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MAXINE GOODMAN LEVIN
COLLEGE OF URBAN AFFAIRS

Cleveland State University

Prepared for:
Lake Erie Protection Fund

Project Director:
Wendy Kellogg, Ph.D.

Project Team:
Erica Methany
Mike McGoun
Levin College of Urban Affairs

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**Economic and
Fiscal
Aspects of
Coastal and
Watershed
Stewardship
Practices:
Final Report**

150-210-13

RESEARCH PROJECT PURPOSE AND DESCRIPTION

This report provides the results of a study to identify the current status of information and training in the Lake Erie basin concerning the economic and financial benefits of coastal and watershed stewardship practices. The project focus was developed as a result of the market study and needs assessment of coastal and watershed training for local decision makers conducted for the Ohio Coastal Training Initiative partners (ODNR Coastal Management, NOAA/ODNR Old Woman Creek, Ohio Sea Grant). That study revealed land use/infrastructure and economic development aspects of coastal and watershed resources management as a most important “gap” in information available to local decision makers and a key knowledge need. The current project followed up on these aspects, as a first step in determining the knowledge base and expertise in the Lake Erie basin regarding the topic focus, identifying needs for applied research on the topic, and identifying opportunities for partnerships in outreach and assistance to local decision makers.

Local decision makers (elected officials, planners, engineers and economic development practitioners) at the county, municipal and township level are responsible for improving physical, social and fiscal conditions in their communities. These decision makers affect coastal and watershed resources through land use, infrastructure, and economic development decisions. Their decisions are often key to protection of ecosystem features, including riparian corridors, aquifer recharge areas, riparian and isolated wetlands, aquatic and terrestrial habitat, coastal dune and bluff areas, coastal wetlands and estuaries. Because of their responsibilities, local decision makers are key in achieving many objectives of the various organizations working on coastal and watershed issues in the Lake Erie basin. Unfortunately, these officials may tend to undervalue ecological systems, in that they often view environmental quality as a source of expenditures, while not fully appreciating the ecological services that such systems provide and the economic and fiscal benefits (and cost or risk avoidance) that accrue from healthy ecosystems.

This project is based on the hypothesis that local decision-makers, because of their charter and statutory obligations, will be receptive to information regarding the economic and fiscal benefits and costs-avoided of watershed and coastal stewardship practices.

This information can thus be a lens through which local decision-makers can be informed more fully about ecosystem stewardship more generally. The need for a more systematic understanding and integration of management of ecological and landscape management issues with management of fiscal accounting in governments has recently been documented through other studies, and motivates this current research project.

Economic and Fiscal Benefits of Stewardship Practices

Measurement of the economic value of natural resources and ecosystem services has received much attention in recent years in both academic literature and in federal environmental protection and natural resource management agencies. The literature organizes the types of benefits and costs avoided into key valuation concepts that will likely have varying relevance for local officials. Cangelosi (2001) frames economic value of natural capital and system services using three aspects: whether the value is articulated through the market or through non-market mechanisms, whether the resource provides direct use or has a non-use (or existence) value, and whether the resource has extractive and/ or in situ services (where the value accrues without disturbing the function through use). Hickling (1993) identifies five categories or levels of ecological benefits (in this case to watershed restoration): sustainability benefits, avoided costs, use benefits (together constituting goods and services for which people will be willing to pay), and direct economic development benefits, and indirect and induced economic development benefits (or the sum of the benefits or impacts resulting from public and private capital and operating expenditures). Costanza, et al (1997) characterizes the benefits of ecosystem services as the “benefits human populations derive, directly or indirectly from ecosystem functions.” Some of these benefits are directly economic; others are indirectly economic or fiscal.

In this study we are particularly interested of the relevance of these concepts and methods of valuation for local public jurisdictions and focus on the current knowledge base communicated to local decision-makers through formal training and informal outreach programs in the Ohio Lake Erie basin.

Definitions

For the purpose of this project, “ecological stewardship” was defined as the long-

term nurture and restoration of ecological function and assets, which implies practices to live off interest, not deplete ecological/resource capital. Examples of stewardship might include land use management practices such as headwater area conservation, floodplain regulation/protection, nodal or cluster development subdivisions, and mixed-use developments; land management practices such as erosion control, reduction in impervious surfaces, and biodiversity management; and water management practices such as institution of best management practices at the site level.

“Economic benefits and costs avoided” included the following concepts:

- **Use benefits:** economic, health or quality of life benefits resulting from direct use of an ecological resource or amenity
- **Non-use benefits:** economic, health or quality of life benefits resulting from the existence of, but not direct use of, an ecological resource or amenity
- **Option value:** value people place on a future ability to use ecological resources; willingness to preserve an option, the future value of something
- **Fiscal costs avoided/savings:** the monetary costs saved to humans due to ecological services or avoidance of risk/hazards that might result in added costs
- **Ecological capital:** stocks of natural resources that constitute and sustain the function of ecological systems
- **Ecological or ecosystem services:** the functions inherent in ecosystems that provide an economic, health, or quality of life benefit to humans (and all other living things)

“Training” is defined as any formal exchange of technical or managerial information designed to enhance work performance or improve the status of a natural or human system. It includes events such as instructional courses, educational events or shared learning experiences that allow coastal and watershed decision-makers to interact with experts in the field while networking with other professionals well versed in coastal and watershed management issues.

“Local decision makers” include elected officials, planners, engineers and economic development practitioners) at the county, municipal and township level, major business enterprises such as marina operators, and large land owners who, by virtue of their decisions and actions, directly affect the status of coastal and watershed resources.

RESEARCH DESIGN

The project methodology is designed to identify and assemble existing training opportunities and training materials currently in use in the Lake Erie basin regarding economic and fiscal aspects of stewardship. These training opportunities and materials offered by training organizations constitute two important sources of information for local decision-makers.

Three methodologies were used to create this inventory: a review of relevant literature on economic benefits; a telephone questionnaire of current training providers in the Ohio Lake Erie basin; and a focus group consisting of staff in various educational outreach organizations that work directly with local decision makers.

Literature Review

The review of literature was completed between September and December 2003. The review consisted of two parts: academic and “think-tank” materials and practitioner-oriented materials. The results were assembled into a bibliography, a working draft of which was delivered to the Ohio Lake Erie Commission in the Interim Report for the project. The final version of the bibliography is available on-line at the Great Lakes Environmental Finance Center website: URL <http://urban.csuohio.edu/glefc/>.

