
VI. Appendices

Appendix A:	Essential Best Education Practices	35
Appendix B:	Summary of Findings by Primary Target Audience	39
Appendix C:	Water Outreach Education Web Site Resources.....	61
Appendix D:	Recommendations Summarized by Target Audiences – Tables 7-15.....	63
Appendix E:	Recommendations Summarized by Outreach Themes – Tables 16-22.....	75
Appendix F:	Plenary Activity – Promoting BEPs and Challenges for Future Action	87

APPENDIX A

Essential Best Education Practices

FOR EVERY EDUCATION OR LEARNING SITUATION

The learning experience:

- Is specifically designed to maximize the type of outreach or education effort selected:
 - Information (one-way communication)
 - Communication (two-way communication)
 - Education (formalized learning process)
 - Capacity building (enhance group or community skills)
- Contributes to meeting learning goals:
 - Knowledge – the development of intellectual skills, such as recall of data, comprehension, application, analysis, synthesis and evaluation
 - Attitudes – the manner in which we deal with things emotionally, such as feelings, values, appreciation, enthusiasms, motivations, and ways of thinking
 - Skills – physical movement, coordination, and use of motor-skill areas

FOR THE INDIVIDUAL

The learning experience:

- Has a clear purpose with tightly focused outcomes and objectives.
- Is learner centered, and consequently:
 - Assesses the learner in order to set appropriately high and challenging standards.
 - Relates to the individual's level of physical, intellectual, emotional, and social development.
 - Can be adapted to individual differences in learning strategies and approaches.
 - Relates to personal interests and provides for personal choice and control.
 - Encourages the learner to set meaningful learning goals and to take personal responsibility for their own learning.
- Promotes active engagement and real world problem solving.
- Enables the learner to link new knowledge to their existing knowledge in meaningful ways.
- Builds thinking and reasoning skills – analysis, synthesis, evaluation, and problem solving – that learners can use to construct and apply their knowledge.
- Presents a new behavior or skill by:
 - Demonstrating its similarity to a current behavior or skill.
 - Relating the new behavior to current social practices.
 - Demonstrating ease of adoption in terms of time, effort and money.
- Provides a *nurturing context* for learning, with attention to: cultural or group background and influences, the physical environment, and the use of tools or practices appropriate to learner skills and abilities.
- Provides opportunities for extended effort and practice.
- Builds on positive emotions, curiosity, enjoyment, and interest.
- Allows a learner to interact and collaborate with others on instructional tasks.

FOR THE CLASS OR GROUP

The learning experience:

- Is based on and shaped by some form of needs assessment and use of a planning model (such as the logic model).
- Is designed to focus on a targeted audience and is built on an understanding of audience skills and interests.
- Content and delivery is determined in cooperation with the target audience and stakeholders.
- Is relevant to and accessible by people with diverse backgrounds and influences.
- Presents accurate and balanced information, incorporating many different perspectives.
- Incorporates methods for assessing the value of the experience, especially as it relates to desired outcomes.
- Is facilitated by quality instructors who have been trained in effective teaching methods and are supported by the program sponsor.
- Uses creative approaches.
- Values lifelong learning.
- Builds environmental literacy:
 - Questioning and analysis skills
 - Knowledge of environmental processes and systems
 - Skills for understanding and addressing environmental issues
 - Personal and civic responsibility
- Builds from key principles underlying environmental education:
 - Systems and interdependence are characteristics of the biological and natural order.
 - Natural sciences, social sciences, and humanities disciplines contribute to understanding of the environment and environmental issues.
 - Learner connections to immediate surroundings provide a base for understanding larger systems, broader issues, causes and consequences.

FOR WEB-BASED LEARNING

The learning module:

- Addresses a specific topic that is narrow in scope.
- Follows a logical hierarchy of skill and knowledge development.
- Moves from knowledge transmission to learner-controlled systems.
- Is self-directed and self-contained (students can progress through the material on their own and all materials are readily accessible as part of the course).
- Has clear and concise directions on how to complete the module.
- Chunks the content into manageable “bites.”
- Provides a complete demonstration of the concept.
- Provides detailed and consistent feedback for practice opportunities.
- Makes appropriate use of a variety of media.

FOR THE COMMUNITY

The learning experience:

- Evolves from work with a coalition or group.
- Supports a person who takes responsibility for managing or leading the process, and relies on quality group planning and facilitation techniques.
- Relates to long-term community vision and goals.
- Takes into consideration the community as a whole, including: socio-political, economic, historical, and cultural influences.

- Builds on locally existing skills and resources.
- Is flexible in response to both process and conditions.
- Generates and makes use of data about the local condition.
- Provides training to increase skills needed to accomplish goals identified by the group.
- Takes place close to the location where people practice a behavior of concern.
- Builds effectiveness through linkages to other communities, partners, and resources.
- Reaches people in multiple ways.
- Provides participants with feedback about the results of their actions.

BEYOND THE COMMUNITY

The learning experience:

- Builds value for education as part of policy development and implementation.
- Builds skills for flexibility and responsiveness to environmental issues and for facilitating community engagement.
- Concerning a particular topic – consolidates the learning goals for all levels of responsibility, but not the teaching methods, which are adapted for the target audience.
- Matches the target audience to the scale of the problem.
 - For example, related to a particular problem, watershed council staff receives training about a locally significant topic, while agency staff receives training about how information about several related topics informs policy development.
- Offers avenues for participation which are competent, fair, and enhance involvement for all levels of responsibility.

References

Essential Best Education Practices were primarily derived from the following resources. Some references summarize major ideas from multiple authors.

American Distance Education Consortium (ADEC). (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/cpse/LCPP.pdf>

Andrews, E., Stevens, M., & Wise, G. (2002). A model of community-based environmental education. In T. Dietz & P.C. Stern (Eds.), *New tools for environmental protection: Education, information, and voluntary measures* (pp. 161-182). Washington, DC: National Academy Press. Chapter 10, A Model of Community-Based Environmental Education, describes an education model that builds on findings of a national study and the work of over 90 authors. It incorporates community development; environmental education; adult and youth education; public participation and empowerment; social marketing; and technology transfer theory.

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*. Report to the U.S. Fish and Wildlife Service – Region 5. This report summarizes environmental education, outdoor education, and fisheries education studies from over 130 authors.

Horton, R. L., & Hutchison, S. (1997) *Nurturing scientific literacy among youth through experientially based curriculum materials*. Washington, DC: National Network for Science and Technology, Cooperative Extension Service – Children, Youth & Family Network CSREES-USDA. See *The Learning Cycle*: student-centered inquiry education developed from Piaget's learning theory and an extension of John Dewey's philosophy of education.

Scott, W., & Fien, J. (1999). *An evaluation of the contributions of educational programmes to conservation within the WWW network: Final report*. Unpublished report to the World Wildlife Fund for Nature, Gland, Switzerland.

Simmons, et al. (2000). *Guidelines for the initial preparation of environmental educators*. Washington, DC: The North American Association for Environmental Education.

University of Tennessee, Office of Information Technology, Educational Technology Collaborative. (2002). *Introduction to designing online learning* (as example of instructional module components and evaluation). Retrieved June 2004, from <http://edtech.tennessee.edu/%7Eset4/default.html>

University of Wisconsin Extension, Program Development and Evaluation. (2002-2005). *Logic model*. Retrieved June 2004, from <http://www.uwex.edu/ces/pdande/evaluation/evallogicmodel.html>. Planning models, such as this Logic Model, are available from a variety of sources. This advice is based on the version used by the University of Wisconsin Cooperative Extension.

APPENDIX B: Summary of Findings by Primary Target Audience

Recommended education practices for each paper, poster, and panel presentation are described according to the following categories: Audience information; Message content; Message delivery vehicle; Outreach strategy/method of teaching; Public participation; Supporting and motivating professionals; Evaluation

**Indicates findings from a research-based paper. Other findings are derived from case studies.*

Conservation professionals			
Author	Target audience(s)	Descriptions	Recommended education practices
Bonnell and Baird <i>Research paper</i>	Environment/ conservation NGOs [Watershed coordinators; and watershed planning volunteers] Soil and water conservation professionals Local decision makers [Planners]	Study of the target audience lead to these conclusions: 1. Provide face-to-face meeting opportunities: to allow for learning from others and to provide camaraderie (networking and moral support). 2. Provide course activities with direct application to work responsibilities (appropriate to local context). 3. Provide instructor feedback. 4. Enable students to personalize their education objectives (through pre-course interviews). 5. Provide students with autonomy in determining content and timing of learning activities. 6. Adapt course design over time using multiple feedback methods.	Outreach strategy/method of teaching <ul style="list-style-type: none"> • Provide face-to-face meeting opportunities: to allow for learning from others and to provide camaraderie (networking and moral support).* • Provide course activities with direct application to work responsibilities (appropriate to local context).* • Provide instructor feedback.* • Enable students to personalize their education objectives (through pre-course interviews).* • Provide students with autonomy in determining content and timing of learning activities.* Evaluation <ul style="list-style-type: none"> • Adapt course design over time using multiple feedback methods.*
Cantrell <i>Panel</i>	County conservationists; natural resource professionals	Ohio DNR, the Ohio Federation of Soil and Water conservation Districts and NRCS created a conservation partnership. The purpose of the project was to build capacity for SWCD to deliver effective education, "we are all educators"; "we are all responsible for outreach". Best practices = provide area workshops; practice what we preach; provide follow-up; encourage peer teaching; ongoing professional development.	Outreach strategy/method of teaching <ul style="list-style-type: none"> • For conservation professionals: <ul style="list-style-type: none"> o Provide area workshops. o Apply environmental education principles in training events. o Provide follow-up. o Encourage peer teaching; ongoing professional development.

			<p>Evaluation</p> <ul style="list-style-type: none"> Evaluate conservation professionals' effectiveness in using models and demonstration tools and in their use of skills taught in the workshops.
<p>Dobrowolski <i>Poster</i></p>	<p>Agencies Soil and Water Conservation Districts</p>	<p>US Forest Service watershed restoration short course Presentation and field experiential learning focuses on upstream-downstream and upslope-downslope relationships. Classroom exercises and visual examples are followed by field application. Activities and evaluation help identify barriers and verify success. One-year follow-up evaluation showed that 62% of contacted participants used course materials, referred to course notes or field experiences or altered some aspect of how they viewed, defined or applied restoration efforts.</p>	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> Follow classroom exercises and visual examples by field application. <p>Evaluation</p> <ul style="list-style-type: none"> Use activities and evaluation to help identify barriers and verify success.
<p>Levin and O'Malley <i>Research paper</i></p>	<p>Agencies Environment/ conservation NGOs Recreational businesses Service clubs</p>	<p>Comparative literature review about fishing and boating education that led to:</p> <ol style="list-style-type: none"> Overall guiding principles from 9 relevant disciplines Basic practices for: <ul style="list-style-type: none"> Program planning Program development and implementation Professional development Evaluation Research <p>See Tables 1 – 5 in the paper. Many of these principles and practices have already been integrated into the <i>Essential Best Education Practices</i> provided in Appendix A of the Symposium Proceedings and on the Water Outreach website.</p>	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> Follow these basic outreach practices: <ul style="list-style-type: none"> Program planning Program development and implementation Professional development Evaluation Research
<p>Wilbur <i>Panel</i></p>	<p>Water educators and professionals</p>	<p>The <i>Getting in Step</i> guide to conducting watershed outreach campaigns features the following components: define driving forces, goals, and objectives; identify and analyze the target audience; create the message; package the message; distribute the message; evaluate the outreach campaign.</p>	<p>Support and motivate professionals</p> <ul style="list-style-type: none"> Train water education professionals to apply these steps when designing an outreach program: <ul style="list-style-type: none"> Define driving forces. Define goals and objectives. Identify and analyze target audience.

