

On Watershed Education

While it may be true that old dogs cannot learn new tricks, there are some hopeful signs that our society will adopt new behaviors to protect the local environment. Witness the universally high rates at which we recycle bottles and newspapers, compost, and dispose of household hazardous wastes in the proper places, compared to a few decades ago. Littering and motor oil dumping are now much less socially acceptable behaviors than they once were. These dramatic social shifts occurred because a compelling case was made that changes were good for the environment (and reasonably convenient and inexpensive to make), and communities heavily invested in environmental education.

As the previous article establishes, the public does not always practice a very good watershed ethic, and continues to engage in many behaviors that are directly linked to water quality problems. Watershed education is the primary tool for changing these behaviors. The basic premise of watershed education is that we must learn two things: that we live in a watershed, and how to properly live within it.

A handful of communities have attempted to craft education programs in recent years to influence our watershed behaviors. These initial efforts have gone by a confusing assortment of names, such as public outreach, source control, watershed awareness, pollution prevention, citizen involvement, and stewardship, but

they all have a common theme: educating residents on how to live within their watershed.

Many more communities will need to develop watershed education programs in the coming years to comply with pending EPA municipal stormwater National Pollutant Discharge Elimination System (NPDES) regulations. Indeed, half of the six minimum management measures prescribed under these regulations directly deal with watershed education: pollution prevention, public outreach and public involvement. Yet, many communities have no idea what kind of message to send, or in which medium to send it out.

This article reviews the prospects for changing our behaviors to better protect watersheds. We begin by outlining some of the daunting challenges that face educators seeking to influence deeply rooted public attitudes. Next, we profile research on the outreach techniques that appear most effective in influencing watershed behavior. Special emphasis is placed on media campaigns and intensive training programs. Lastly, recommendations are made to enhance the effectiveness of watershed education programs.

Challenges in Watershed Education

Watershed managers face several daunting challenges when they attempt to influence watershed behaviors:

Table 1: Provisional Estimates of Potential Residential Polluters in the United States

Watershed Behavior	Prevalence in Overall Population	Estimates of Potential Residential Polluters
Over-Fertilizers	35%	38 million
Bad Dog Walkers	15 %	16 million
Chronic Car washers	25%	27 million
Septic Slackers	15%	16 million
Bad Mechanics	1 to 5%	3 million
Pesticide Sprayers	40%	43 million
Driveway Hosers	15%	16 million

Note: Estimates are based on 1999 U.S. population of 270 million, 2.5 persons per household, and average behavior prevalence rates based on surveys in Understanding Watershed Behavior.

A Lot of Minds to Change

The most pressing challenge is that there are simply a lot of minds to change. Some notion of the selling job at hand can be grasped from Table 1, which contains provisional but conservative estimates of potential residential “polluters” in the United States in various categories. It is clear that we are not just dealing with a few bad actors or scofflaws, but rather the deeply rooted attitudes that are held by millions of people. While most people profess to support the environment, only a fraction actually practice much of a watershed ethic in their homes and yards.

Most Residents Are Only Dimly Aware of the Watershed Concept

It stands to reason that if citizens are asked to practice a watershed ethic, they need to know what a watershed is. Surveys indicate, however, that the average citizen is unaware of the watershed concept in general, and does not fully understand the hydrologic connection between the yard, the street, the storm sewer and the stream. Resident surveys also continue to show limited or incomplete understanding of terms such as “watershed,” “stormwater quality” or “runoff pollution.” For example, a recent Roper survey found that only 41% of Americans had any idea of what the term “watershed” meant (NEETF, 1999). The same survey found that just 22% of Americans know that stormwater runoff is the most common source of pollution of streams, rivers, and oceans.

At the same time, most of us claim to be very environmentally aware. For example, a Chesapeake Bay survey reported that 69% of respondents professed to be very active or at least somewhat active in helping to reduce pollution in the environment (SRC, 1994).

