

RI NEMO Review
of National Stormwater/NPS Outreach Efforts

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1.0 WHAT'S OUT THERE

RIDEM compiled national stormwater outreach efforts in the summer of 2004. In the spring of 2006, the U.S. EPA released a beta-version of an online resource called the Digital NPS Outreach Toolbox. These two sources, as well as information collected by RI NEMO from 2004 to the present through the NPS Information Exchange Digest listserv, our requests via national listservs from March to April 2006, and information gathered at the *Nonpoint Source and Stormwater Pollution Education Program Conference* (Chicago, October 2005), formed the basis of the material that we used to review national outreach efforts.

Due to the large volume of material available, our review attempted to focus on efforts that had been formally evaluated. We not only wanted to determine whether other states and programs had evaluated the reach and recognition of their messages, but we also wanted to determine, where appropriate, whether those messages had any impact on behavior and, more importantly, water quality improvements.

We found that a small percentage of the outreach efforts that we reviewed had been formally evaluated for impacts. Notable among those that had been evaluated were campaigns by: Metroshed Watershed Partners (MN); Chesapeake Bay Program (MD); Department of Environmental Protection (ME); Santa Clara Valley Urban Runoff Program (CA); City of San Diego Stormwater Pollution Prevention Program (CA); State Water Resources Control Board (CA); League of Women Voters of Colorado Education Fund (CO); Puget Sound Action Team (WA); and University of Connecticut Cooperative Extension (CT). Unfortunately, only the last effort evaluated any type of water quality impacts stemming from outreach efforts. We do acknowledge, however, that not all of the afore-mentioned outreach efforts were designed to affect behavior and consequently water quality. Some of the campaigns intended only to raise awareness of the issue.

We have listed the evaluated efforts, and others that we felt warranted being included due to the novelty of the idea or presentation, in a matrix attached to this document as Appendix A. Guided by the U.S. EPA's Toolbox structure and our own experience with the topic, we generated the following audiences and issues, upon which we will focus further comment in our conclusions.

Audiences	Issues
Homeowners	Septic System Care
General Public	Lawn Care
Businesses	Motor Vehicle Care
Children	Household Chemicals & Waste
Teachers	Pet Care
Decision-Makers/Regulators	General Stormwater Awareness
	Development Practices

Table 1 - Frequently-targeted audiences and issues relevant to stormwater outreach

2.0 BACK TO BASICS: BASELINE EVALUATIONS

There are two important reasons to conduct a baseline evaluation, prior to any type of education or outreach:

- 1.) so that you know the areas of focus that your education and outreach will need
- 2.) so that you can evaluate the effectiveness of an educational or outreach campaign

Our review of baseline evaluations revealed that there are a large number that have been conducted that measure an audience's stormwater knowledge, attitudes, and current behaviors. The questions common to many of those baseline evaluations include:

2.1 Attitudes about the importance of stormwater:

- Importance of various issues the Town/City/State is dealing with

2.2 Attitudes about local water bodies:

- How often respondents visit the beach, lakes, ponds, rivers, etc.
- Perceptions of the usual cause of water body closures due to contamination
- Water bodies that are viewed as being part of the community where respondents live
- Water bodies used for recreational purposes
- Perceived health of the water body or bodies into which storm water from respondents' zip codes drain

2.3 Knowledge about water concepts:

- Familiarity with the concept of a watershed
- Among those familiar with the concept: ability to define the term; whether respondents believe they live in a watershed
- Extent to which respondents have heard something about the storm drain system
- Where things that enter the storm drains go

2.4 Data about individual behavior with respect to pollutant sources:

- Among vehicle owners:
 - Whether vehicles are washed at home
 - Where the wash water runs
 - Whether oil is changed at home
 - How the used oil is disposed of
 - Whether radiators are drained at home
 - How the radiator fluid is disposed of
- Among those with gardens:
 - How lawn clippings or other green waste are disposed of
 - How clippings on walkways, patios, and driveways are cleaned up
 - How often water from the garden runs into the gutter or street
 - Whether pesticides, herbicides, or fungicides are used
 - How well instructions are followed when pesticides, herbicides, or fungicides are used
 - How often these chemicals wash off into the street
 - How leftovers of these chemicals are disposed of
 - Types of chemicals used
 - Considerations in choosing chemicals to use
- Among those who have dogs:
 - How often droppings are picked up when the dog is being walked
 - How often dog droppings are cleaned up in yards
- Among those who have septic systems:
 - How often system is pumped
- After cooking, how grease in pots and pans is disposed of
- Among those who paint around the house:
 - Where paint brushes, rollers, and pans are cleaned out