				<ul style="list-style-type: none"> o Create the message. o Package the message. o Distribute the message. o Evaluate the outreach campaign.
Decision makers, leaders, and community groups				
Author	Target audience(s)	Descriptions	Recommended education practices	
Edwards <i>Research paper</i>	Local decision makers Neighborhood organizations Policy makers	With appropriate instruction, students and volunteers can identify aquatic insects accurately enough for use in professional biological work. Program strengths include: 1. Learning to recognize key features, via narrated slide discussion 2. Availability of a live insect for reference	Outreach strategy/method of teaching <ul style="list-style-type: none"> • To teach recognition of key aquatic insects use narrated slide discussion and provide a live insect for reference.* 	
Hagley <i>Poster</i>	Local decision makers Policy makers	DuluthStreams.org provides web-based delivery of real-time automated data for understanding urban stormwater and water quality issues. Data is linked on-line to GIS land use maps, other data, text and photos. The website provides stream and watershed specific data and supports use by specific target audiences such as students, property owners and contractors. Linking observed phenomenon with photos and simple explanations is an important feature of this resource. Website resources are complemented by outreach with schools and municipal officials, including adopt a stream and NEMO.	Outreach strategy/method of teaching <ul style="list-style-type: none"> • Provide web-based delivery of real-time automated stormwater and water quality data. • Link data about observed phenomenon with photos and simple explanations in a web-based delivery. • Use website resources for outreach with schools and municipal officials. 	
Herpel <i>Panel</i>	Community	Groundwater Guardian provides a framework to protect local water sources. Over 300 communities have participated since 1994. Groups include citizens, business, agriculture, education, local government, public health and youth representatives. The purpose is to: assess source water by understanding and completing data; to prioritize threats; and to develop and implement action strategies. Outreach strategies include:	Outreach strategy/method of teaching <ul style="list-style-type: none"> • Encourage community groups to assess source water in order to prioritize threats, and to develop and implement action strategies. • Encourage community groups to develop outreach strategies such as: public awareness campaigns, water conservation campaigns, pollution prevention activities (such as 	

Langston <i>Poster</i>	Agencies Local decision makers Policy makers Soil and Water Conservation Districts	public awareness campaigns, water conservation campaigns, pollution prevention activities (such as household hazardous waste collection), application of BMPs on farms, public policy protection strategies. A Missouri Extension capacity building initiative supports 20 watershed-planning groups that want to or are required to focus on their water resources. The effort engages citizens in controlling their destiny and takes a holistic approach looking at all aspects of the watershed including: human resources, economic development, environmental quality, infrastructure, and public safety. Findings: <ul style="list-style-type: none"> • People will become involved if they understand the problem/situation. • People need assistance from agencies to do the work. The initiative outlines appropriate roles for citizens and agencies.	household hazardous waste collection), application of BMPs on farms, public policy protection strategies. Outreach strategy/method of teaching <ul style="list-style-type: none"> • Involve citizens in a watershed planning group by facilitating their understanding of the problem/situation. • Support watershed planning groups with assistance from agencies.
Lawrence and Koontz <i>Research paper</i>	Local decision makers Policy makers	Local officials' survey: Findings present information about what local officials knew about storm water management based on an unknown source of training. <ol style="list-style-type: none"> 1. Local officials in Ohio had a good understanding of their communities' storm water management plan. 2. Officials felt they had sufficient information to make informed decisions about storm water management. 3. Most officials did not see a role for local watershed groups in water quality monitoring, stormwater management planning, plan implementation, compliance monitoring or environmental stewardship. This shows that local officials do not understand the potential role for education, including community involvement strategies. 	Audience information <ul style="list-style-type: none"> • Before designing training, survey local officials to learn if they: <ul style="list-style-type: none"> ○ Have a good understanding of their communities' storm water management plan.* ○ Feel they have sufficient information to make informed decisions about storm water management.* ○ See a role for local watershed groups in water quality monitoring, stormwater management planning, plan implementation, and compliance monitoring or environmental stewardship.*
Liukkonen <i>Panel</i>	Planners	Project NEMO (nonpoint source pollution education for municipal officials) application in Minnesota: The purpose of this education resource is to enable local land use officials to ask the right questions. Challenges	Supporting and motivating professionals <ul style="list-style-type: none"> • Build skills to ask the right questions about land use. • Build land use training program acceptability

		include the need to demonstrate impacts, availability of staff and funding resources, need to provide repeated education for new decision makers, need to keep the science current.	<ul style="list-style-type: none"> by: <ul style="list-style-type: none"> o Demonstrating impacts o Making staff and funding resources availability o Providing repeated education for new decision makers o Keeping the science current
Maben <i>Poster</i>	Agencies Local decision makers Policy makers	The WEF Water Leaders Class focuses on building water leadership capacity in California among young professionals, especially: members of minority and ethnic communities, engineers, law professionals, environmental planners, and public interest advocates.	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> • Build water leadership capacity among young professionals, especially: <ul style="list-style-type: none"> o Members of minority and ethnic communities o Engineers o Law professionals o Environmental planners o Public interest advocates
Maben <i>Panel</i>	Policy makers Decision makers	The WEF Board is made up of stakeholders. This water policy organization provides: a bi-monthly magazine, special publications, broadcast features, policy briefings, reports, stakeholder symposia, and tours focus on audience specific interests.	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> • In water-related organizations, include stakeholders as Board members.
Struss <i>Poster</i>	Agencies Households Neighborhood organizations	A storm water education initiative strives to provide a consistent storm water message and support the twin cities and their neighborhoods in implementing outreach. Educators formed a stormwater collaborative that supported mass media campaigns and messages; provided convenient access to storm water educational materials across neighborhoods in a large city.	<p>Message vehicle</p> <ul style="list-style-type: none"> • Work with a collaborative to provide consistent storm water message across neighborhoods in a large city.

Ethnic groups			
Author	Target audience(s)	Descriptions	Recommended education practices
Magee <i>Poster</i>	Youth Teachers Specific ethnic groups	Team WET Schools is an urban water quality education program that serves minority and economically disadvantaged students. Team WET implementation practices build capacity among schools to deliver water education effectively and with a community-based focus. Features include: a nationally tested curriculum linked to national and state academic standards; local partner, volunteer, and expert networks; training workshops; service learning opportunities; program evaluation procedures. Teachers, volunteers and community leaders receive extensive training and support. Student-led projects are encouraged.	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> To build capacity among urban schools to deliver water education effectively and with a community-based focus, provide: <ul style="list-style-type: none"> A nationally tested curriculum linked to national and state academic standards. Training workshops for local partner, volunteer, and expert networks. Training and support for teachers, volunteers and community leaders. Service learning opportunities. Program evaluation procedures. Encouragement for student-led projects.
Marzolla <i>Research paper</i>	Specific ethnic group: Latino youth Latino families	Literature review and application to new Latino youth curriculum 1. Community-based science program is constructivist education in practice, allowing participants to apply their learning to a wide variety of home, neighborhood and community situations. Constructivist education, which views direct experience as being antecedent to learning, is applied to encourage youth to solve problems grounded in real-world contexts and requires complex problem solving skills. 2. Place-based pedagogies are needed so that the education of citizens might have direct bearing on the well-being of the social and ecological places people actually inhabit (Grunenewald). 3. Place-based education can lead to civic engagement and help overcome the exclusion of Latinos and other under-represented ethnic groups.	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> With Latino youth programs, use place-based pedagogies so that the education of citizens might have direct bearing on the well-being of the social and ecological places people actually inhabit.* <ul style="list-style-type: none"> Allow participants to apply their learning to a wide variety of home, neighborhood and community situations.*
McCowan, Smolen <i>Research paper</i>	Households Specific ethnic group: Underserved	Pilot study of drinking water education in two counties with predominately low income and minority populations. Findings:	<p>Audience information</p> <ul style="list-style-type: none"> Identify specific education needs, for example the percent of households with drinking water

	minorities	<ol style="list-style-type: none"> 1. Identified specific education need – more than 1/3 of the drinking water did not meet public health standards. 2. Identified specific education need – learning materials had to be tailored to learning style, educational level and vision problems of relatively uneducated, elderly audience. 3. Education outreach initiatives are carried out through community-based organizations that already have a relationship with the target audience. 4. New education materials are field tested by lead community-based organizations. 5. New drinking water data is collected and mapped by paraprofessionals. Household education takes place during personal data collection and reporting visits. 6. Local information is generated and used as the basis for local public education programs. 7. Program success is evaluated as paraprofessionals provide individual follow up to check if household problems have been corrected. 	<p>that does not meet public health standards.*</p> <ul style="list-style-type: none"> • Tailor drinking water education materials to the learning style, educational level and potential vision problems of a relatively uneducated, elderly audience.* <p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> • Carry out education outreach initiatives through community-based organizations that already have a relationship with the target audience.* • Field test new education materials with a lead community-based organization.* • Generate local information and use it as the basis for local public education programs.* <p>Evaluation</p> <ul style="list-style-type: none"> • Evaluate program success by following up with household to check if problems have been corrected.*
Farmers			
<p>Author</p> <p>Bianchi <i>Poster</i></p>	<p>Target audience(s)</p> <p>Agricultural commodity groups Farmers</p>	<p>Descriptions</p> <p>Monterey Bay National Marine Sanctuary area Farm Quality Planning Short Course – farmers develop individual water quality management plans. Course is offered to Watershed Working Groups staffed by County Farm Bureaus. Peer information exchanged was highly valued by participants.</p>	<p>Recommended education practices</p> <p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> • Facilitate farmers developing their own water quality management plans. • Emphasize, peer information exchange in farm quality planning.
<p>Bird Research paper</p>	<p>Farmers</p>	<p>Partnerships for Livestock Environmental Management Systems: Goals were to build understanding of the concept, provide for stakeholder input and conduct assessments and action planning. The project identified approaches to: recruiting participants and working directly with</p>	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> • Tailor materials to details of the farm operation.* • Work with farmers to compare farm records related to environmental management over

<p>time.*</p> <ul style="list-style-type: none"> • Provide farmers with real life examples for new ideas.* 	<p>producers. 37 assessment tools were tested in part or in total in nine states.</p> <p>Findings:</p> <p>An evaluation of participants in Georgia gave high marks to the training and resources, and intent to implement recommendations, but half of participants were unsure of how to reduce identified risks. Pennsylvania had similar results, but had some complaints about lack of the relevance or difficulty in using some tools. Virginia poultry operators found the tools less helpful. New York and Wisconsin operators liked the support and the tools, but felt that the procedure was too lengthy. The study also evaluated Idaho, Montana, Iowa, and Texas participants. Recommendations included the need to tailor materials to details of the operation, support comparison of records over time, and the need for real life examples. The study produced extensive recommendations for how to teach about this topic.</p> <p>Positive findings:</p> <ul style="list-style-type: none"> ○ Quality training and resources ○ Materials well received ○ Showed intention to implement <p>Negative findings:</p> <ul style="list-style-type: none"> ○ Unsure how to reduce identified risks ○ Lack of relevance of some tools ○ Difficulty of using some tools ○ Procedure too lengthy <p>Recommendations:</p> <ul style="list-style-type: none"> ○ Tailor materials to details of the operation ○ Support comparison of records over time ○ Provide real life examples 	
<p>Message vehicle</p> <ul style="list-style-type: none"> • Time education with heightened audience awareness created by press coverage of rules release, public hearings and a compliance deadline. 	<p>The delivery of nutrient and manure management Extension training programs was timed to couple education with heightened awareness surrounding new regulations and their application.</p> <p>Finding:</p> <p>Heightened awareness, created by press coverage of rules release, public hearings and a compliance deadline, resulted in farmer participation at a</p>	<p>Everett <i>Poster paper</i></p>
	<p>Farmers</p>	

Farrell, Holsman, Krueger <i>Research paper</i>	Agricultural commodity groups Farmers	substantially higher rate than experienced with previous manure management education programs. Timing education with heightened audience awareness can be a key strategy in education program design. Groundwater technicians conduct voluntary and confidential assessments on individual farms culminating with an "Improvement Action Plan". Findings: 1. More than half of farms with high-risk groundwater conditions made recommended changes. 2. A significant number of farmers made changes in selected stewardship practices.	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> Conduct voluntary and confidential assessments on individual farms, in cooperation with groundwater technicians.* Develop an "Improvement Action Plan" for individual farms.*
Fisher <i>Poster</i>	Agricultural commodity groups Farmers	The Montana Beef Environmental Management Systems project Stakeholders group chose "self-assessment" as the most effective approach to environmental assessment on the ranch. Findings: Pilot testing had mixed success. Pilot testing resulted in new relationships and energizing of partnerships, particularly with NRCS. Livestock owners were willing to mitigate risks through implementation of best management practices. But producers were intimidated by "high risk" designations and failed to determine whether it was related to an environmental priority.	<p>Audience information</p> <ul style="list-style-type: none"> Check with stakeholders concerning which approach to environmental assessment on the ranch they perceive as most effective.
Green <i>Poster</i>	Agencies Agricultural commodity groups Farmers Environment/conservation NGOs Soil and Water Conservation Districts	This project links economic risk to over application of nutrients, a common practice for ensuring maximum yield. The farmer works with a crop advisor to develop a nutrient management plan and checks with a comparison strip. Findings: Reduced nutrient applications resulted in as high or higher yields. This process effectively addresses perceived economic risk barrier to applying BMP applications of nitrogen, phosphorus, and potassium.	<p>Message content</p> <ul style="list-style-type: none"> Link economic risk to over-application of nutrients, a common practice for ensuring maximum yield. <p>Evaluation</p> <ul style="list-style-type: none"> Use a comparison strip to provide the farmer with opportunity to make their own evaluation of pros and cons of a new procedure.

