

Action Plan 21. Enhancing Public Education and Participation

Problem¹²⁰

Government can be slow to address environmental problems because of work force or financial constraints, political pressures, concerns of potential economic impacts, or failure of legislative and executive bodies to revise or adopt new laws and regulations. In a democracy, the response of government to any problem is strongly driven by the public's concerns and understanding of the issues. While it is true that given the same set of facts, persons can disagree about the proper course of actions depending on individual priorities and values, a common vocabulary in defining problems can facilitate the development of consensus among disparate parties. If the public is ill-informed on a particular environmental problem, or if it does not have a clear understanding of important technical and regulatory issues, they may fail to appreciate the costs and benefits of management actions, or inaction. Contributing to the problem, people, first as children then adults may not have been educated about concepts like water flow and pollution in local watersheds, how wastewater is treated and disposed, or the connection between ground and surface waters.

Because many of the recommendations in the Buzzards Bay CCMP are directed toward local government, and may require voter approval, or approval by town meeting or local boards, it is particularly important to have an informed citizenry to help make these decisions. Citizen groups and environmental non-governmental organizations can provide a crucial role in educating adults and children that will ultimately lead to the necessary social, political, regulatory, legislative, and legal actions to support efforts to protect and restore Buzzards Bay and surrounding watershed. The contribution of these non-governmental partners will be most important when legislative bodies and governmental boards must make specific planning, regulatory, and budgetary decisions.

Many action plans in this document include elements of outreach and education. This action plan addresses some statewide and regional issues that should be addressed to meet the broader goals of the CCMP.

Goals

Goal 21.1. To expand the public's knowledge of the natural resources and water quality of Buzzards Bay and surrounding watershed and the threats they face.

Goal 21.2. To increase public participation in actions that support the goals, objectives, and recommendations in the CCMP.

Objectives

Objective 21.1. To better convey concepts of watersheds and the flow of water from precipitation along the land surface and in the ground.

Objective 21.2. To better convey an understanding of pollution sources and pathways in the environment.

Objective 21.3. To improve the public understanding of human and natural effects on plant and animal populations and ecosystems.

Solutions

The Massachusetts education curriculum needs to better convey a basic understanding of local watersheds and the pathways of water and pollution through ground and surface waters. To address this problem, the University of Massachusetts developed a primary school teacher education program called "Our Town, Our City" to help teachers adopt local curriculum that incorporates local history and environmental information into their school programs, including showing local watershed maps. This approach should be emulated throughout the Buzzards Bay watershed and local school districts could teach essential concepts about water and pollution flow through watersheds as part of earth science curricula.

Advocacy and education by leaders and citizen groups will remain a core strategy to promote the adoption of regulatory and non-regulatory actions by local, state and federal government. Both private groups and public agencies should better utilize alternate strategies for communicating information including videos on local cable access channels and the internet, and social media.

Costs and Financing

Annual public education costs can be appreciable or negligible depending on the approach and type of campaign. Schools, government agencies, and non-governmental agencies must prioritize outreach programs based on their resources. Potential funding includes various, state, federal, and private sources depending upon initiative.

Measuring Success

There is no simple way to determine if education efforts are successful. One potential method of quantifying the success is to periodically conduct baseline public opinion surveys of attitudes and knowledge. This is a long-term, generational, and unending task.

¹²⁰ This action plan was not in the original CCMP.

Background

In recent decades, as our understanding of the effect of individual and cumulative environmental impacts of human activity has improved, environmental standards to protect the environment have become stricter, and new tools have been developed and implemented by all levels of government. While there have been continued and ongoing successes in Massachusetts and elsewhere in controlling point-source and certain non-point source pollution, water quality improvements have begun to taper off because of unabated development pressures on the coast, together with regulatory limitations and self-imposed limits of state and federal agencies to address certain types of environmental degradation.

Simply put, we have collectively picked the low-hanging fruit by fixing the largest problem point discharges, but have left many watershed-level non-point source pollution problems lingering. This situation arose because of the complexity, scale, and costs associated with addressing the cumulative impacts of non-point source pollution at the watershed level. Although restoration actions will continue under federal mandates like the Clean Water Act, the actual implementation of unfulfilled programs will be difficult without broader public support and awareness of the problems. In many cases, technology alone will not solve problems, and individual decisions and behavior driven by socio-economic pressures, will define long term solutions to protect the environment. These adoption of these solutions will often require the public to have a better understanding of the fundamental relationships between human activity and the environment¹²¹.

