

FINDINGS

Building the Value of Education as a Management Tool

The success of water management strategies is strongly linked to how effective we are at facilitating audience changes in behavior. Education research offers tested theories and principles for how to get people to think critically about new issues and/or to effect change. These principles, as found in areas of study such as *environmental education*, *communication*, *social marketing*, and *diffusion of innovation theory*, are the basis for the human dimensions work that has gained much attention within USDA Cooperative Extension and other natural resource agencies over the last few years.

The Water Outreach Education Project provides tools for helping natural resource professionals choose and use education principles more easily and effectively. We have synthesized the applicable education theories and principles into simplified language; made best education practice (BEP) recommendations for target audiences; collected water education materials that correspond to instructional strategies and the Cooperative Extension's water management topics; developed the pilot National Extension Water Outreach Education Web site at <http://wateroutreach.uwex.edu> to provide access to our work; and held this national symposium to fine-tune project products and strategies, and to identify gaps for future work.

The 2004 Symposium, *Best Education Practices (BEPs) for Water Outreach Professionals: Defining BEPs, Refining New Resources and Recommending Future Actions*, was held at the University of Wisconsin in Madison. Symposium goals were to:

1. Advance the dialogue about best practices for water outreach education.
2. Introduce Water Outreach Project products.
3. Showcase current water management research that illustrates our BEP recommendations.
4. Engage national Extension water quality coordinators and key stakeholders in fine-tuning Project products and marketing plans.

We anticipated that Symposium findings and recommendations would help educators more effectively guide water organizations and agencies to integrate the use of BEPs into water management strategies.

Throughout a variety of Symposium activities, we expected participants to demonstrate their knowledge of BEPs and how to apply them, and to recognize that how BEPs are applied could contribute to achieving a water management strategy. In return, we expected participants to use their growing understanding to help the project by analyzing gaps in BEPs for target audiences; and by making recommendations for proposed future work to facilitate the use of BEPs, to develop BEPs for underserved target audiences, and to increase broad recognition of the value of education to water management strategies. Finally, we asked participants to use their understanding to advise us about the BEP web site design and content.

Since the Symposium, we have worked, and will continue to work, to implement suggestions solicited through Symposium evaluations of the web site and of the project in general. We look to Symposium participants to build on their connection with this project to promote use of BEPs among natural resources professionals in their organizations, and to become conduits for collection of additional target audience case study resources. Eventually, through promotion of the Symposium outcomes and other project products, we expect agency partners to provide institutional support/funding for application of BEPs within their own work.

The primary components of the Symposium were:

- An introduction to BEP Project resources and products.
- Individual and small group activities to refine and expand BEP project resources and products and to develop a marketing strategy.
- Seminar presentations and discussions to facilitate gap analysis of BEPs for target audiences.
- Opportunities for networking and partnering among water education professionals/ administrators.

Participants included:

- Agency educators
- Extension educators
- Extension National Water Quality Program Coordinators
- Natural resources professionals
- US EPA staff
- Water education providers
- Agriculture and recreational business
- Decision-makers
- Representatives of proposed target audiences
- Policy makers
- University/College Researchers
- Water organizations

Paper Presentations and Poster Sessions

In preparation for the Symposium, we put out a national call for research papers and target audience case studies. The Water Outreach Project is collecting audience-specific best education practices and topic-specific water outreach resources. Expansion of the collection hinges on identification of relevant research, discovery of links to published information about water management topics, and access to case studies that demonstrate best education practices. Some authors were specifically invited to submit paper proposals. Symposium paper and poster presentations were eventually selected to showcase water management research projects and programs that have successfully incorporated best education practices. These sessions provided the foundation of our Symposium discussions.

We sought:

- Papers that reviewed and summarized multiple studies of audience-specific Best Education Practices
- Papers or posters that reported on research about audience specific Best Education Practices

- Posters that described a case study where Best Education Practices have been applied

Paper and posters about research were to focus on identifying best education practices for one of the target audiences listed in Table 1. Case studies were to refer to an education/outreach purpose, one of the theories that contribute to Best Education Practices, or both, as described in Table 1. Proposed abstracts were subjected to a rigorous review by the planning committee. Those selected represent carefully constructed case studies or research about water outreach initiatives with target audiences.

Panel presentations also contributed to information that participants used to help guide recommendations and their presentations are integrated into Symposium findings. Panelists were personally invited, based on their work that specifically related to Symposium goals and criteria for excellence.

Table 1. *Paper and Poster Solicitation Criteria: Did the Work Address One or More of the Following?*

Audiences	Purposes	Theories contributing to BEPs
<ul style="list-style-type: none"> • Local Decision and Policy Makers • Agency Partners • Industrial Water Users • Recreational Water Users • Recreational Businesses (water-related) • Retailers of Water Recreation Equipment • Agricultural Commodity Groups • Farmers • Landowners • Households • Homeowners • Neighborhood Organizations • Service Clubs • Environmental/Conservation Nongovernmental Organizations • Soil and Water Conservation Districts • Specific Ethnic Groups 	<ul style="list-style-type: none"> • Information (one way) • Communication (two way) • Education (formalized process with a goal) • Capacity building (community management of the environment) 	<ul style="list-style-type: none"> • Development Theory • Principles of Adult Education • Principles of Youth Education • Technology Transfer and Diffusion of Innovation • Social Marketing • Civic Empowerment • Communication • Leadership • Citizen Participation/Community Involvement • Non-economic Social Sciences

Water Outreach Web Site Resources for Professionals

Over the course of the three-day Symposium, participants were invited to investigate project Web site resources, and Web site organization. In addition to a large group feedback opportunity on the last day of the Symposium, participants were also asked to complete an evaluation about the usefulness and ease of use of Web site resources.