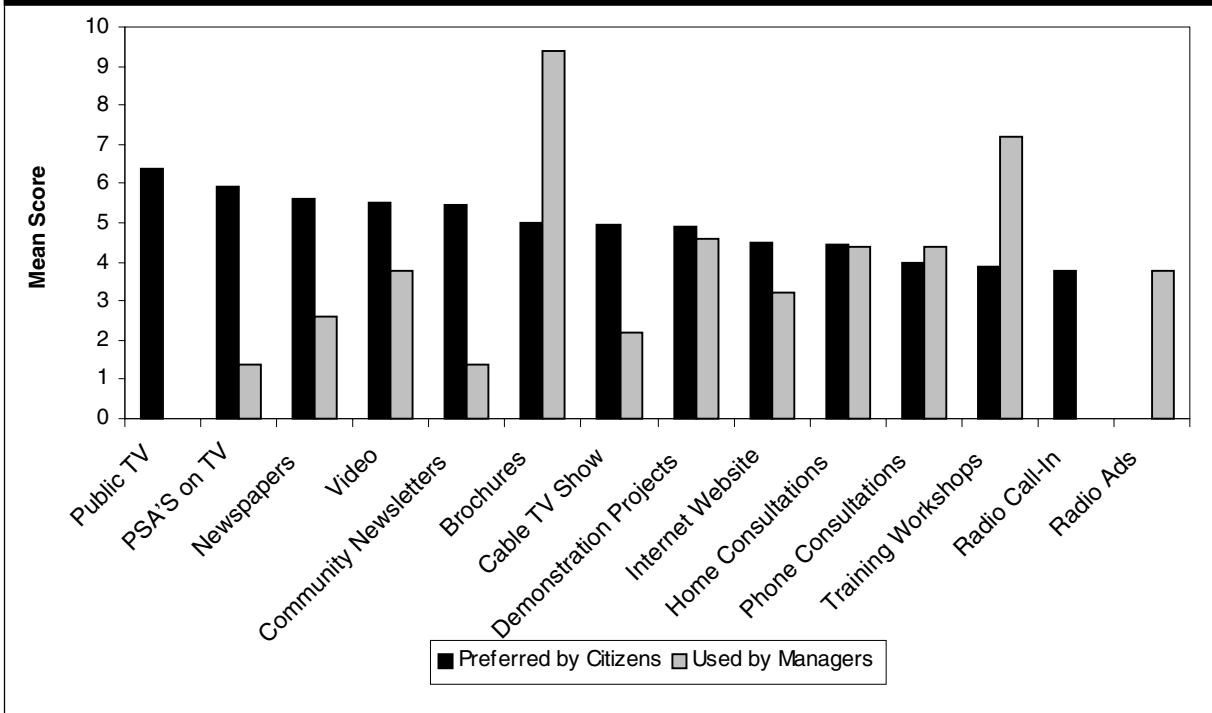
Resources Devoted to Watershed Education Are Inadequate

In recent years, several communities have developed education programs to influence the watershed behaviors practiced by their residents. Most of these efforts, however, are run on a shoestring. For example, CWP recently surveyed 50 local programs that have tried to influence lawn care, septic cleaning and pet waste behaviors (Swann, 1999). These education programs are typically run by the cooperative extension services, local recycling or stormwater agencies, or urban soil and water conservation districts. Most are poorly staffed (0.1 to 0.5 staff years), relatively new (within last five years), and have tiny annual budgets (\$2,000 to \$25,000). Given these limited resources, most watershed education programs have no choice but to practice retail, rather than wholesale, outreach techniques. Consequently, most watershed educators rely heavily on low cost techniques such as brochures, posters, workshops, and demonstration projects to disseminate their message.

Table 2: Most Influential Methods of Getting Messages to Citizens in Eight Citizen Surveys

	This Survey	WA (Elgin, 1996)	OR (AMR, 1997)	CA (Assing, 1994)	CA (PRG, 1998)	MI (PSC, 1994)	WI (Simpson, 1994)	MN (Morris, 1996)
Most Influence	TV	TV ad	Direct Mail	TV Ad	TV	TV	TV	Newspaper
	TV ad	TV	TV ad	Stencils	Newspaper	Newspaper	Newspaper	Direct Mail
	Newspaper	Newspaper	Newspaper	Billboard	Radio	Cable TV	Newsletter	TV
	Local paper	Radio Ad	Radio	Local paper	Magazine	Local paper	Brochure	Neighbors
Least Influence	Video	Brochure	TV	Brochure	Neighbors	Newsletter	Site Visit	Ext Service
	Brochure	Radio news	Bill Insert	Radio Ad	School	Video	Video	Radio
	Local cable	Paper Ad	Newsletter	Bus Sign	Billboard	Meetings	Meeting	Meeting
	Meeting	Billboard	Local paper	Direct Mail	Brochure	Brochure	--	Local cable

Figure 1: Comparison of Outreach Methods Preferred by Residents to Those Used by Watershed Educators



The Marketing Techniques We Can Afford Don't Reach Many People

Watershed managers need to send a clear and simple educational message that can attract the attention of the average citizen, who is bombarded by dozens of competing messages every day. A number of surveys have asked residents which outreach techniques are most influential in attracting their attention (Table 2). Messages sent through television, radio and local newspapers are consistently more influential in reaching residents than any other technique, with up to 30% recall rates by the watershed population for each medium. In contrast, messages transmitted through meetings, brochures, local cable and videos tend to be recalled by only a very small segment of the watershed population.