<p>Shepard (for Yencha presentation) <i>Research paper</i></p>	<p>Farmers, corn</p>	<p>This paper reports research comparing the rate of adoption of nutrient management strategies by farmers in two different Wisconsin watersheds over the same five-year period. The research compared impacts of a (1) diffuse communication campaign effort vs. (2) one-on-one information transfer techniques. Results supported an integration of a diverse set of educational approaches and discouraged over-reliance on diffuse information dissemination.</p> <ol style="list-style-type: none"> 1. Educator emphasis on local, direct farmer contact produced greatest changes in fertilizer application behavior. This was carried out through on-farm visits, small group demonstrations, and workshops. 2. Educator identified key target audiences. 3. Targeting of key audiences allowed educator to acknowledge individual grower characteristics, perceptions of problems, current use of practices, and preferences for educational formats. 4. Program changes were tracked through a comprehensive pre-treatment survey and follow up surveys. 5. Program resources were deployed in ways that insure that they actually reached targeted audiences. 	<p>Audience information</p> <ul style="list-style-type: none"> Identify key target audiences and acknowledge individual grower characteristics, perceptions of problems, current use of practices, and preferences for educational formats.* <p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> Provide on-farm visits, small group demonstrations, and workshops emphasizing local, direct farmer contact.* <p>Evaluation</p> <ul style="list-style-type: none"> Track program changes through a comprehensive pre-treatment survey and follow up surveys.* Assure that program resources actually reached targeted audiences.*
<p>Shepard, Yencha, Klingberg <i>Panel</i> See Research paper summary</p>	<p>Farmers</p>	<p>This panel presentation describes a land and water education grant program focused on general education, nutrient management, and rotational grazing. 40 projects have worked with over 300 farmers. The program uses a comprehensive pre-survey; conservation plans, soil tests, workshops, farm visits during the growing seasons.</p>	<p>Audience information</p> <ul style="list-style-type: none"> Use a comprehensive pre-survey; conservation plans, soil tests, workshops, and farm visits during the growing seasons as a basis for developing relevant land and water education programs.
<p>Vickery <i>Research paper</i></p>	<p>Farmers</p>	<p>This study applied a combination survey and focus group methodology to learn about Minnesota farmer education content and delivery preferences. Study results support initial expectations that learning target audience interests and preferences about farm management topics is a complex process which may require in-depth discussion and interviews to provide a useful finding.</p> <ol style="list-style-type: none"> 1. Found this method of studying the target audience to 	<p>Audience information</p> <ul style="list-style-type: none"> Use in-depth discussion and interviews to provide a useful finding about target audience interests and preferences about farm management topics.*

		<p>provide reliable and nuanced results.</p> <p>2. Highly ranked survey preferences did not indicate that farmers would choose that preference, but instead showed that it was the best choice among the survey options.</p> <p>3. Complex farm management topics, such as nutrient management, led to complex responses depending on how the question was asked. Respondents preferred farm tour/demonstrations in the survey, but in the focus group said they wouldn't attend. But on further exploration of a specific problem – lack of implementation of recommended practices – respondents both expressed doubt that practices could work and suggested that more demonstrations were needed.</p>	
Households and neighborhoods			
Author	Target audience(s)	Descriptions	Recommended education practices
Dietz, Clausen, Filchak <i>Research paper</i>	Homeowners	<p>This paired watershed study investigated whether stormwater quality could be improved by educating homeowners and implementing best management practices in a suburban neighborhood.</p> <ol style="list-style-type: none"> 1. Researchers trained volunteers to perform household site assessments. 2. The trained volunteers met with individual homeowners to assess the site and make specific recommendations for reducing bacteria and nitrogen runoff. 3. 35% of lots adopted some BMP following education efforts. 4. A 75% reduction in nitrate+nitrate and a 127% reduction in fecal coliform concentrations occurred. 	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> • Assist individual homeowners to assess their site using trained volunteers, and make specific recommendations for reducing bacteria and nitrogen runoff.*
Ingram <i>Poster</i>	Landowners Households Urban landscapers	<p>This project focused on application of fertilizers and pesticides on lawns. Used a social marketing approach to understand and redesign educational outreach</p>	<p>Audience information</p> <ul style="list-style-type: none"> • To encourage sustainable practices in application of fertilizers and pesticides on

	Urban watershed organizations	<p>strategies. Identify barriers and benefits to the use of IPM by paid landscape managers. Landscape and watershed organizations helped to set project goals.</p>	<p>lawns, use a social marketing approach to understand and redesign educational outreach strategies.</p> <ul style="list-style-type: none"> Identify barriers and benefits to the use of IPM by paid landscape managers. <p>Outreach strategy/teaching method</p> <ul style="list-style-type: none"> Rely on landscape and watershed organizations help to set project goals.
Kauffman <i>Poster</i>	Homeowners	<p>Christina Basin Clean Water Strategy – Delaware, Maryland, Pennsylvania: The Christina Basin Partnership was one of 20 watersheds from throughout the USA (from a pool of 170 applications) that received a \$1 million Watershed Initiative Grant from the USEPA. Public outreach efforts including: distribution of native plants, non-chemical landscape design, and rain barrels; bus tours, and information dissemination.</p>	<p>Message delivery vehicle</p> <ul style="list-style-type: none"> Communicate information about a watershed initiative by: <ul style="list-style-type: none"> Distributing native plants Providing non-chemical landscape design advice and rain barrels Arranging bus tours Disseminating information
Hargrove <i>Poster paper</i>	Homeowners Households	<p>Tennessee funded a variety and sequence of outreach activities designed for the target audience: media releases, base-line survey, youth recognition, stakeholder meetings, website resources. <i>WaterWorks!</i> models social change through focused marketing to an audience of Tennessee households and homeowners, with specific components designed to promote and reinforce the message of individual responsibility. Project components:</p> <ul style="list-style-type: none"> Video and audio messages using entertaining approaches to communicate simple messages. Partnership with a state broadcast association to assure dissemination of video and audio messages. Statewide survey to determine citizen perceptions and knowledge about water quality. Youth water projects were eligible for cash awards and “Stream Saver” status. Website provided group connections and watershed resources. 	<p>Audience information</p> <ul style="list-style-type: none"> Conduct a survey to determine citizen perceptions and knowledge about water quality. <p>Message delivery vehicle</p> <ul style="list-style-type: none"> Provide awards for youth water projects. Use entertaining approaches to communicate simple messages in video and audio communication materials. Partner with a state broadcast association to assure dissemination of video and audio messages. Use a website to provide group connections and watershed resources.

<p>Mahler <i>Panel</i></p>	<p>Citizens</p>	<p>Focus on water education needs in the Pacific northwest: This project formed a regional team representing colleges, universities, EPA, and NRCS. The project used a regional survey to establish priorities and to set baseline information. The group has offered an annual satellite conference, a domestic water handbook, a "riparian" concept campaign, and water quality monitoring workshop. The group provides a theme based fact sheet or report twice a month for stakeholders and policy makers.</p>	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> • Form a regional team to determine water education needs. • Use a regional survey to establish priorities and to set baseline information about regional water education needs. • Coordinate team outreach efforts through a variety of techniques: <ul style="list-style-type: none"> ○ An annual satellite conference ○ A domestic water handbook ○ A "riparian" concept campaign ○ A water quality monitoring workshop ○ A semi-monthly theme based fact sheet or report for stakeholders and policy makers
<p>Mahler, Simmons, Sorensen <i>Research paper</i></p>	<p>Homeowners Households</p>	<p>This program designed a survey to assess public attitudes and interests. Findings: 1. Resident interest focused on drinking water and human health; water quantity and policy; and watershed management. 2. A low percentage of residents were interested in workshops or short courses as a way to learn about the general topics presented in the survey. Most preferred the media as a source of information.</p>	<p>Audience information</p> <ul style="list-style-type: none"> • Implement a program design survey to assess public attitudes and interests about water.*
<p>McCowan, Smolen <i>Research paper</i></p>	<p>Households Specific ethnic group: Underserved minorities</p>	<p>Pilot study of drinking water education in two counties with predominately low income and minority populations. Findings: 1. Identified specific education need – more than 1/3 of the drinking water did not meet public health standards. 2. Identified specific education need – learning materials had to be tailored to learning style, educational level and vision problems of relatively uneducated, elderly audience. 3. Education outreach initiatives are carried out through community-based organizations that already have a relationship with the target audience.</p>	<p>Audience information</p> <ul style="list-style-type: none"> • Identify specific education needs, for example the percent of households with drinking water that does not meet public health standards.* • Tailor drinking water education materials to the learning style, educational level and potential vision problems of a relatively uneducated, elderly audience.* <p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> • Carry out education outreach initiatives through community-based organizations that

<p>already have a relationship with the target audience.*</p> <ul style="list-style-type: none"> Field test new education materials with a lead community-based organization.* Generate local information and use it as the basis for local public education programs.* <p>Evaluation</p> <ul style="list-style-type: none"> Evaluate program success by following up with household to check if problems have been corrected.* 	<p>4. New education materials are field tested by lead community-based organizations.</p> <p>5. New drinking water data is collected and mapped by paraprofessionals. Household education takes place during personal data collection and reporting visits.</p> <p>6. Local information is generated and used as the basis for local public education programs.</p> <p>7. Program success is evaluated as paraprofessionals provide individual follow up to check if household problems have been corrected.</p>		
<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> Rely on these outreach components for a conservation initiative: <ul style="list-style-type: none"> Stakeholder involvement in program development. Support for stakeholder groups, especially those with similar missions. Workshops and seminars on key topics and for key audiences such as: rainwater harvesting, riparian management, rangeland "rescue", golf course management, and youth education. Demonstration sites featuring practical techniques for conserving water and energy in rangeland situations. 	<p>West Texas water conservation outreach initiatives: Key components include: focus on sustainability; stakeholder involvement in program development; support for stakeholder groups, especially those with similar missions; workshops and seminars on key topics and for key audiences such as: rainwater harvesting, riparian management, rangeland "rescue", golf course management, and youth education; demonstration sites featuring practical techniques for conserving water and energy in rangeland situations; and applied research and outreach on relevant questions.</p>	<p>Households Irrigation districts Soil and Water Conservation Districts</p>	
<p>Audience information</p> <ul style="list-style-type: none"> Specify audiences by need.* <p>Message content</p> <ul style="list-style-type: none"> Provide information that has immediate utility to the program.* <p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> Target educational resources to meet specific needs.* Structure programs to address the educational 	<p>Montana conducted a voluntary, private well water test program to educate the public about water quality issues, as well as improve decision-making skills of private well owners. The evaluation will help guide new drinking water education programs. Specific changes supported by the impact evaluation include the need:</p> <ul style="list-style-type: none"> To target specific educational resources To specify audiences by need To structure programs to address the educational level of audiences To provide information that has immediate utility to the 	<p>Homeowners Private well owners</p>	<p>Roffe, Bauder, Pearson <i>Research paper</i></p>

<p>Severtson <i>Poster paper</i></p>		<p>program.</p> <p>Drinking water program impact assessment questionnaires results:</p> <ol style="list-style-type: none"> 1. Concern about family health and curiosity about the quality of water were cited as the most important reasons for participating. 2. Perceived benefit from the program appeared to be its cost effective test results and the immediate usefulness of information to the participant based on survey results and information about short term and long term participant expenses on wells and point-of-use water treatment equipment. 3. Printed text and communication with the county agent were the preferred form of education delivery. 	<p>level of audiences.*</p>
	<p>Households Agencies Environment/ conservation NGOs</p>	<p>Research investigated how a Wisconsin arsenic well testing program was working and those elements of the program that have stronger associations with outcomes. Findings indicate that program impact may increase if:</p> <ol style="list-style-type: none"> 1. Information is publicly available from a variety of sources. Residents who opt to test privately need easy access to accurate information. Awareness is the first step in identifying a problem. People in high awareness communities use more information and have higher levels of risk recognition than participants in low awareness communities. 2. Well water testing information is offered locally on an ongoing basis. Participants in a community offering yearly well testing: rated information as more useful, selected a lower arsenic safety threshold, disagree that the threshold 10 ug/L was too strict and had more confidence in how their town government is dealing with arsenic than participants in a high publicity community. High publicity was related to information use and ability to recognize risk, but education seemed to be a factor in the adoption of a lower drinking water standard. Community education may be a better strategy than increased publicity. 	<p>Message content</p> <ul style="list-style-type: none"> • Provide clear information. • Accompany findings or data with information and especially information which emphasizes the meaning of the results. • Provide information about the pros and cons of control methods and which are most effective. • Assure that different agencies provide consistent messages. • Design and deliver information based on communication and health behavior theories. <p>Message vehicle</p> <ul style="list-style-type: none"> • Make information publicly available from a variety of sources. <p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> • Offer well water testing information locally on an ongoing basis.

	<p>3. People test their water for arsenic. Participants who didn't test or who didn't know the results of their test had a weaker sense of risk.</p> <p>4. People who have not tested get clear information describing that their household is at risk for having elevated levels of arsenic and that a well test is the only way to know their level of arsenic.</p> <p>5. Arsenic level findings are accompanied by information about the meaning of the results and information about the inability to perceive arsenic tainted water (and many other contaminants) with the senses.</p> <p>6. The meaning of arsenic test results is emphasized (low risk, high risk, etc.). Test meanings are better remembered than the actual test results. People need information about how drinking water standards are developed and how they can be applied to understand test results.</p> <p>7. People feel certain about which control methods are most effective. Provide information about the pros and cons of control methods.</p> <p>8. Different agencies provide consistent messages about how to identify an arsenic problem, its timeline, causes of arsenic in well water and of arsenic exposure, consequences of and how to reduce arsenic exposure, and appropriate policies that address root causes of arsenic in well water.</p> <p>9. Information about arsenic is designed and delivered based on communication and health behavior theories. The common sense model may be a useful theory for understanding and designing outreach programs.</p>		
		Homeowners	
		Tang, Murray Poster	
	<p>Residential yard and garden practices to minimize urbanization effects on a lake in Washington State: Property owners were provided with a Lake-Friendly Gardening Kit that included coupons for lake-friendly gardening products. Recipients were surveyed three months later. Findings: Of those who responded, more than half changed their</p>		<p>Evaluation</p> <ul style="list-style-type: none"> • Provide property owners with do-it-yourself kits and coupons for environmentally friendly products.

			lawn care and pest management practices and almost half shared what they learned with someone else.	
Landowners				
Author	Target audience(s)	Descriptions	Recommended education practices	
Burkett and Blickenderfer <i>Research paper</i>	Landowners Neighborhood organizations	Findings: Hands-on, practical training about individual property management choices set in the context of information about broader ecosystem science and impacts resulted in a high percentage of skill development and sensitivity to the benefits of applying skills taught in the session.	Outreach strategy/method of teaching <ul style="list-style-type: none"> Provide landowners with hands-on, practical training about individual property management choices set in the context of information about broader ecosystem science and impacts.* 	
Janowitz <i>Poster</i>	Developers Real estate sales people Real estate brokers Real estate appraisers	Water resource education for real estate professionals: This poster describes a course developed in response to a needs assessment. Real estate professionals were identified as an under-served audience. Experts gave presentations designed to put real estate professionals at ease, accompanied by a field trip. Attendees receive continuing education credit toward professional license recertification. Over 600 professionals in the South Puget Sound region have attended one or more courses. Findings: Evaluation showed an increase in knowledge, high number of repeat attendees, positive response from attendees.	Outreach strategy/method of teaching <ul style="list-style-type: none"> Provide training for real estate professionals in a supportive atmosphere accompanied by a field trip. 	
Smith, Johnson <i>Poster paper</i>	Landowners	Tennessee Agricultural Extension Service provides landowners with a BMP handbook and a calendar to convey information on a large variety of best practices for farming and forestry via photographs.	Message delivery vehicle <ul style="list-style-type: none"> Provide landowners with information using a handbook and a calendar, making good use of photographs. 	