In the more academic literature, we found a broad literature in economics, public administration, planning, regional studies and environmental management on the economic benefits of stewardship practices. Most of the studies focus on direct application in a specific context and the specific benefits that might be accrued in a given situation or community. Many case studies of efforts to quantify and otherwise characterize the economic benefits and fiscal savings from specific restoration, protection and pollution control activities. The literature review identified typologies of economic benefits and costs avoided and valuation methods:

- direct and observed (market prices and replacement costs for natural services)
- direct and hypothetical/predicted (contingent valuation and simulated markets/shadow prices)
- indirect and observed (travel cost and property valuation (hedonic price))

Types of economic benefits identified in the studies included enhanced land values from provision of recreational open space, riparian corridors and wetlands; enhanced private sector and sales tax revenues from coastal-oriented tourism and eco-tourism; enhanced income tax revenues through provision of quality of life amenities to attract new residents; enhanced tourism through protection of coastal habitat, recreation access and visual amenities; and enhanced tax revenues through protection of critical coastal and watershed aesthetic and ecosystem features as destination areas for regional tourism.

Cost savings identified in the literature included reduced drinking water treatment costs through protection of critical lands around reservoirs and source streams; lowered infrastructure and insurance costs through enhanced flood control through more integrative protection of flood ways, wetlands, riparian corridors, and coastal marshes; lower costs for storm water management through use of pervious pavement systems and regulation for conservation or low impact subdivisions; reduced cost to land developers for infrastructure and higher sale prices through use of conservation subdivisions; and lower costs for drinking water through protection of aquifer recharge areas. These results were combined with resource and management issues particular to the Ohio Lake Erie basin and were used to formulate a questionnaire given to training providers.

Various agencies' web pages were reviewed for practitioner-oriented materials regarding economic/fiscal benefits of stewardship. These included the Army Corps of Engineers, the National Sea Grant Program, the Coastal Coalition, numerous soil and water conservation districts, and the World Water Partnership. Curricular materials in hand at the Great Lakes Environmental Finance Center were also reviewed. These materials had been assembled during a previous study on the overall coastal management training market in the Lake Erie basin conducted for Ohio Department of Natural Resources, Ohio Sea Grant, and NOAA (See URL.. <http://urban.csuohio.edu/glefc/publications.htm> for the reports for this project)

The resources identified through the literature searches were organized into a matrix format according to resource topic (wetlands, greenways, erosion, etc.) and type of economic/fiscal benefit (infrastructure cost reduction, increased tax revenue, increased property values, tourism expenditures, etc.) This format was used to identify "gaps" in the

search and in the literature. Results from this summary were also used to organize the summary materials to be presented at the focus group/workshop session.

Questionnaire

The purpose of the questionnaire was to identify current training opportunities existing in the Ohio Lake Erie basin that focus on or include economic aspects of stewardship practices. Potential Respondents were identified using the database assembled for the GLEFC previous training market study. Thirty-five organizations participating in that study had indicated training sessions or materials related to economic or fiscal aspects of coastal management. From initial contact we found that 10 of these organizations were no longer delivering this information, most often because the person who had given their training sessions had left the organization. Through the course of administering the questionnaire, an additional 10 organizations with relevant training topics were identified. From this population of 35, we completed 19 questionnaires. The organizations participating in the study included formal training/educational outreach organizations: federal, state and regional staff members; non-profit organizations, and private consultants actively engaged in training and outreach to local decision makers.

The questionnaire was administered using a telephone interview of training providers. We contacted potential respondents and secure their consent to participate in the study. The questionnaire was sent to the respondent via fax or email to provide opportunity for the respondent to review and answer the questions. During the initial contact, we scheduled a telephone date and time, and one of the project team called the respondent back, retrieving their answers over the telephone. This method allowed the respondent to answer questions more accurately, and allowed the research team to expand on questions a bit, get more information on open-ended questions during the interview.

The respondents were asked questions focused on the economic and fiscal aspects about the types of services provided (training, materials and technical assistance), the training topics offered, their target audiences, the level of interest among training participants across a variety of topics, the kind of technical assistance provided, any non-

economic (ecologically-oriented) training and education services offered, and the needs of the organization to deliver its training more effectively.

The results of the questionnaire were tabulated using spreadsheet software.

Focus Group

A focus group of staff from organizations that interact with local decision-makers was held in the last phase of the project. Invited participants included all those who had completed the survey and staff from a set of what we call “intermediary” organizations—which may not have formal training programs, but who interact with local decision makers and provide technical information and assistance on coastal and watershed stewardship practices.

A focus group work session is an interactive session where a small group of similar participants (usually 8-14) are engaged for several hours in an exchange of information and ideas. The purpose of the work session is to introduce topics, engage participants in thinking through these topics regarding their own experiences, responsibilities and actions, and elicit opinions and ideas regarding the implications of the new knowledge.

The focus group for the current study had several purposes: to convey the results of the literature search and questionnaire; to collect data regarding their perceptions of the economic and fiscal aspects of stewardship based on their interaction with local decision makers; to ascertain their views on the opportunities for enhanced curriculum, partnerships and outreach activities in the basin; and to ascertain their perceptions about the current needs of local decision makers and the types of educational and training systems to which they would respond.

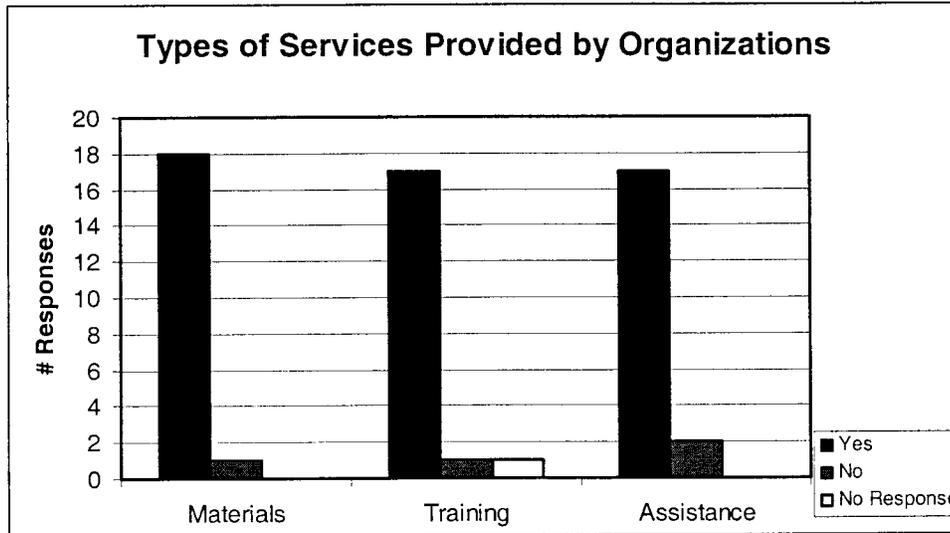
The focus group session consisted of a power point summary of the literature review and questionnaire results. Next a presentation by a local non-profit organization staff representative was given. The organization, consisting of local governments and regional agencies in a northeast Ohio watershed, focuses on economic and fiscal aspects of watershed stewardship. Finally, the structured discussion followed, and was based on a question protocol developed specifically for this project. The protocol was based on the review of academic and practitioner-oriented literature and the results of

the telephone questionnaire. The session lasted three ½ hours and was facilitated by the project director. Participant comments were recorded by hand on a newsprint flipchart and real-time note taking on a laptop by project staff. Twelve participants represented local and regional planning, natural resource and economic development agencies and several non-profit organizations. Their professional careers ranged from 4 to more than 25 years, while the median time in practice was 12 years.

