>	<u>ACTIVITIES / STRATEGIES</u>	<u>SHORT TERM OUTCOMES</u>	<u>INTERMEDIATE OUTCOMES</u>	<u>LONG TERM OUTCOMES</u>
Technical Assistance from experts/contractors Partners <ul style="list-style-type: none"> • National Park Service • Conservation Study Institute • National Wildlife Foundation • National Forest Service • Shelburne Farms Teachers/Educators Community Forest Stewardship Network Funding National Parks Service JL Foundation Ittleson Foundation Wellborn Fund Promising Practices/Research Evaluation Graduate Credit Resource Materials	Collaborative Partnerships Community Forum and other community events Sustained and embedded professional development Ongoing support for educators Standards based curriculum development (instruction and assessment) Peer coaching Network building (sustained over time) Service Learning Access to resource specialist and community resources Mini grants	Develop and pilot a professional development model in place-based education and citizenship education. Evaluation of program including: <ul style="list-style-type: none"> • Assessment in student learning and stewardship activities • Teacher practices in place-based education pedagogy and service learning • Community involvement/investment • Partners' capacity Resource development for replication in other communities	Students who have the knowledge, skills and motivation (social potency) to be active stewards/citizens. Teachers/schools are committed to and have the capacity to create and implement place-based learning that fosters student participation in the community. Social Capital increases in the community demonstrated by increased interaction between school and community and stronger sense of place Government and non-government organizational effectiveness and capacity is increased by working together in partnership. Learning Organizations	Strengthening civil society Stewardship of communities and special places.

Appendix B: Evaluation Overview 2002-03

September 25, 2002

Amy Powers

Forest For Every Classroom Goals and Objectives

FEC Project goals:

- To increase student environmental awareness- and forestry knowledge and to promote civic responsibility

FEC Project objectives:

- increase teachers' abilities to teach EE and natural resource concepts using the forest as a classroom, through inquiry-based learning, decision-making, service-learning and problem-solving
- link educators to resource specialists and local resources/places while meeting educational standards
 - *create an effective teacher training model for national dissemination*

Project evaluation will:

- assess effectiveness of the FFEC model in terms of process (program implementation)
- assess effectiveness of the FFEC model in terms of outcomes (results)
- *provide useful information for FFEC project partners and funders to assist with program development, justification and refinement*

Evaluation Questions for Year One evaluation:

1. Process effectiveness

- Which aspects of the FFEC professional development model are most effective?
- What barriers have existed for teachers or FFEC project partners?
- How could costs be reduced without compromising the effectiveness of the program?
 - *Focus groups with teachers and FFEC project partners*
 - *Teacher Pre and Post Survey from FFEC 1 and FFEC 2*
 - *Institute feedback surveys*
 - *Classroom and/or field observations of FFEC 1 and FFEC 2 teachers by evaluator*

2. Teacher outcomes

- How does involvement with FFEC affect a teacher's utilization of local natural and human resources in their curriculum?
- Did the teachers continue to use FFEC concepts/tools/curriculum units after year one, and/or do they intend to do so in future years?

- Is the citizenship/service-learning element effectively incorporated and utilized in the teachers' curriculums? Is this perceived as an important educational method by teachers and students?
- What kinds of relationships are being established between community resources and teachers? (*Beginning of a longer-term study.*)
- How does participation in one of these place-based education programs change teachers' teaching practices? *
 - *Focus groups with teachers and FFEC project partners*
 - *Teacher Pre and Post Survey from FFEC 1 and FFEC 2*
 - *Institute feedback surveys*
 - *Classroom and/or field observations of FFEC 1 and FFEC 2 teachers by evaluator*
 - *Collection of teacher work*

3. Student outcomes

- How does involvement with FFEC change students' perception of and relationship to their local community?
- How does participation in one of these place-based education programs affect students' level of civic engagement? *
 - *Survey of students (pre and post-unit implementation)*
 - *Classroom and/or field observations by evaluator and coordinator*
 - *Portfolios, collection of student work*

4. Documentation of program

- *What teacher and student work demonstrates understanding of FFEC principles?*
 - *Collection of student and teacher work*
 - *On-going staff records*
 - *Photo documentation*

5. Needs assessment for next year's evaluation (and beyond)

- What are the highest priorities for next year's evaluation and beyond?