Recreational water users			
Author	Target audience(s)	Descriptions	Recommended education practices
Waltz, Carrow, Duncan <i>Poster paper</i>	Recreational water users Recreation business	<p>University of Georgia turfgrass faculty developed a water conservation training program for golf course superintendents, in cooperation with the Golf Course Superintendents Association of America. While program impact is yet to be tested, the program incorporates design measures worthy of mention. The course:</p> <ol style="list-style-type: none"> 1. Was developed in cooperation with students. 2. Was actively promoted by the professional association. 3. Is readily accessible to superintendents: via an on-line introductory course followed by a class-room type seminar with a workbook held at the annual professional conference. <p>For two months following the workshop, instructors are available via a list serve to help participants develop water conservation BMPs for their golf course. The association hosted this technical service.</p>	<p>Message delivery vehicle</p> <ul style="list-style-type: none"> • Work in collaboration with the professional association to publicize a course for golf course managers. <p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> • Engage golf course conservation superintendents in developing a course on turf grass management. • Make turf grass management courses readily accessible to golf course managers and provide instructor support for completing assignments and application to their own golf course.
Volunteers			
Author	Target audience(s)	Descriptions	Recommended education practices
Godwin <i>Panel</i>	Watershed groups Households Volunteers	<p>Master Watershed Steward volunteer training program: The training program includes 8 training sessions and a 40 hour service project. Projects include: enhancement, monitoring, management planning, team building, and education. Success includes telling the story of the program and publicizing impacts. Include county commissioners, stakeholders, and partners in reporting outcomes. Master Watershed Stewards serve their communities by completing a project with assistance from OSU Extension, resource agencies or watershed councils, and becoming points of contact for their communities. http://seagrant.oregonstate.edu/wsep/</p>	<p>Evaluation</p> <ul style="list-style-type: none"> • Tell the story of the program and publicize impacts. • Encourage county commissioners, stakeholders, and partners in reporting outcomes.

Stepenuck <i>Panel</i>	Volunteers	The purpose of the Volunteer water quality monitoring – USDA national facilitation project is to identify current Extension programs; develop multi-media training materials; offer training; develop internet tools; and increase collaboration. There are 38 programs in 27 sites, an interactive website, and a listserve. Target audiences include: conservation groups, general public, civic groups, youth, farmers, and underserved audiences. Sharing success stories and communication is a major feature of this coordination effort.	<p>Message delivery vehicle</p> <ul style="list-style-type: none"> Facilitate volunteer water quality monitoring efforts through sharing success stories and communication among groups using an interactive website and listserve.
Youth			
Author	Target audience(s)	Descriptions	Recommended education practices
Madzura <i>Poster paper</i>	Youth Agencies Citizen-based watershed groups Farmers Natural resource interest groups	The University of Missouri Extension Water Quality program, through the Missouri Watershed Information Network (MoWIN) Project, provides internet resources for school-based watershed education programs.	<p>Message delivery vehicle</p> <ul style="list-style-type: none"> Facilitate school-based watershed education programs through interactive resources and communication among groups using an interactive website.
Noel <i>Poster</i>	Youth Homeowners Households Local decision makers Policy makers	University of Vermont Watershed Alliance sponsors youth water monitoring and service learning that provides local water quality assessment data and outreach to the community. The Alliance is working to address a public education problem that arises when audiences are geographically scattered and resources are limited. The goal of the program is to prepare youth to inform and engage communities.	<p>Message delivery vehicle</p> <ul style="list-style-type: none"> Prepare youth to inform and engage communities about watershed information as a mechanism for reaching audiences who are geographically scattered when resources are limited.
Ponzio, Enfield <i>Research paper</i>	Youth leaders Neighborhood organizations and service clubs with applied education components	<ol style="list-style-type: none"> Water education activities can support the goal of reconceptualizing the role of young people in modern democratic societies to build social and economic capital within our society. Situated problem-solving teaches learners skills that translate to workforce skills – learners possess both 	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> Use water education activities to provide “situated problem-solving” practice that can translate to workforce skills.* Teach water science through “service-learning” experiences that apply principles of

		<p>the technological skills and capacities to be productive in organizations and the social skills to be effective participants in organizations and society.</p> <p>3. A successful educative experience includes both interaction and continuity.</p> <p>4. Academic learning can be more authentic and visible through “service learning” principles and adding depth through applying principles of interaction and continuity.</p>	<p>interaction and continuity: both significant features of education that leads to learning.*</p>
Rager <i>Poster</i>	Youth Agencies Environment/ Conservation NGOs Natural resource professionals	<p>Best practices for environmental field days organized for 4th through 6th grade youth: Best practices were derived from a literature review and practical experiences of the University of Minnesota environmental science education working group.</p>	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> Use best education practices in organizing environmental field days for youth.
Seavey <i>Poster</i>	Teachers	<p>Findings: A survey of teacher perceptions of Iowa Project WET workshops showed that educators were likely to use Project WET activities and related water curricula if they were able to: experience activities first-hand; interact with other educators; and learn about the materials. Survey data showed that teachers selected activities to meet curriculum goals and used activities to meet multiple goals.</p>	<p>Supporting and motivating professionals</p> <ul style="list-style-type: none"> Provide teachers with an opportunity to experience activities first-hand; interact with other educators; and learn about the materials. Provide teachers with activities that meet one or more curriculum goals.
Tramontana <i>Poster paper</i>	Agencies Landowners Environment/ conservation NGOs Service clubs	<p>The St. Johns River Water Management District “Legacy” program for schools: This program links educators, students and District staff with public lands activities. Findings: Professional evaluation of the program demonstrates increased student performance and interest in school, increased student concern for protecting and conserving the environment, and increased educator motivation.</p>	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> To increase student performance and interest in school, student concern for protecting and conserving the environment, and educator motivation, provide educators, students and District staff with opportunities to participate in public lands activities.
Walker <i>Poster</i>	Teachers	<p>Quality watershed education teacher manuals were adapted to address barriers to implementation. The</p>	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> When developing watershed education

<p>Zint, Kraemer, Northway, Lim <i>Research paper</i></p>	<p>Teachers Youth</p>	<p>process included: identifying goals; identifying obstacles through a survey and interviews; working with partners to produce a quality product and to raise visibility and approval for the effort. Materials were adapted to directly address needs – development of a curriculum that uses activities described in the manual, aligning the curriculum with 9th grade earth systems science standards, and involving the Utah Office of Education and other stakeholders in the revision process. The Governor’s Watershed Initiative endorsed the final product. Developers propose to evaluate knowledge change and teacher training elements as a next step.</p>	<p>teacher manuals, identify barriers to implementation and adapt materials to respond to identified needs.</p> <ul style="list-style-type: none"> • Adapt watershed education teaching materials to align with grade-appropriate science curriculum standards. • When developing watershed education materials involve the state office of education and other education stakeholders in the revision process.
		<p>Pre and post surveys evaluating the impact of youth education initiatives in the Chesapeake Bay area. Initiatives included a 2-week field trip, a 3-day field trip, a 1-day field trip, a shad restoration project, and classroom use of a curriculum.</p> <ol style="list-style-type: none"> 1. Findings seem to confirm that education programs need to be focused, provide multiple experiences over extended periods of time, and be coordinated with other interventions to reach their full potential in promoting Environmentally Responsible Behaviors (ERB). 2. Each of the nine ERB characteristics. (knowledge of issues, skill in actions, knowledge of ecology and actions, group locus of control, intention to act, environmental sensitivity, personal responsibility, individual locus of control) was affected by at least one of the five programs, with all groups increasing in knowledge of issues. 3. Curriculum groups scored higher than comparison groups on only knowledge of issues. This result may be explained in part by the fact that teachers used only about one third of the recommended activities and few implemented the recommended service-learning project. 4. Programs that showed an impact with a large number of ERB characteristics should have also led to an 	<p>Outreach strategy/method of teaching</p> <ul style="list-style-type: none"> • Build student environmental stewardship motivation and competencies by focusing on the characteristics of environmentally responsible behavior -- knowledge of issues, skill in actions, knowledge of ecology and actions, group locus of control, intention to act, environmental sensitivity, personal responsibility, and individual locus of control.* • Build environmentally responsible behavior among students through field-based experiences and service-learning.*

	<p>increased intention to act, but not all did. This suggests that further research is needed to test the Hungerford and Volk model (1990).</p> <p>5. Personal responsibility and locus of control improved only among field trip participants. This suggests that programs are not providing youth with enough opportunities to develop self-confidence in their abilities.</p> <p>6. It is likely that some youths' ERB increased as a result of participation in outdoor programs, but the results are less clear for the curriculum and restoration project youth.</p> <p>7. Teachers who participated in the 5-day field inservice improved in all ERB characteristics. Teachers who participated in the 2-day curriculum inservice improved in all ERB characteristics except environmental sensitivity, not surprising given the indoor setting of the workshops.</p>	
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APPENDIX C

Water Outreach Education Web Site Resources

Education theory, water research, and high quality education materials are linked together through the following 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. 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. 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?
- *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:
 - Clarify what they want to accomplish.
 - Choose a strategy to decide exactly what type of outreach effort is appropriate to the situation.
 - Plan using recognized program design and communication strategies.
 - Identify BEPs that will help accomplish the objective.
 - Assess the program.
 - Learn from others.
- *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.
- *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 1 shows examples of the knowledge areas and target audiences that we address on the Web site.

Table 1. *Web Site Knowledge Areas and Target Audiences*

Knowledge Areas	Target Audiences
Adult education principles	Agricultural commodity groups
Communication principles	Environmental/ Conservation NGOs
Citizen participation/ Community involvement principles	Farmers
Education planning	Government agencies
Leadership development principles	Homeowners
Learning theory	Industrial water users
Social marketing principles	Landowners
Technology transfer/ Diffusion of innovation theory	Land development businesses
Youth education principles	Local decision and policy makers
	Recreational water users
	Specific ethnic groups

APPENDIX D
**Recommendations Summarized by Target Audiences:
Tables 7 – 15**

TABLE	TITLE	PAGE
Table 7	<i>Conservation Professionals: Symposium Recommended Best Education Practices</i>	64
Table 8	<i>Decision-makers, leaders, and community groups: Symposium Recommended Best Education Practices</i>	65
Table 9	<i>Ethnic Groups: Symposium Recommended Best Education Practices</i>	66
Table 10	<i>Farmers: Symposium Recommended Best Education Practices</i>	67
Table 11	<i>Households and Neighborhoods: Symposium Recommended Best Education Practices</i>	68
Table 12	<i>Landowners: Symposium Recommended Best Education Practices</i>	70
Table 13	<i>Recreational water users: Symposium Recommended Best Education Practices</i>	71
Table 14	<i>Volunteers: Symposium Recommended Best Education Practices</i>	72
Table 15	<i>Youth: Symposium Recommended Best Education Practices</i>	73

Table 7. Conservation Professionals: Symposium Recommended Best Education Practices

Audience Description	Professionals who apply natural resources training and skills to water management, including: county conservationists, soil and water conservation professionals, watershed coordinators, and other natural resource professionals who interface with the public
Sources	Findings for this audience are based on the results of two research papers, one poster, and two panel presentations. *Indicates findings from a research-based paper. Other findings are derived from case studies.
Outreach Themes	Recommendations
Audience information	No examples available
Message content	No examples available
Message delivery vehicle	No examples available
Outreach strategy	<ul style="list-style-type: none"> • Provide face-to-face meeting opportunities: to allow for learning from others and to provide camaraderie (networking and moral support).* • Provide course activities with direct application to work responsibilities (appropriate to local context).* • Provide instructor feedback.* • Enable students to personalize their education objectives (through pre-course interviews).* • Provide students with autonomy in determining content and timing of learning activities.* • Follow classroom exercises and visual examples by field application. • For conservation professionals: <ul style="list-style-type: none"> ○ Provide area workshops. ○ Apply environmental education principles in training events. ○ Provide follow-up. ○ Encourage peer teaching; ongoing professional development. • Follow these basic outreach practices:* ○ Program planning ○ Program development and implementation ○ Professional development ○ Evaluation ○ Research
Supporting and motivating professionals	<ul style="list-style-type: none"> • Train water education professionals to apply these steps when designing an outreach program: <ul style="list-style-type: none"> ○ Define driving forces. ○ Define goals and objectives. ○ Identify and analyze the target audience. ○ Create the message. ○ Package the message. ○ Distribute the message. ○ Evaluate the outreach campaign.
Evaluation	<ul style="list-style-type: none"> • Evaluate conservation professionals' effectiveness in using models and demonstration tools and in their use of skills taught in the workshops. • Use activities and evaluation to help identify barriers and verify success. • Adapt course design over time using multiple feedback methods.*

Table 8. Decision-makers, leaders, and community groups: Symposium Recommended Best Education Practices

