

Improving Water Quality in the Santa Monica Bay and its Tributaries: A Long-term Outlook

*A Project of the
UCLA School of Law's Frank G. Wells Environmental Law Clinic*

Editors

*Jennifer K. Liebeler¹
Felicia Federico¹*

Authors

*Jennifer K. Liebeler
Felicia Federico
Kymberleigh Damron-Hsiao²
Suzan Given¹
Holly Williams²*

Faculty Advisors

*Sean B. Hecht²
Mary D. Nichols^{2,3}*

1 UCLA School of Public Health, Environmental Science and Engineering Program

2 UCLA School of Law

3 UCLA Institute of the Environment

TABLE OF CONTENTS

- I. Introduction.....3
 - A. Problem scope3
 - B. Study team and methodology3
- II. Major Contributors to Impaired Water Quality4
 - A. Pathogens4
 - B. Metals.....4
 - C. Organic toxins.....5
 - D. Nutrients.....5
 - E. Trash6
 - F. Impervious surfaces.....6
- III. Existing Framework of Controls.....6
 - A. Permit system7
 - B. Water quality standards.....8
 - C. State legislation / voter propositions9
 - D. Local government initiatives10
 - E. Non-governmental initiatives11
- IV. Recommended Actions for Improving Water Quality11
 - A. Support and implement existing permit and regulatory system.....12
 - 1. Continue to enforce and defend current laws and permit provisions.....12
 - 2. Implement and enforce recent legislation13
 - B. Strengthen and expand permit and regulatory system13
 - C. Reduce runoff volumes through increased infiltration15
 - D. Other critical tools for achieving pollutant reductions.....16
 - 1. Maximize funding commitments and use16
 - 2. Change individual behavior16
 - 3. Prioritize threats through improved monitoring and research18
 - 4. Address consumer products that are significant pollutant sources.....18
 - 5. Create San Pedro Baykeeper18
- V. Conclusions.....19
- VI. References20
- VII. Appendices.....22
 - A. List of Interviewees22
 - B. Suggestions from the Chesapeake Bay educational program.....22

I. INTRODUCTION

In January 2005, Santa Monica Baykeeper requested assistance from the UCLA School of Law's Frank G. Wells Environmental Law Clinic and the UCLA Institute of the Environment to prioritize its long-term advocacy work. Specifically, the UCLA team was asked to determine the major threats to water quality in Los Angeles, review the existing legal and institutional frameworks to address these threats, and make recommendations for actions to improve water quality. This report presents the results of this project, beginning with a brief background on the state of coastal water quality in Los Angeles and a description of the study team and methodology. The report discusses the sources and relative importance of major pollutants of concern, and provides an overview of relevant legal and institutional controls. Finally, the report presents a menu of recommendations from which Baykeeper can select those which best fit its mission and vision.

A. Problem scope

Human activities within Los Angeles' dense urban environment severely impact the region's inland and coastal waters physically, chemically and biologically. Pathogens, metals, trash, nutrients, and organic toxins create unsafe and unsightly conditions for beach users, damage freshwater, estuarine and marine biota, and contribute to high levels of dangerous chemicals in locally-caught fish. The prevalence of impervious surfaces and efficient drainage systems have bypassed the natural cleansing effect of infiltration and allowed chemicals to reach waterways in high concentrations. Polluted urban runoff is the major contributor to impaired water quality.

The need to restore the Santa Monica Bay to a healthy state has been recognized for at least two decades. In 1988, the State of California and the United States Environmental Protection Agency (EPA) established the Santa Monica Bay Restoration Project (SMBRP) to ensure long-term health of the Santa Monica Bay (Bay) and surrounding watershed. In 1994, the SMBRP authored the Draft Action Plan of the Santa Monica Bay Restoration Plan. The plan addresses methods to reduce pollution at the source, protect public health, protect and restore Bay habitats, manage the watershed, and provide for public involvement in these efforts. In 2003, the SMBRP became the Santa Monica Bay Restoration Commission (SMBRC), an independent state agency with the same mission as the SMBRP. In early 2005, SMBRC published State of the Bay 2004, which assesses Bay health and measures progress in implementing the Bay Restoration Plan. Despite progress made since the 1998 State of the Bay Report, work remains to be done. The Bay is still threatened with water quality problems. Furthermore, ecological and human health impacts due to water pollutants are not well understood. Action by advocacy groups, such as the Baykeeper, is therefore important to ensure a future healthy Bay.