The Water Outreach Web site includes resources that create access to, build on, and link to education research, water management research, and water management information. Project activities focus on building a repository of audience-specific BEPs, and on providing access to those and other water education and resources. Recommended BEPs integrate education theory and water management research, and answer questions about effective water outreach practices.

Education theory, water research, and high quality education materials are linked together through these types of unique tools:

- The *Best Education Practices (BEP) DECISION TREE* is set up like a field guide key. The TREE leads to answers for common water outreach problems through a series of yes or no questions. For instance, do you want:
 - Tree 1 – To tackle a *specific* water use or management problem?
 - Tree 2 – To increase *public awareness* or help the community meet a water goal?
 - Tree 3 – To build *community capacity* to manage water use and environmental impacts?

Ultimately, the user connects to BEP advice with links to specific applications, tips, and resources that apply to situations that we commonly face in our work as natural resource professionals.

- *USE BEPS* helps the educator to analyze the situation, determine the "hook" or the "teachable moment", and use communication and teaching skills to accomplish objectives. Selections lead the educator through a process to:
 1. Clarify what they want to accomplish
 2. Choose a strategy to decide exactly what type of outreach effort is appropriate to the situation
 3. Plan using recognized program design and communication strategies
 4. Identify BEPs that will help accomplish the objective
 5. Assess the program
 6. Learn from others
- *BEP RESEARCH* tells the story behind education practice recommendations. This section includes the research bibliography, a research summary for specific target audiences, and background about important areas of education theory we call knowledge areas. Table 2 provides a sample of the knowledge areas and target audiences that we address on the Web site.
- *TOOLS FOR TEACHING* provides quick access to tips and techniques for implementing successful teaching or training initiatives. Resources range from tips about how to facilitate or how to make a presentation, to helpful advice about planning a typical outreach event.

- *SEARCH RESOURCES* allows the user to find high quality water education resources that are linked to the new educational strategies you've learned about on the Web site and want to use to meet your water management goal.

Table 2. Water Outreach Web Site Knowledge Areas and Target Audience Information

KNOWLEDGE AREAS	TARGET AUDIENCES
<ul style="list-style-type: none"> • Adult education principles • Communication principles • Citizen participation/ Community involvement principles • Education planning • Leadership development principles • Learning theory • Social marketing principles • Technology transfer/ Diffusion of innovation theory • Youth education principles 	<ul style="list-style-type: none"> • Agricultural commodity groups • Environmental/ Conservation NGOs • Farmers • Government agencies • Homeowners • Industrial water users • Landowners • Land development businesses • Local decision and policy makers • Recreational water users • Specific ethnic groups

Outreach Education and Best Education Practices (BEPs)

Outreach education relies on the existence of a body of knowledge which is not only transferred to the individual but is instrumental in transforming the individual. In other words, the individual has to actively receive the knowledge and know how to use it (Andrews, 2000).

Underlying questions that Symposium participants were asked to explore is the need for a fundamental understanding of what is meant by *outreach* – and specifically outreach undertaken for the purpose of improving citizen stewardship and management of water. Cooperative Extension, government agencies, and water educators have been grappling with this question for a decade of meetings, symposia, and conference presentations (e.g. Andrews, Hawthorne, & Pickering, 1996). Discussions have led to broad agreement that sophisticated outreach initiatives are important to water management, and that outreach planning that follows key steps increases the likelihood of a successful effort.

This advice from *Getting in Step* characterizes the relationship between water management and outreach.

Watershed citizens must be informed about basic water quality problems. Stakeholders must be told about the process and encouraged to get involved. Elected officials will want to know what's happening and how they can support the initiative. And, finally, those who are contributing to water quality degradation by engaging in practices that increase polluted runoff will need to be informed, engaged, and motivated to adopt more appropriate behaviors (MacPherson & Topping, 2003).

As you progress through your watershed management process, your outreach objectives and activities will change. For example, during the early stages it might be necessary to generate basic awareness on watershed issues, but as problems are identified your objectives will focus on educating your target audiences on the causes of the problems. Finally, during the implementation phase of your watershed planning and management process, your objectives will focus on action by your target audience to reduce adverse water quality impacts (MacPherson & Topping, 2003).

Designing effective outreach education depends on following steps outlined by experienced educators, such as those listed in Table 3.

Table 3. *Tips for Planning*

-
1. Identify the type of outreach or education effort that you will emphasize:
 - Provide Information
 - Communicate
 - Educate
 - Build Capacity
 2. Familiarize yourself with the "community of interest". Link your effort to local issues and activities.
 3. Assess and define the target audience(s).
 4. Define clear goals and objectives, in cooperation with stakeholders and target audience.
 5. Inventory resources and constraints, and adapt your initiative to capitalize on results.
 6. Design your initiative with a focus on your goals, audience characteristics, and resources.
 - Match to resources and audience characteristics.
 - Identify education or outreach knowledge areas relevant to the topic and use best education practices for each.
 - Actively engage target audience.
 7. Pilot test and modify
 8. Implement, deliver, or disseminate
 9. Evaluate and revise
-

“Good,” “Better,” and “Best,” Education Practices

We constructed the Symposium to allow participants to delve into details about effective use of education practices in outreach initiatives. Our focus was to assess use of *best* education practices, with a particular emphasis on how well educators understand and apply information about the *target audience* in their outreach plan.