Audience Description	People who provide recognized leadership in the community whether in elected, appointed, salaried, or volunteer positions
Sources	Findings for these audiences are based on the results of two research papers, four posters, and three panel presentations. *Indicates findings from a research-based paper. Other findings are derived from case studies.
Outreach Themes	Recommendations
Audience information	<ul style="list-style-type: none"> • Before designing training, survey local officials to learn if they: <ul style="list-style-type: none"> ○ Have a good understanding of their communities' storm water management plan.* ○ Feel they have sufficient information to make informed decisions about storm water management.* ○ See a role for local watershed groups in water quality monitoring, stormwater management planning, plan implementation, and compliance monitoring or environmental stewardship.*
Message content	No examples available
Message delivery vehicle	<ul style="list-style-type: none"> • Work with a collaborative to provide consistent stormwater message across neighborhoods in a large city.
Outreach strategy	<ul style="list-style-type: none"> • To teach recognition of key aquatic insects use narrated slide discussion and provide a live insect for reference.* • Use website resources: <ul style="list-style-type: none"> ○ To provide web-based delivery of real-time automated stormwater and water quality data. ○ To link data about observed phenomenon with photos and simple explanations. ○ For outreach with schools and municipal officials. • Encourage community groups <ul style="list-style-type: none"> ○ To assess source water in order to prioritize threats, and to develop and implement action strategies. ○ To develop outreach strategies such as: public awareness campaigns, water conservation campaigns, pollution prevention activities (such as household hazardous waste collection), application of BMPs on farms, public policy protection strategies. • In water-related organizations, include stakeholders as Board members. • Involve citizens in a watershed planning group by facilitating their understanding of the problem/situation. • Support watershed planning groups with assistance from agencies. • Build water leadership capacity among young professionals, especially: <ul style="list-style-type: none"> ○ Members of minority and ethnic communities ○ Engineers ○ Law professionals ○ Environmental planners ○ Public interest advocates.
Supporting and motivating professionals	<ul style="list-style-type: none"> • Build skills to ask the right questions about land use. • Build land use training program acceptability by: <ul style="list-style-type: none"> ○ Demonstrating impacts ○ Making staff and funding resources availability ○ Providing repeated education for new decision makers ○ Keeping the science current
Evaluation	No examples available

Table 9. *Ethnic groups*: Symposium Recommended Best Education Practices

Outreach Themes	Recommendations
Audience Description	A population from a specific ethnic or cultural group
Sources	Findings for these audiences are based on the results of two research papers and one poster. *Indicates findings from a research-based paper. Other findings are derived from case studies.
Audience information	<ul style="list-style-type: none"> • Identify specific education needs, for example the percent of households with drinking water that does not meet public health standards.* • Tailor drinking water education materials to the learning style, educational level and potential vision problems of a relatively uneducated, elderly audience.*
Message content	No examples available
Message delivery vehicle	No examples available
Outreach strategy	<ul style="list-style-type: none"> • To build capacity among urban schools to deliver water education effectively and with a community-based focus, provide: <ul style="list-style-type: none"> ○ A nationally tested curriculum linked to national and state academic standards ○ Training workshops for local partner, volunteer, and expert networks ○ Training and support for teachers, volunteers and community leaders ○ Service learning opportunities ○ Program evaluation procedures ○ Encouragement for student-led projects • With Latino youth programs, use place-based pedagogies so that the education of citizens might have direct bearing on the well-being of the social and ecological places people actually inhabit.* <ul style="list-style-type: none"> ○ Allow participants to apply their learning to a wide variety of home, neighborhood and community situations.* • Carry out education outreach initiatives through community-based organizations that already have a relationship with the target audience.* • Field test new education materials with a lead community-based organization.* • Generate local information and use it as the basis for local public education programs.*
Supporting and motivating professionals	No examples available
Evaluation	<ul style="list-style-type: none"> • Evaluate program success by following up with household to check if problems have been corrected.*

Table 10. *Farmers: Symposium Recommended Best Education Practices*

Audience Description	People who work on the land to grow and produce food, animal feed, or other consumer products; and business professionals who support agricultural production
Sources	Findings for these audiences are based on the results of four research papers, three posters, one poster paper, and one panel presentation. *Indicates findings from a research-based paper. Other findings are derived from case studies.
Outreach Themes	Recommendations
Audience information	<ul style="list-style-type: none"> • Check with stakeholders concerning which approach to environmental assessment on the ranch they perceive as most effective. • Identify key target audiences and acknowledge individual grower characteristics, perceptions of problems, current use of practices, and preferences for educational formats.* • Use in-depth discussion and interviews to provide a useful finding about target audience interests and preferences about farm management topics.* • Use a comprehensive pre-survey; conservation plans, soil tests, workshops, and farm visits during the growing seasons as a basis for developing relevant land and water education programs.
Message content	<ul style="list-style-type: none"> • Link economic risk to over-application of nutrients, a common practice for ensuring maximum yield.
Message delivery vehicle	<ul style="list-style-type: none"> • Time education with heightened audience awareness created by press coverage of rules release, public hearings and a compliance deadline.
Outreach strategy	<ul style="list-style-type: none"> • Provide on-farm visits, small group demonstrations, and workshops emphasizing local, direct farmer contact.* • Tailor materials to details of the farm operation.* • Provide farmers with real life examples for new ideas.* • Conduct voluntary and confidential assessments on individual farms, in cooperation with groundwater technicians.* • Work with farmers to compare farm records related to environmental management over time.* • Facilitate farmers developing their own water quality management plans. • Emphasize, peer information exchange in farm quality planning. • Develop an "Improvement Action Plan" for individual farms.*
Supporting and motivating professionals Evaluation	<p>No examples available</p> <ul style="list-style-type: none"> • Use a comparison strip to provide the farmer with opportunity to make their own evaluation of pros and cons of a new procedure. • Track program changes through a comprehensive pre-treatment survey and follow up surveys.* • Assure that program resources actually reached targeted audiences.*

Table 11. *Households and Neighborhoods*: Symposium Recommended Best Education Practices

Audience Description	Personal space of individuals and families
Sources	Findings for these audiences are based on the results of four research papers, five posters, three poster papers, and one panel presentation. *Indicates findings from a research-based paper. Other findings are derived from case studies.
Outreach Categories	Recommendations
Audience information	<ul style="list-style-type: none"> • Specify audiences by need.* • Implement a program design survey to: <ul style="list-style-type: none"> ○ Assess public attitudes and interests about water.* ○ Determine citizen perceptions and knowledge about water quality. • Tailor materials and programs to the learning style, educational level and potential vision problems of the audience.* • Identify specific education needs, for example, identify the percent of households with drinking water that does not meet public health standards.* • To encourage sustainable practices in application of fertilizers and pesticides on lawns: <ul style="list-style-type: none"> ○ Use a social marketing approach to understand and redesign educational outreach strategies. ○ Identify barriers and benefits to the use of IPM by paid landscape managers.
Message content	<ul style="list-style-type: none"> • Provide clear information. • Accompany findings or data with information: <ul style="list-style-type: none"> ○ That emphasizes the meaning of the results. ○ About the pros and cons of control methods and which are most effective. • Assure that different agencies provide consistent messages. • Design and deliver information based on communication and health behavior theories. • Provide information that has immediate utility to the program.*
Message delivery vehicle	<ul style="list-style-type: none"> • Make information publicly available from a variety of sources. • Use a website to provide group connections and watershed resources. • Provide awards for youth water projects. • In video and audio communication materials, <ul style="list-style-type: none"> ○ Use entertaining approaches to communicate simple messages. ○ Partner with a state broadcast association to assure dissemination. • Communicate information about a watershed initiative by: <ul style="list-style-type: none"> ○ Distributing native plants ○ Providing non-chemical landscape design advice and rain barrels ○ Arranging bus tours ○ Disseminating information
Outreach strategy	<ul style="list-style-type: none"> • Form a regional team to determine water education needs and coordinate team outreach efforts through a variety of techniques: <ul style="list-style-type: none"> ○ An annual satellite conference ○ A domestic water handbook ○ A “riparian” concept campaign ○ A water quality monitoring workshop ○ A semi-monthly theme based fact sheet or report for stakeholders and policy makers

- Support stakeholder groups:
 - Rely on stakeholder involvement in program development.
 - Rely on landscape and watershed organizations help to set project goals.
 - Support groups, especially those with similar missions and those that already have a relationship with the target audience.*
- Generate local information:
 - Use a regional survey to establish priorities and to set baseline information about regional water education needs.
 - Use local information as the basis for local public education programs.*
- Test new educational materials:
 - Target educational resources to meet specific needs.*
 - Field test new education materials with a lead community-based organization.*
- Rely on these outreach components for a conservation initiative:
 - Workshops and seminars on key topics and for key audiences such as: rainwater harvesting, riparian management, rangeland “rescue”, golf course management, and youth education
 - Demonstration sites featuring practical techniques for conserving water and energy in rangeland situations
 - Individual homeowners make site assessments with help from trained volunteers who make specific recommendations for reducing bacteria and nitrogen runoff*
 - Awards for youth water projects
 - Well water testing information locally on an ongoing basis

Supporting and
motivating professionals
Evaluation

No examples available

- Evaluate program success by following up with household to check if problems have been corrected.*
- Provide property owners with do-it-yourself kits and coupons for environmentally friendly products.

Table 12. Landowners: Symposium Recommended Best Education Practices

Audience Description	People who own property and use it for residential, recreational, forestry, or agricultural purposes. People who work the land, such as farmers or loggers, are described as separate target audiences
Sources	Findings for this audience are based on the results of one research paper, one poster, and one poster paper. *Indicates findings from a research-based paper. Other findings are derived from case studies.
Outreach Themes	Recommendations
Audience information	No examples available
Message content	No examples available
Message delivery vehicle	<ul style="list-style-type: none"> • Provide landowners with information using a handbook and a calendar, making good use of photographs.
Outreach strategy	<ul style="list-style-type: none"> • Provide landowners with hands-on, practical training about individual property management choices set in the context of information about broader ecosystem science and impacts.* • Provide training for real estate professionals in a supportive atmosphere accompanied by a field trip.
Supporting and motivating professionals	No examples available
Evaluation	No examples available

Table 13. Recreational water users: Symposium Recommended Best Education Practices

Audience Description	Adults and youth who engage in fishing, boating, and other recreational activities on or near bodies of water
Sources	Findings for this target audience are based on the results of one poster paper. *Indicates findings from a research-based paper. Other findings are derived from case studies.
Outreach Themes	Recommendations
Audience information	No examples available
Message content	No examples available
Message delivery vehicle	<ul style="list-style-type: none"> • Work in collaboration with the professional association to publicize a course for golf course managers.
Outreach strategy	<ul style="list-style-type: none"> • Engage golf course conservation superintendents in developing a course on turf grass management. • Make turf grass management courses readily accessible to golf course managers and provide instructor support for completing assignments and application to their own golf course.
Supporting and motivating professionals	No examples available
Evaluation	No examples available

Table 14. *Volunteers*: Symposium Recommended Best Education Practices

Audience Description	Citizens who voluntarily gather and organize data about a local watershed
Sources	Findings for this audience are based on the results of two panel presentations. *Indicates findings from a research-based paper. Other findings are derived from case studies.
Outreach Themes	Recommendations
Audience information	No examples available
Message content	No examples available
Message delivery vehicle	<ul style="list-style-type: none"> Facilitate volunteer water quality monitoring efforts through sharing success stories and communication among groups using an interactive website and listserv.
Outreach strategy	No examples available
Supporting and motivating professionals Evaluation	<p>No examples available</p> <ul style="list-style-type: none"> Tell the story of the program and publicize impacts. Encourage county commissioners, stakeholders, and partners in reporting outcomes.

Table 15. Youth: Symposium Recommended Best Education Practices

Audience Description	Young people engaged in informal, nonformal, or formal, elementary and secondary education programs
Sources	Findings for these audiences are based on the results of two research papers, four posters and two poster papers. *Indicates findings from a research-based paper. Other findings are derived from case studies.
Outreach Themes	Recommendations
Audience information	No examples available
Message content	No examples available
Message delivery vehicle	<ul style="list-style-type: none"> • Facilitate school-based watershed education programs through interactive resources and communication among groups using an interactive website. • Prepare youth to inform and engage communities about watershed information as a mechanism for reaching audiences who are geographically scattered when resources are limited.
Outreach strategy	<ul style="list-style-type: none"> • When developing watershed education <i>teacher manuals</i>, identify barriers to implementation and adapt materials to respond to identified needs. • When developing watershed <i>education materials</i>: <ul style="list-style-type: none"> ○ Adapt watershed education teaching materials to align with grade-appropriate science curriculum standards. ○ Involve the state office of education and other education stakeholders in the revision process. • Use best education practices in organizing environmental field days for youth. • Use water education activities to provide “situated problem-solving” practice that can translate to workforce skills.* • Teach water science and build environmentally responsible behavior among students through “service-learning” experiences that apply principles of interaction and continuity: both significant features of education that leads to learning.* For example, <ul style="list-style-type: none"> ○ Provide educators, students and District staff with opportunities to participate in public lands activities. This experience has been shown to increase student performance and interest in school, student concern for protecting and conserving the environment, and educator motivation. ○ Focus on the characteristics of environmentally responsible behavior – knowledge of issues, skill in actions, knowledge of ecology and actions, group locus of control, intention to act, environmental sensitivity, personal responsibility, and individual locus of control – to build student environmental stewardship motivation and competencies.*
Supporting and motivating professionals	<ul style="list-style-type: none"> • Provide teachers with an opportunity to experience activities first-hand; interact with other educators; and learn about the materials. • Provide teachers with activities that meet one or more curriculum goals.
Evaluation	No examples available

APPENDIX E
**Recommendations Summarized by Outreach Themes:
Tables 16 – 22**

TABLE	TITLE	PAGE
Table 16	<i>Audience information:</i> Symposium Recommended Best Education Practices	76
Table 17	<i>Message content:</i> Symposium Recommended Best Education Practices	77
Table 18	<i>Message delivery vehicle:</i> Symposium Recommended Best Education Practices	78
Table 19	<i>Outreach strategy/method of teaching – Outreach strategy:</i> Symposium Recommended Best Education Practices	79
Table 20	<i>Outreach strategy/method of teaching – Outreach design and implementation:</i> Symposium Recommended Best Education Practices	82
Table 21	<i>Supporting and motivating professionals:</i> Symposium Recommended Best Education Practices	85
Table 22	<i>Evaluation:</i> Symposium Recommended Best Education Practices	86