B. Study team and methodology

Supervised by Sean Hecht, co-Director of the Wells Clinic and director of the UCLA School of Law's Evan Frankel Environmental Law and Policy Program, and Mary D. Nichols, Director of the Institute of the Environment and Professor in Residence at the School of Law, the team consisted of two students in the UCLA School of Law and three doctoral students from the Environmental Science and Engineering Program in the UCLA School of Public Health.

In order to narrow and identify key water quality issues, the team interviewed nineteen experts in the Los Angeles area, including scientists, university professors and other researchers, agency personnel (staff and executive level), attorneys, economists, and representatives from

non-profit environmental groups (Appendix A). The team also reviewed numerous reports, regulatory materials, agency policies, applicable statutes and regulations, and case law. The team synthesized this information to draw conclusions about the primary issues facing Santa Monica Bay today, to identify major challenges to improving the Bay's water quality, and to produce a set of recommendations for action.

II. MAJOR CONTRIBUTORS TO IMPAIRED WATER QUALITY

In order to make clear-cut recommendations on how to improve coastal water quality, it is first necessary to categorize pollutants responsible for impaired water quality. Five categories of pollutants were identified as significant concerns based on their impacts on human and ecosystem health. This section describes the sources, impacts, and any specific regulatory controls unique to each pollutant. The issue of imperviousness is addressed as a sixth contributor; although it is not a pollutant *per se*, it is the mechanism by which high concentrations of pollutants are rapidly conveyed to coastal ocean waters. While this section addresses pollutants individually the following recommendation section is organized into types of actions that can be taken to achieve reductions across multiple pollutants.

A. Pathogens

Waterborne pathogens in the coastal ocean can impact human health and have led to beach closures across Southern California. Pathogens enter the bay from storm water drains, leaking sewage infrastructure, septic systems, sewage spills due to infrastructure failure, and animal and transient human droppings. Coastal agencies have undertaken programs, voluntarily or due to lawsuits, to mitigate coastal water pollution from pathogens. Cities in both Los Angeles and Orange Counties divert surface water run-off to sewage treatment plants during the dry season. Orange County Sanitation District recently began a costly upgrade to its sewage treatment plant.

B. Metals

Miles of Los Angeles' rivers and creeks are listed as impaired due to high metals concentrations in either the water column, sediments or fish tissue. Among the impacted waterways are Ballona Creek, the Dominguez Channel, Topanga Canyon Creek, and numerous reaches of the Los Angeles and San Gabriel Rivers. Metals are believed to be a major source of aquatic toxicity in urban systems; for example, zinc and copper are believed to be responsible for a significant portion of the toxicity in Ballona Creek.

Specific metals of concern in Los Angeles waterways include zinc, lead, copper, cadmium, selenium and silver. Major source categories of heavy metals in urban runoff include atmospheric emissions, automotive, industrial, residential, and water supply. Atmospheric emissions include industrial point sources and mobile sources (diesel and gasoline-fueled vehicles). According to recent research findings, atmospheric dry deposition to the land surface is believed to be a major contributor to metals loading in stormwater runoff.

Automotive sources of metals include tire and brake pad wear. Brake pads are potentially significant sources of metals to urban runoff, as are some ubiquitous components of commercial and industrial developments such as galvanized fencing and roofing. Industrial sources include auto dismantlers, scrap metal recyclers, fabricators and electroplating shops. Sources in residential areas include pesticides, fertilizers and paints. Water supply system sources include piping corrosion and algae/corrosion inhibitors.

C. Organic toxins

The category of organic toxins is very broad, with different levels of toxicity associated with each toxin or chemical. The majority of organic toxins are suspected carcinogens. However, potential effects from toxins are difficult to evaluate because of inadequate information about effects of low-level mixtures, transformation products, and seasonal exposure. Organic toxins bioaccumulate in the tissue of organisms, beginning at the base of the food chain with sediment-associated fauna and accumulating through top predators, such as the bald eagle.

DDT and PCBs, two persistent organic toxins that cause thinning of eggshells in sea birds and bioaccumulate in the food chain, were discharged into the Santa Monica Bay onto the Palos Verdes Shelf from 1947 until the early 1970's. According to the 2004 State of the Bay Report, health and environmental risks continue to exist today due to DDT and PCB contamination of sediments in the Palos Verdes Shelf.

Today, mobile sources are main contributors of a major category of organic toxin, polyaromatic hydrocarbons (PAHs). PAHs accumulate on roads, parking lots, and vehicle maintenance areas, washing off into storm drains when it rains. Some PAH's tend to sorb to sediment and detritus (including trash), facilitating their transport to coastal waters, while other PAH's are more likely to volatilize to the air. Although many non-mobile sources such as chemical manufacturer and petroleum facilities create organic toxins, these sources are highly controlled and are not a significant source of organic toxins to the bay.