- How leftover paint is disposed of

2.5 Knowledge about individual behavior with respect to pollutant sources:

- What common practices and activities in homes and communities, other than factories, are you aware of that contribute to water pollution?
- What action can you personally take to reduce water pollution?

2.6 Data about media preferences:

- TV stations watched
- Radio stations listened to
- Presence of billboards on driving routes normally traveled
- Attention to direct mail

3.0 DETAILS OF OUTREACH EVALUATIONS

The following sections highlight the results of evaluations of education and outreach campaigns conducted nationally.

3.1 Maine: A Statewide Effort Using Rubber Ducks

Primary Goals: Raise awareness and begin the move to action

Maine's Department of Environmental Protection's campaign began with data gathering; they hired a professional marketing company to conduct focus groups, which were used to design the outreach. Those focus groups revealed that Mainers did not understand what a watershed is, where stormwater goes, or what is polluting the water in their localities. The campaign was intended to be awareness-raising. This result was confirmed by an initial survey of municipal employees (sample size of 3600).

Maine's DEP tested various styles of existing Phase I ads, using focus groups. They then selected the San Diego "Fowl Water" (rubber duck) ad. They offered a one-day training on social marketing to all of the MS4s, in order to promote cooperative efforts on a statewide outreach.

The campaign product design involved a partnership with Burgess Advertising to oversee the production of the TV, radio, and print ads, to do PR for stormwater issues, and to purchase airtime. DEP contributed funds toward the statewide effort, while MS4s contributed money for their portion of the media buy.

The evaluation of their 2003-2004 Think Blue TV and radio Campaign revealed that:

- 14.4% of Maine adults remembered the ads and the message, and 8.7% of adults said that the ads were related to stormwater runoff or pollutants in water. This was compared to a 5-10% recall standard, cited as being used by most marketing campaigns. Maine's target audience (35-55 year-old residents with some college education) was identified by an independent market research firm's focus groups and phone surveys.
- 26% of the adult Maine population said that they have or are likely to take action to reduce stormwater pollution
- There was no significant change after the campaign in the percentage of Maine adults who think that stormwater has a major impact or somewhat of an impact on water quality. However, the evaluation notes that with 80% or greater of the population already

understanding that stormwater affects water quality, they did not want to focus further on that issue.

Maine's DEP provides a budget of their education efforts:

Research/Development/Management

2003 fall focus groups (2 groups in Portland & 2 in Bangor) (MDEP)	\$13,000
Maine DEP NPS Soil Erosion Program ¹	\$ 5,350
Maine DEP Stormwater Program ¹	\$11,500
State Planning Office - web site design	\$1,500
Contract Admin (Partnership)	\$1,204
Before survey questions - spring 2004 (MDEP)	\$1,180.00
Follow-up survey questions - Fall 2004 (MDEP)	\$4,500.00
Total	\$38,244.00

¹ Update of soil radio ads, work on San Diego TV ad, development of draft print piece, PR.

Money Raised for Airtime

² \$500 of the money raised went to contract administration (see above table)

Total spent:	
Development/management -	\$38,244.23
Media buy	\$213,912.00
	\$252,156.23

As stated above, the total media buy was \$213, 912, of which, \$110,093 was spend on TV and \$103,819 was spent on radio.

3.2 Connecticut: A Scientific Approach Focusing on Stormwater Quality Improvements

Primary Goal: Improve stormwater quality

Dietz, Clausen, and Filchak published an article¹ addressing whether stormwater quality could be improved by educating homeowners or by implementing best management practices (BMPs) in a suburban neighborhood. Unlike the other efforts highlighted in this summary, this was a scientific study that included an evaluation of education efforts, tested with a control group, and a water quality analysis of stormwater in the test watershed and control watershed.