Table 16. Audience information: Symposium Recommended Best Education Practices

Audience information Theme Description	Development and use of information about a target audience *Indicates findings from a research-based paper. Other findings are derived from case studies.
Audience	Recommendations
Conservation professionals Decision-makers, leaders and community groups	No examples available <ul style="list-style-type: none"> • Before designing training, survey local officials to learn if they: <ul style="list-style-type: none"> ○ Have a good understanding of their communities' storm water management plan.* ○ Feel they have sufficient information to make informed decisions about storm water management.* ○ See a role for local watershed groups in water quality monitoring, stormwater management planning, plan implementation, and compliance monitoring or environmental stewardship.*
Ethnic groups	<ul style="list-style-type: none"> • Identify specific education needs, for example the percent of households with drinking water that does not meet public health standards.* • Tailor drinking water education materials to the learning style, educational level and potential vision problems of a relatively uneducated, elderly audience.*
Farmers	<ul style="list-style-type: none"> • Check with stakeholders concerning which approach to environmental assessment on the ranch they perceive as most effective. • Identify key target audiences and acknowledge individual grower characteristics, perceptions of problems, current use of practices, and preferences for educational formats.* • Use in-depth discussion and interviews to provide a useful finding about target audience interests and preferences about farm management topics.* • Use a comprehensive pre-survey; conservation plans, soil tests, workshops, farm visits during the growing seasons to develop relevant land and water education programs.
Households and neighborhoods	<ul style="list-style-type: none"> • Specify audiences by need.* • Implement a program design survey to: <ul style="list-style-type: none"> ○ Assess public attitudes and interests about water.* ○ Determine citizen perceptions and knowledge about water quality. • Tailor materials and programs to the learning style, educational level and potential vision problems of the audience.* • Identify specific education needs, for example, identify the percent of households with drinking water that does not meet public health standards.* • To encourage sustainable practices in application of fertilizers and pesticides on lawns: <ul style="list-style-type: none"> ○ Use a social marketing approach to understand and redesign educational outreach strategies. ○ Identify barriers and benefits to the use of IPM by paid landscape managers.
Landowners	No examples available
Recreational water users	No examples available
Volunteers	No examples available
Youth	No examples available

Table 17. Message content: Symposium Recommended Best Education Practices

Message content Theme Description	What information to provide *Indicates findings from a research-based paper. Other findings are derived from case studies.
Audience	Recommendations
Conservation professionals	No examples available
Decision-makers, leaders and community groups	No examples available
Ethnic groups	No examples available
Farmers	<ul style="list-style-type: none"> • Link economic risk to over-application of nutrients, a common practice for ensuring maximum yield.
Households and neighborhoods	<ul style="list-style-type: none"> • Provide clear information. • Accompany findings or data with information: <ul style="list-style-type: none"> ○ That emphasizes the meaning of the results. ○ About the pros and cons of control methods and which are most effective. • Assure that different agencies provide consistent messages. • Design and deliver information based on communication and health behavior theories. • Provide information that has immediate utility to the program.*
Landowners	No examples available
Recreational water users	No examples available
Volunteers	No examples available
Youth	No examples available

Table 18. *Message delivery vehicle: Symposium Recommended Best Education Practices*

<i>Message delivery vehicle</i>	Theme Description
	How to effectively deliver information to the target audience *Indicates findings from a research-based paper. Other findings are derived from case studies.
Audience	Recommendations
Conservation professionals	No examples available
Decision-makers, leaders and community groups	<ul style="list-style-type: none"> • Work with a collaborative to provide consistent stormwater message across neighborhoods in a large city.
Ethnic groups Farmers	<p>No examples available</p> <ul style="list-style-type: none"> • Time education with heightened audience awareness created by press coverage of rules release, public hearings and a compliance deadline.
Households and neighborhoods	<ul style="list-style-type: none"> • Make information publicly available from a variety of sources. • Use a website to provide group connections and watershed resources. • Provide awards for youth water projects. • In video and audio communication materials: <ul style="list-style-type: none"> ○ Use entertaining approaches to communicate simple messages. ○ Partner with a state broadcast association to assure dissemination. • Communicate information about a watershed initiative by: <ul style="list-style-type: none"> ○ Distributing native plants. ○ Providing non-chemical landscape design advice and rain barrels. ○ Arranging bus tours ○ Disseminating information
Landowners	<ul style="list-style-type: none"> • Provide landowners with information using a handbook and a calendar, making good use of photographs.
Recreational water users	<ul style="list-style-type: none"> • Work in collaboration with the professional association to publicize a course for golf course managers.
Volunteers	<ul style="list-style-type: none"> • Facilitate volunteer water quality monitoring efforts through sharing success stories and communication among groups using an interactive website and listserve.
Youth	<ul style="list-style-type: none"> • Facilitate school-based watershed education programs through interactive resources and communication among groups using an interactive website. • Prepare youth to inform and engage communities about watershed information as a mechanism for reaching audiences who are geographically scattered when resources are limited.

Table 19. Outreach strategy/method of teaching – Outreach strategy: Symposium Recommended Best Education Practices

<i>Outreach strategy</i> Theme Description	How to provide education that leads to measurable impacts *Indicates findings from a research-based paper. Other findings are derived from case studies.
Audience	Recommendations
Conservation professionals	<ul style="list-style-type: none"> • Provide face-to-face meeting opportunities: to allow for learning from others and to provide camaraderie (networking and moral support).* • Provide course activities with direct application to work responsibilities (appropriate to local context).* • Provide instructor feedback.* • Enable students to personalize their education objectives (through pre-course interviews).* • Provide students with autonomy in determining content and timing of learning activities.* • Follow classroom exercises and visual examples by field application. • For conservation professionals: <ul style="list-style-type: none"> ○ Provide area workshops. ○ Apply environmental education principles in training events. ○ Provide follow-up. ○ Encourage peer teaching; ongoing professional development. • Follow these basic outreach practices:.* <ul style="list-style-type: none"> ○ Program planning ○ Program development and implementation ○ Professional development ○ Evaluation ○ Research
Decision-makers, leaders and community groups	<ul style="list-style-type: none"> • To teach recognition of key aquatic insects use narrated slide discussion and provide a live insect for reference.* • Use website resources: <ul style="list-style-type: none"> ○ To provide web-based delivery of real-time automated stormwater and water quality data. ○ To link data about observed phenomenon with photos and simple explanations. ○ For outreach with schools and municipal officials. • Encourage community groups <ul style="list-style-type: none"> ○ To assess source water in order to prioritize threats, and to develop and implement action strategies ○ To develop outreach strategies such as: public awareness campaigns, water conservation campaigns, pollution prevention activities (such as household hazardous waste collection), application of BMPs on farms, public policy protection strategies • In water-related organizations, include stakeholders as Board members • Involve citizens in a watershed planning group by facilitating their understanding of the problem/situation. • Support watershed planning groups with assistance from agencies. • Build water leadership capacity among young professionals, especially: <ul style="list-style-type: none"> ○ Members of minority and ethnic communities ○ Engineers ○ Law professionals ○ Environmental planners ○ Public interest advocates.
Ethnic groups	<ul style="list-style-type: none"> • To build capacity among urban schools to deliver water education effectively and with a community-based focus, provide: <ul style="list-style-type: none"> ○ A nationally tested curriculum linked to national and state academic standards ○ Training workshops for local partner, volunteer, and expert networks ○ Training and support for teachers, volunteers and community leaders ○ Service learning opportunities ○ Program evaluation procedures. ○ Encourage student-led projects • With Latino youth programs, use place-based pedagogies so that the

Outreach strategy Theme Description	How to provide education that leads to measurable impacts *Indicates findings from a research-based paper. Other findings are derived from case studies.
Audience	Recommendations
Farmers	<p>education of citizens might have direct bearing on the well-being of the social and ecological places people actually inhabit.*</p> <ul style="list-style-type: none"> ○ Allow participants to apply their learning to a wide variety of home, neighborhood and community situations.* • Carry out education outreach initiatives through community-based organizations that already have a relationship with the target audience.* • Field test new education materials with a lead community-based organization.* • Generate local information and use it as the basis for local public education programs.* <ul style="list-style-type: none"> • Provide on-farm visits, small group demonstrations, and workshops emphasizing local, direct farmer contact.* • Tailor materials to details of the farm operation.* • Provide farmers with real life examples for new ideas.* • Conduct voluntary and confidential assessments on individual farms, in cooperation with groundwater technicians.* • Work with farmers to compare farm records related to environmental management over time.* • Facilitate farmers developing their own water quality management plans. • Emphasize, peer information exchange in farm quality planning. • Develop an "Improvement Action Plan" for individual farms.*
Households and neighborhoods	<ul style="list-style-type: none"> • Form a regional team to determine water education needs. • Support stakeholder groups: <ul style="list-style-type: none"> ○ Rely on stakeholder involvement in program development. ○ Rely on landscape and watershed organizations help to set project goals. ○ Support groups, especially those with similar missions. • Generate local information: <ul style="list-style-type: none"> ○ Use a regional survey to establish priorities and to set baseline information about regional water education needs. ○ Use local information as the basis for local public education programs.* • Test new educational materials: <ul style="list-style-type: none"> • Target educational resources to meet specific needs.* ○ Field test new education materials with a lead community-based organization.* • Carry out education outreach initiatives through community-based organizations that already have a relationship with the target audience.* • Coordinate team outreach efforts through a variety of techniques: <ul style="list-style-type: none"> ○ An annual satellite conference ○ A domestic water handbook ○ A "riparian" concept campaign ○ A water quality monitoring workshop ○ A semi-monthly theme based fact sheet or report for stakeholders and policy makers. • Rely on these outreach components for a conservation initiative: <ul style="list-style-type: none"> ○ Workshops and seminars on key topics and for key audiences such as: rainwater harvesting, riparian management, rangeland "rescue", golf course management, and youth education ○ Demonstration sites featuring practical techniques for conserving water and energy in rangeland situations • Assist individual homeowners to assess their site using trained volunteers, and make specific recommendations for reducing bacteria and nitrogen runoff.* • Provide awards for youth water projects. • Offer well water testing information locally on an ongoing basis.
Landowners	<ul style="list-style-type: none"> • Provide landowners with hands-on, practical training about individual property management choices set in the context of information about broader ecosystem science and impacts.*

Outreach strategy Theme Description	How to provide education that leads to measurable impacts *Indicates findings from a research-based paper. Other findings are derived from case studies.
Audience	Recommendations
Recreational water users	<ul style="list-style-type: none"> • Provide training for real estate professionals in a supportive atmosphere accompanied by a field trip. • Engage golf course conservation superintendents in developing a course on turf grass management. • Make turf grass management courses readily accessible to golf course managers and provide instructor support for completing assignments and application to their own golf course.
Volunteers	No examples available
Youth	<ul style="list-style-type: none"> • Use water education activities to provide “situated problem-solving” practice that can translate to workforce skills.* • Teach water science through “service-learning” experiences that apply principles of interaction and continuity: both significant features of education that leads to learning.* • When developing watershed education <i>teacher manuals</i>, identify barriers to implementation and adapt materials to respond to identified needs. • When developing watershed <i>education materials</i>: <ul style="list-style-type: none"> ○ Adapt watershed education teaching materials to align with grade-appropriate science curriculum standards. ○ Involve the state office of education and other education stakeholders in the revision process. • Use best education practices in organizing environmental field days for youth. • To increase student performance and interest in school, student concern for protecting and conserving the environment, and educator motivation, provide educators, students and District staff with opportunities to participate in public lands activities. • Build student environmental stewardship motivation and competencies by focusing on the characteristics of environmentally responsible behavior – knowledge of issues, skill in actions, knowledge of ecology and actions, group locus of control, intention to act, environmental sensitivity, personal responsibility, and individual locus of control.* • Build environmentally responsible behavior among students through field-based experiences and service-learning.*

Table 20. Outreach strategy/method of teaching – Outreach design and implementation: Symposium Recommended Best Education Practices

<i>Outreach design and implementation</i> Theme Description	How to provide education that leads to measurable impacts *Indicates findings from a research-based paper. Other findings are derived from case studies.
Audience	Recommendations
a. Quality – provide a clear purpose; pilot test	<ul style="list-style-type: none"> • Follow these basic outreach practices:* ○ Program planning ○ Program development and implementation ○ Professional development ○ Evaluation ○ Research • Field test new education materials with a lead community-based organization.* • Form a regional team to determine water education needs. • Generate local information: <ul style="list-style-type: none"> ○ Use a regional survey to establish priorities and to set baseline information about regional water education needs.* • Test new educational materials: <ul style="list-style-type: none"> ○ Target educational resources to meet specific needs.* ○ Field test new education materials with a lead community-based organization.*
b. Stability – frequent opportunities sustained over time	<ul style="list-style-type: none"> • Support watershed planning groups with assistance from agencies. • Offer well water testing information locally on an ongoing basis.
c. Access – inclusive, accessible, all interested audiences can participate	<ul style="list-style-type: none"> • Carry out education outreach initiatives through community-based organizations that already have a relationship with the target audience.* • Encourage community groups: <ul style="list-style-type: none"> ○ To assess source water in order to prioritize threats, and to develop and implement action strategies. ○ To develop outreach strategies such as: public awareness campaigns, water conservation campaigns, pollution prevention activities (such as household hazardous waste collection), application of BMPs on farms, public policy protection strategies. • Provide on-farm visits, small group demonstrations, and workshops emphasizing local, direct farmer contact.* • Make turf grass management courses readily accessible to golf course managers and provide instructor support for completing assignments and application to their own golf course.
d. Connection – involve stakeholders and partners	<ul style="list-style-type: none"> • In water-related organizations, include stakeholders as Board members. • Involve citizens in a watershed planning group by facilitating their understanding of the problem/situation. • Support stakeholder groups: <ul style="list-style-type: none"> ○ Rely on stakeholder involvement in program development. ○ Rely on landscape and watershed organizations help to set project goals. • Build water leadership capacity among young professionals, especially: <ul style="list-style-type: none"> ○ Members of minority and ethnic communities ○ Engineers ○ Law professionals ○ Environmental planners ○ Public interest advocates. ○ Support groups, especially those with similar missions • When developing watershed <i>education materials</i>: <ul style="list-style-type: none"> ○ Adapt watershed education teaching materials to align with grade-appropriate science curriculum standards. ○ Involve the state office of education and other education stakeholders in the revision process.