D. Nutrients

High nutrient conditions can lead to eutrophication in poorly mixed harbors and lagoons, often resulting in harmful algal blooms that cloud the water and block sunlight, harming photosynthetic organisms. When algae die and decompose, oxygen is consumed; a reduction in dissolved oxygen levels is harmful to fish and other oxygen consuming aquatic organisms. Eutrophic conditions have occurred in Malibu lagoon due to high nutrient inputs from Malibu Creek and groundwater inputs.

Excess nutrients, primarily nitrogen and phosphorous enter Santa Monica Bay through rivers, creeks, storm drains, sewage outfalls, and atmospheric deposition. During significant runoff events such as during and following storms, runoff and other nonpoint sources of nutrients exceed nutrient input from sewage outfalls.

Principal nitrogen sources to the Santa Monica Bay are Publicly Owned Treatment Works (POTWs). The Hyperion sewage treatment plant discharges sewage treated to the secondary level (with approximately half of the nitrogen removed) to the Santa Monica Bay. Upgrades to remove additional nitrogen would be prohibitively costly. Discharges from the Donald C. Tillman Water Reclamation Plant (WRP), the Los Angeles-Glendale WRP, and the Burbank WRP contribute to nitrogen loading in the Los Angeles River, which discharges into the San Pedro Bay. During dry weather periods, major POTWs contribute 84% of the total dry weather nitrogen load to the river. Urban runoff, stormwater, and groundwater discharge may also contribute to the nitrogen loadings. While eutrophication has been identified as a major problem in some enclosed embayments, such as harbors, further research needs to be conducted to determine if nutrients are a major problem in the bay.

E. Trash

Trash has major aesthetic impacts that affect enjoyment of beaches and waterways, with implications for tourism and beach use. Plastic debris can be eaten mistakenly by marine mammals and result in serious health impacts including death. To the extent that other pollutants adhere to trash, it serves as a delivery mechanism to waterways.

Trash deposits in the watershed are largely attributable to intentional and accidental littering. Trash is transported from the streets and deposited into waterways through storm drains, wind and direct dumping. The negative impacts of non-degradable wastes, in particular plastics, are significant. These materials may start to see environmental impact taxes imposed by local governments and ultimately passed onto the consumer. Recently, the City of Malibu passed an ordinance banning Styrofoam (polystyrene) food packaging that was opposed by businesses claiming that compliance is too costly. The City of Santa Monica has initiated an investigation to pass a similar ban. Various countries (Australia, Canada, Philippines, United Kingdom) have plans to ban or tax plastic bags. In 2004, the City of San Francisco passed a resolution imposing a \$0.17 tax on plastic bags because of their lifecycle impacts on the environment.

F. Impervious surfaces

Runoff from impervious surfaces has been identified by the USEPA as a major threat to the nation's water quality. Numerous studies have shown significant impacts to stream ecosystems at a "threshold" of 15-20% watershed imperviousness, with measurable impacts at as little as 2-3%. Los Angeles area streams are at risk, with the Ballona Creek Watershed currently at 55% impervious on average, and the Malibu Creek Watershed averaging 13% impervious.

Urban development increases the effective imperviousness of watersheds through multiple mechanisms, including vegetation removal, soil compaction, construction of roads, buildings, parking lots and other paved areas, and the installation of drainage conveyance systems designed to move runoff as rapidly as possible to waterways. As a watershed becomes increasingly impervious, there is an increase in the volume of runoff for a given storm event. Instead of infiltrating, rainfall will run as sheet flow over urban surfaces, carrying pollutants to creeks, rivers and bays. Due to Southern California's precipitation patterns, the "seasonal first flush" phenomenon is very pronounced. The first storm event each year carries very high concentrations of pollutants that have accumulated on impervious surfaces during many months of dry weather. Streams with concrete banks and beds, such as Ballona Creek and the Los Angeles River carry these pollutants directly into the ocean. In natural (non-concrete) streams, excess runoff can cause channel erosion, resulting in destabilized banks and the delivery of excess sediment downstream. In Malibu Creek Watershed, excess runoff volumes can cause Malibu Lagoon to breach, resulting in high pathogen levels at Surfrider Beach.

III. EXISTING FRAMEWORK OF CONTROLS

As background for addressing the threats identified in Section II above, it is necessary to review the existing framework of controls in place to protect water quality.