Evaluator's Roles

- Maintain email, phone and personal communication with project coordinators
- Development of evaluation process and instruments
- Data collection and compilation
- Data analysis
- Process watching

* Evaluation Collaborative Question (to be evaluated across four programs)

- Report writing
- Total number of days for FEC: 27

Project Staff's Role in evaluation process

- Approve evaluation plan
- Meet with evaluator as needed
- Provide input on evaluation direction, appropriateness of instruments
- Provide access to participant contact information
- Act as liaison between evaluator and school, including assistance setting up appropriate observation/interview days, and distribution and collection of written surveys
- Administer institute surveys (workshop evaluations)
- Assist with data collection such as project documentation, photos and portfolio gathering
- Meet with evaluator to consider needs assessment for Year Two and beyond

Evaluation Tools for Forest for Every Classroom 2002-2003

	Instrument	Timing	Aprx. No. of participants	Where/How Administered	Administered By
1.	FEC 1 and FFEC 2 Teacher PRE and POST Survey	-FEC 1 PRE Spring 2001, POST Fall 2002 --FEC 2 PRE July 2002, POST April 2002	(15 and 13) 28	Mail PRE to teachers before summer workshop. Administer POST after series has ended and some implementation time has passed.	FEC Staff
2.	Student Pre and Post Survey	September 2002 April 2002	(15?x20) 300	Mail to all FFEC 1 and 2 middle school teachers to distribute with permission slip for pre-survey, post-survey and photo documentation.	Amy , FFEC Staff
3.	FEC 1 and FFEC 2 Teacher Focus Groups	January 2002 (FEC 1) February 2002 (FEC 2)	13 15	Gathering convened by FFEC partners	Amy
4.	FEC Partner Focus Group	September 2002	8	November at Shelburne Farms Amy will provide questions to send in advance. (PS, LS, MC, BS, KD, NM, TM, RD)	Amy
5.	Workshop Evaluation Form	July 2002	15 + 13	After workshop.	FEC Staff
6.	Workshop Observation Guide	July 2002	N/A	During workshop.	Amy
7.	Classroom/Field Observation Sheet	Fall/Winter 2002	8	During site visit with past teachers implementing a unit. Includes informal interviews with students and teachers.	Amy, Staff
8.	Student Work	On-going	N/A	Collected (copied) during school/ community visits and training workshops.	FEC Staff, Amy
9.	Teacher Work	On-going	N/A	Collected (copied) during school/ community visits and training workshops.	FEC Staff, Amy,
10.	Photographs	On-going	N/A	Taken during school/ community visits or training workshops. Collected from teachers.	FEC Staff, Amy

Includes

- Site visits with 8 implementing teachers. (6-7 days)
- Talk informally with students, teachers.
- Observe curriculum in action.
- Gather examples of student (and teacher) work.
- Take photos.
- Observation at FFEC summer and fall workshops (2-3 days)
- Focus groups with all FFEC 1 and all FFEC 2 teachers (2 days) and partners (1/2 day)

Appendix C: Teacher Focus Group Guide

FEC Evaluation 2002-2003

Teacher Focus Group FFEC 1

Setting/Format:

Focus groups with teachers to be held during the January retreat/workshop days.

- Two-hour session.
- FEC Partners not present for this session to encourage more candid conversation.
- FEC goals and objectives posted
- Audio tape the group.

Overview for participants:

We want to look critically at the FFEC program as a whole, both the process of delivering such a program and the impacts it has. We're interested in finding out from the teachers' perspectives: what are the most effective parts of the FFEC program? How could the partners improve the program for other teachers and for dissemination? In what ways has participation in FFEC affected your teaching practice and what your students learn, believe or how they behave?

Focus Group Rules:

No one should dominate, everyone gets a turn, opinions only, no right or wrong answers, not everyone needs to speak every time, may need to move on without hearing from everyone

Context:

FEC project goals and objectives

Questions for Teachers

Evaluating the Process:

Here are the various aspects of the FFEC program: (posted)

- Professional development series: summer institute and two-day institutes
- Residential summer institute
- Modeling activities
- Providing content information
- On-going support from partners
- Providing tangible resources (books, etc.)
- Introducing teachers to resource people/places
- Demonstrated partnership
- Other:

If the program needed to trim its budget:

- What aspects would you say were absolutely essential to you (i.e. the program would fall apart without this feature)?
- What could be limited or left behind (i.e. this feature was not critical to your success)?
- Are there features missing that would have been or would be valuable to you?
- In your opinion, what is the value of this program being the result of a partnership between Shelburne Farms, National Wildlife Federation, National Park Service and US Forest Service? (In what ways, if any, do you think you have directly benefited from this being a partnership rather than a program of a single organization?)

Barriers

What barriers, challenges or frustrations did you feel during your year with FEC?
What about this year, after FFEC concluded?

What kind of follow up—that is, contact *outside* of the workshop series framework-- have you had with any of the FFEC partners? If none or little, why? Has this been helpful to you? How could follow up be improved upon?