Outreach design and implementation
Theme Description

How to provide education that leads to measurable impacts
 *Indicates findings from a research-based paper. Other findings are derived from case studies.

Audience	Recommendations
e. Program – adapted to particular audience or topic needs	<ul style="list-style-type: none"> • Generate local information and use it as the basis for local public education programs.* • Tailor materials to details of the farm operation.* • Provide training for real estate professionals in a supportive atmosphere accompanied by a field trip. • Engage golf course conservation superintendents in developing a course on turf grass management. • When developing watershed education <i>teacher manuals</i>, identify barriers to implementation and adapt materials to respond to identified needs. • For conservation professionals: <ul style="list-style-type: none"> ○ Provide course activities with direct application to work responsibilities (appropriate to local context).* ○ Provide area workshops. ○ Apply environmental education principles in training events. ○ Provide follow-up. ○ Encourage peer teaching; ongoing professional development. • Use website resources: <ul style="list-style-type: none"> ○ To provide web-based delivery of real-time automated stormwater and water quality data. ○ To link data about observed phenomenon with photos and simple explanations. ○ For outreach with schools and municipal officials. • To build capacity among urban schools to deliver water education effectively and with a community-based focus, provide: <ul style="list-style-type: none"> ○ A nationally tested curriculum linked to national and state academic standards ○ Training workshops for local partner, volunteer, and expert networks ○ Training and support for teachers, volunteers and community leaders ○ Service learning opportunities ○ Program evaluation procedures. ○ Encouragement for student-led projects • Rely on these outreach components for a conservation initiative: <ul style="list-style-type: none"> ○ Workshops and seminars on key topics and for key audiences such as: rainwater harvesting, riparian management, rangeland “rescue”, golf course management, and youth education. ○ Demonstration sites featuring practical techniques for conserving water and energy in rangeland situations.
f. Marketing – how audiences know about the opportunity	No examples available
g. Management – to assure smooth operation	<ul style="list-style-type: none"> • Coordinate team outreach efforts through a variety of techniques: <ul style="list-style-type: none"> ○ An annual satellite conference ○ A domestic water handbook ○ A “riparian” concept campaign ○ A water quality monitoring workshop ○ A semi-monthly theme based fact sheet or report for stakeholders and policy makers.
h. Relevant instructional strategies	<ul style="list-style-type: none"> • Provide face-to-face meeting opportunities: to allow for learning from others and to provide camaraderie (networking and moral support).* • Provide instructor feedback.* • Enable students to personalize their education objectives (through pre-course interviews).* • Provide students with autonomy in determining content and timing of learning activities.* • Follow classroom exercises and visual examples by field application. • To teach recognition of key aquatic insects use narrated slide discussion and provide a live insect for reference.* • With Latino youth programs, use place-based pedagogies so that the

Outreach design and implementation
Theme Description

How to provide education that leads to measurable impacts
 *Indicates findings from a research-based paper. Other findings are derived from case studies.

Audience	Recommendations
<p>i. Recognition of contributors</p>	<p>education of citizens might have direct bearing on the well-being of the social and ecological places people actually inhabit.*</p> <ul style="list-style-type: none"> ○ Allow participants to apply their learning to a wide variety of home, neighborhood and community situations.* ● Work with farmers: <ul style="list-style-type: none"> ○ Provide farmers with real life examples for new ideas.* ○ Conduct voluntary and confidential assessments on individual farms, in cooperation with groundwater technicians.* ○ Compare farm records related to environmental management over time.* ○ Facilitate farmers developing their own water quality management plans. ○ Emphasize, peer information exchange in farm quality planning. ○ Develop an “Improvement Action Plan” for individual farms.* ● Assist individual homeowners to assess their site using trained volunteers, and make specific recommendations for reducing bacteria and nitrogen runoff.* ● Provide landowners with hands-on, practical training about individual property management choices set in the context of information about broader ecosystem science and impacts.* ● Use best education practices in organizing environmental field days for youth. ● Use water education activities to provide “situated problem-solving” practice that can translate to workforce skills.* ● Teach water science and build environmentally responsible behavior among students through “service-learning” experiences that apply principles of interaction and continuity: both significant features of education that leads to learning.* For example, <ul style="list-style-type: none"> ○ Provide educators, students and District staff with opportunities to participate in public lands activities. This experience has been shown to increase student performance and interest in school, student concern for protecting and conserving the environment, and educator motivation. ○ Focus on the characteristics of environmentally responsible behavior – knowledge of issues, skill in actions, knowledge of ecology and actions, group locus of control, intention to act, environmental sensitivity, personal responsibility, and individual locus of control – to build student environmental stewardship motivation and competencies.* <p>● Provide awards for youth water projects.</p>

Table 21. *Supporting and motivating professionals*: Symposium Recommended Best Education Practices

<i>Supporting and motivating professionals</i>	
Theme Description	
How to help professionals to be more effective in water education work *Indicates findings from a research-based paper. Other findings are derived from case studies.	
Audience	Recommendations
Conservation professionals	<ul style="list-style-type: none"> • Train water education professionals to apply these steps when designing an outreach program: <ul style="list-style-type: none"> ○ Define driving forces. ○ Define goals and objectives. ○ Identify and analyze the target audience. ○ Create the message. ○ Package the message. ○ Distribute the message. ○ Evaluate the outreach campaign.
Decision-makers, leaders and community groups	<ul style="list-style-type: none"> • Build skills to ask the right questions about land use. • Build land use training program acceptability by: <ul style="list-style-type: none"> ○ Demonstrating impacts. ○ Making staff and funding resources availability. ○ Provide repeated education for new decision makers. ○ Keep the science current.
Ethnic groups	No examples available
Farmers	No examples available
Households and neighborhoods	No examples available
Landowners	No examples available
Recreational water users	No examples available
Volunteers	No examples available
Youth	<ul style="list-style-type: none"> • Provide teachers with an opportunity to experience activities first-hand; interact with other educators; and learn about the materials. • Provide teachers with activities that meet one or more curriculum goals.

Table 22. Evaluation: Symposium Recommended Best Education Practices

Evaluation Theme Description	How to develop and use evaluation to improve the quality of water outreach *Indicates findings from a research-based paper. Other findings are derived from case studies.
Audience	Recommendations
Conservation professionals	<ul style="list-style-type: none"> Evaluate conservation professionals' effectiveness in using models and demonstration tools and in their use of skills taught in the workshops. Use activities and evaluation to help identify barriers and verify success. Adapt course design over time using multiple feedback methods.*
Decision-makers, leaders and community groups Ethnic groups	<p>No examples available</p> <ul style="list-style-type: none"> Evaluate program success by following up with household to check if problems have been corrected.*
Farmers	<ul style="list-style-type: none"> Use a comparison strip to provide the farmer with opportunity to make their own evaluation of pros and cons of a new procedure. Track program changes through a comprehensive pre-treatment survey and follow up surveys.* Assure that program resources actually reached targeted audiences.*
Households and neighborhoods	<ul style="list-style-type: none"> Evaluate program success by following up with household to check if problems have been corrected.* Provide property owners with do-it-yourself kits and coupons for environmentally friendly products.
Landowners	No examples available
Recreational water users	No examples available
Volunteers	<ul style="list-style-type: none"> Tell the story of the program and publicize impacts. Encourage county commissioners, stakeholders, and partners in reporting outcomes.
Youth	No examples available

APPENDIX F

Plenary Activity: Promoting BEPs and Challenges for Future Action

Comments, Suggestions, Reactions

A-1

- ❖ Need to make usable by locals and non-academics (whole concept).
- ❖ Compare and contrast with examples what moves from good, better, etc. Even an artificial example to clearly illustrate a particular technique.
- ❖ Be open to new visions of good, better, best. Inter-connections are encouraged among educators and community structures.
- ❖ Analyze assumptions of focus on education v. communication and anthropology.
- ❖ It's not just Extension; make applicable to non-Extension educators.
- ❖ Good facilitation (dot groups) to identify barriers to understanding BEPs (Thursday groups). Share information gathered from groups (email).
- ❖ Limited time for questions/interaction.
- ❖ Eliminate terminology "good and better" but keep "best". Too hard to differentiate between terms, but definitions of good and better are OK.
- ❖ Include all PowerPoints in conference materials we received. Please include on website.
- ❖ Research papers would have been easier to work through if they were compiled in order presentations were given. Summaries provided were good though.

A-2

- ❖ Awesome concept behind conference and overall done very well. Like working conference concept.
- ❖ Symposium has opened eyes to tools and processes to improve work plans and projects.
- ❖ May need a "non-working" regional conference to "bring tradition of extension people" into Education Practice emphasis. (Training based--identifying current trends and products).
- ❖ Develop regional work groups (web conferencing?) between national conferences to promote more interaction and participation.

- ❖ Better defined agenda and expectations from participants. If you intend us to work let us know ahead.
- ❖ Don't start conference on Monday, don't end on Friday.
- ❖ Liked to know hotel away from conference site. Didn't bring umbrella that could have been needed.
- ❖ Field trips as appropriate.
- ❖ More time for panel presentations.
- ❖ More program presentations.
- ❖ Pre-conference planning to link to state/regional issues.
- ❖ Need to broaden subject areas covered linked to regional/state priorities.
- ❖ More diverse audience (1890s to 1974s).
- ❖ Offer scholarships.
- ❖ Didn't understand what conference was--more pre-conference information.

A-3

- ❖ Like the idea that Natural Resource staff needs education training.
- ❖ Nice combination of academic and program people, but no tribal representation.
- ❖ More BEP evaluation models--how do you go from good to better to best?
- ❖ Talk about demographic, cultural, geographic differences. There will be specific standards for each group.
- ❖ Have full agenda to this type of gathering out earlier to encourage more non-academic attendance and help spread the word.
- ❖ Invite classroom teachers, field staff (non-educators) doing "education" as they see it, citizen monitors (representatives of target audiences), and wastewater treatment staff.
- ❖ Take advantage of resource out the window, i.e. pontoon boat ride to demonstrate a BEP or need for change. Make sure objectives are clear.
- ❖ Change name to PEP--Proven Education Practices (or you'll give impression that "best" is better than "good"). BEP evokes judgmentally rather than the learning process we're encouraging.
- ❖ Develop master's program in National Resource Education.
- ❖ Close the gap between delivery methods details and research/evaluation nuts and bolts practicality.

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- ❖ Walk the talk--research based examples used.
 - ❖ User fewer disposable products; plates, cups, lunch boxes, etc.

A-4

- ❖ What does CSREES mean?
- ❖ Define acronyms.

A-5

- ❖ This is an important effort--need to continue to promote education as valued tool, not fluff.
- ❖ More networking opportunities available with the ??? areas.
- ❖ More time for questioning panel, fewer breakouts. Time to network at specific topics.
- ❖ A tour of Lake Mendota shorelines and education practice. Tour limnology lab.
- ❖ Start with definitions of good/better/best E.P.s and role of participants. Consider how others will understand these terms outside this meeting.
- ❖ Extend these ideas to other outreach/education programs such as USFS, NPS, NERRS Sea Grant. Bring more to the table.
- ❖ EPA and CSREES National Program leaders should be here. And OMB.
- ❖ Stronger “connection” between “better” education and better end result or implementation/action reffecting water quality with education.
- ❖ Include social marketing strategies and successes among the BEPs on the website.
- ❖ Create an education success story by utilizing this good, better, best concept. Give us tools to take home.

A-6

- ❖ Need to include water quantity issues (e.g. conservation).
- ❖ Could website include means to facilitate collaboration between participants?
- ❖ Links to successful projects or the opportunity to enter information about the success of me project (searchable DB).
- ❖ Pre-conference information didn't let us know this was a “working conference.”
- ❖ Website needs to be grammar and spell checked.
- ❖ Need to model exemplary BEPs throughout conference: this activity is highly engaging. Lead some sessions outside; find innovative alternatives/BEPs for talking head PowerPoints. How about an icebreaker? Low waste lunches? Hands-on? Peer teaching?

- ❖ Start with a paper copy of a BEP definition and examples.
- ❖ Do this conference in each state through Cooperative Extension. Put on a “Road Show.”
- ❖ Don’t ask for questions without available time for discussion. Build time in for real group definition.

A-7

- ❖ Make time for review of web ??? products.
- ❖ Definition of good, better, and best and need for this framework still confusing and needs more group discussion.
- ❖ Yearly conferences in Hawaii, San Antonio, and Mexico.
- ❖ Too much/too short time issues. Plan for more networking and social events. Have break out sessions for regional groups.

What Can They Do To Refine and Promote Project Products?

B-1

- ❖ Send flier to watershed managers and other target audience; define target audience; send postcard or business card out with all mailings; list serves.
- ❖ Discussion board to easily post comments regarding website content. Networking opportunity?
- ❖ Survey monkey (online organization) to give feedback on specific questions.
- ❖ Take article from website and put in publications as articles. Journals?
- ❖ Make note of newly updated information; pay attention to flow of web traffic (where they leave the site); check spelling and grammar in articles; keep up to date.
- ❖ Online website evaluations.
- ❖ Posting regional conferences and workshops. Posting case studies and outcomes and real stories--success stories.
- ❖ “Are you interested?” button/database in water education conferences.
- ❖ Attend and present nationally and regionally--provide service to local state associations.
- ❖ Website--constantly make sure functions well and quick. Also make more visually appealing less extension looking or academic looking. View the website as a product--define target market, create marketing plan, get feedback.