One clear implication is that watershed education efforts must utilize a mix of outreach techniques if they are going to get the message across to enough residents to make a difference in a watershed. Most existing watershed education programs, however, cannot afford to use the more sophisticated “wholesale” outreach techniques that are most effective at reaching the public with their watershed message. This gap is evident in Figure 1, which compares the outreach methods actually used by local watershed education programs with the outreach methods that residents prefer, based on responses from the Chesapeake Bay survey (Swann, 1999).

Crafting Better Watershed Education Programs

The first step in crafting better watershed education programs is to compile some baseline information on local awareness, behaviors and media preferences. The following are some of the key questions watershed managers should consider:

- Is the typical individual **aware** of water quality issues in the watershed they live in?
- Is the individual or household **behavior** directly linked to **water quality problems**?
- Is the behavior widely prevalent in the watershed **population**?
- Do specific **alternative(s)** to the **behavior** exist that might reduce pollution?
- What is the most clear and direct **message** about these alternatives?
- What **outreach** methods are most effective in getting the message out?
- How much **individual behavior change** can be expected from these outreach techniques?

The best way to elicit this information is to conduct a market survey within the watershed. If money is tight, a watershed manager can consult other resident surveys that are profiled in article 126.

The next critical step in crafting a watershed education program is to select the right outreach techniques. Several communities have recently undertaken

before and after surveys to measure how well the public responds to their watershed education programs. From this research, two outreach techniques have shown some promise in actually changing behavior: media campaigns and intensive training. *Media campaigns* typically use a mix of radio, TV, direct mail, and signs to broadcast a general watershed message to a large audience. *Intensive training* uses workshops, consultation and guidebooks to send a much more complex message about watershed behavior to a smaller and more interested audience. Intensive training requires a substantial time commitment from residents of a few hours or more.

Both media campaigns and intensive training can produce a 10 to 20% improvement in selected watershed behaviors among their respective target populations (Tables 3 and 4). Both outreach techniques are probably needed in most watersheds, as each complements the other. For example, media campaigns cost just a few cents per watershed resident reached, while intensive training can cost a few dollars for each resident that is actually influenced. Media campaigns are generally better at increasing watershed awareness and sending messages about negative watershed behaviors. Intensive training, on the other hand, is superior at changing individual practices in the lawn, home and garden.

Both techniques work best when they present a simple and direct watershed message, are repeated frequently, utilize multiple media and are directly connected to local water resources that are most important in the community.

Other important considerations for effectively marketing a watershed message are outlined below:

Develop a stronger connection between the yard, the street, the storm and the stream. Outreach techniques should continually stress the link between a particular watershed behavior and the undesirable water quality it helps to create (i.e., fish kills, beach closure, algae blooms). Several excellent visual ads that effectively portray this link are profiled in our watershed outreach award winners.

Form regional media campaigns. Since most outreach programs operate on small budgets, they should consider pooling their resources together to develop regional media campaigns utilizing the outreach techniques proven to reach and influence residents. In particular, regional campaigns allow communities to hire the professionals needed to create and deliver a strong message through the media. Also, the campaign approach allows a community to employ a combination of media, such as radio, television, and print, to reach a wider segment of the population. It is important to keep in mind that since no single outreach technique will be recalled by more than 30% of the population at large, several different outreach techniques will be needed for an effective media campaign.

Use television wisely. Television is the most influential medium for influencing the public, but careful choices need to be made regarding the form of television that is used. Our surveys found that community cable access channels are much less effective than commercial or public television channels. Program managers should consider using cable network channels targeted