A **target audience** is a segment of the population that has a *specific opportunity to take action* on the identified problem, or is *specifically affected* by the identified problem. For example, the target audience for our water outreach project is natural resource management and outreach professionals. We invited our target audience to help us review project products and help guide project recommendations. Research and case studies

presented at the Symposium summarized results of work with one or more specific audiences.

To find out whether an education technique is a *best* practice, we apply a selected education technique and study the outcome using research methodologies. A best practice is one that is shown to be equally effective in multiple cases with like audiences.

To the extent that research-based information is available, the water outreach project strives to present *best* practices. Where research-based information is not available, we have worked to identify case studies and the best available information, or *good* practices. *Good* practices are widely established practices, applied by experienced educators, but which may not have been subjected to researched comparisons. Table 4 lists the definitions of good, better, and best education practices used in the water outreach project.

Table 4. Definitions of Good, Better, and Best, Education Practices

Good Education Practice	An education practice that yields desired outcomes when applied under a certain set of conditions with the appropriate audience (after Holsman, 2001, p. 2).
Better Education Practice	A good education practice that has been shown; through research, critical reflection, or both; to be more effective in achieving intended changes than some other education practice or practices.
Best Education Practice (BEP)	"...a program or practice that has been clearly defined, refined through repeated delivery, and supported by a substantial body of research" (Fedler, 2001, p. 7).

To call an education practice a *best education practice* is to say it is better than all other practices to which it has been compared using some standard or criterion of comparison. To fully specify the relative quality of a practice requires that its value be described in the educative context. Not only must the claims of "best education practice" be shown to hold in comparison to other practices, the claim must narrow its recommendations to also describe the contexts and audiences for which the practice is shown to be the best.

All claim that an education practice is a good, better, or best, education practice require the following information:

- Relative to what?
- In what circumstance?
- With what audience?

We undertook the Symposium and a related project, a target audience literature review, because of our perception that there is a gap in information about impacts on target audiences in education and resource management research. While many environmental education research papers recommend education practices, few of these papers focus on adult audiences, and few identify education practices that are best for specific audience groups. Few resource management papers test specific education practices, relying

instead on the admonition that good resource management needs to be accompanied by outreach to the public or to a target audience.

In our call for research papers, we looked specifically for research that applied outreach and education practices with target audiences that are not well represented in the literature: farmers, producers, local decision makers, policy makers, households, neighborhoods and landowners. Published studies about youth water outreach education are more common, but invited Symposium papers summarized unique developments for work with the youth audience. Symposium research paper findings will be integrated into other project research findings.

Essential Best Education Practices

Prior to the Symposium, we summarized an extensive review of education theory in a form we call, *Essential Best Education Practices* (See Appendix A).

Practices are grouped according to typical educator challenges, for:

- Every education or learning situation
- The individual
- The class or group
- Web-based learning
- The community
- Beyond the community

This list of essential practices was derived primarily from references which summarized major ideas from many authors in the field they describe. Sources include, for example, the American Distance Education Consortium, *ADEC Principles for Distance Teaching and Learning*; and the American Psychological Association Board of Educational Affairs, *Learner-Centered Psychological Principles*.

We present these practices as a foundation that outreach professionals can use to gauge what they know and don't know about how to create effective education strategies; and to help professionals to determine design considerations that will improve effectiveness of their efforts in "transforming" individuals in their target audience so that they are able to use new information and skills.

Research about outreach with target audiences amplifies these theoretical findings with concrete examples. During the Symposium, participants practiced the process of identifying BEPs from theory and research. This experience contributed to participant ability to develop advice about project initiatives.

Education – An Essential Ingredient for Successful Water Management

To kick off the Symposium, we invited Kevin Coyle, President of the National Environmental Education and Training Foundation (NEETF), to paint a broad picture of the need for quality water education. Mr. Coyle's presentation was based on findings

from years of Foundation investment in understanding and promoting citizen environmental literacy.

Reports and studies support the idea that is possible to extend the concept of Best Management Practices to education because there is a “growing body of evidence that education works in a practical sense and produces results both by itself and as an added measure in the larger natural resource and water management arenas.” Education is needed as part of the current scenario of water management because:

- Water management principles and practices are complex and that complexity is rapidly increasing.
- Complex surface and groundwater dynamics at the urban-rural interface impact how water quantity and water quality stewardship is shared among groups of people.
- Citizen knowledge of environmental subjects, including how water bodies become polluted, is relatively low.

Mr. Coyle described three levels of learning, about the environment that lead to three levels of impact. Learning at the *awareness* level can lead to public support, but lack of understanding of details can foster misunderstandings. Learning at the *personal steps* level has been shown to change behavior, but may not be durable. This type of knowledge needs constant updating and reminders. Learning at the *literacy* level means knowing and understanding underlying environmental principles and being able to analyze and apply them. One potential goal for outreach education is to build environmental literacy among community “influentials” who are actively involved in the community and “constantly making decisions on every aspect of community life.”

The NEETF funded research suggests several questions that educators could ask to determine whether their initiatives have the potential for success. These points could contribute to assessing the quality of BEPs for water outreach.

1. Can we achieve improved water management without stronger education?
2. Does the information to be imparted require simple awareness or deeper education?
3. Do the BEPs that are delivered adhere to other basic rules of pedagogy?
4. Does the instruction teach skills and application?
5. Will BEPs aim at community leaders or influentials?

Framing the Dialogue: Target Audience Success Stories

The Symposium was designed with a combination of panel and paper presentations; small and large group discussion sessions; poster viewing; and Web site evaluation. To begin each day, we engaged a number of well-know water outreach educators to help participants focus their thinking on the questions we hoped they could answer about the quality and content of the Web site, about marketing Web site tools, and about providing advice for policy development.