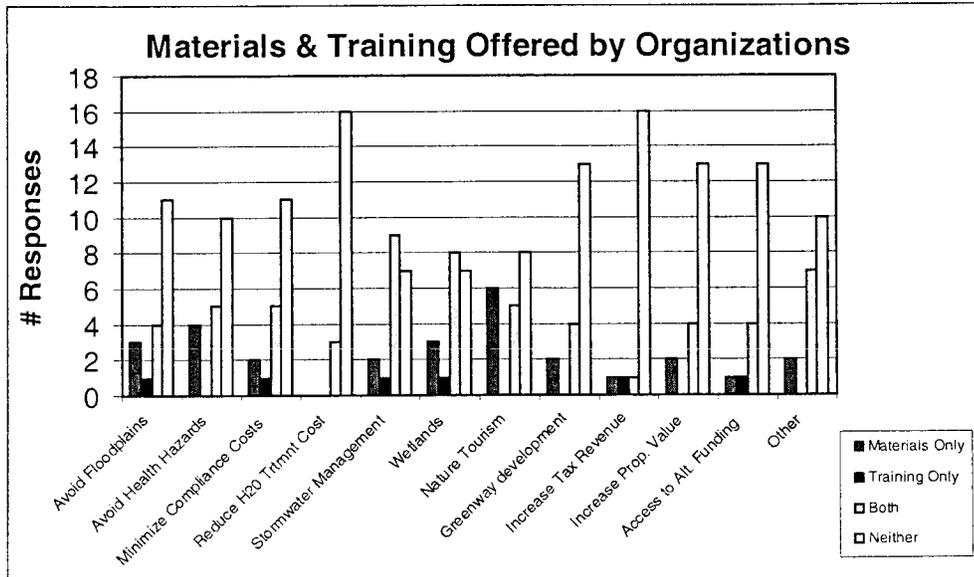
RESULTS

Questionnaire

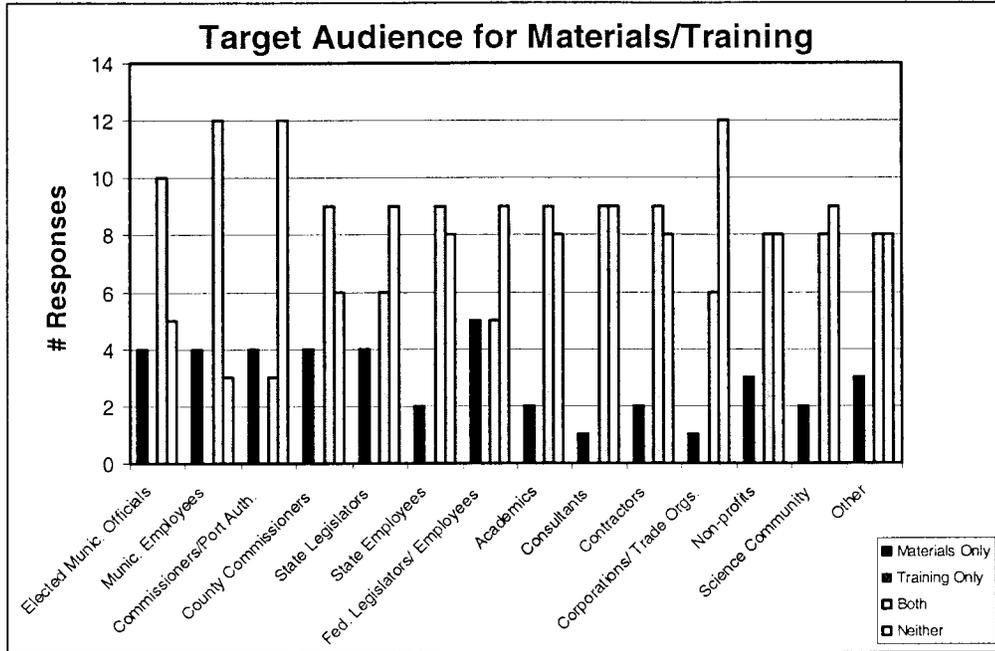
The following charts summarize the responses to the questions given to training providers. Does your organization provide any of the following type of service regarding the economic, financial, or fiscal value or benefits of coastal and watershed stewardship?



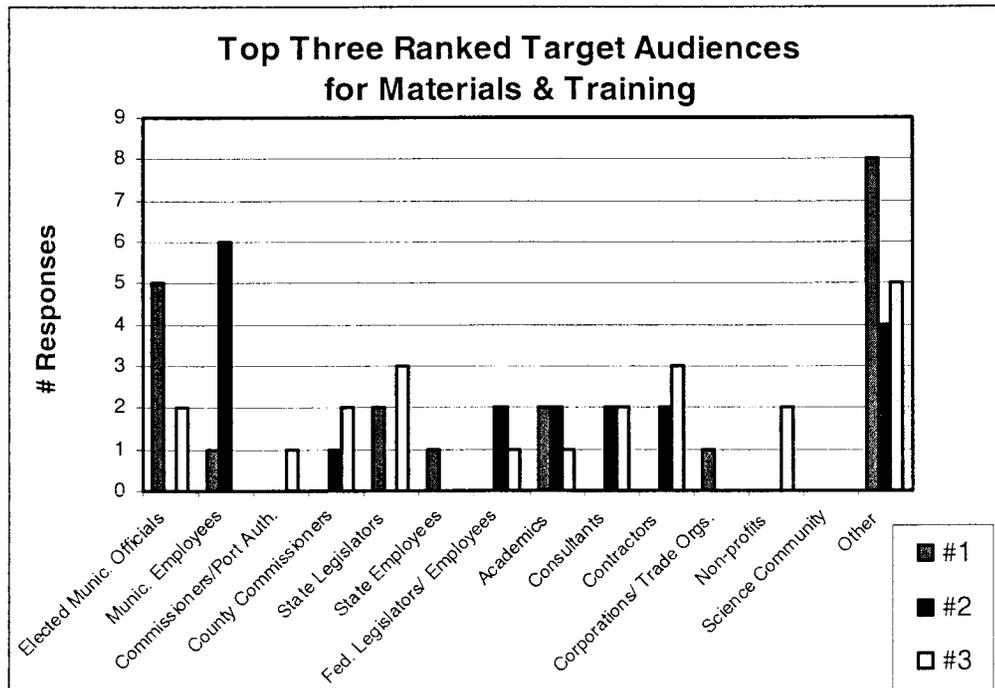
Regarding any informational/educational materials your organization distributes, (either in paper or on-line), or training courses your organization may offers, please indicate the topics covered by your organization. (Remember, we are focused on the economic, financial, or fiscal value or benefits of these aspects):