**Table 3: Effectiveness of Media Campaigns in Influencing Watershed Behaviors
Four Surveys**

Location and Nature of Targeted Campaign	Effectiveness of Campaign
San Francisco Radio, TV and Buses <i>BHI, 1997</i>	Awareness increased 10-15% Homeowners who reduced lawn chemicals shifted from 2 to 5%
Los Angeles Radio and Newspapers <i>PRG, 1998</i>	Best recall: motor oil and litter (over 40%) Worst recall: fertilizer and dog droppings (<10 %) Drop in car washing, oil changing, radiator draining of about 5 to 7% Greater self-reporting of polluting behaviors: dropping cigarette butts, littering, watering and letting water run on street, hosing off driveways into the street (10% or more)
Oregon Radio, TV <i>AMR, 1997</i>	19% reported a change in behaviors changes included being more careful about what goes down drain, increasing recycling and composting, using more nature-friendly products etc.
Oakland County, MI Direct Mail <i>PSC, 1994</i>	44% of mail respondents recalled lawn care campaign 50% desired more information on lawn care and water quality 10% change in some lawn care practices as a result of campaign (grass recycling, fertilizer use, hand weeding). No change in other lawn care practices as a result of campaign

Table 4: Effectiveness of Intensive Training in Changing Watershed Behaviors

Location and Nature of Training Campaign	Effectiveness of Intensive Training
Maryland Direct Homeowner (Smith, 1996)	10% shift from self to commercial car washing. No change in fertilizer timing or rates. Better claims of product disposal.
Florida Master Gardener (Knox <i>et al.</i> , 1995)	No significant change in fertilization frequency after program. Some changes in lower rates, labels, slow release (8 to 15%). Major changes in reduced pesticide use (10 to 40%).
Virginia Master Gardener (Aveni, 1998)	30 to 50% increase in soil testing, fertilizer timing and aeration. 10% increase in grass clippings and 10% decrease in fertilizer rate.

for specific audiences, and develop thematic shows that capture interest of the home, garden and lawn crowd (i.e., shows along the lines of “This Old Watershed”). Well-produced public service announcements on commercial television are also a sensible investment.

Understand the demographics of your watershed. The middle-aged male should usually be the prime target for watershed education, as he is prone to engage in more potentially polluting watershed behaviors than other sectors of the population. Indeed, the most attractive audience for the watershed message is generally composed of men in the 35 to 55 year age group with higher incomes and education levels. Specialized outreach techniques can appeal to this group, such as radio ads on weekend sports events.

Another target group worth reaching includes what the Pellegrin Research Group (1998) terms the “rubbish rebels”— 18 to 25 year olds that tend to have low watershed awareness, engage in potentially polluting behaviors and are often employed in lawn care and other service industries. This age group is hard to reach using conventional techniques, but may respond to ads on alternative radio shows, concerts, and other events.

As America becomes more diverse, watershed managers should carefully track the unique demographics of their watersheds. For example, if many residents speak English as a second language, outreach materials should be produced in other languages. Similarly, watershed managers should consider more direct channels to send watershed messages to reach particular groups, such as church leaders, African-American newspapers, and Spanish-speaking television channels.

Watershed educators should also be careful about using the traditional environmental education model in which schools educate children who, in turn, educate their parents. Although environmental education in the schools was instrumental in achieving greater rates of recycling, it may not be as effective in changing watershed behaviors. While it is important to educate the next

generation of fertilizers, dog walkers, septic cleaners, and car washers, we need to directly influence the boomer generation now.

Keep the watershed message simple and funny. Watershed education should not be preachy, complex, or depressing. Indeed, the most effective outreach techniques combine a simple and direct message with a dash of humor. Some useful guidance on these techniques can be found in CSG, 1999.

Make information packets small, slick and durable. Watershed educators continually struggle with how to impart detailed information to residents on practicing the watershed ethic without losing their interest. The trick is to avoid the ponderous and boring watershed handbook that looks great to a bureaucrat but ends up lining a residential bird cage or litter box. One solution is to create small, colorful and durable packets that contain the key essentials about watershed behaviors and direct contact information to get better advice. These packets can be stuck on the refrigerator, the kitchen drawer or the workbench for handy reference when the impulse for better watershed behavior strikes. A particularly good example is provided in Figure 2.

Educate private sector allies. A wide number of private sector companies stand to potentially benefit from changes in watershed behavior. Better watershed behavior can drum up more sales for some companies, such as septic tank cleaners, commercial car washes, and quick oil change franchises, although these groups may need some help in crafting their watershed marketing pitch.

Clearly, the potential exists for lawn care companies and landscaping services to shift their customers toward more watershed-friendly practices. Nationally, lawn care companies are used by seven to 50% of consumers, depending on household income and lot size. Lawn care companies can exercise considerable authority over which practices are applied to the lawns

they tend, as long as they still produce a sharp looking lawn. For example, 94% of lawn care companies reported that they had authority to change practices, and that about 60% of their customers were “somewhat receptive to new ideas” according to a Florida study (Israel *et al.*, 1995). De Young (1997) also found that suburban Michigan residents expressed a high level of trust in their lawn care company.