Panelists were asked to make their presentations in such a way as to build participant skills. Our goals for participants were that they would be able to:

1. Identify the target audience(s) for any outreach activity.
2. Identify the type of education practice that is or could be used with the target audience.
3. Determine whether the education practice is a good, better, or best, practice, based on whether the practice has been repeatedly tested and evaluated.
4. Identify standards/benchmarks for measuring the success of any particular education practice.

Symposium presentations highlighted audiences in one of three groupings:

- Group One: Farmers, decision-makers, leaders, and community organizations
- Group Two: Households, neighborhoods, and landowners
- Group Three: Youth, youth educators, and volunteers

We launched the first half-day by asking participants to reflect about good, better, or best education practices: setting the stage for discussion about best education practices with a case study that incorporated each of the four features of our proposed model, above. Following the plenary, a panel focused on the target audience portion of the outreach equation (goals 1 and 2).

Making Our Nonpoint Source Pollution Programs Effective, the plenary presentation, described results from a water outreach research project that have been used to guide Wisconsin education (Shepard, 1999). The study compared the rate of adoption of nutrient management strategies by farmers in two Wisconsin watersheds over the same five-year period. The educator for one watershed relied on a diffuse communication campaign; the educator for the other relied on one-on-one information transfer techniques. Results supported use of a diverse set of educational approaches and discouraged over-reliance on diffuse information dissemination. Guidance from these findings has been incorporated in forty Wisconsin projects working with over three hundred farmers. Each project uses a comprehensive pre-survey to help segment the audience, followed by conservation planning, soil tests, workshops, and farm visits by educators during the growing season.

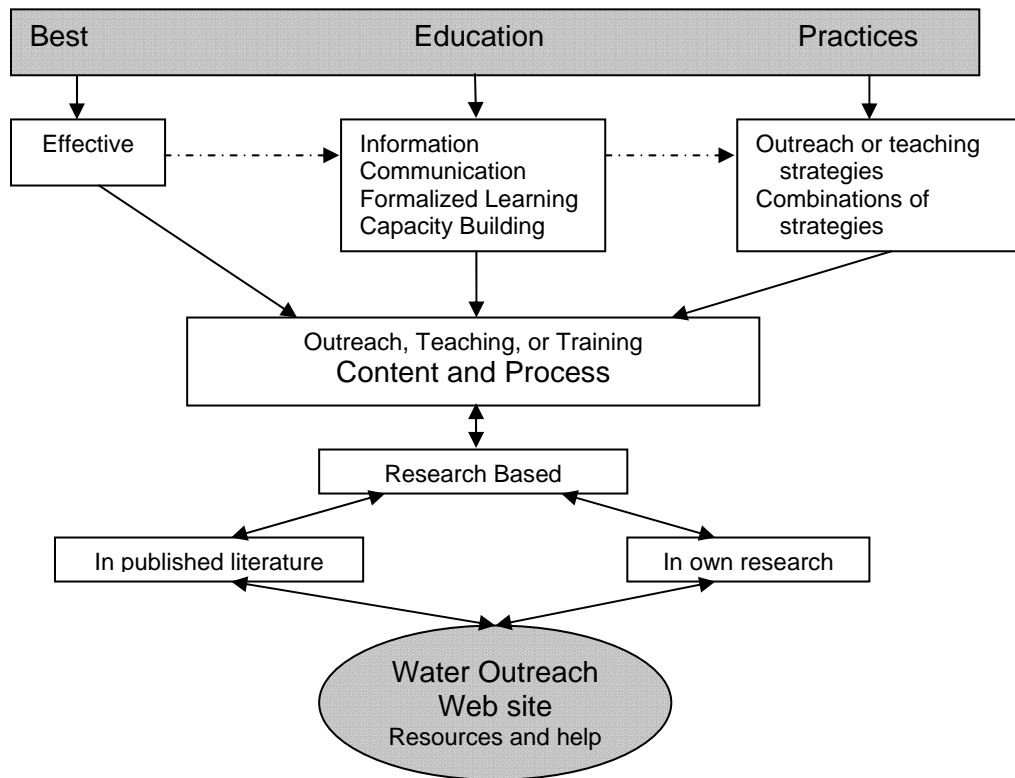
Panelists for the follow-up session included representatives from two nongovernmental organizations, and two state natural resources agencies. The audiences for their work included youth, county soil and water conservation professionals, business, industry, and agency water education professionals. Presentations show-cased a variety of techniques for working with these selected target audiences.

This session led to a small group session where participants were asked to reflect on their own situation. Participants summarized education practices that they used in their work; talked about whether they thought the practices were good, better, or best practices, according to our definitions; and explained how they made their determination. This led to some lively discussions.

Participant Response to the BEP Framework

Participant groups deconstructed BEPs to mean: Effective – Information, Communication, Formalized Learning, or Capacity Building – Practices, as illustrated in Figure 1. “Practices” refer to application of a teaching or outreach practice or a combination of practices. Resources on the National Water Outreach Web site contribute to the educator’s ability to use BEPs, but are also built by educator research and case study applications.

Figure 1. The Best Education Practices concept, deconstructed



Participants identified a number of questions about applying BEPs, which are listed in Table 5. These are considered in the Symposium recommendations.