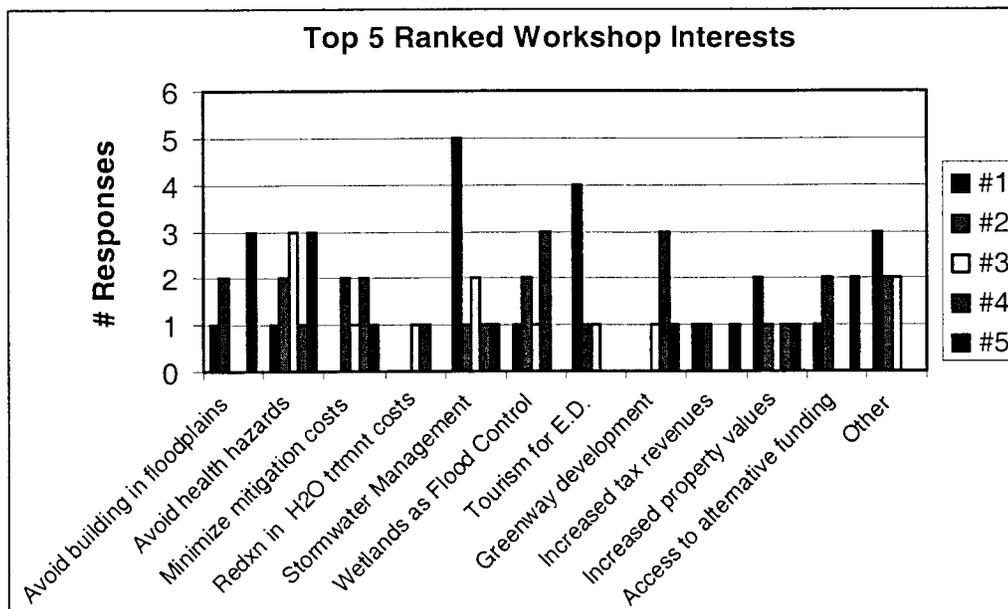
Who are the target audiences or participants for your informational materials and/or training programs? (Please check all that apply).



Who are the top three target audiences from the list above?



To what kind of economic, financial, or fiscal value or benefits have participants in your workshops been **most** receptive? Please rank 1 through 5, with 1 being the most important.

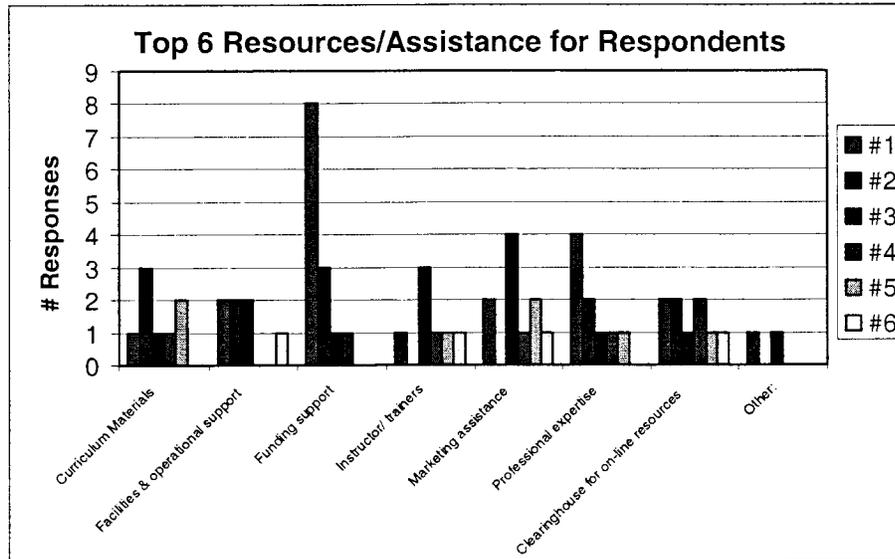


Do different types of workshop participants respond differently, in regards to economic, fiscal, and financial benefits?

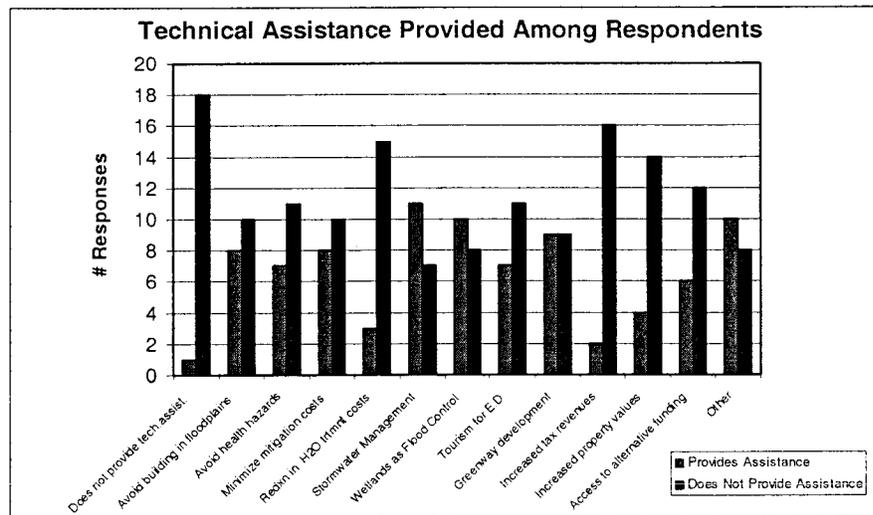
Response Summary

Not surprisingly, training providers noted that public sector participants tended to be more interested in fiscal impacts of regulations and the fiscal (tax revenue) implications of job creation, and development. Local decision-makers respond to compliance rather than voluntary investment in natural resources. Private land owners tend to be more concerned with privacy and use issues rather than economic aspects of regulation. And private businesses are more interested in how stewardship practices affect their profits. Overall, respondents reported that there was a growing recognition that the health of the lake and its tributary waterways were important for economic growth and quality of life characteristics in the basin. However, across the board there were comments that in their experience, decision makers had a short term view from which to judge benefits and costs, having difficulty seeing how long term economic or fiscal benefits outweighed short term costs.

What kind of resources or assistance would be of help to you in providing a better product regarding the economic, financial, or fiscal value or benefits to stewardship? Please rank from 1 to 6 in order of importance. (1=most important, 2=second most important, etc...)