Indeed, a small but rising proportion of lawn care companies feel that environmental advertising makes good business sense and can increase sales (Israel *et al.*, 1995). Clearly, intensive training and certification will be needed to ensure that watershed-friendly ads reflect good practice and not just slick salesmanship. It needs to be acknowledged that lawn care companies that are strongly committed to practices that reduce fertilizer and pesticide inputs need to be strongly endorsed by local government.

Right now, it is not likely that such companies are being chosen by the average consumer, who primarily relies on direct mail, word of mouth and cost when choosing a lawn care company (Swann, 1999 and AMR, 1997). For example, in the Chesapeake Bay survey, only 2% of residents indicated that they had chosen a lawn care company primarily on the basis that it was “environmentally friendly” (Swann, 1999).

Lawn and garden centers are another natural target for watershed education. Study after study indicates that product labels and store attendants are the primary

and almost exclusive source of lawn care information for the average consumer who takes care of his or her own lawn. At first glance, national retail chains should be strongly opposed to better watershed behavior, since it could sharply cut into lawn and garden product sales and the lucrative profits they produce (even at the expense of the community and environmentally friendly image they often market). The key strategy is to substitute watershed-friendly products for ones that are not, and to offer training for the store attendants at the point of sale on how to use such products.

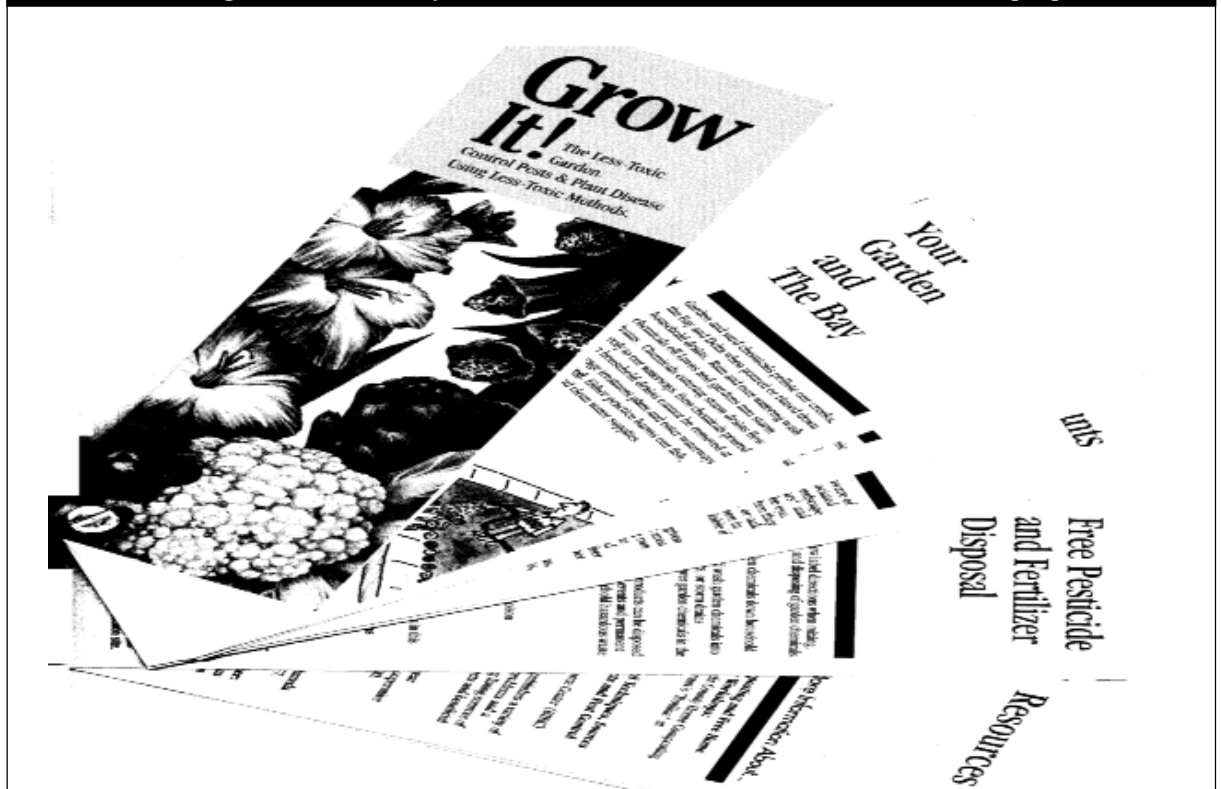
Summary

Aldo Leopold summed up his opinion of what he termed “conservation education” in a 1942 essay entitled *Land Use and Democracy*:

Conservation education, in facing up to its task, reminds me of my dog when he faces another dog too big for him. Instead of dealing with the dog, he deals with a tree bearing his trademark. Thus, he assuages his ego without exposing himself to danger.