Their analysis of survey data indicated that education efforts in the form of workshops and one-on-one consulting led to the significant adoption of BMPs and *resulting improvement in stormwater quality*. However, no significant changes in measured behaviors occurred after education efforts, with regards to specific questions about lawn watering and fertilization, car washing, leaf disposal, or pet waste management.

3.3 City of San Diego Stormwater Pollution Program: Think Blue

Primary Goals: Increase awareness of slogan and general stormwater flow; change some behaviors

Evaluation of the 2002-2003 public information campaign revealed:

- 9% increase in the number of those of recycle leftover paint
- Increase (percentage not disclosed) in the number of people who recycle radiator fluid

¹ Dietz, Michael E., John C. Clausen and Karen K. Filchak. (2004). Education and Changes in Residential Nonpoint Source Pollution. *Environmental Management*. Vol. 34, No. 5, pp. 684-690.

- Awareness of what happens to things that go into storm drains remained static
- Awareness of “Think Blue” slogan increased (percentage not disclosed).

3.4 Santa Clara Valley Urban Runoff Pollution Prevention Program: Watershed Watch Campaign

Primary Goals: Increase target audience’s awareness about watershed stewardship and pollution prevention; influence behavior to protect watersheds

Evaluation of the campaign revealed:

- Between 1999 and 2003, a 19% increase in watershed awareness, measured as someone having heard something about watersheds.
- An increase in the percentages saying oil and grease enter storm drains (1991: 16%; 2003: 44%)
- An increase in the percentage saying pesticides, herbicides, and fertilizers affect water quality (1991: 7%; 2003: 19%)
- An increase in the percentage saying garbage affects water quality (1991: 5%; 2003: 16%)
- A decrease in the percentage that recognize that various pollutants enter the storm drain (1999: 49%; 2002: 32%; 2003: 43%)
- A decrease (percentage not disclosed) in the number of people who say that they take preventative actions to keep pollution out of storm drains.

These last two results are somewhat surprising, and the group who performed the evaluation offers specific recommendations as to how the campaign can be re-directed and improved.

3.5 California State Water Resources Control Board: Erase the Waste Campaign

Primary Goal: Change Some Polluting Behaviors

The \$5 million dollar “Erase the Waste” campaign was launched in August 2003 to encourage Los Angeles County residents to reduce stormwater pollution by adopting simple, everyday actions such as throwing trash in a can or recycling bin, cleaning dog waste consistently, putting cigarette butts in ashtrays, joining or organizing community clean ups, and reducing, reusing, and recycling materials when possible. The dominant campaign message focused on potential health problems associated with stormwater pollution, as this was shown to be a compelling motivation to the target audiences.

Three target audiences were defined, using a demographic analysis performed by Pelegrin Research Group for a Los Angeles County Stormwater Segmentation Study (1997): Neat Neighbors², Fix It Foul-Ups³, and Rubbish Rebels⁴, constituting approximately 74% of the total County population over 16. These audiences were selected based on a baseline survey, conducted in 1997, indicating that these groups accounted for relatively high volumes of stormwater relevant pollutants. The baseline survey also indicated that Neat Neighbors and Fix It Foul-Ups were open to changing their polluting behavior, if given a good reason to do so.

² Neat Neighbors were defined as people who contribute significantly to stormwater runoff/pollution simply through their daily household activities such as washing cars, walking the dog and not picking up after it, or dropping cigarette butts.

³ Fix It Foul-Ups were defined as conscientious citizens who contribute significantly to stormwater runoff/pollutions through their high level of do-it-yourself activities.

⁴ Rubbish Rebels were defined as people most likely to engage in polluting behavior, often intentionally.

The campaign did not attempt to target Prove-It-To-Me Polluters⁵, Preoccupied Polluters⁶, or Concerned Non-Contributors. Neither did the campaign seek to target all polluting behavior, and intentionally did not address lawn and garden care or automobile maintenance.