The costs of solving certain problems, such as meeting bacteria and nitrogen TMDLs will be immense, and consequently unpopular. To enable fruitful discussions, a common understanding of the problems must be developed among the people. While it is true that given the same set of facts, persons can disagree about the proper course of actions based on individual priorities and values, a common vocabulary is essential help in developing a consensus among stakeholders. If the public is ill-informed about a particular environmental problem, or if it does not have a clear understanding of important technical and regulatory issues, they may fail to appreciate the costs and benefits of management actions, or inaction.

To address these problems, government officials, local leaders, and citizen groups need to educate and communicate problems, solutions, and costs, especially to the voting public. Similarly, educators should promote a clearer understanding of pollution and watershed

issues in our schools to create a better informed citizenry for the future.

On one level, comprehensive watershed management plans have little practical significance or importance to most citizens. In fact, it is generally true that public participation on environmental issues is driven principally by two forces. The first is "not in my backyard" reactions to specific problems or development projects. The second force is the propensity of citizens to focus on environmental issues from which they will most likely receive benefits, or incur costs. These attitudes often lead to serendipitous (but often successful), collaborative efforts to implement specific environmental protection or restoration projects. For example, a group of citizens may mobilize town meeting members to purchase a particular parcel for open space in which they see important values.

There are also residents involved with broader environmental causes and issues, or promoting environmental education to the public. These efforts may be activity-focused like nature walks and watershed bike rides. These efforts can be especially important in connecting the public to the environment, a need ever more important to be addressed as both children and adults become increasingly detached from the natural world because of technology or new forms of social networking. Simply put, there is less public support to protect the local environment when that are detached from it or have no experience or memories of it.

Given these realities, government managers can acknowledge that it is relatively unimportant whether many of the 200,000 residents in the Buzzards Bay watershed understand that a watershed plan exists for Buzzards Bay. It is essential, however, that government recognize that the general public must have a good grasp of



Figure 102. The Buzzards Bay Coalition's watershed bike ride and bay swim help build public awareness of Buzzards Bay as a place and a watershed ecosystem.

¹²¹ A broader discussion of the global needs for environmental education is contained in Day and Munroe (2000), *Environmental Education & Communication for a Sustainable World* 268

the ideas and principals that are the basis of environmental protection goals in that management plan. To this end, local government has opportunities to improve understanding of important scientific principals through primary education of children and broader education efforts for adults. For both categories, non-governmental organizations can help fill the void in not only the education and mobilizing of the citizenry but also in pressing government and initiating political action to address the most challenging issues. This awareness and education is a necessary element for successfully implementing this CCMP.

In each of the action plans in this CCMP, recommended actions are identified for the Buzzards Bay NEP, other agencies, and NGO partners like the Buzzards Bay Action Committee and the Buzzards Bay Coalition. This action plan discusses certain broader principles that address public outreach and education needs in support of this watershed management plan.

In the 1980s, the Buzzards Bay NEP had a "Citizen Advisory Committee" or CAC that was part of the program and was helping with the evaluation of pollution and identification of management options to protect and restore Buzzards Bay. This CAC broke off from the Buzzards Bay NEP and eventually became two independent, not-for-profit organizations. The first organization called itself The Coalition for Buzzards Bay (now called the Buzzards Bay Coalition). It was a '501(c)3' educational and outreach citizen-based group. The second became the Buzzards Bay Action Committee, a non-profit organization composed of municipal officials, that has become more involved with state, local, and federal legislative and regulatory issues. Today, both organizations are on the Buzzards Bay NEP's Steering Committee, and both have adopted, as one of their major goals, the implementation of recommendations contained in the Buzzards Bay Comprehensive Conservation and Management Plan.