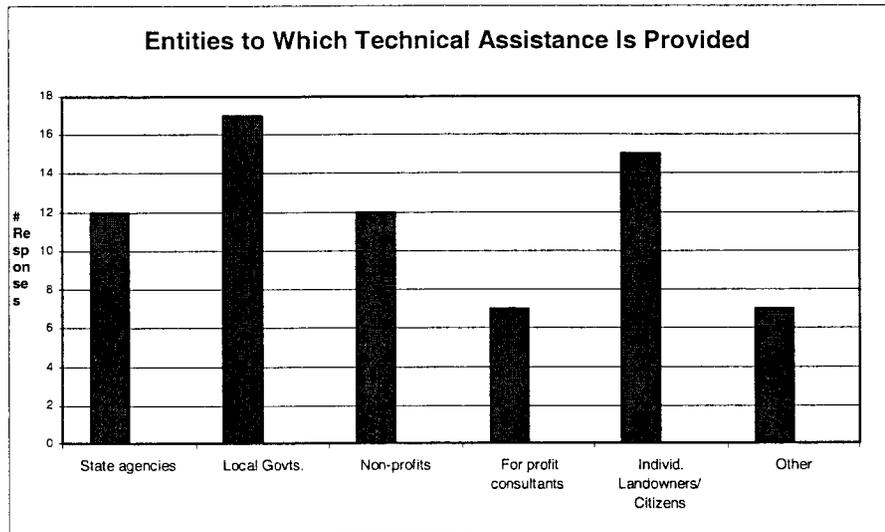


Regarding technical assistance your organization offers, please indicate the topics included by your organization; again, we are focused on the economic, financial, or fiscal value or benefits of these aspects:

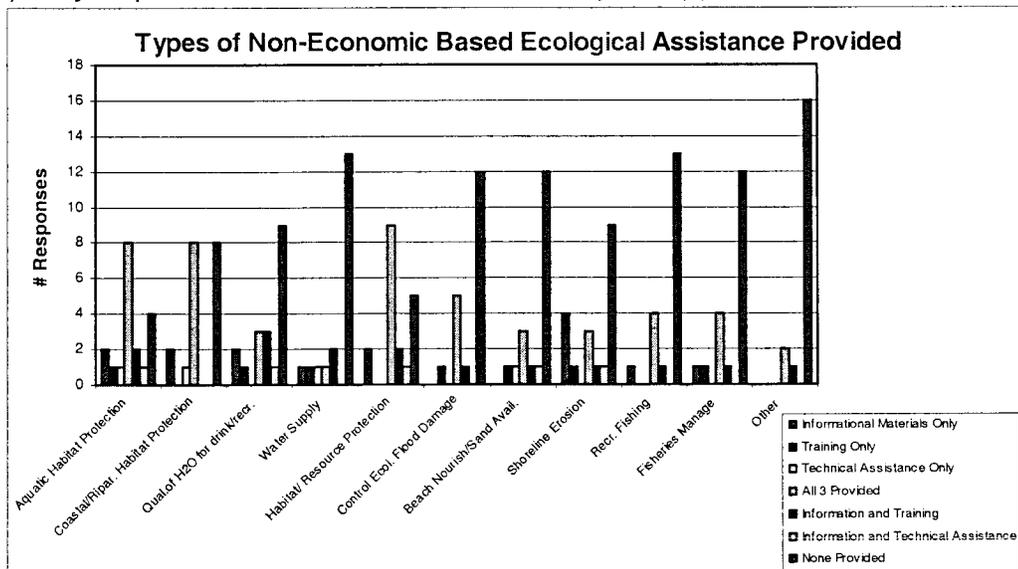


* 1 Respondent did not provide any technical assistance on any of these topics.

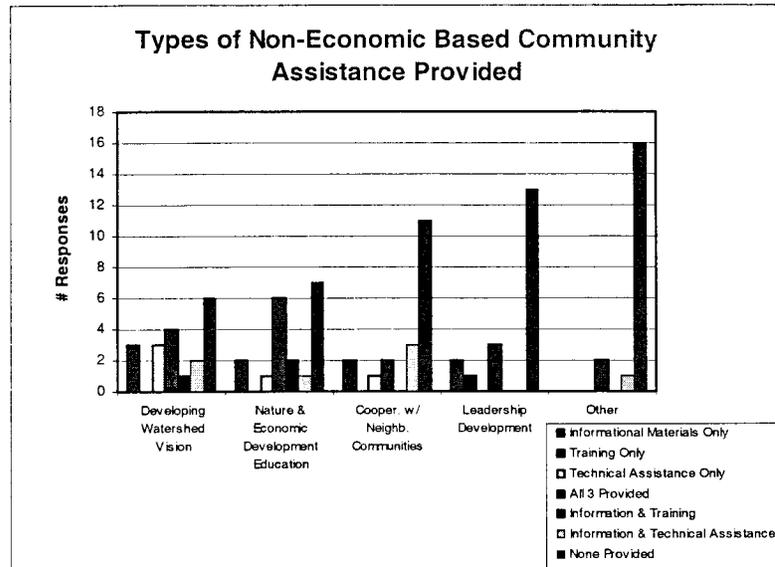
To which type(s) of entity do you supply technical assistance on the economic, financial, or fiscal value or benefits of these topics? (Please check all that apply):



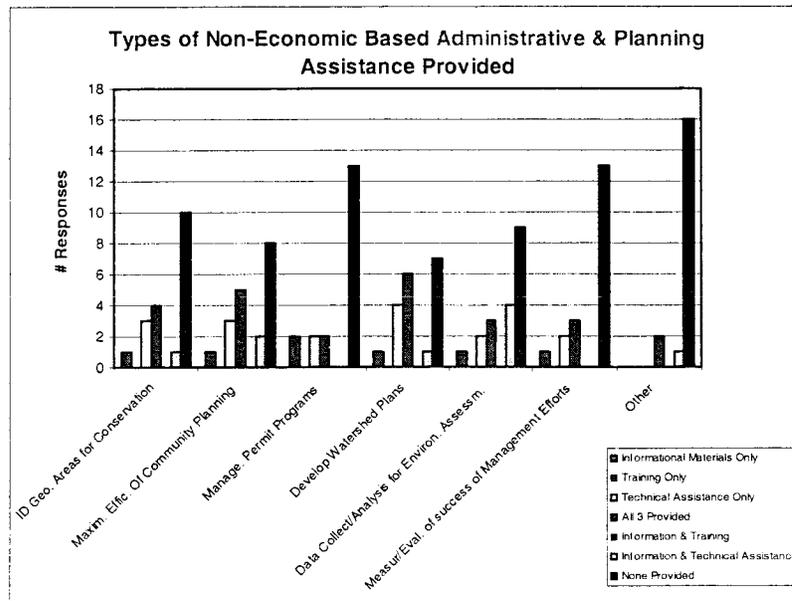
For what non-economic aspects of coastal and watershed stewardship (planning, land management practices and education of the general public or local decision makers designed to sustain the ecological function and human use values of a resource or place over time) do you provide services? Check as many as applicable.