Observed Outcomes: Your Teaching

I'd like to ask you to compare your own teaching before your involvement with FFEC and after the year of FFEC involvement. Consider these aspects of teaching (write on chart paper)

- Content/Subject
- Use of outdoors
- Collaboration with other teachers
- Inquiry-based learning
- Use of community places/spaces
- Use of community people
- Teaching philosophy
- Other:

Guiding questions:

- What aspects of your teaching have changed, if any? (What do you do differently?)
- Is it mainly adding forest-related activities, or has your teaching changed in other ways?
- Do you feel part of a network as a result of participation in this program?

Community Connections

Tell me about the kinds of places you've visited or utilized in the community that you had not before FEC.

Tell me about the people or places you've made contact with since FEC. Were they introduced to you or suggested by FFEC staff? Did you seek their help for your own information, for data sources, or did they work with the students directly?

Observed Outcomes: Students

We could break down a teacher's impact on students into four broad categories:

(write these on chart paper)

- Knowledge or understanding
- Skills or abilities
- Attitudes and beliefs (such as inspiration or caring for forests or community resource)
- Behaviors or actions

What evidence do you have that implementation of your curriculum--or any other changes you made to your teaching because of FEC—is affecting your students in *any* of those four areas?

Focus: Service-Learning

Doing community based service-learning projects with students is one of the elements that FFEC hopes to encourage and facilitate for teachers.

- a. Would you say there is a bona-fide service-learning component to your curriculum?
- b. Did you feel the FFEC series adequately prepared you to incorporate service-learning into your curriculum? (If not, what suggestions do you have for the partners to incorporate that piece more effectively into your training?)

How do you think students benefit from engaging in service-learning projects?

Do you feel students gained citizenship skills because of your project? What skills are they? What do those skills look like?

Wrapping Up

Take a look at the program goals and objectives. (posted)

- a. What suggestions do you have for the FFEC program partners that would help them more fully realize their goals and objectives?
- b. Are there some they are more clearly attaining than others?

Any other questions or comments to share?

Appendix D: Field/Classroom Observation Guide

The purpose of this form is to provide some guiding questions for Amy, Pat or Liz to think about and answer during or after an observation or team-teaching session (or meeting) with FFEC teachers

Observer: Teacher(s): School: Grade: Setting/Location: Date:

1. Briefly describe the lesson or activity you're observing or assisting with. Include mention of your role today.
2. How does this lesson relate to the teacher's FFEC experience? (concepts, tools, examples, sites, use of FFEC printed resources,)
3. What evidence, if any, did you see that the teacher incorporates service-learning into his/her curriculum?
4. What evidence did you see of the teacher utilizing resources (human or otherwise) from "outside" the school?
5. Were there external conditions—personal, environmental, etc.--that may have affected the quality experience today?
6. What is the general reaction of students to this lesson/activity? (e.g. did they seem extremely excited, highly engaged, interested, distracted, complaining, bored, etc.?)
7. Any great quotes from kids or adults?
8. Please attach any additional notes or comments about today's observation.

Please return this reflection sheet to Amy. Thanks.

Appendix E: Teacher post survey

Teacher Post-Survey (FFEC 2 teachers)

To FFEC 2 participants: As you may know, you have participated in a pilot program that will be refined for use at the national level. Your candid feedback will help us continue to improve the FFEC program and to understand its effects. Please send your completed survey in the enclosed envelope, before *March 24, 2003* to: Amy Powers, 836 Snipe Ireland Road, Richmond, VT 05477. Your input will be greatly appreciated. Thank you!

Name: _____ School: _____ Grade level: _____
 Date: _____

Concepts and Skills

1. What does the phrase “forest stewardship” mean to you?

a. Does your teaching currently address this concept? If so, in what ways?

2. What does “service learning” mean to you?

a. Does your teaching currently address this concept? If so, in what ways?

3. How knowledgeable are you about the following: *(circle one number for each topic)*

Topic	Strong knowledge base	Somewhat knowledgeable	Little knowledge	No knowledge
<i>a. Geology</i>	1	2	3	4
<i>b. Soil science</i>	1	2	3	4
<i>c. Forest ecology</i>	1	2	3	4
<i>d. Tree identification</i>	1	2	3	4
<i>e. Forest fragmentation</i>	1	2	3	4
<i>f. Bird identification</i>	1	2	3	4
<i>g. Land settlement & early use of forest</i>	1	2	3	4
<i>h. Forest-inspired poetry and writing</i>	1	2	3	4

Comments:

4. How familiar are you with these forestry practices and issues? (*circle one number for each topic*)

Topic	Very familiar	Somewhat familiar	Slight familiarity	No experience
<i>a. Conducting a forest inventory</i>	1	2	3	4
<i>b. Current logging techniques and practices</i>	1	2	3	4
<i>c. Use of Biltmore stick</i>	1	2	3	4
<i>d. Global forces in the wood product industry</i>	1	2	3	4
<i>e. Sustainable forestry certification</i>	1	2	3	4
<i>f. "Multiple use" issues</i>	1	2	3	4

