

SUPPORTING COMMUNITY-BASED WATERSHED EFFORTS

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Over the last decade, the Environmental Protection Agency (EPA) has been promoting the adoption of a watershed approach as a means to more comprehensively address aquatic resources protection and restoration. One of the core principles of the watershed approach is partnerships. Supporting community-based watershed partnerships is also one of the major tenets of the *Clean Water Action Plan*. This emphasis on citizen stewardship gives those people who depend on the aquatic resources for their health, livelihood, or quality of life a voice in the decisionmaking process and a responsibility in the management of these resources. These community-based efforts have many and diverse needs for scientific knowledge and technical skills, some of which could be fulfilled by the wealth and diversity of expertise housed within universities. Public service is an integral part of many universities' missions. The public looks to universities to be active participants in their local communities. In addition to public service, universities are responsible for educating our future water resources professionals. These two responsibilities, public service and the innovative education and training of future water resources professionals, can come together through university service-learning programs in which faculty and students become partners and service providers of socially relevant research and expertise to community-based watershed efforts. University assistance to community-based watershed efforts can benefit communities, can enrich the education of our future water resources professionals, can be personally and professionally rewarding for faculty, and can make a tremendous difference in the health of our nation's aquatic resources.

HISTORY OF EPA'S SUPPORT FOR COMMUNITY-BASED WATERSHED APPROACHES

In 1991, nearly two decades since the passage of the Clean Water Act, EPA's senior managers were reflecting on progress made toward fulfilling the Act's goals, "to restore and maintain the chemical, physical, and biological integrity of the nation's waters." Assessment of the leading causes of water quality degradation illustrated that the "command and control" approach of the 70s and 80s, which emphasized

reducing pollutants from individual sources, yielded tremendous success. Yet despite billions of dollars of federal investments, the goal of fishable and swimmable waters remained elusive, and many barriers still needed to be overcome.

With approximately one-third of the nation's assessed waters still not fully meeting the clean water goals established by Congress (EPA 1992), it became evident that EPA's regulatory tools for reducing pollutants from point sources were not sufficient, by themselves, to meet the goals of the Act. The leading problems, reported by the states, included: siltation, nutrients, organic enrichment, and metals (EPA 1992). Many of these problems were largely attributed to diffuse sources of runoff from residential areas, city streets, construction sites, agricultural and timber lands. But polluted runoff was not the only challenge remaining. Changes in instream flows and temperature regimes and hydromodification, all of which contribute to habitat degradation and fragmentation, were also not being addressed through EPA's regulatory tools. Remaining problems were a byproduct of the way we lived, worked, played, and commuted. To overcome these more complex problems would require the commitment of local citizens who have a stake in the creeks, rivers, lakes, estuaries, and groundwater flowing through their neighborhoods and their communities. EPA's managers began searching for an alternative paradigm.

Examining some of the Agency's own geographically-targeted efforts, like the Chesapeake Bay, Great Lakes, and initiatives such as the Wellhead Protection, and National Estuary Programs suggested that a flexible approach tailored to the local conditions could more effectively solve the nation's remaining aquatic resources problems. For example, efforts begun in the late 1980s in the Chesapeake Bay highlighted the benefits of taking a more comprehensive and cooperative approach to natural resources problems in a watershed. A broad-based coalition of concerned citizens, academicians, and government officials concluded that if all the sewage treatment systems in the Bay were brought into compliance with the law, citizens would still be unable to harvest oysters because of pollutants from diffuse or nonpoint sources such as septic systems and polluted runoff. Only through

coordinated efforts of the public and private sectors that drew upon both mandatory and voluntary controls would these important natural and economic resources be restored.

Thus began EPA's transition from a national, program-by-program focus to a more holistic, community-based watershed approach, first articulated in an internal Office of Water document, *Watershed Protection Approach Framework* (EPA 1991). This paradigm shift was intended to more comprehensively address cumulative impacts to aquatic resources and to prevent further degradation by tailoring and integrating efforts within individual watersheds. The following core principles guide the Watershed Approach:

Geographic Focus – *Activities are focused within the hydrologic boundaries of watersheds.*

Partnerships – *In many cases the solutions to natural resources problems depend upon voluntary actions of those who live, work, and play within the watershed. Consequently, the diversity of people that are most affected by management decisions, often referred to as stakeholders, need to be involved throughout and shape key decisions. Watershed partnerships comprised of the breadth of stakeholder interests, with the help of government agencies, academia, private businesses, and others, need to be involved with the assessment, planning, and implementation of solutions.*

Because water is a resource of the commons, a resource in which citizens with diverse viewpoints have a stake, better policy decisions can be made through democratic deliberation that includes a broad citizenry (Ingram 1998). The democratization of decisionmaking is an important element of the watershed approach. This ensures that better policy decisions are made because environmental objectives are well integrated with stakeholders' objectives for economic stability and other sociocultural goals.