Does your organization provide informational materials, training or technical assistance regarding any of the following non-economic aspects of coastal and watershed stewardship (planning, land management practices and education of the general public or local decision makers designed to sustain the ecological function and human use values of a resource or place over time)? Check as many as applicable.



Does your organization provide informational materials, training or technical assistance regarding any of the following non-economic aspects of coastal and watershed stewardship (planning, land management practices and education of the general public or local decision makers designed to sustain the ecological function and human use values of a resource or place over time)? Check as many as applicable.



Analysis

When we compare the matrix of literature (which suggests both economic benefits/cost savings and potential training topics) with the results of the training provider questionnaire, we see that relatively few of the training topics are covered in current market among our respondents. Most often training and materials being delivered are connected to surface water management. In particular, training and outreach around Phase 2 storm water management and flood control were the most frequently identified training topics. This is likely due to the recent regulatory requirements faced by local governments and the efforts among training and educational organizations to assist local governments in developing their storm water management plans for their NPDES permits. Greenways were another frequent topic covered, although the reason for this emphasis is less clear.

It is likely that there are other organizations that may be providing additional topics, and despite our constrained resources to identify these, we are confident that we have contacted the majority of organizations, and have a representative sample of those that may remain unknown.

An important question that remains is whether the “gaps” in training opportunities in the Ohio Lake Erie basin merely reflect the perceptions of providers (their assessment of what local decision makers need), exist as a result of a lack of demand overall, or truly constitute an unmet market demand. This question can only be answered by additional research that obtains input from local decision-makers on a sufficiently wide geographic scale and in sufficient number.

Technical assistance offered by responding organizations reflects an emphasis on surface water as well, with floodplains, storm water, and wetlands the most frequent topics. Greenways, tourism for economic development (7), avoiding health hazards (7), and identifying funding sources (6) ranked in a second tier for technical assistance. However, for most of the topics, fewer organizations provide TA than do. The respondents indicated that they most often provide technical assistance to local governments and individual landowners

In terms of the organizational needs of the training providers, respondents cited

additional funding, professional expertise and additional curriculum as their greatest training delivery needs. The need for professional expertise and new curriculum is not surprising, given that most of the organizations interviewed are primarily focused on ecological resources stewardship directly, and are now venturing into the economic and fiscal aspects of stewardship to respond more effectively to client needs. (This is not the case, however, for agents in the Ohio Sea Grant Program, whose mission has always been economic development and resource protection together.) The results do suggest an opportunity to improve training/educational outreach system around economic and fiscal aspects of stewardship through creation of some sort of partnerships or collaborative arrangements among organizations and with universities, which are a likely source of professional expertise and curriculum.

Focus Group Results

Focus group participants were asked questions about the following topics:

- In your experience working with local decision makers, what issues seem to be of highest priority in the areas of finance, economic and fiscal aspects of conservation and stewardship practices?
- What factors have the most influence in shaping the decisions and actions of local decision-makers?
- How important are weighing benefits and costs to their thinking or actions? What examples can you give
- What are the most effective ways to inform decision-makers?
- Given the curriculum OR SUBJECT gaps among organizations offering training and educational materials that we identified, what other types of training and materials do you think need to become available?
- Is it important to have local examples of the economic value or benefits of stewardship practices?
- What value can the Levin College add to the current status of knowledge among decision-makers about economic and fiscal benefits of stewardship?

In your experience working with local decision makers, what issues seem to be of highest priority in the areas of finance, economic and fiscal aspects of conservation and stewardship practices?

Participants suggested the following key issues:

1. Having financial tools that local jurisdictions and land owners can use for preservation; For example, participants suggested development of conservation tax credits, similar to

historic preservation, that might help non-profit organizations to preserve land or use of tax increment financing schemes to try and “capture the value” of watersheds.

2. Innovative land use practices that are legally defensible;
Participants suggested techniques such as land Pooling, where a group of landowners collectively band together towards a larger vision; and the need for ruling in courts upholding use of riparian setbacks as protection mechanism
3. Presence of a crisis-driven approach to decision making (reactive) rather than planning for change, which is in part based on a lack of understanding of economic value of resources and their protection.
Participants noted that local decision makers do not have an appreciation of the economic or ecological value of water-related resources, and only respond to a crisis that destroys or reduces that value or triggers real costs to respond. They agreed that when people in the Lake Erie basin see the lake, they perceive it is clean and that there is a lot of water, so what is the problem?

What factors have the most influence in shaping the decisions and actions of local decision-makers?

Participants offered these responses and suggestions for actions:

1. Level of knowledge about coastal and watershed issues
Participants noted that most local decision makers have minimal knowledge about coastal and watershed issues, so one needs to provide information that is very focused and accessible. Give information that makes the decision easy for them.
2. Dollars
Participants noted that “dollars are the bottom line for most decision makers” and that local jurisdictions to money. The participants suggested that receipt of state money in programs that local decision makers want, such as for transportation, should be tied to water quality protection and stewardship practices.
3. Bad publicity or a crisis
Participants commented that local decision-makers need to see an actual negative thing happening in their community, a crisis...that causes a reaction from them.
4. Aversion to risk
Local decision-makers are averse to risk, either because they are being fiscally prudent or to preserve their long-term political viability. New ideas are a challenge and they don't know if new actions will work out, if citizens will accept them.
5. Enforcement
Participants agreed that decision-makers respond to enforcement and it is needed to get their attention.

How important are weighing benefits and costs to their thinking or actions? What examples can you give?

Participants agreed that weighting benefits and costs are not the usual mode of decision making. Localities make economic decisions that are good for each locality, but may not be good for the watershed, which they do not take into account. Most decision-makers don't think about the impact or costs to the whole community and there are no institutional mechanisms or forums that let them do that. Most decisions are driven by the need for economic benefit because development is needed in the Ohio Lake Erie basin.

What are the most effective ways to inform decision-makers?

Participants suggested that the most effective way for senior decision-makers is through peer-to-peer exchange of information and experiences. They also suggested that bringing decision makers onsite using "fieldtrips" so they can see for themselves the effects of good or bad stewardship practices and giving them other site specific examples that they can relate to their own situation are key. If workshops are used, they need to be very focused and targeted to decision-makers' specific needs and constraints.

Given the subject gaps among organizations offering training and educational materials that we identified, what other types of training and materials do you think need to become available?

Participants suggested that technical assistance might be more critical than additional educational materials. As literature review suggested that studies have shown economic benefits, the appropriate task might be to "translate" these into more accessible information. This fits with their suggestion that peer-to-peer and on-site experience may be more important than workshops. They suggested formation of a technical assistance team that could be available to local decision-makers to help them articulate plans and strategies for local jurisdictions and other decision-makers to use.

Is it important to have local examples of the economic value or benefits of stewardship practices?

Participants suggest that local examples are critical, in part because decision-makers want to gain insight from experiences and strategies of others. They suggested that research needs to quantify the economic value of public actions, public service to protect land and water in the Ohio Lake Erie basin.