Comments:

Curriculum and Teaching Practice

5. During this school year, how often have you done each of the following? (*circle one number for each activity*)

Topic	Always	Frequently	Sometimes	Rarely/ Never
a. Teach standards-based curriculum?	1	2	3	4
<i>b. Create standards-based curriculum?</i>	1	2	3	4
<i>c. Teach about environmental citizenship?</i>	1	2	3	4
<i>d. Use hands-on science activities in your classroom?</i>	1	2	3	4
<i>e. Use the surrounding community in your teaching?</i>	1	2	3	4
<i>f. Teach your students outdoors?</i>	1	2	3	4
<i>g. Take your students on field trips?</i>	1	2	3	4
<i>h. Promote service-learning opportunities for your students?</i>	1	2	3	4
<i>i. Invite community specialists to your classroom?</i>	1	2	3	4

Comments:

6. To what degree are you implementing your FFEC curriculum during the year you are participating in FFEC (2002-03)? *(please check one box)*

- Fully implemented
- Implemented most of it
- Implemented small pieces of it
- Have not YET implemented any of it
- Do not intend to implement FFEC curriculum
- Other: _____

Your comments:

7. To what degree do you plan to implement your FFEC curriculum during the school years following your participation in FFEC (e.g. next year and beyond)? *(please check one box)*

- Integral part of overall curriculum, will incorporate indefinitely
- Will use whenever possible
- May use pieces in the future
- Will not implement after this year
- Other: _____

Your comments:

8. Apart from development and implementation of your FFEC unit, has your participation in FFEC affected *what or how* you teach? *(please circle one)* **Yes or No**

If yes, please describe any changes in the content you teach, your philosophy about teaching or your collaboration with other teachers.

Program Goals

9. Overall, how would you rate the success of FFEC in accomplishing these program goals: *(circle one number after each)*

FFEC Program Goals	Goal attained!	Goal nearly attained	Goal met to a small degree	Goal not met	Unsure/ No opinion
<i>a. Link teachers to resource specialists</i>	1	2	3	4	0
<i>b. Link teachers to local resources and places</i>	1	2	3	4	0
<i>c. Provide teachers with useful printed resources or other media</i>	1	2	3	4	0
<i>d. Assist teachers in meeting educational standards</i>	1	2	3	4	0
<i>e. Increase teachers' environmental awareness</i>	1	2	3	4	0
<i>f. Increase teachers' knowledge about forests</i>	1	2	3	4	0
<i>g. Assist teachers in incorporating service learning into their curriculum</i>	1	2	3	4	0
<i>h. Increase respect and caring for local forestry resources in students</i>	1	2	3	4	0

Your comments:

10. Do you have any other written feedback or comments for us? Your suggestions for program improvements or successes will be greatly valued.

11. If you have not already done so, would you be willing to have a program evaluator visit and observe you and your students engaged in a FFEC-related lesson? *(please circle one)* **Yes or No or Already had a visit**

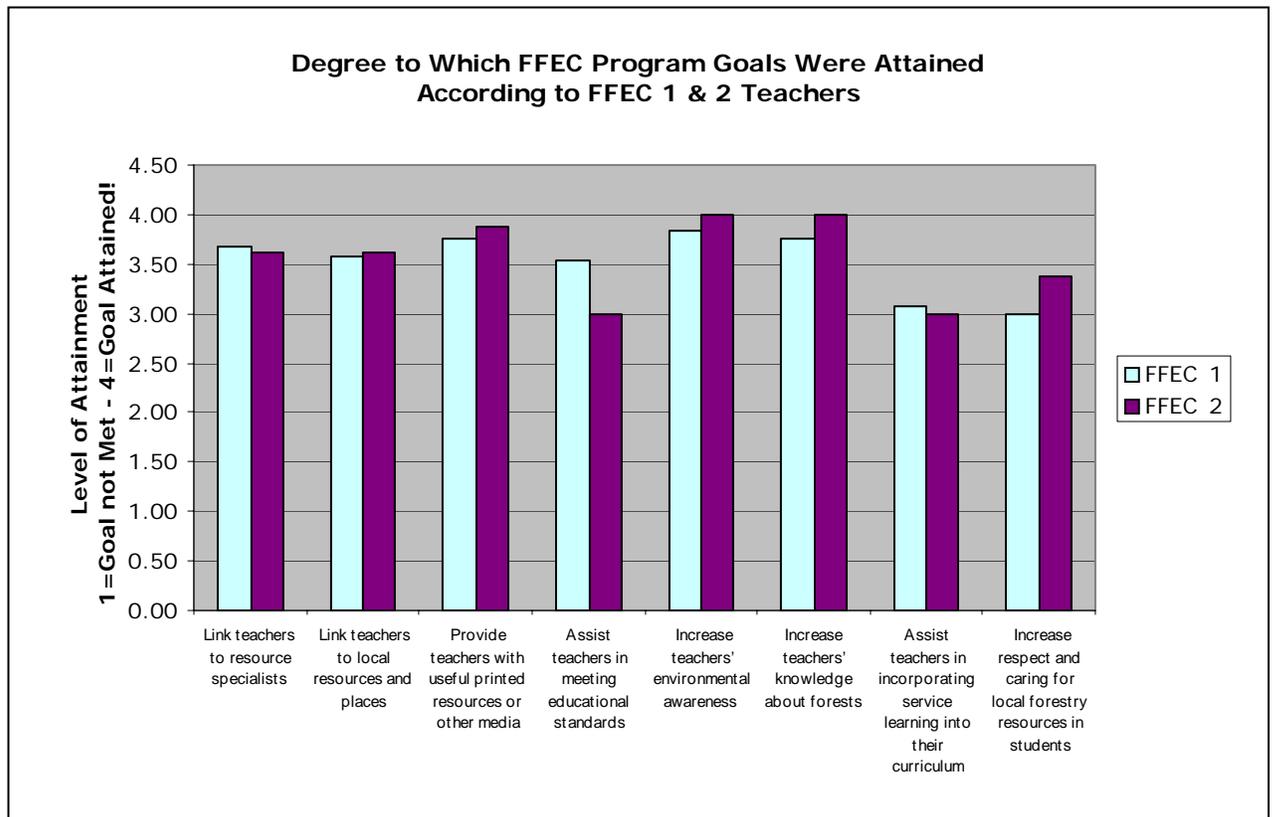
If yes: please indicate the earliest possible time this winter or spring that would be appropriate for a visit:

(month, week of possible visit)

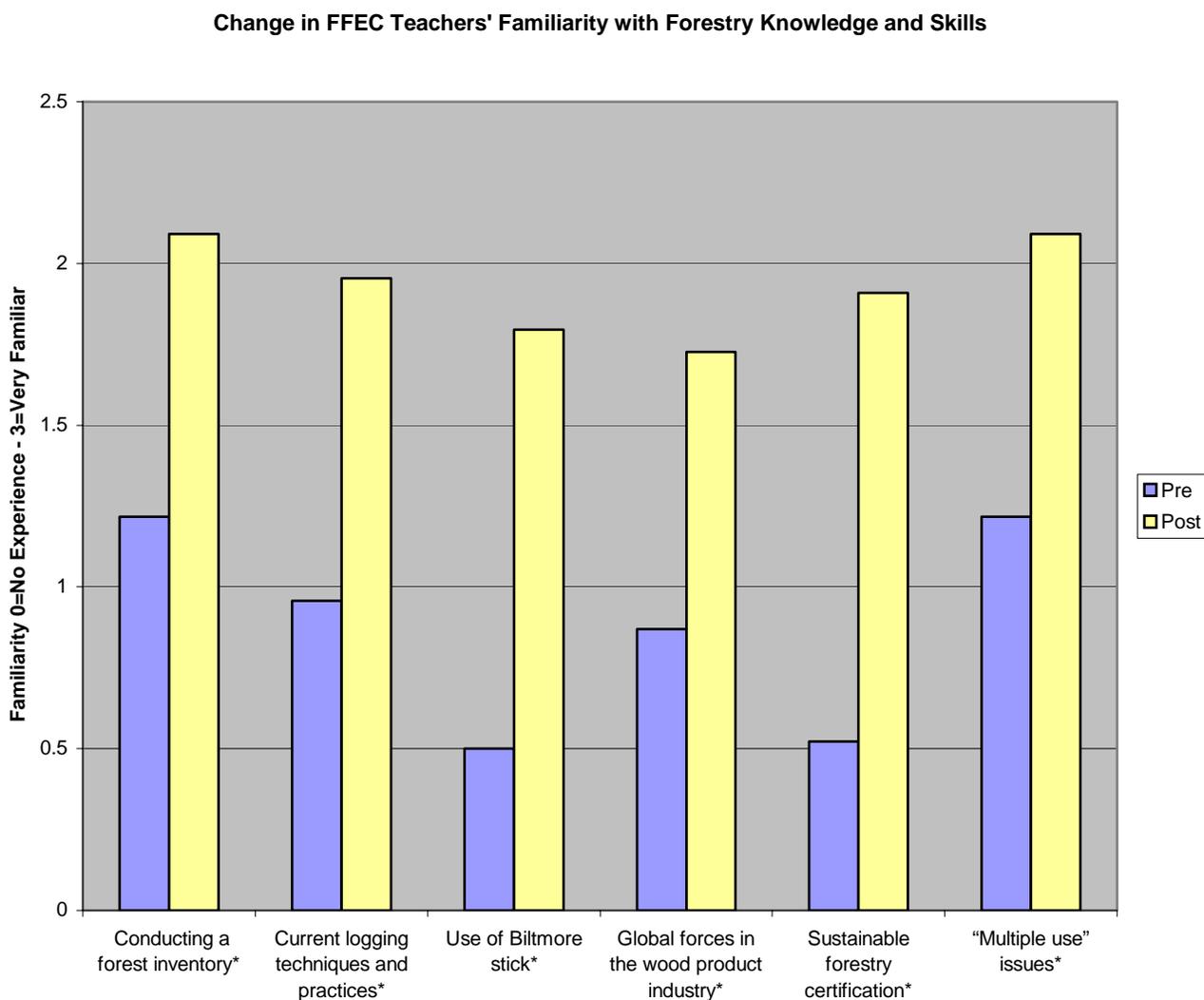
Thank you very much for your time and input! Please return this survey by March 24, 2003 to: Amy Powers, 836 Snipe Ireland Road, Richmond, VT 05477