A follow-up survey was conducted in 2001, and this evaluation was conducted in 2004.

- Concern about pollution was found to be moderately high (percentage not disclosed), and most residents consider themselves knowledgeable about neighborhood litter and pollution's effects on the environment.
- About 64% of residents had seen or heard messages about pollution of water bodies.
- Approximately one-third had seen or heard messages about neighborhood pollution.
- Television was the most commonly cited media through which messages were recalled.
- Nearly half of Neat Neighbors and Rubbish Rebels claim to have changed at least one polluting behavior in the past year.
- Polluting behaviors such as littering were reported to have generally declined since the baseline study (percentage not disclosed).
- Household lawn and garden care has generally increased (percentage not disclosed), although the Erase the Waste Campaign did not target this behavior.

3.6 Chesapeake Bay, Maryland Social Marketing Initiative: Beyond Environmental Appeals to Tackle Lawn Care Practices

Primary Goal: Reduce fertilizer application in the spring

The Chesapeake Bay Program was aware that 90% of watershed residents reported being concerned about the Bay's health. In spite of that concern, many individual behaviors continue to damage the Bay. After considering a few dozen stewardship behaviors, their impact on water quality, and the ability of watershed residents to engage in those behaviors, the Program decided to target the use of fertilizer in the spring, because it has been reported to lead to a spike in nutrient runoff during that time of the year.

Program leaders believed that lawn fertilization was an ideal target behavior because it was simple, a controllable action that affects Bay water quality, and a visible, public behavior that is subject to social reinforcement. The Program attempted to build a brand identity that was NOT associated with an environmental appeal, but rather as a lifestyle issue. The messages were intentionally "humorous and somewhat irreverent, rather than dour and serious."⁷

The seven-week campaign was launched in late February, specifically to coincide with the most popular season for fertilizer decision-making. The campaign consisted primarily of television ads, purchased on the four major networks in the Washington, D.C. area. The TV ads were supplemented with newspaper ads, transit signs on two Metro lines, and outdoor advertising in Union Station. In addition, lawn care partners were recruited to offer watershed residents a "Bay-friendly" service option. Coasters with the brand identity (one message was: "Save the crabs, then eat 'em") were distributed to local seafood restaurants, with the fertilizer message printed on the back. In this way, restaurants also became partners in the campaign.

A follow-up evaluation of 599 watershed residents was conducted, beginning the last week of the television buy. The results indicated:

⁵ Prove-It-To-Me Polluters were defined as generally conscientious citizens who do not contribute significantly to stormwater runoff/pollution, primarily because of their low numbers.

⁶ Preoccupied Polluters were defined as people who do not contribute significantly to stormwater runoff/pollution because of their very small numbers and are difficult to persuade to change behaviors.

⁷ Chesapeake Bay Social Marketing Initiative 2004-2005 Final Report

- 72% reported exposure to a Chesapeake Bay campaign about lawn care and could correctly identify one of the themes of the campaign.
- Respondents exposed to the campaign were less likely to use fertilizer in the spring (38% compared to 43% for those not exposed).
- Respondents exposed to the campaign were more likely not to fertilize at all (37% versus 27% for those not exposed).
- The number of respondents who said that they planned not to fertilize at all doubled from 15% in 2004 to 34% after the 2005 campaign.

3.7 League of Women Voters of Colorado Education Fund, Colorado: It's Our Water, Colorado

Primary Goal: Raise awareness about polluted runoff

In order to increase awareness about the causes of and solutions to urban and suburban polluted runoff, the League of Women Voters of Colorado Education Fund conducted a media campaign in 1999. That campaign's effectiveness was evaluated with a follow-up survey. The results indicated:

- Approximately 20% of respondents reported having seen or heard information about polluted runoff.
- There was an increase from 44% in 1998 to 46.4% in 1999 of respondents who correctly answered that runoff from streets goes into local water bodies.
- There was not a statistically significant change in the mean value (4.35 on a scale of 1 to 10) that respondents reported, when asked how much household activities contribute to polluted runoff.
- There was an increase from a mean value of 6.06 in 1998 to 7.76 in 1999, when respondents were asked how much individuals can prevent household-generated polluted runoff.