Table 5. *Participant Questions about the Concept of Best Education Practices (BEPs)*

- 1) How and where to find BEPs?
- 2) How to move from good to best?
 - a) Encourage projects to publish outcomes and impacts: contribute to the profession of water outreach and education
 - b) Provide administrative support
 - c) Disseminate research standards
 - d) Provide resources for quality education – time, money, staff
- 3) Can we take the BEP concept to the next step and develop a model that frames “best” for program planning and implementation?
- 4) How do we sustain education programs through changes in budgets, government, etc? Is that part of the “best” model?
- 5) How to decide when to apply BEPs? Consider:
 - a) How the quality of the practice is determined
 - b) How the practice should be delivered
 - c) How the practice relates to:
 - i) Audience
 - ii) Strategies
 - iii) Accessibility
 - iv) Context
 - v) Efficiency
 - d) Whether the practice has long-term applicability, based on its:
 - i) Flexibility
 - ii) Adaptability
 - iii) Replicability
 - iv) Sustainability
 - v) Life cycle

The Target Audience Presentations

Participants spent the remainder of the first full-day reviewing posters and the Web site, attending paper presentations, and participating in a small group discussion about gaps in target audience research. The second day focused on participant response to paper, poster, and panel presentations. Based on their Symposium experiences, participants considered how to move water education to the forefront of water management strategies and how to promote best education practices in our work.

There were a total of fifty-one presentations throughout the Symposium; summarized by category in Table 6. Papers, poster abstracts, and panel presentations are provided in the printed proceedings and on the Water Outreach Web site. Symposium posters are available for viewing only on the Web site.

Table 6. *Symposium Presentation Types*

Presentation Type	Number of presentations
Research paper	17
Poster	19
Poster paper	6
Panel presentation	9
TOTAL	51

For convenience in comparing presentation highlights, we provide descriptions and findings organized by target audience in Table B7: including every paper, poster, and

panel presentation from the Symposium. Summaries were reviewed and edited by presenters after the Symposium.

The editors took the liberty of converting presentation descriptions into recommended education practices after the Symposium. These are also listed in Table B7. Practices represent a collection of good, better, and best education practices, based on the Table 4 definitions.

We looked at each paper, poster, and panel presentation for specific recommendations related to the following *themes*:

- Audience information
- Message delivery vehicle (a special case of outreach strategy)
- Message content
- Outreach strategy/method of teaching
- Supporting and motivating professionals
- Evaluation

Finding the Gaps in Our Understanding of Targeted Audiences

We invited symposium papers, posters, panelists and speakers to help us do two things:

- 1) Identify what we know about audiences of particular interest to water educators;
- 2) Identify gaps in our knowledge about target audiences.

Participants listened to presentations, viewed posters, and read abstracts to help develop recommendations regarding strengths and gaps for audience information. Their recommendations about missing audiences, barriers to studying audiences or best practices, and advice to funders and policy makers about best practices are reported later in this section.

To more easily identify and analyze strengths and gaps in target audience information, we conducted our own analysis of participant recommendations. We sorted presentation descriptions and recommendations from Table B7 in two ways. Tables B8-16 summarize recommendations by audience, for each of nine audiences featured in symposium presentations. Tables B17-22 reconfigure the arrangement, presenting recommendations according to the six outreach themes.

Recommendations by audience

Recommendations for households and neighborhoods provide the most comprehensive advice of all the groups gathered for the Symposium (Table B12). Recommendations for landowners, recreational water users, and volunteers were the least comprehensive, although informative (Tables B13, B14, and B15). Essentially there were fewer presentations for these audiences. The lack of Symposium recommendations for these three audiences could be interpreted as a gap, since these audiences were listed in the call for presentations and proposals on these topics were carefully considered by the selection committee (although *volunteers* were not singled out from broader categories of organizations and clubs).

Conservation professionals (Table B8)

Provide professionals with autonomy in determining content and timing for their own training and enable them to personalize their training objectives. Direct application to work responsibilities, networking, and moral support are keys to learning new outreach or education skills for this audience.

Decision makers, leaders, and community groups (Table B9)

Use the internet for providing leaders with access to data and relevant interpretations. Encourage community groups to develop their own environmental assessments and to develop their own outreach strategies. Build community-wide program acceptability.

Ethnic groups (Table B10)

Carefully identify education needs that are specific to the group. Apply *place-based* teaching strategies so that education has a direct bearing on the well-being of the places people actually inhabit.

Farmers, producers (Table B11)

Emphasize local, direct farmer contact. Use in-depth discussion and interviews to learn about farmer interests and management preferences.

Households and neighborhoods (Table B12)

Generate local and detailed information about audience attitudes, interests, and needs: with the help of a regional team, if available. Support and rely on stakeholder groups that already have a relationship with the target audience. Test education materials for their applicability with the audience of interest. Provide practical techniques and home assessments for households to apply with help from a trained volunteer to develop new practices.

Landowners (Table B13)

Provide landowners with hands-on, practical training in a supportive atmosphere.

Recreational water users (Table B14)

Train recreation professionals about water management in collaboration with their professional associations.

Volunteers (Table B15)

Tell the story of the program and publicize impacts.

Youth and youth educators (Table B16)

Use education materials that are relevant and easy to adapt to the school situation. Use field-based and service-learning experiences to provide: problem-solving experience; interaction with real things; learning that can be applied throughout life; and practice for environmentally responsible behaviors.

Recommendations by theme

In Tables B17-22, we sort presentation recommendations by six themes. This enables us to look broadly at the type of advice available for the educator. Most presentation recommendations address the theme *outreach strategies and methods of teaching* (Table B20). Recommendations for *message content* and *supporting and motivating professionals* were the least comprehensive, although informative (Tables B18 and B22). The lack of Symposium recommendations for these themes could be interpreted as a gap. For each of the other three themes, there were recommendations for at least four of the nine audiences.