What value can the Levin College and other universities add to the current status of knowledge among decision-makers about economic and fiscal benefits of stewardship?

The participants suggested that the university could add value through primary research on economic benefits and developing case studies of either benefits or costs related to local practices. They suggest that the Ohio Urban University Program could take as a focus research issues to get data that can be used across the basin. The Levin College is as well respected as being impartial in providing information. They suggested that the college could facilitate interactions between individuals and organizations that don't generally get to interact, perhaps through research, student projects or the Levin Forum program. The college needs to have research and outreach to "pull in" Lake, Geauga,

Medina, Lorain and Summit county (regional urbanizing) communities to build knowledge and conduct outreach needed by them as a function of ex-urban or metropolitan planning. Finally, they suggested the university should document success stories of coastal and watershed stewardship.

SUMMARY

The results of this study suggest that further research should be conducted to identify the perceptions of local decision-makers and ascertain the true needs for inclusion as topics in the existing training, educational materials and technical assistance market. Additional research should also document the economic/fiscal benefits and costs to existing practices in the Lake Erie basin to provide case studies and examples of peer-to-peer approaches for local decision-makers. The results also suggest increased collaboration among training providers and educational institutions in the Lake Erie basin to focus on economic and fiscal aspects of land use change and coastal and watershed stewardship. Such collaboration might develop case studies or fact sheets of benefits and costs and might assemble the technical advisory network concerning economic benefits and costs that the focus group participants suggest would provide a useful service. One likely set of collaborators are between universities in the urban and rural university programs, which are both working with client audiences responding the land use change and impacts. Finally, universities and training and technical assistance providers should consider a regional or basin-wide forum on these issues, highlighting success stories in stewardship practices from which decision-makers can learn.

The results of this study will be presented at the May, 2005 conference of the International Association of Great Lakes Research. A paper summarizing the project and its results is being written for submission to the Journal of Great Lakes Research.

This report, the power point presentation used at the focus group session, and the bibliography assembled in the literature review are available at the web page of the Great Lakes Environmental Finance Center for review (URL <http://urban.csuohio.edu/glefc/>)

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Questions or comments regarding this research should be directed to Dr. Wendy A. Kellogg, Levin College of Urban Affairs, Cleveland State University (216-687-5265; wendy@urban.csuohio.edu)

INTERNET-BASED RESOURCE LINKS

USEPA National Center for Environmental Economics

<http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/homepage>

USEPA National Center for Environmental Economics

Publications page:

<http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Publications.html>

USEPA <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/InternetLinks.html>

link to environmental economics web pages

USEPA Water Efficiency Program

<http://www.epa.gov/owm/water-efficiency/index.htm>

Center For Watershed Protection

<http://www.cwp.org/>

Cuyahoga County Soil & Water Conservation District

<http://www.cuyahogawcd.org/sed&erosion.htm>

Erosion control fact sheets and info on the website concerning erosion and sediment control for construction sites and agriculture, including some information about economic costs of erosion control practices.

United Nations Environment Programme (UNEP)

<http://www.unep.org/unep/products/eeu/ecoserie/ecos11/ecos110.htm>

Environmental Trading Network. <http://www.envtn.org/>. Devoted to information on development and implementation of successful water quality trading programs and other market-based strategies for achieving healthy sustainable ecosystems

Economics of Erosion Control. Martha Herzog and Jon Harbor, Department of Earth and Atmospheric Sciences, Purdue University,

<http://www.eas.purdue.edu/geomorph/grbrres.html>;

National Oceanic and Atmospheric Administration's Coastal Services Center <http://www.csc.noaa.gov/training/>

Ohio Department of Natural Resources (Watershed Programs)

<http://www.dnr.state.oh.us/soilandwater/watershedprograms.htm>

Ohio Watershed Network <http://ohiowatersheds.osu.edu/>

Pennsylvania Organization for Watershed & Rivers

<http://pawatershed.org.waterhsed.asp>

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Economic and Fiscal Benefits of Coastal and Watershed Stewardship

August 5, 2004

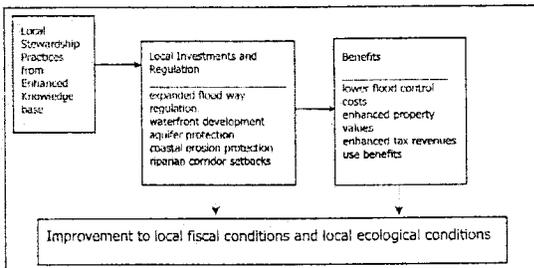
Funded by Ohio Lake Erie Protection Fund
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Wendy Kellogg, Principal Investigator
Mike McGoun, GLEFC
Erica Matheny, Levin College

Coastal and Watershed Stewardship and Local Decision Makers

- Generation of project
- Project focus
 - local decision makers
 - economic v. ecological benefits

Local Decisions and Resource Outcomes



Examples of Ecological Benefits

- Water quality improvements
- Habitat preservation
 - Aquatic
 - Riparian
 - Coastal
- Stream morphology and function
- Soil conservation

Stewardship Practices

- Ecological stewardship: long-term nurturance and restoration of ecological function and assets; living off interest, not depleting capital
 - Land use
 - Headwater area conservation
 - Floodplain regulation/protection
 - Nodal or cluster development subdivisions
 - Mixed-use developments
 - Land management
 - Erosion control
 - Impervious surfaces
 - Biodiversity management
 - Water management
 - Best management practices

Economic and Fiscal Benefits of Stewardship Practices

- Hypothesis
 - Local decision makers will be motivated by economic benefits of ecological stewardship in their decision making and knowledge thereof may change that decision making
- Project design
 - Literature review
 - Empirical research

Literature Review

- Objective:
 - Review peer-reviewed articles, government "think tank" reports, and books
 - To understand the kinds of economic studies that have been completed, the types of economic benefits and costs avoided these studies investigate, and the specific results of studies
- We reviewed dozens
- Bibliography will be available on web site
URL: <http://urban.csuohio.edu/giefc/>

Literature Review Summary

- Found a broad literature in economics, public administration, planning, regional studies and environmental management on the economic benefits of stewardship practices
- Most of the studies focus on direct application in a specific context and the specific benefits that might be accrued in a given situation or community
- Many case studies of efforts to quantify and otherwise characterize the economic benefits and fiscal savings from specific restoration, protection and pollution control activities.