As noted in Chapter 1, the roles of the Buzzards Bay NEP, Buzzards Bay Action Committee, and the Buzzards Bay Coalition have all evolved over the years. Today the Buzzards Bay Action Committee principally acts a liaison between the towns and the Buzzards Bay National Estuary Program, but also works to improve the consistency and coordination in municipal laws and regulations. BBAC municipalities have also participated in efforts to increase resident awareness of problems and solutions. Examples include harbormasters participating in the BBAC sponsored bilge sock program, handing out free oil trapping bilge socks and literature to boat owners and including BBAC produced lawn fertilizer practices brochure to residents through water bills and town hall displays. The Coalition has focused on outreach and education relating to their water quality and natural resource monitoring programs, and land protection efforts. The Buzzards Bay Coalition had implemented primary

Citizen Action and the Clean Water Act

One of the more profound tools available to citizens is the ability to file lawsuits under the Clean Water Act (CWA), and this provision has helped protect and restore the coastal waters in Massachusetts. For example, the upgrade of the Dear Island sewage facility and the construction of the new ocean outfall in Boston, and the upgraded wastewater facility in New Bedford, were prompted court orders that followed CWA lawsuits by the Conservation Law Foundation in the 1980s.

State and federal agencies achieve compliance with the CWA through the regulatory process, as well as civil enforcement, fines, and criminal prosecution. Congress empowered citizens to bring their own lawsuits to stop illegal pollution discharges when state and federal agencies fail to act. The citizen suit authority is found in subchapter V, General Provisions, Section 505, of the CWA (USC 33, Section 1365). If a person or entity is adversely affected by a pollution discharge, they can request injunctive relief (court orders prohibiting the pollution from continuing), civil penalties, as well as reimbursement of legal costs. If a regulatory agency fails to take enforcement actions against a violator, or if they do not get acceptable results from their enforcement actions, citizens have the right to file these citizen suits against the state regulatory agency or the EPA.

A citizen seeking to utilize this provision of the CWA must first send a letter to the EPA administrator, and a copy the delegated state agency (in Massachusetts, this is the Department of Environmental Protection) that it intends to file a law suit after sixty days under Section 505(b) of the CWA. Generally this letter very specifically describes which CWA provisions have been violated, and specifically describes the adverse effect experienced by the citizen (that is, their standing), and includes any supporting data and information. This letter gives both the state and federal agencies that enforce the CWA time to review the case and determine its legal merits. In many cases, this "60-Day Notice of Intent to File" letter is enough to prompt action by EPA or the state to take action to address the concern of the citizen or citizen group. This grace period may also prompt voluntary action by the violator.

After 60 days, if the violation continues, and if the regulatory agencies fail to require compliance with the CWA, a citizen may then attempt to intervene with the filing of a lawsuit. Civil actions would normally involve just the plaintiffs (the regulatory agency) and the defendants (the polluter), but persons with an interest in the suit can seek to become a party in the lawsuit by filing a Motion to Intervene. A citizen suit must be filed in the judicial district in which the violation occurred and a copy of its complaint or suit must also be sent to the U.S. EPA Administrator and the U.S. Attorney General. The district court that oversees the citizen suit would then try the case, and potential enforce the CWA by mandating certain actions by EPA and the defendant under a court order. The judge can also order civil penalties up to \$25,000 per day per violation.

education programs in the past, and the BBAC has entered into this field as well.

Major Issues

One of the most important foundations for protecting the environment is the concept of watersheds in defining the pathway and flow of rainwater, groundwater, and the pollutants they convey. The lack of appreciation and understanding of this concept, by both members of the public and sometimes municipal officials, is often evident in public meetings. In particular, residents are often skeptical that groundwater and surface waters are connected, or that a town's drinking water is derived (in most cases) from rain falling on that town or its immediate neighbors. Some believe that groundwater comes from some distant source conveyed by underground rivers.

Part of the problem is that schools generally do not teach watershed concepts as part of the standard Curriculum Framework¹²², except at the High School level in an optional Earth and Space Sciences. At grade levels 3-5, the water cycle is taught, however the diagrams used showing the cycling of rain falling on mountains, and flowing to the ocean sow later seeds of confusion by communicating the local scale of these pathways, or the connection between surface waters and groundwater. This problem can be easily remedied at the grade school level through use of simple models and diagrams, and the Massachusetts Division of Conservation and Recreation has developed Project WET (Water Education for Teachers).