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- ❖ Good website counter so you can tell which pages get most hits. Include online evaluations. Get others to link to your site. Good editing process for all products--also way to submit corrections.
 - ❖ Product easily printable--printer friendly.
 - ❖ Work in interactive features.
 - ❖ Pop-up online feedback opportunities (Usefulness? What questions has it answered? Not answered?)
 - ❖ Promote interconnections among interested users--way to ask for help.

B-2

- ❖ Create marketing plan for BEP.
- ❖ Get feedback from non-educators.
- ❖ Condensed histories of lesson learned across ??? disciplines, etc. (Meta-analysis of education/evaluation).
- ❖ Promote to funders--what is BEP and what is not--are they funding poor education practice?

B-3

- ❖ Streamline website and materials so users are not overwhelmed. Less is more.
- ❖ Have succinct categories to browse, because the scope of this is so large. Make sure even in categories that there are subsets, i.e. youth--urban, farm, youth organizations/recreation.
- ❖ Make sure it's clear what the products are and what the goal of this whole project is.
- ❖ Advocate renewed interest in EE schools (Flagging. Waning.) Work with DPI.
- ❖ Get this URL hot-linked from other organizational websites. Use state WQ education coordinator to develop promotion plan using their intimate knowledge of their own site. Use existing state EE and watershed organizations, SWCDs, NGOs, NAAEE, and WQ educator list serves.
- ❖ Explore other state agencies with comparable focus and their networks/websites.
- ❖ Provide links to action programs such as WAV, etc. Make program descriptions brief and let people go to link to get more information if they are interested. Still many problems with the site crashing, opening documents, etc.

B-4

- ❖ Think nationally, act regionally, implement locally.

- ❖ Literature review on web should be helpful. This is how best practices are defined.
- ❖ List education strategies with “rating” (good--best) and literature that supports rating.
- ❖ Feedback form or message board. Self-evaluation of website developers to determine what information stays/goes.
- ❖ Links to “best” programs. Include grant sources for education programs. Programs/practices searchable by audience or issue (e.g. agriculture).
- ❖ Marketing the site, we’re assuming audiences will use this. Advertise on list serve.
- ❖ Short course--CEU/credits (online, distance learning, interactive, in-person).
- ❖ People as resource in the database. Method for networking.
- ❖ Organize by geographical districts to refer local projects to legislatures.
- ❖ Send out announcements about the website in our emailing lists/newsletters with a link.
- ❖ Materials used for grant writing.
- ❖ Analyze webpage hits to see the interest in topics and adapt information to match interests.

B-5

- ❖ How to replicate without duplication.
- ❖ Create our own language--stop co-opting “Biz Speak.” We need to describe our work in plain English!

B-6

- ❖ Monthly email highlighting web education--specific case study, BEP, education theory. Promote ideas, not just products.
- ❖ Send email on a weekly basis to potential contributors until they give in...
- ❖ Provide examples of “best” evaluations under this educational resource topic. Show how this example met the G/B/B criteria to be placed on this website.
- ❖ Provide basic information/introduction to Learning Theory: how people learn best and how BEPs are based on this research. Make this connection because it may not be obvious to non-educators.
- ❖ Publicize website in Journal of Extension, Western Water trade publications, EE newsletters and journals, etc.
- ❖ Links to and from other water websites.
- ❖ Make Google friendly. Make link friendly--accessibility.

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- ❖ Make website with more graphics, learner style friendly, use graphics, tables, and graphs.
 - ❖ Presentation of website at other conferences--NAI, NAAEE.
 - ❖ Consider allowing website search by audience type--“I’m a high school teacher, where do I start?”
 - ❖ Best acronym page--help us understand!

Recommendations for Future Actions

C-1

- ❖ Explaining the parallels and differences in education policy development.
- ❖ More information on the influences. Establish regional workgroups to continue work. Tell more stories. More emphasis on packaged, ready to go programs in a session.
- ❖ Hold training programs for practitioners on program design tools and techniques. Add another session--develop consensus building and future policy.
- ❖ Instead of national--series of regional meetings (greater input and ???). Also more stories collected.
- ❖ Trainer format for regional meeting. More training and definitions of good, better, and best--how this relates to program development and efficiency. How you use it--what level do you really need of good, better, best?
- ❖ Consistent message and materials and delivery of message.
- ❖ Provide seed money for innovative projects and proven projects. Promote collaboration on similar projects and programs.
- ❖ Get the website more meat, not enough to analyze. Promote dialogue of users of these programs who are non-educators. What are their thoughts?
- ❖ Provide examples of how you can do a best management practice for a project you will only do once. You won’t be able to benefit from your own evaluation.
- ❖ Hold a future conference. Put model programs on the website. More networking opportunities. Link the website to library systems in order to link this database to a larger audience.
- ❖ Sessions on types of levels of evaluation and evaluation theory. Sessions on creative v. critical thinking to expand perspectives of educators.
- ❖ Team this conference up with “Tools for Non-Formal Educators”--just developed nationally.
- ❖ The term theory scares people.

C-3

- ❖ Tighten definition of good, better, best from the get-go so we don't spend so much time floundering. Due to lack of clarity, we're unsure of where to go next. Maybe this reflects a growth process for our profession.
- ❖ More discussion on how to reach "influentials." More definition of "influentials." Invite influentials and ask them. More discussion on reaching media.
- ❖ Get agenda out before the symposium. Have BEP II in Langston U/Oklahoma State U.
- ❖ Integrate learning from other education disciplines that've experienced similar struggles in articulating education goals. Don't reinvent the wheel. Maybe other professions have been there, too.
- ❖ Invite Doug Mackenzie. Mohr to another one.
- ❖ Make reasons why we want to do this clearer to web viewers.
- ❖ Take critical look at social marketing--if it's a good approach, make resources available. Take a critical look at BEPs.
- ❖ Off to a good start, but a long way to go. Publicize/link to websites where academic research can be found quickly.
- ❖ Provide PPTs in advance of presentations on website. Short course on education theory for "accidental educators." Could provide direction and validation and ability to perfect approaches.
- ❖ Help for topic experts who are called on to teach. Explore connections between fields of social psychology, marketing, education, group processes, and citizen involvement.

C-4

- ❖ Symposium that includes target audiences to provide feedback on their experiences with each described practice.
- ❖ Boundary workshop on water outreach between Canada and the U.S.
- ❖ Educational practices will not work in all cultural audiences. They need to have more input (cultural issue). Different culture audiences require different BEPs.
- ❖ In future distribute fragrance-free pens.
- ❖ Maintain a dialogue on the website for questions, sharing of ideas, or announcements.
- ❖ Focus on value--add programs for diversity. Use us as resources to identify key resource people for this topic.
- ❖ Post a simple list with hotlinks to successful outcome based project. Don't bury it in a bunch of academic clutter.

C-5

- ❖ Success must equal outcome of cleaner water, not numbers contacted, etc. Success equals a permanent change in behavior.
- ❖ Funding needed for long-term evaluation of changes achieved. Continue to emphasize documenting impacts, especially as a way to convince resource managers of value of education as a tool. (Give us more examples!)
- ❖ Give this group an opportunity to review changes made to website before going public. Email URL and password to participants.
- ❖ Consider information about education theory/learning styles on website--simple, understandable, applied.
- ❖ Develop evaluation templates.
- ❖ Tribal colleges are not represented--encourage more diversity.
- ❖ Bringing in people involved in social movements and environmental justice.
- ❖ Examine the consequences of bringing a sociological focus into water management when funding and time are already limiting.
- ❖ Bring education and sociology into the process, not us doing everything.

C-6

- ❖ Next year's conference should be at a spa or natural area. Immerse us in water, water, water!
- ❖ More work on website--expand definitions, examples of BEPs, assistance to research search engines, and examples of methods of conducting search strategies for improving results to narrow searches.
- ❖ Education theory--brief primer for natural resource professionals (on website?). Who's Dewey? Gardner? Others? What did he/she contribute to learning theory? Why is this important? How do we apply this to our water education?
- ❖ Schedule more time and space for poster viewing sessions.
- ❖ More networking time--scheduled or during the day rather than at the end.
- ❖ Protein at breakfast!
- ❖ Consider regional BEP conferences that provide training to water professionals from Extension, SWCD, and state and local agencies. Have examples of good/better/best BEPs and have participants determine why this will lead us to criteria/standards.
- ❖ Establishment of regional centers to disseminate information once the information is ready. The term BMP is behind the times, isn't it? Shouldn't BEP follow?

How to Encourage Resource Submissions on the Website?

D-1

- ❖ Call for resources in Journal of Ext. and other journals (Ed. Soil and Water, etc.).

Contact:

1. State Association for Environmental Education
2. Informal Educators
3. City Water Department and Associations, American Water Works Association, and Rural Water Works Association.

- ❖ Links to other educational websites. Work with University, School of Education and Natural Resources, and Environmental Educations Schools in group projects to use website resources.
- ❖ Make criteria and expectations very clear. Have State coordinators emphasize career ladder benefits. Build dossier and curriculum vitae.
- ❖ Go outside extension method. Many people in our state won't go through the extension to submit. Work with EE organizations and have a booth at conferences to advertise and bring publications to share.
- ❖ Extension monitors, solicits, facilitates getting groups in state to submit--reverse process.
- ❖ Incentives or prizes (money) for submissions--memory stick computer, posters, curricula, etc. Maybe something as simple as having their name picked to be the submitter of the month. Or a prize certificate for the "best" submitted project.
- ❖ Design a survey to determine gaps and challenge submissions to address gaps.
- ❖ Work through list serves.

D-2

- ❖ Develop strategy for submissions, BEP submissions relationship to existing websites.
- ❖ Identified resource to keep website updated over time. Website should be developed during the workshop/conference in order to become one of our significant resources.
- ❖ Send letters to Educators to invite them to submit especially in areas where there are gaps.
- ❖ Get feedback from end users of programs.
- ❖ It must be easy to submit! Allow you to edit entire submission easily before final submission.
- ❖ Make a Thank-You-Box to tell you what number your submission was.
- ❖ Personal note of thanks/recognition from Webmaster.
- ❖ Pop-up box telling you what other submissions are in the database that are similar to what you submitted.

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- ❖ Pop-up box to automate an email to send a request that will be sent to colleagues to ask them to submit a resource to the database.
 - ❖ Comment/Thank You box for submission so people can tell you it worked for them, too.

D-3

- ❖ Make direct invitations to key individuals (more effective to target busy people).
- ❖ Use existing list serves to give monthly update of topics/submitters recently added.
- ❖ Consider juried process v. catch-all. (We like boutiques, not Wal-Mart). Make submission easy and fast. Target specific gaps in literature.
- ❖ Another search category (scholarly research, program descriptions, books, scripts). Encourage more urban submissions via broader target audiences--need for rural, too.
- ❖ Explore overlays with US, EPA, NPS education coordination. Offer a free gift for submitters or a discount to BEP II Symposium. Market the website in general to get more submitters. Make it a mandatory requirement for grant recipients, e.g. CSRES, EPA, other feds, Watershed Academy, etc.
- ❖ Clarify goals and value of submission: "What's in it for me if I submit?" Who will this potentially reach?
- ❖ Make it clear what kinds of submissions you want--what kinds of programs? Materials? Everything related to water or specific areas? How far out will this go? Are there limits (windsurfing, water references in the Bible, water park programs)?
- ❖ Policies needed relative to commercial products. Clarity in what is being sought and why.

D-4

- ❖ Continuing Education credits. Make site easier to navigate (didn't find button to submit resources).
- ❖ Pre-submission review by peers. Involve people in the content/education group as reviewers for the website. Emphasize importance of submitting.
- ❖ Feedback to submitters about quality and quantity of visits to their submission.
- ❖ Marketing of site to others. Link to research on content issues like "meth labs."
- ❖ Reduce the number of data entry cells for submitting--how about a place to insert you name, the project, and a hot link.
- ❖ Link to the resource sources--State programs, etc.
- ❖ Create a space for highlighting programs or where folks can suggest that a resource should be added.

- ❖ Identify clubs/organizations, universities, businesses, agencies, etc. and send announcements requesting they submit their resources. Distribute announcements to customers or constituents.
- ❖ Have a way to submit ideas, templates that others could adapt to their local context.
- ❖ How will you control for quality of resources? Will there be a physical library of resources?
- ❖ Make submission as easy as possible, including mailing in resources.
- ❖ Need a way to reference sources for materials to give credit.

D-6

- ❖ Record hits on individual resources and make available to authors. Include email contacts to author of people who download materials. Call individual and request materials.
- ❖ Offer opportunities for peer review abstracts. Offer opportunities for peer reviewed publications.
- ❖ Incentives (money, movie tickets, pencils).
- ❖ Subscription to update about new materials.
- ❖ Professional recognition/graduate credit for submission. Free credit for next year's conference.
- ❖ Bulletin board of submissions--main ideas, titles, sharing. "Ask the expert".
- ❖ Break submissions into more detailed/defined categories and divide into youth-adult categories. Refine "search" so that adult materials/sources don't come up when you search for youth resources, etc. Educator-parent-general citizens-industry-resource professional.
- ❖ Have author's email included if interest in contacting them/or other means of contact.

D-7

- ❖ Provide categories--practices, strategies, applies theory, publications, courses, etc. Collect examples (Show us what you want!) from JOE and other professional applied education journals.
- ❖ Contact information for water resource professionals (by state or region).
- ❖ Keep submissions simple!