Economic and Fiscal Benefits: Key Concepts and Definitions

- Use benefits
- Non-use benefits
- Option value
- Fiscal costs avoided/savings

- Ecological capital
- Ecological or ecosystem services

Key Concepts and Definitions

- **Use benefits:** economic, health or quality of life benefits resulting from direct use of an ecological resource or amenity
- **Non-use benefits:** economic, health or quality of life benefits resulting from the existence of, but not direct use of, an ecological resource or amenity
- **Option value:** value people place on a future ability to use ecological resources; willingness to preserve an option, the future value of something
- **Fiscal costs avoided/savings:** the monetary costs saved to humans due to ecological services or avoidance of risk/hazards that might result in added costs

Key Concepts and Definitions

- **Ecological capital:** stocks of natural resources that constitute and sustain the function of ecological systems
- **Ecological or ecosystem services:** the functions inherent in ecosystems that provide an economic, health, or quality of life benefit to humans (and all other living things)

Non-marketed Services with Economic Value Provided by Natural Capital and Flows

- Purification of air and water
- Formation, renewal and retention of soil
- Mitigation of droughts and floods
- Pollination of crops and natural vegetation
- Detoxification and decomposition of wastes

Value, Benefits and Costs: to Whom?

- Individuals
- Communities
- Entrepreneurs
- Local governments

Measuring or Assigning Value

- Direct and observed
 - Market prices
 - Replacement costs for natural services
- Direct and hypothetical/predicted
 - Contingent valuation
 - Simulated markets/shadow prices
- Indirect and observed
 - Travel cost
 - Property valuation (hedonic price)

What Kinds of Economic Benefits Documented in Literature?

- enhanced land values from provision of recreational open space, riparian corridors and wetlands;
- enhanced private sector and sales tax revenues from coastal-oriented tourism and eco-tourism
- enhanced income tax revenues through provision of quality of life amenities attracting new residents
- amenities such as greenways to improve quality of life perceptions leading to investment and higher income workers
- enhanced tourism through protection of habitat, recreation access and visual amenities
- enhanced tax revenues through protection of critical coastal and watershed aesthetic and ecosystem features as destination areas for regional tourism

What Kinds of Cost-savings?

- reduced drinking water treatment costs through protection of critical lands around reservoirs and source streams
- lowered infrastructure and insurance costs through enhanced flood control through more integrative protection of flood ways, wetlands, riparian corridors, and coastal marshes
- lower costs for storm water management through use of pervious pavement systems and regulation for conservation or low impact subdivisions
- reduced cost to land developers for infrastructure and higher sale prices through use of conservation subdivisions
- lower costs to drinking water through protection of aquifer recharge areas

Project Research

- A first step: describe the current market
 - As one source of information for local decision makers, what is the current status of training and educational outreach regarding economic and fiscal aspects of watershed and coastal stewardship?
 - Who provides training, on what topics, etc.

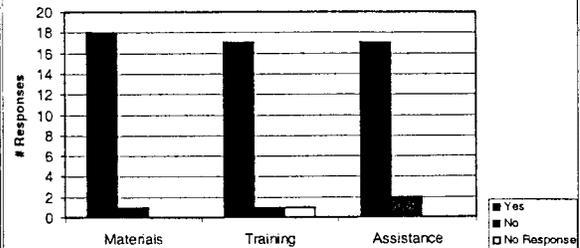
Project Research

- Methodology
 - Respondents
 - Drawn from GLEFC study
 - Range of organizations
 - 54% response (19)
 - Tabulated using spreadsheet
 - Questionnaire administered by telephone

Questionnaire

- Types of services provided
- Training topics offered
- Target audiences
- Workshop interest
- Technical assistance
- Non-economic training and education services
- Trainer organization needs

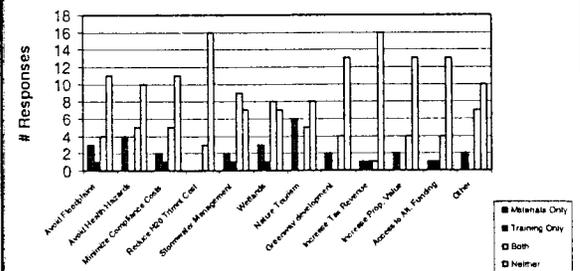
Types of Services Provided by Organizations



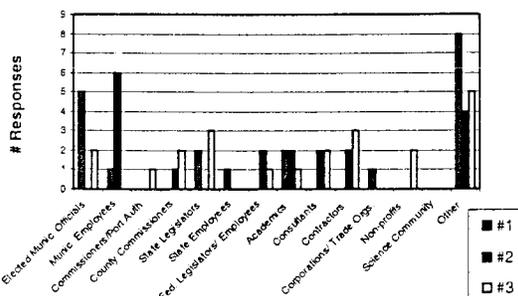
Types of Economic Benefits/Costs on Survey

- Avoiding hazards of building in flood plains
- Avoiding pollution hazards to human health
- Minimizing compliance and mitigation costs
- Reduction in drinking water treatment costs
- Storm water management
- Wetlands as flood control
- Nature-based tourism for economic development
- Greenway development
- Increased tax revenues
- Increased property values
- Access to alternative funding sources for capital projects

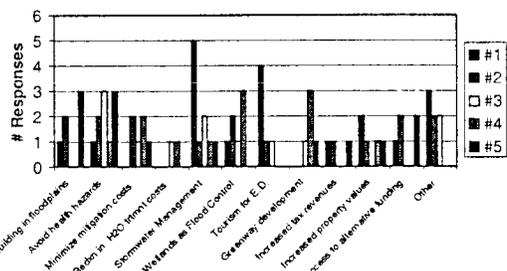
Materials & Training Offered by Organizations

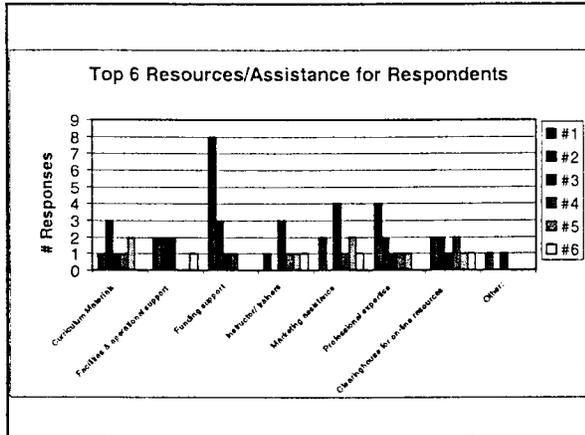


Top Three Ranked Target Audiences for Materials & Training



Top 5 Ranked Workshop Interests





- ### Analysis of Results
- Topics
 - Relatively few of our training topics are covered in current market among our respondents
 - To what extent are other organizations "under the radar" providing these?
 - Most often training and materials connected to surface water management; Phase 2 storm water management, flood control and greenways
 - Do "gaps" reflect perceptions of providers or lack of demand?
 - Organizational needs
 - \$, Professional expertise and curriculum: is there an opportunity there to improve training/educational outreach system?

- ### Final Project Reporting
- <http://urban.csuohio.edu/glefc/>
 - Interim Report to OLEC
 - Final Report to OLEC
 - Bibliography of Literature Review
 - Resources
 - Web pages for information on related topics
 - This power point presentation