Sound Management Techniques – *Collectively, watershed stakeholders employ an iterative decision making process whereby the natural resources conditions are researched and assessed, plans are developed, priorities are identified, and solutions are implemented. Environmental, economic, and social objectives are integrated into the decision making process.*

To help states integrate their efforts on a watershed level, EPA subsequently published *Watershed Protection: A Statewide Approach* (EPA 1995) and *Watershed Approach Framework* (EPA 1996). EPA recommended that states adopt a comprehensive,

ecosystem-based approach to address the very intertwined natural resources issues facing society, and stressed that solving remaining natural resources problems requires the involvement of local governments and local citizens.

With the release of the *Clean Water Action Plan* in 1998 (EPA and USDA 1998), EPA teamed up with nine other federal natural resources agencies to better coordinate and align efforts to support watershed approaches. Supporting community-based watershed partnerships is one of the major tenets of the Plan. This emphasis on citizen stewardship gives those people who depend on the aquatic resources for their health, livelihood, or quality of life a voice in the decisionmaking process and a responsibility in the management of these resources. Through such active and broad involvement, the watershed approach can build a sense of community, reduce conflicts, and increase commitments to the actions necessary to meet societal goals.

THE GROWTH OF GRASS ROOTS GROUPS

There has been a recent surge in bottoms-up, grass roots stakeholder groups dedicated to addressing aquatic resources concerns. More than 75 percent of the watershed partnerships in Conservation Technology Center's National Watershed Network have formed in the last ten years (Griffin and Gannon 2000). Today, there are more than 3,000 organizations dedicated to improving their local aquatic resources, catalogued in EPA's *Adopt Your Watershed* a geographically referenced database <<http://www.epa.gov/owow/adopt/>>. The newer groups may begin by focusing their fledgling efforts on a particular stream or a particular concern, rather than an entire watershed. As knowledge and capacity of these grass roots partnerships grows, they adopt more comprehensive, watershed, or possibly even basin-wide, approaches. Some are successfully bringing multiple stakeholders, with diverse viewpoints, to the table. Others need information or education on how to bring diverse stakeholders together to develop open, participatory decisionmaking processes that share power and contribute to the democratization of water resources management (Foster 1998). These grass roots efforts clearly have many and diverse needs, some of which could be fulfilled by the wealth and diversity of expertise housed within universities.

THE CASE FOR UNIVERSITY SUPPORT OF COMMUNITY-BASED WATERSHED EFFORTS

Why should water resources professionals employed by universities and other institutions of higher education support these locally-led watershed efforts? The answer is simple. Public service is an integral part of many

universities' missions. The public looks to universities to be active participants in their local communities. Integrating more university knowledge into community-based watershed efforts could make a tremendous difference in the health of our nation's aquatic resources. The American people will benefit through cleaner waters for swimming, drinking, fishing, and other important uses. Clean and healthy water can benefit the economy. In addition to the travel and tourism industry, many sectors of our economy – agriculture, real estate, commercial fishing, and manufacturing – rely on clean water to operate and ensure productivity (EPA 2000).

Other professions engage in providing “socially responsible” services. For example, physicians and medical students offer pro-bono services at community health clinics, and law professors and law students provide pro-bono services at legal clinics (Ingram and Schneider 1998). Grass roots watershed groups need the expertise and skills of water resources professionals to be able to effectively partake in the participatory decisionmaking processes that can impact the future condition of their watersheds. The intent of these participatory decisionmaking processes is to give all stakeholders a voice in the decisions and policies being made that can affect their well-being. Yet these grass roots groups do not have the same kinds of resources available as the more powerful interests that are sitting at the same “decisionmaking table.” Ingram and Schneider (1998) suggest pro-bono services provided by water resources professionals could be a means for “socially responsible scientists” to even the playing field and assist with the greater public interest which is at stake during group decisionmaking processes that are affecting policies.