3.8 Metroshed Watershed Partners, Minnesota: Think Clean Water

Primary Goals: Change behavior to keep leaves, grass clippings, and fertilizer off streets and driveways and use fertilizer with a middle number of "3" (phosphorus content) or lower

The WaterShed Partners – Met Council conducted a campaign through the use of newspaper ads, radio spots, shopping bag messaging, fridge magnets, lawn care publications, press releases, and water education workshops with resource materials.

The campaign was evaluated during June 1999 through the use of a telephone survey, and the results indicate:

- Significantly more people who had seen or heard the campaign about improving the quality of lakes and rivers, rated the following behaviors as "very important" than those who had not seen or heard the campaign: the purchase of products such as household cleaners, automotive products, lawn fertilizer; the disposal of paint, oil, and other products.
- Significantly more people who knew where water goes when it enters the storm drain or catch basin (62% vs. 41%) had seen or heard about using low phosphate lawn fertilizer to help improve water quality.
- Significantly more people who knew where water goes when it enters the storm drain or catch basin (54% vs. 41%) had seen or heard about keeping leaves out of the street to help improve water quality.
- 13% of respondents reported that they purchased safer or different products.

- 11% of respondents reported that they don't use or use less fertilizer.
- 6% of respondents reported that they clean up grass clippings/leaves, yard debris and trash.
- 5% of respondents reported that they use fertilizer or other products with little or no phosphate.

Costs included:

Development costs	\$20,000+
Newspaper ads	\$42,000+
CUB Foods bags	\$12,000
Radio ads	\$30,000
Refrigerator magnets	\$7,000
Publications	\$1,000
Water Education Resource	\$8,000
Press releases	\$0
Workshops	\$1,000+
Evaluation	\$10,000
TOTAL (\$131,000 accounted for)	\$200,000

3.9 Puget Sound Action Team/Water Quality Consortium, Washington

Primary Goals: Increase awareness about specific behaviors contributing to water quality and encourage behavior change

The Water Quality Consortium (consisting of six government agencies) used television and newspaper advertising to address four individual behaviors that they believe contribute to water pollution in the Puget Sound: lawn fertilizing, leaking oil from cars, disposing of pet waste, and car washing.

Edmunds Research Services was hired to assess general public awareness of water quality issues in the Puget Sound region. Research of the target audience showed that they fell within the first two stages of the communications hierarchy, defined by that researcher as the Stages of Awareness and Commitment. Consequently, the campaign was designed to increase awareness about the effect of individual behaviors and to encourage citizens to change these behaviors. The campaign lasted one year.

The evaluation of the campaign's effectiveness was conducted using a telephone survey of randomly-selected respondents. The results revealed:

- Residents are growing more conscious of environmental issues, but those issues are secondary to crime and education in their region.
- When asked to identify environmental issues of greatest importance in the region, the percent of respondents answering "water pollution" increased from 24% in 1995 to 39% at the end of the one-year campaign in 1996.
- Industrial waste was still considered the leading cause of water pollution by residents. However, boating, driving cars, fertilizing lawns, and pet waste all received increased ratings in terms of perception of their contribution to the area's water pollution.
- On an overall basis, practice of listed environmentally-friendly habits (e.g. recycling motor oil, avoid using pesticides/fertilizers when there's chance of rain) **decreased slightly** after the campaign.

4.0 WHAT ABOUT RHODE ISLAND'S SPECIFIC NEEDS?

4.1 Drinking Water Issues in the New England Region and Citizen Involvement

A survey completed by Julie Wawrzynek from the University of Idaho in May 2005, surveyed over 1000 residents of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. The results indicate that while 99% of respondents said that clean drinking water was very or extremely important, only 23% were very aware of factors affecting drinking water and human health. Additionally, respondents indicated that they already felt that they had adjusted their behaviors with respect to water quality issues, including: 50% had changed their yard watering practices and 43% had changed their use of pesticides.