Appendix F: Graph: Degree to Which FFEC Program Goals Were Attained

(reported by FFEC 1 and 2 teachers)



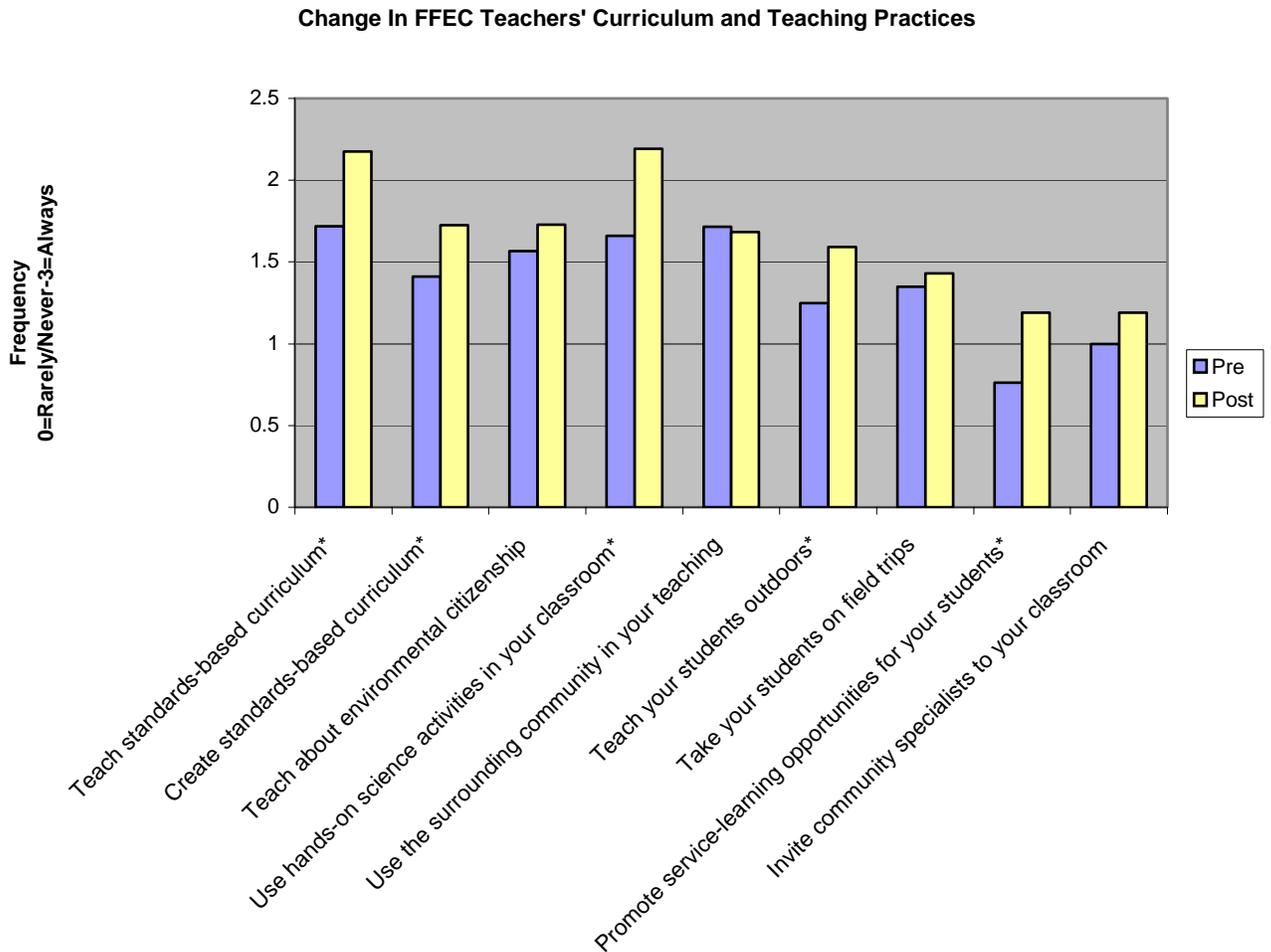
Appendix G: Graph: Change in FFEC Teachers' Forestry Knowledge and Skills



**Difference between pre and post test means statistically significant at $p < .05$ using t -test.*

Note: Likert scales reversed and grounded to improve clarity of presentation.