In addition to public service, water resources professionals employed by universities are responsible for educating our future water resources professionals and are responsible for the “incorporation of new tools and ideas into the education and training programs of their institutions to produce better prepared and more effective graduates” (UCOWR 1998). These two responsibilities, public service and the innovative education and training of future water resources professionals, can come together through service-learning programs in which faculty and students become partners and service providers of socially relevant research and expertise to community-based watershed efforts.

Because many community-based efforts are relatively new, some are entirely dependent on passionate volunteers and are operating on very small budgets. For these efforts to be effective in building integrated

watershed approaches, they need access to research and technical expertise in a multitude of disciplines. Local watershed practitioners recognize the value that students and faculty can bring to the table. The number one recommendation that emerged from the first Eastern Coal Region Watershed Roundtable, convened in 1999, was to promote integrating university knowledge, through service-learning, into local watershed partnerships (Lewicki 1999).

The more successful community-based efforts assemble a collaborative, interdisciplinary team to more fully understand the ecologic, economic, and social issues at play in the watershed and to take appropriate action. Depending on the nature of the goals of the community-based effort, the team could require individuals that have expertise in the areas of: hydrology, geology, biology, aquatic chemistry, civil engineering, limnology, sociology, anthropology, economics, education, communications, and facilitation and conflict resolution, to name just a few. Most, if not all, of these areas of expertise converge within universities. In this place-based paradigm, the scientist, or technical expert, serves as an advisor and educator to these civic efforts, rather than as the central decision-maker (Foster 1998).

Community-based watershed groups are not the only ones that stand to gain from university service-learning programs. University students embarking in water resources careers stand to benefit, too. Service-learning programs that support local watershed efforts can provide students a learning laboratory to experience first-hand the challenges and complexities of today's water resource problems. The incorporation of service-learning curricula into the education of our future water resources professionals will allow students to learn that to be effective in their future careers, they will need to have some familiarity with other disciplines. Service-learning can illustrate for future water resources professionals the importance of seeing the larger picture. Our future water resources professionals will need to recognize how other disciplines can contribute to the understanding of the intricate issues at play in the watershed and be able to collaborate with experts from other disciplines.

Effective collaboration requires strong verbal and written communication skills. Today's water resources professional must not only be able to communicate with other experts outside his or her discipline, but must also be able to communicate with the lay person. This is especially true in the current watershed management paradigm that demands active citizen participation in aquatic resources decisionmaking and management. Service-learning programs can provide students opportunities to learn how to communicate their

findings, results, and ideas to the average citizen as well as to professionals in other disciplines.

In brief, to solve our remaining water resources problems requires the teamwork of individuals with different skill sets willing to collaborate with and learn from one another. University service-learning programs can be instrumental in preparing the nation's future water resources professionals to operate and be successful within this framework.

WHAT'S IN IT FOR ME, THE FACULTY?

Perhaps you are still not convinced that adopting service-learning curricula is a worthy endeavor. You may be asking yourself, "*What's in it for me?*" This is often the first question we ask ourselves when we assess whether it is worth our time to take on new activities or responsibilities. I believe a service-learning program that supports community-based watershed efforts is worth your time in your role as faculty.

- It can be personally and professionally rewarding to assist communities that need and value your scientific knowledge and technical skills.
- By engaging your university in community issues, you can help to overcome a common stereotype that faculty are in an "ivory tower" and not interested in getting their "hands dirty" to address on-the-ground problems.
- Working with community-based watershed partnerships provides you and your students a learning laboratory to break out of the shackles of your traditional discipline, freeing you to become more interdisciplinary.
- As you reach your "interdisciplinary limits" in your service providing role to watershed efforts, you could find yourself initiating partnerships with faculty from other departments that can provide the local watershed effort with the needed expertise. You may become a leader in breaking down some of the on-campus discipline barriers that can be inherent within departments.
- You may find yourself in a better position to compete for grants from foundations and government agencies, some of whom are increasingly willing to provide money to collaborative partnerships. For example, EPA's Environmental Monitoring for Public Access and Community Tracking (EMPACT) grant application

states: "The most competitive grants under this solicitation will be developed with a consortium of organizations that have a variety of expertise . . ."

- You may be basking in your students appreciation as they thank you for offering a service-learning curriculum that allows them to better understand and appreciate how their classroom learning applies to real world community and societal concerns.