Two particular issues in the CCMP pose the greatest communication challenge because of their immense cost: managing nitrogen loading and stormwater discharges to coastal waters. Because these issues will cost billions of dollars to address in the Buzzards Bay watershed alone, a special focus is needed to communicate the long term social and economic benefits of achieving Clean Water Act goals.

Management Approaches

To address some of the shortcomings in the primary school education curriculum, in 2006 the University of Massachusetts developed a teacher education program called "Our Town, Our City" which developed local curriculum models to help teachers develop programs that better communicate lessons that illustrate local relev-

ance¹²³. The program was initiated because a survey found that 80% of Massachusetts K-12 teachers do not live in the communities where they teach, and 97% of those teachers say they "know very little" about the history and culture of the community where they teach. The program leads concluded that "Most teachers do not have the background and experience they need to follow the productive teaching avenues available through place-based education."

The Our Town, Our City approach included a component to use local watershed maps for lessons on the water cycle and watersheds. The effort was developed in partnership with the Massachusetts Bays Program NEP, The UMass Natural Resources and Environmental Conservation department, and the Massachusetts Watershed Initiative. One of the goals of the initiative was to provide a science knowledge base to help students and adults understand watershed specific problems. This approach could be more widely implemented in the Buzzards Bay watershed.

A similar program was developed by the Hitchcock Center¹²⁴ called "Wild About Water." The program addresses the curricula for grade levels: 2-8 in History and Social Science and Science & Technology. The program helps students and teachers answer the questions: "Where does our drinking water come from? How much water do we need? How do we protect this precious resource?"

With respect to adult education and increasing awareness of environmental problems and solutions in the Buzzards Bay watershed, citizen groups like the Coalition for Buzzards Bay, the Westport River Watershed Alliance, and area land trusts must continue initiative-specific outreach campaigns, as well as broader efforts to educate the public, and to better connect them to the environment. The latter focus is increasingly problematic because fewer programs involve young people in the outdoors. For this reason, efforts like beach cleanups, watershed rides, and nature hikes help people connect with and appreciate the environment.

Ultimately, the goal of all these efforts is to promote individual behaviors that are protective of the environment, and to encourage residents to participate in government, either at the ballot box, or through serving as elected or appointed officials. A broader goal of these education efforts must be change values and behaviors

¹²² As required under the Massachusetts Education Reform Act of 1993, the Massachusetts Board of Education has developed a Curriculum Framework which forms the basis of local curricula. The 2006 Earth and Space Science curricula framework is available at www.doe.mass.edu/frameworks/scitech/1006.pdf. Although local communities can use the state frameworks to develop more specific curriculum individual schools or districts may not implement such specific elements, such as watershed pollution concepts.

¹²³ The UMass Amherst Natural Resources and Environmental Conservation Department developed a primary school curriculum of "materials, training, and demonstration projects to build a constituency of educators and general public who can ably teach the science and environmental civics of watershed protection and engage others, including youth, in problem solving and action to protect the environment and for involving youth in building environmentally healthy and sustainable watershed communities."

See: <http://www.msp.umb.edu/OurTown/>

¹²⁴ See: www.hitchcockcenter.org.

toward sustainability and environmental conservation (Thompson et al., 2010).

Financial Solutions

While EPA and other environmental agencies often provide grants to foster environmental education, membership dues and private donations from individuals and trusts form the basis of most environmental education programs conducted by non-governmental agencies.

On the other hand, government agencies must set aside funds for outreach and education. Some municipal outreach efforts are mandated, like reporting to residents about the results of drinking water testing. Other educational efforts like encouraging participation recycling programs or in hazardous waste pickup days can save towns save money in the long run.

Monitoring Progress

The success of individual training and education programs can be evaluated through surveys and questionnaires among participants (Thomson et al., 2010), but longer term behavioral changes are more difficult to assess due because the length of time to evaluate and many confounding factors. Some of evaluations of education programs will fall into the realm of academic research. Other assessments, like the success of public service announcements, will be easier to document if it measures participation in a particular event, such as participation in a hazardous waste recycling event. The success of early education and adult education efforts are inherently more difficult to assess, although the passage of articles at town meeting or at local elections will be arguably measures of success of specific outreach campaigns. Periodical local public opinion surveys of attitudes and knowledge could be conducted, but the cost and value of such efforts may often be better dedicated to environmental education programs instead,

References Cited

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