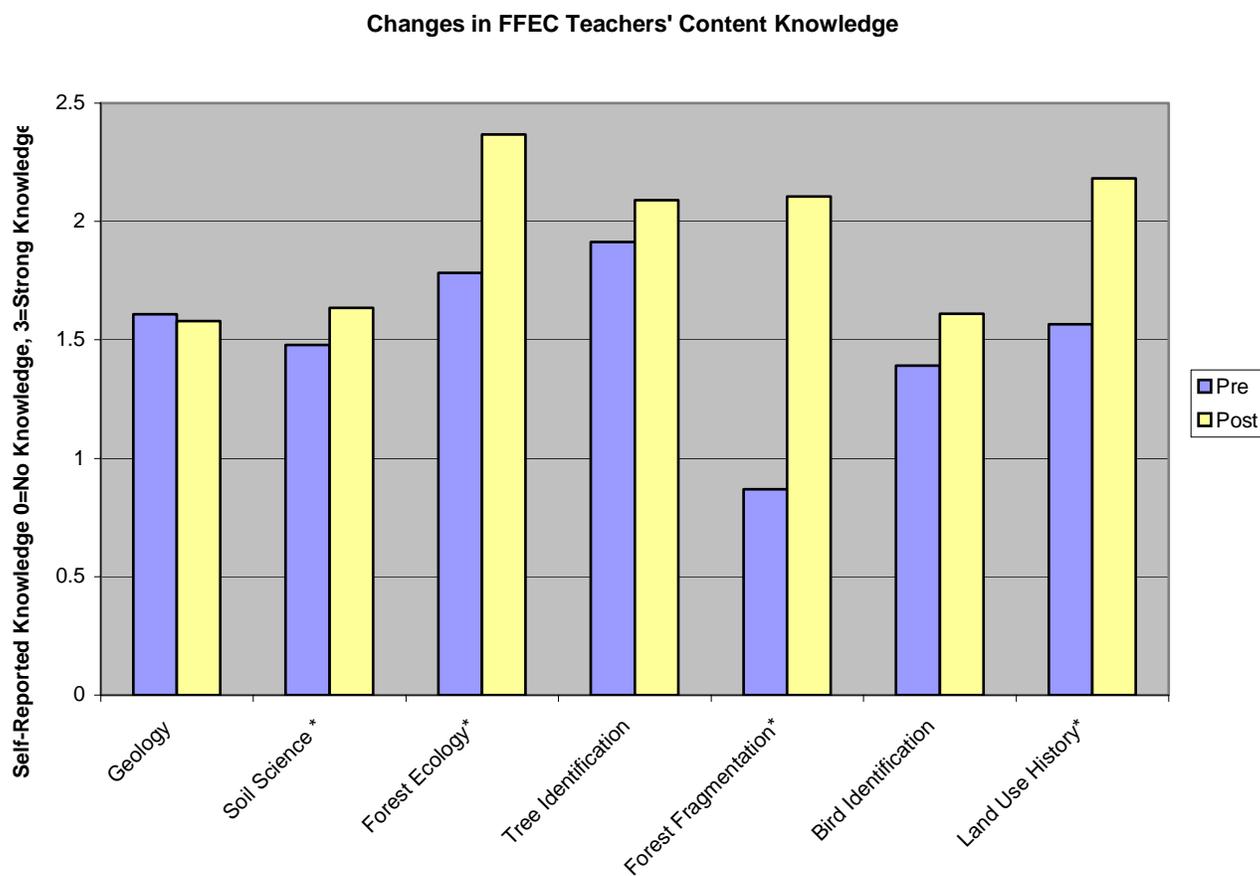
Appendix H: Graph: Change in FFEC Teachers' Curriculum and Teaching Practice



**Difference between pre and post test means statistically significant at $p < .05$ using t-test.*

Note: Likert scales reversed and grounded to improve clarity of presentation.

Appendix I: Graph: Change in FFEC Teachers' Content Knowledge



**Difference between pre and post test means statistically significant at $p < .05$ using t -test.*

Note: Likert scales reversed and grounded to improve clarity of presentation.