SOME RESOURCES

[Examples of EPA Grants That Can Support Integrating University Knowledge into Community-Based Watershed Efforts](#)

National Center for Environmental Research Grants (NCER) <<http://es.epa.gov/ncerqa>>

- **Environmental Monitoring for Public Access and Community Tracking (EMPACT)**
<<http://es.epa.gov/ncerqa/rfa/empact01.html>>

Morgan State University teamed with the Baltimore Aquarium and several other partners and the consortium received an EPA EMPACT grant. Morgan State University students conduct monitoring, assessment, and data analysis that provides the Baltimore community with real-time data. The ultimate goal of EMPACT is to assist communities with public access to real time environmental monitoring data and information. The Fiscal Year 2001 grant cycle, which closes February 21, 2001, will make available approximately \$4 million, with an award potential of up to \$400,000 over the lifetime of the project.

- **Science To Achieve Results (STAR)**
<<http://es.epa.gov/ncerqa/grants/>>

The University of Wisconsin (Madison campus) teamed with the Wisconsin Department of Natural Resources, and received an EPA STAR Water and Watersheds grant in the amount of \$886,000. Through this grant, they will be developing an alternative urbanization scenarios model for the North Fork of Pheasant Branch, near Madison. Their goal is to assist the rapidly urbanizing community minimize hydrologic and ecologic impacts of urbanization.

Finding Civic Groups Involved in Protecting Aquatic Resources

Adopt Your Watershed

< <http://www.epa.gov/owow/adopt/>>

EPA has built a voluntary, national catalog of organizations involved in protecting and restoring local water bodies, including formal watershed partnerships and alliances, local civic groups, and schools. There are over 3000 organizations in this searchable, on-line database or catalog. Organizations can be located geographically (by 8 digit Hydrologic Unit Code, zip code, state, or city) as well as by category of organization (Watershed Alliance/Council, Volunteer Monitoring, Youth Education Project, or Restoration/Conservation Project).

National Watershed Network

<<http://www.ctic.purdue.edu/KYW/nwn/nwn.html>>

Conservation Technology Information Center (CTIC), located at Purdue University, has created a registry of locally led watershed partnerships, with broad stakeholder representation, working to meet local goals. CTIC's registry of about 700 partnerships is a subset of EPA's Adopt Your Watershed catalog.

1998-1998 River and Watershed Conservation

Directory <<http://www.rivernet.org>>

River Network's directory includes over 3000 public and nonprofit agencies and organizations, including local and state activist groups, state and federal government agencies, and national and multistate organizations whose missions directly involve river and watershed conservation. The directory will soon be on-line and searchable. A hard copy of the directory can be ordered from above website.

Finding Watershed Partnership Educational Materials:

Know Your Watershed

<http://www.ctic.purdue.edu/KYW/>

Conservation Technology Information Center's Know Your Watershed program has developed a series of guides to educate people who want to organize a local partnership to protect their watershed. They were designed to provide guidance for going through the process of building a voluntary partnership, developing

a watershed management plan and implementing that plan. Some of the guides include:

- Building Local Partnerships
- Leading & Communicating
- Managing Conflict
- Putting Together a Watershed Plan
- Reflecting on Lakes
- Groundwater and Surface Water: Understanding the Interaction
- Wetlands: A Key Link in Watershed Management

Watershed Academy 2000

<http://www.epa.gov/owow/watershed/wacademy/>

EPA's Watershed Academy's Distance Learning Program (Academy 2000) is a set of self-paced Internet training modules that provide a basic but broad introduction to the many facets of watershed management. The time and complexity of each module varies, but most are at the college freshman level of instruction. Academy 2000 follows six themes:

- **Introduction/Overview.** These modules introduce the principles of the watershed approach and justify the values of working at a watershed level.
- **Watershed Ecology.** These modules show that watersheds are natural systems, whose structure and functions provide substantial benefits to people and the environment when allowed to operate properly.
- **Watershed Change.** These modules describe both natural and human-induced changes in watersheds, and the concepts of change vs. change of concern.
- **Analysis and Planning.** These modules address how watershed problems are analyzed as a first step toward finding solutions.
- **Management Practices.** These modules present overviews of the ways in which the common categories of watershed management challenges -- urban runoff issues, cropland management, forestry, and other issues -- are addressed by techniques that reduce or control negative environmental impacts.
- **Community/Social Context.** These modules concentrate on the human element of watershed management, in recognition that community support for watershed management goals is ultimately the strongest determinant of the chances for success.

DISCLAIMER

This paper reflects the views of the author alone and does not necessarily represent the policies or views of the U.S. Environmental Protection Agency.

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