Audience information (Table B17)

Prior to designing the program, implement a system to investigate the interests and needs of the stakeholders and target audience. Tailor materials to address identified needs. Identify barriers and benefits to recommended behaviors.

Message content (Table B18)

Provide clear messages that have immediate utility for the program goal. Assure that different groups and agencies provide consistent messages.

Message delivery vehicle (Table B19)

Message vehicles may be people, opportunities, or things. Work with a collaborative, a professional association, or youth leaders to deliver information. Time a message to coordinate with heightened awareness resulting from other public events. Be creative in delivering messages, through vehicles such as Web sites, youth awards, video and audio communication, handbooks, calendars, plants and landscape design, rain barrels, and bus tours.

Outreach strategy/method of teaching (Tables B20 and B 21)

We grouped the large number of findings for this theme into two major subthemes: *outreach design components* and *outreach implementation*. Outreach design was further subdivided into quality, stability, access, connection, program, and marketing. Outreach implementation was subdivided into management, relevant instructional strategies, and recognition of contributors. Subthemes and divisions were selected based on previous work to outline standard elements of success for this theme and are reported on the Water Outreach Web site (National Extension Water Outreach Education. 2004).

The richness of recommendations for all but one design and implementation component, *marketing*, indicates a strong understanding among outreach professionals for effective techniques. Consistent application of these recommendations will influence the quality of efforts.

Supporting and motivating professionals (Table B22)

Build skills among conservation professionals to apply best communication practices. Build skills among land use professionals to ask the right questions.

Evaluation (Table B23)

Encourage policy makers and stakeholders to report outcomes. Use follow up visits/calls, comparison crop strips, and pre and post surveys to evaluate impacts. Assure that program resources actually reach the targeted audience.

Symposium Recommendations

One goal for the Symposium was to develop recommendations about the gaps in BEPs for target audiences, and to make recommendations for proposed future work to facilitate the use of BEPs and to increase broad recognition of the value of education to water management strategies. This section summarizes gaps in information about target audiences identified by the Proceedings editors as well as those identified by participants. A summary of strengths and gaps is followed by broader recommendations for next steps. Discussion also highlighted gaps or needs related to the BEP concept itself. Recommendations relate to needs for professional development about the concept and the need for building the validity of the concept.

Gaps in Target Audience Research

Project analysis of gaps

Symposium presentations provided outreach recommendations for nine audiences, broadly representing the sixteen audiences originally identified by the Advisory Committee. We were not successful in finding any presentations about industrial water users. Recreational water-related businesses or retailers generated only one study (Waltz). Another study about boating and fishing education (Levin) was comprehensive, but related more closely to other studies and reports about work with conservation educators.

Recommendations also broadly addressed all six outreach themes. Those for *message content* and *supporting and motivating professionals* were the least comprehensive, although informative, but their minimization in the work could be interpreted as a gap. Apparently, our hand-picked presenters did not focus their work on these themes. For each of the other three themes, there were recommendations from at least four of the nine audiences. The richness of recommendations about outreach design and implementation indicates a strong understanding about effective techniques among outreach professionals. Consistent application of these recommendations will influence the quality of efforts.

To our surprise, even from this limited effort to identify audience-specific recommendations based on recognized education principles, pooled findings created gems of advice for each of the nine featured audiences and for the six themes. Our theory is that these well-grounded recommendations for conducting water outreach have been developing for the last decade or more. This Symposium may be one of a very few times when the wisdom of these water professionals has been combined to create unique advice, however. The power of the recommendations lies, in part, in their combination with others for the same audience. Together they provide a more holistic picture of outreach about water that enables us to see what works.

Participant analysis of gaps

Following paper and poster presentations, participants were asked to start identifying gaps through small group discussion sessions. We prepared participants by asking them to observe certain features about each poster and paper presentation they attended: what audiences did the presentation address; what education practices were recommended; were the education practices good, better, or best practices? Facilitators led small groups through a number of questions about their day-long experience, supporting the group while it processed a large amount of information. We asked facilitators to answer three specific questions in their group report:

- 1) What audiences are important that were not included in presentations?
- 2) Why didn't we hear about certain audiences? Are there barriers?
- 3) What advice would you give to funders and *policy makers* on how to reach selected target audiences with our BEPs to improve information and understanding of water management strategies?

The BEP concept: participant recommendations

Participant discussions led to questions and discussion about the BEP concept itself. Participants developed their own analysis and questions about the concept earlier in the meeting, as presented in Figure 1 and Table 5. Discussion also produced a number of significant recommendations important to improving our understanding about the need for gathering exemplary practices, and important to framing professional development needs and strategies that will improve outreach effectiveness.

Participants' recommendations:

- Build a common understanding of BEPs, and especially, to find a way to articulate the theory that supports the practice in the minds of the practitioner.
- Encourage education-related professional development among natural resource professionals, and especially help professionals create clearly defined learning objectives.
- Promote rigorous social science research and evaluation methods to build the body of literature about and for BEPs, including the requirement that claims of cause and effect are well supported.
- Assure that BEPs identified through research are tested in practice.