Appendix J: Service-learning “best practices”

The following list is a summary of methods that have been effective in incorporating service learning into schools. The list is distilled from numerous sources, including relevant research, publications by Vermont Community Works, and the National Youth Leadership Council.⁷

- ◆ **Participation:** Students, community members and teachers must be involved in the design, implementation and evaluation of the service-project (VCW, 2002). This includes developing a timeline, a detailed list of expectations and responsibilities of those involved with the project, and clear service and learning goals (Wade, 1997).
- ◆ **Service Goals:** The project needs to meet a clearly stated community need with accomplishable goals. Goals should be pertinent to the well-being of all invested individuals and organizations, including the agency and the learners (Athman & Monroe, 2002). Projects should be small and discreet with a definitive start and end. This will help ensure the project is completed.
- ◆ **Curricular Goals:** Learning goals are clearly defined (VCW, 2002). The curriculum incorporates sound educational practices and is multi-disciplinary. Learners therefore gather the knowledge and skills necessary to adequately resolve issues of local concern, and gain a sense of civic responsibility. Projects approach environmental issues from a variety of perspectives (Athman & Monroe, 2002).
- ◆ **Diversity** The project provides opportunities to discuss differing opinions and values (VCW, 2002). and serves diverse populations (Bouillion & Gomez, 2001).
- ◆ **Assessment:** Assessment should be authentic and pertain directly to the activities and learning objectives of the project (ARC, 1999b).
- ◆ **Community Connections:** Efforts should be made to ensure that students develop positive relationships with a variety of community members, gaining increased and diverse knowledge about local resources in their community (VCW, 2002).
- ◆ **Challenges:** The service-learning project is challenging to students, both academically and personally. (VCW, 2002).

⁷ This compilation was excerpted from the unpublished 2003 master’s thesis of Sharon Plumb, University of Vermont.

- ◆ **Parental Involvement:** Parents should be brought into the learning process, bridging the gap between school and home while engaging the parents in the community (Bouillion & Gomez, 2001).
 - ◆ **Reflection:** The curriculum should include meaningful activities that help students to reflect upon their participation in the service-learning activities (Wade, 1996).
 - ◆ **Celebration:** Opportunities should be made to provide teachers, students and the community to celebrate their achievements (VCW, 2002).
- Communication** ongoing and effective communication between teachers and community partners is essential (Robertson, 2001). Without it, interested parties may lose faith in the process and become reluctant to participate in the future.

Appendix K: Place-based education professional development “best-practices”

The following list is a summary of practices that have been found to be effective methods to assist teachers in incorporating place-based education, and environmental education, into their classroom.⁸

- ◆ ***Provide extensive training and follow-up support:*** Providing support after workshops is critical; this maintains trust between the teacher and the professional development provider, and helps teachers to implement successful programs. (Paul & Volk, 2002; Winther, Volk, & Shrock, 2002).
- ◆ ***Collegial support:*** Give teachers the chance to come together throughout the school year. This provides opportunities for self and group reflection, and a place for teachers to share ideas (Dresner, 2002; Winther et al., 2002).
- ◆ ***In-school collaboration:*** Formalize the partnership between teachers and the people they will be working with. If teachers will be conducting field science (or any kind of research) with their students, have the people they will be working with train them to use appropriate protocols (Dresner, 2002).
- ◆ ***Team teaching:*** Build teams of teachers who are committed to the theory and practice of place-based education (Liebermann & Hoody, 2002).
- ◆ ***Provide access to funding:*** Most schools have limited budgets. By providing adequate funding, teachers will be able to procure the resources they need to venture into the community (buses, materials, substitutes, passes to museums). The school should eventually provide necessary funding ((VCW, 2002), but until then provide outside funding or grant support.
- ◆ ***Establish community-wide support:*** Involve parents, local businesses, community and technical resources, elders, resource management agencies and town leaders early in the process (Liebermann & Hoody, 2002).
- ◆ ***Start small and build gradually*** A few well-planned, well-executed will help to build momentum and support (Liebermann & Hoody, 2002).
- ◆ ***Rigorous, standards-based education:*** Demonstrate how place-based education can meet state and federal standards (Gibbs & Howley, 2000).

⁸ This compilation was excerpted from the unpublished 2003 master’s thesis of Sharon Plumb, University of Vermont.

- ◆ ***Authentic assessment:*** Provide teachers training as needed to design authentic assessment tools that match the goals and the processes of the learning projects (ARC, 1999a; ARC, 1999b; VCW, 2002).
- ◆ ***Include evaluation in the process:*** Evaluate programs internally and externally (Liebermann & Hoody, 2002). This should include both the school and any programs that are assisting the school in change.
- ◆ ***Be patient and have faith:*** Change is slow, and progress is not always immediately recognizable (Liebermann & Hoody, 2002; ARC, 1999a; ARC, 1999b). Keep track of successes and challenges, and engage participants in efforts for program improvement.