4.2 Quonset Environmental Associates Report: Needs and Barriers to Effective Stormwater Management (2000)

See Appendix B for the complete document.

4.3 Municipalities Construction Activity Survey

RI DEM and the Southern Rhode Island Conservation District conducted a Municipalities Construction Activity Survey, to which 19 regulated MS4s responded. The specific details of stormwater-related practices investigated in this survey should be consulted when outreach about each is being designed.

At this stage of review, it seems most important to note that at the time of the survey, 47% of the respondents were not familiar with Phase II requirements, and 53% had not read any of the existing materials about it. However, 68% indicated that they would be interested in participating in workshops to learn more.

5.0 CONCLUSIONS

The majority of stormwater outreach efforts that we reviewed seemed designed to educate and involve residents, and specifically to move that target audience from a state of pre-contemplation to a state of contemplation.⁸ However, the evaluations reveal very mixed results; in some cases, there were significant gains in understanding of watershed concepts and the recognition that individual behaviors contribute to water pollution. But without results indicating that behavior changes related to that increased knowledge actually occur, and those behavior changes, in turn, leading to stormwater quality improvements, our conclusions about the usefulness of these national outreach efforts are limited.

In light of the variable results of the evaluations that have been conducted, we suggest a multi-faceted approach to Phase II efforts in Rhode Island, targeting not only behavior change related to specific pollution activities (lawn care, motor vehicle care, etc.) but also

⁸ For an overview of the Stages of Behavior Change, please see:

- Prochaska, James O. and Wayne F. Velicer. (1997). Behavior Change: The Transtheoretical Model of Health Behavior Change, *American Journal of Health Promotion*: Vol. 12, No. 1, pp. 38–48.
- Andreasen, Alan. (1995). *Marketing Social Change: Changing Behavior to Promote Health, Social Development, and the Environment*. Josey-Bass, Inc.: Washington, D.C.

behavior change that relates to actual land use decisions and the ordinances and regulations governing those decisions. While we recognize that satisfying the goals of Phase II Minimum Measures 1 and 2: Public Outreach/Education and Public Participation/Involvement can be accomplished solely by targeting the general public, we would like to suggest that efforts to change individual resident behaviors be closely linked to efforts that support the decision-making process. Recognizing that both individual actions and institutional policies contribute to stormwater problems, the overarching goal would be to impact the regulatory climate in which homeowners, residents, and businesses, operate.

Major components of the Phase II outreach and education project involve training and education for agency staff, municipal officials, and consulting professionals in the use of updated stormwater control methods. Actually applying these control methods at the local level will require adopting new roadway maintenance policies and practices, amending zoning ordinances and subdivision regulations with innovative stormwater control techniques, and implementing other Phase II minimum measures such as stormdrain mapping, maintenance, and retrofits. Local success in adopting and implementing all these measures will depend upon public support.

Directing general public education to these issues can raise individual awareness and promote personal behavior change, while also supporting institutional changes for greater impact collectively. For example, general education and outreach can be directed to public understanding and support for new stormwater control techniques that may be perceived as creating problems with standing water or mosquito habitat. Public education can support adoption of updated local stormwater control standards designed to protect and restore local water resources that might otherwise be viewed only as infringement on individual property rights. Education can be directed to support local budget decisions that will provide the resources needed to implement local stormwater plans.

Consequently, we would like to refine the scope of issues, referenced in Table 1, to focus upon regulatory changes. The two primary target audiences would be the general public, who vote on bond issues, and the decision-makers and regulators, who can propose and lend support to them. This issue could be connected to any of the others, frequently targeted in stormwater outreach. For example, an effort to raise awareness about the consequences of stormwater on Narragansett Bay could be connected to a concurrent campaign urging residents to vote for local bond issues that mandate low impact development practices.

In conclusion, we hope that our work on an education and outreach program will consider all of the following elements present, at least in part, in the various existing campaigns across the nation, that we have surveyed, even if our research leads us to forego certain elements:

- Overall media plan with budget rationale, based on program objectives
- Advertising
- Non-media outreach
- Commercial/business outreach
- Public relations
- School education
- Website development
- Watershed and municipality implementation