Missing audiences

Participants identified quite a list of audiences they felt were not addressed during the Symposium. This should provide researchers and educators with plenty of latitude in thinking about what groups they may have missed in their work. More published studies are needed for:

- Scientists, hydrologists, and engineers: as partners for collaborative learning about water
- Grounds keepers and facilities managers, including city/public works staff, golf course and park managers, and commercial landscape maintenance professionals

- Planners and design professionals, including architects, engineers, city planners, developers, builders, zoning officials
- *Policy makers* and influentials, including journalists, media, legislators
- Underserved audiences, including Latinos, non-English speakers, socioeconomic underserved, minorities
- Recreational water users, including anglers, golfers
- Ranchers and irrigators

Barriers to studying audiences or best practices

Responses to this question went beyond the traditional “not enough time”, “not enough money”. Time was certainly a concern, but groups also identified lack of professional training, inadequate access to information and research about target audiences, and the fact that there are no BEPs that fit every situation. Participants asked, “How do we make training within our organizations palatable?”

Participants point out that state agencies can’t keep track of who is being educated and that all the work we do is in a context that is a moving target (as referenced by MacPherson and Topping [2003] earlier in this section). There was particular interest in stakeholders, both to actively include them and to understand conflicts in their interests. Participants recommend that journalists become partners in the water outreach enterprise, for example. Gaps in information about audiences could be addressed if agency administrators encouraged managers to carry out program evaluation.

Advice to funders and policy makers

We didn’t ask participants to couch their recommendations in a sound bite, or one-minute presentation, but the quality of their answers had that effect. Participants identified needs according to several themes.

This “top ten” is a synopsis of about 75 recommendations that participants had for funders and policy makers:

- Education or outreach programs, if based on sound education principles, lead to citizens who know how to make informed decisions and will take actions that have a positive or desired impact on the community.
- Clearly state *the issue*, or provide detail about the issue, that would benefit from attention by outreach or education.
- Ask questions before funding. Clearly state *the standard* required for each educational strategy, practice, or program. Ask what combinations of BEPs are proposed? How does the grantee defend or support their use?
- Post education practice standards, so that educators can compare their programs to see if they are meeting standards.
- Reach out to audiences beyond youth, farmers and households.
- Know who the target audience is. Market segmentation research and identification of relevant best education practices; provide “more bang for the buck”.

- Study audiences carefully, including the influential leaders among the target audience. Train educators to address what the target audience knows and needs to know, and require quality programs and methodology.
- Share BEPs for specific audiences among agencies.
- Stay the course. It takes time for outcomes to occur.
- Accept behavioral change resulting from BEPs as a proxy for future water quality improvements.

Moving Water Outreach and Education from Backwater to Mainstream

To further prepare participants to offer recommendations, we provided participants with one more piece to the outreach puzzle. The last panel focused on how to apply BEPs for water management in a broader context: how to make water education and actions part of the mainstream of community life. Panelists provided four examples: Master Watershed Stewards (Godwin); Nonpoint Education for Municipal Officials or NEMO (Liukkonen); USDA Volunteer Monitoring National Facilitation Project (Stepenuck); and a multi-state team initiative (Mahler).

Panelists outlined basic pieces for “making the leap”. These included:

- Value a team effort and coordinate the team through a variety of activities.
- Establish baseline information about water education needs to improve ability to show progress and to help establish outreach priorities.
- Build citizen and group skills to ask the right questions.
- Provide avenues for communication among groups.
- Build program acceptability, especially through encouraging decision-makers and partners to tell the story of the program and to publicize impacts.

Challenges for Future Action

We ended the Symposium with a round-robin opportunity for small groups to provide advice about each of four points. In this scenario, participants read comments provided by a previous group before adding their own. This reduces duplication and often clarifies points made by an earlier group. The resulting recommendations for each question were superb and are provided as their own resource in Appendix C. As we hoped, participants provided a list of suggestions that will keep the project team working hard. We summarize a few main points here.

General comments, suggestions, reactions to the Symposium

The group liked the concept that natural resource professionals, or “accidental educators”, need education training. Some went so far as to suggest that a natural resources education master’s degree would be useful. There was lots of discussion about the BEPs themselves. One person suggested renaming the concept, PEPs, for Proven Education Practices in order to provide a more complimentary status for *good* and *better* practices. The group encouraged the Water Outreach project to analyze our focus on education, as opposed to communication or community development, and our

assumptions about *good, better, and best*, education; and to be open to new visions. There was interest in how to acknowledge cultural differences within BEP recommendations, and how to link social marketing concepts. Participants requested models of successful BEP applications and for how to go from *good* to *best*. The need for *sharing* opportunities also emerged as a theme. Participants suggested regional conferences, regional work groups, and email postings. Finally representatives from federal agencies and national program leaders from USDA Cooperative Extension were encouraged to investigate concepts proposed in the Symposium.

Refine and promote project products

The group viewed the Web site at a draft stage. Following the Symposium, the Water Outreach project added a considerable amount of material to the Web site, taking advantage of recommendations where possible. There remain a number of excellent suggestions, as yet unmet. Themes from the discussion suggested the following:

- Develop a market plan.
- Provide a discussion or message board and feed-back opportunities.
- Promote interconnectivity and provide users with a way to ask for help.
- Announce newly updated information on the Web site.
- Add interactive features and condensed histories of lessons learned.
- Enable users to search information by audience, such as youth, urban, farm, organizations, etc.
- Ask non-educators to review the site for usability.

How to encourage submissions for the education collection

In addition to standard recommendations like working with state water quality coordinators and posting the opportunity in standard journals, participants suggested a number of other ideas that focused on providing submitters with feedback about their effort. Participants suggest that the call for submissions talk about “what’s in it for me”: How will submitting an item help me? Providing a clear message for what is needed would also make it easier for educators to respond. People submitting materials need feedback about their submittal. Suggestions included: a pop-up thank you box; a submission acknowledgement that states the number of the submission (this is submission number 143, etc.); a list of other items in the database similar to the item submitted; a message to the author about the number of “hits” on their item. The project was encouraged to use the listserv to provide a monthly update of topics submitted.