It can be said that our watershed education efforts are still in the “little dog” category. It is doubtful we can expect to protect or improve the quality of our urban watersheds until we shift our attention from the tree, and squarely confront the bigger dog. -TRS

Figure 2: An Example of Innovative Watershed Education Packaging



References

- Advanced Marketing Research (AMR). 1997. *Stormwater Tracking Study*. City of Eugene, Oregon. Unpublished Marketing Survey.
- Assing, J. 1994. *Survey of Public Attitudes*. February and July, 1994. Russian Hill Associates. Alameda County Urban Runoff Clean Water Program. San Francisco Ca. 84 pp.
- Aveni, M. 1998. *Water-wise Gardener Program: Summary Report*. Unpublished Data. Virginia Cooperative Extension. Prince William County, VA.
- Basmaa (Bay Area Stormwater Management Agencies Association) and the San Francisco Water Pollution Prevention Program. 1997. *Grow It! The Less Toxic Garden*. Bay Area Stormwater Management Agencies Association, Oakland, CA.
- Big Honking Ideas, Inc (BHI). 1997. *Final Report: Spring Regional Advertising Campaign*. Prepared for Bay Area Stormwater Management Agencies Association. Oakland, CA.
- Council of State Governments. 1999. *Getting in Step: a Guide to Effective Outreach in Your Watershed*. Lexington, KY. 68 pp.
- De Young, R. 1997. *Healthy Lawn and Garden Survey: Data Analysis Report*. Rouge River National Wet Weather Demonstration Project. Oakland County, MI. 40 pp.
- Elgin, D. 1996. *Public Awareness Study: Summary Report*. The Water Quality Consortium. Seattle, WA. 24 pp.
- Israel, G., S. Pinheiro and G. Knox. 1995. *Environmental Landscape Management — Assessing Practices among Commercial Groups*. University of Florida. Cooperative Extension Service. Bulletin 307. Monticello, FL. 18 pp.
- Knox, G., A. Fugate and G. Israel. 1995. *Environmental Landscape Management — Use of Practices by Florida Consumers*. University of Florida Cooperative Extension Service. Bulletin 307. Monticello, FL. 26 pp.
- Leopold, A. 1942. "Land Use and Democracy." In: *the River of the Mother of God and Other Essays*. S. Flader and J. Callicott Editors. University of Wisconsin Press. Madison, WI. pp. 295-300.
- Morris, W. and D. Traxler. 1996. *Dakota County Subwatersheds: Residential Survey on Lawn Care and Water Quality*. Dakota County, Minnesota, Decision Resources, Ltd.
- National Environmental Education Training Foundation (NEETF). 1999. *National Report Card on Environmental Knowledge, Attitudes and Behaviors: Seventh Annual Roper Survey of Adult Americans*. National Environmental Education Training Foundation, Washington, D.C.
- Pellegrin Research Group (PRG). 1998. *Stormwater/urban Runoff Public Education Program: Interim Evaluation, Resident Population*. Los Angeles County Department of Public Works. 28 pp.
- Public Sector Consultants, Inc (PSC). 1994. *A Strategy for Public Involvement*. Rouge River National Wet Weather Demonstration Project. 56 pp.
- Simpson, J. 1994. "Milwaukee Survey Used to Design Pollution Prevention Program." Technical Note 37. *Watershed Protection Techniques*. 1(3):133-134.
- Smith, J. 1996. "Public Survey Used to Estimate Pollutant Loads in Maryland." Technical Note 73. *Watershed Protection Techniques*. 2(2): 361-363.
- Survey Research Center (SRC). 1994. *The Chesapeake Bay Attitudes Survey*. Communications Subcommittee. Chesapeake Bay Program. U.S. Environmental Protection Agency. 42 pp.
- Swann, Chris. 1999. *A Survey of Residential Nutrient Behaviors in the Chesapeake Bay*. Widener-burrows, Inc. Chesapeake Research Consortium. Center for Watershed Protection. Ellicott City, MD. 112 pp.