Recommendations for future actions

Comments in this section mirrored the general comments. An emphasis on more training, networking, and work groups emerged. Participants are looking for program models and evaluation templates. They would like training on related topics: program design tools and techniques; and consensus building. Long term evaluation of changes achieved by applying BEPs is an important next step. In searching for how to describe the experience one participant suggested, philosophically, that a lack of clarity experienced by participants probably reflected a growth process for our profession.

Education – Is It an Essential Ingredient for Community Based Water Management?

The Symposium was designed to bring a diverse group of experience outreach professionals together to investigate opportunities for applying best education practices and for improving access to resources for professional development. Following a day and a half of critiquing exemplary programs and philosophizing, it was time to bring the discussion back to the concrete challenge about whether education is an essential ingredient for community-based water management. Kevin Coyle kicked off the Symposium by affirming the relevance of water education and by providing some checks that educators could use for answering this question. Cornelia Butler Flora ended the Symposium by helping us look at how education can play a pivotal role.

Dr. Butler framed her recommendations in terms of *capitals*: human capital, financial capital, political capital, cultural capital, and natural capital. In her words, capitals are resources invested to create new resources over a long time horizon. The role of the educator is to maintain a balance among the capitals in their work. In her view, a lack of knowledge may be only a small obstacle in moving toward a more sustainable ecosystem and therefore educators need to focus on the “pyramid of social control.” We need to understand why structures and actions are in place that lead to ecosystem degradation and identify the best ways to change those structures and actions.

Our concern as water educators is to understand why people act in the public interest. Educators provide citizens with information that helps them do the ecologically responsible thing. If citizens don’t know how, then our job is to provide technologies and skills to enable them to perform the action successfully. Accompanied by sound environmental education practice to foster decision-making skills and civic investment, these steps lead citizens to the literacy level described by Mr. Coyle in the kick-off address.

The next level is to support groups that share values, or to expand *social capital*. Ultimately the educator helps citizens and groups to develop *political capital*, the ability to mobilize in a democratic forum. As Mr. Coyle describes, a potential goal is to build environmental literacy among community influentials who are actively involved in the community and “constantly making decisions on every aspect of community life”.

These are challenging concepts for educators more familiar with the comfortable role of the neutral or who focus on providing awareness or “personal steps”. Exactly how the application of best education practices meshes with an understanding of societal structures is the subject for another symposium. What we can do is to perform well within the structures and settings where citizens or democratic rule have provided clear goals for change or improvement. Best education practices apply, no matter where the educator is positioned – with individuals, homeowners, neighborhoods, groups or leaders and *policy makers*. Use of BEPs will contribute to building environmental literacy among all levels in the community.

The answer to the question, “Education – is it an essential ingredient for community-based water management?”, is a resounding YES from Symposium speakers and participants. Participants provided examples of BEPs in practice with specific audiences; and they provided recommendations for building the BEP concept and promoting the use of BEPs. New directions are to:

- Refine the concept of BEPs, provide training and networking among water educators.
- Promote the value of applying BEPs among agencies and funders.
- Provide models and evaluation templates for measuring whether we have achieved BEPs and to determine if they have the effect we predict.

References for Findings

American Distance Education Consortium. (2003) *ADEC guiding principles for distance teaching and learning*. Retrieved June 2004, from the ADEC Web site: http://www.adec.edu/admin/papers/distance-teaching_principles.html

American Psychological Association (APA). (1997). *Learner-centered psychological principles: A framework for school redesign and reform* (Revision prepared by a Work Group of the APA Board of Educational Affairs). Retrieved July 13, 2005, from the APA Web site: <http://www.apa.org/ed/lcp.html>

Andrews, E. (2000). *U.S. Environmental Protection Agency/Cooperative Extension partnerships—No. 7, building capacity: From transferring to transforming*. Madison: University of Wisconsin, Environmental Resources Center. Retrieved June 2004, from <http://www.uwex.edu/erc/envstew.html>

Andrews, E., Hawthorne, J., & Pickering, K. (1996). *Watershed education - Goals and strategies for training, communication, and partnerships* (a report on Watershed ‘96 Preconference Education Symposium, sponsored by U.S. EPA and the Water Environment Federation). Washington, D.C.: National Fish and Wildlife Foundation.

Fedler, A. J. (Ed.) (2001). *Defining best practices in boating, fishing, and stewardship education*. Alexandria, VA: Recreational Boating and Fishing Foundation. Retrieved June 2004 from the Recreational Boating and Fishing Foundation Web site: <http://rbff.org/educational/BPE1.pdf>

Holsman, R. H. (2001). *What works: Documenting standard practices for aquatic resource education*. U.S. Fish and Wildlife Service – Region 5.

MacPherson, C., & Tanning, B. (2003). *Getting in step: A guide to effective outreach in your watershed* (A Web-based training module from EPA's Watershed Academy developed in 1998 by Tetra Tech, Inc.). Retrieved June 2004, from the U.S. EPA Watershed Academy Web site: <http://www.epa.gov/watertrain/gettinginstep/step1a.html>

National Extension Water Outreach Education. 2004. *Plan*. Retrieved December 2005
from <http://wateroutreach.uwex.edu/use/plan.cfm>

Shepard, R. (1999). Making our nonpoint source pollution education programs effective.
Journal of Extension, 37(5). Retrieved June 2004, from <http://www.joe.org/joe/1999october/a2.html>