An extensive framework of laws, regulations, and local initiatives address water quality in the Los Angeles region. The Federal Clean Water Act (CWA) and the California State Porter-Cologne Act provide the basis for the majority of this structure. Under the CWA, water quality protection is achieved through two major mechanisms: the National Pollutant Discharge Elimination System (NPDES) permitting program and the Water Quality Standards (WQS)

program. Realizing enforcement of the Act's provisions may prove to be too cumbersome for one agency to manage, Congress, under 33 U.S.C. § 1365, granted ordinary citizens a powerful enforcement tool by empowering them to file civil lawsuits against persons or entities in violation of the CWA.

The Porter-Cologne Act established the California State Water Resources Control Board (State Board) as the agency responsible for formulating and adopting state policy for water quality control; further, it established nine California Regional Water Quality Control Boards that operate under the purview of the State Board. The Porter-Cologne Act governs the issuance of waste discharge permits, including discharges to land, surface water and groundwater. Since its enactment in 1969, it has been revised to comply with the Clean Water Act.

A. Permit system

The Los Angeles Regional Water Quality Control Board (Regional Board) is responsible for implementing the NPDES by issuing and enforcing permits for point sources, including industrial process water, municipal wastewater treatment facilities, industrial stormwater, and municipal stormwater permits.

The Regional Board's website shows over 275 active individual NPDES permits and over 440 facilities or operations with active permits under the State General Stormwater Program (General Industrial Permit). Most individual permits contain numerical limits, specific monitoring and reporting requirements, and are renewed every five years. Draft permits are issued for public comment prior to finalization. The General Industrial Permit program requires sites that come under eleven industrial categories to comply with the General Industrial Permit issued by the State Board in order to regulate their stormwater discharge. Some categories are subject to EPA numerical effluent limitations; others are only required to implement Best Management Practices (BMPs) to control discharges. All permittees must prepare and maintain a Stormwater Pollution Prevention Plan (SWPPP). The statewide General Industrial Permit is under review; the State Board received public comment on a new draft permit in early 2005.

An additional category of permits is the General Permit for Discharges of Storm Water Associated with Construction Activity. This permit applies to projects which disturb one or more acres of soil or which disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres. Requirements include implementing BMPs and preparing an SWPPP.

The Regional Board also issues special Municipal Separate Storm Sewer System Permits, commonly referred to as "MS4 Permits." The Los Angeles County MS4 Permit (LA County Permit) was renewed on December 13, 2001. This permit covers all 84 municipalities in Los Angeles County (except Long Beach) and the LA County Flood Control District. The goal of the MS4 permit is to reduce all pollutants in stormwater; it contains requirements and restrictions in the areas of public information and participation, development planning and construction, and illicit connection / illicit discharge elimination. Under this permit, the County of Los Angeles has obligations to track, inspect and ensure compliance at industrial and commercial facilities that are critical sources of pollutants in storm water.

The MS4 permit requires each municipality to develop and implement Best Management Practices (BMPs) to reduce stormwater discharges to the maximum extent practicable, with the goal of ensuring that receiving waters are cleaned up. If the adopted BMPs do not succeed in meeting this goal, the Regional Board will work cooperatively with local governments through an

“iterative process” to develop further measures to meet the goal. The Regional Board has the authority to require further BMPs and to seek remedies against municipalities that fail to engage in good faith in the process to develop and implement measures to meet receiving water standards. As long as municipalities participate in the process in good faith, they are generally considered to comply with the MS4 permit.

Another significant component of the MS4 permit is the requirement that municipalities conduct inspections of businesses within their respective jurisdictions to ensure those businesses have met their obligations under applicable laws and permits. The LA County Permit also addresses the need for managing runoff quantity by requiring controls on post-development peak stormwater runoff in natural drainage systems. This is applicable to a range of project types including residential, industrial, and commercial; it covers both new construction and redevelopment, with size or land usage triggers. This permit also imposes a number of other requirements on new developments or redevelopments including the implementation of Standard Urban Storm Water Mitigation Plans (SUSMPs), site-specific mitigation plans for projects that don't require SUSMPs, and incorporation of treatment control BMPs with a flow-based or volumetric-based design standard.

B. Water quality standards

Under 303(c) of the CWA, a water quality standard (WQS) is defined as the designated beneficial uses of a water segment and the water quality criteria necessary to support those uses. Beneficial uses considered when establishing water quality standards as specified by the CWA include public water supplies, propagation of fish and wildlife, recreation, agricultural uses, industrial uses, and navigation. WQS must protect public health or welfare and enhance water quality. States must review their WQS triennially and include a public participation process as part of the review.

Under Section 303(d) of the CWA, states must develop a list of water bodies not meeting water quality standards. All water bodies listed as impaired must have a Total Maximum Daily Loads (TMDL) established. A TMDL represents the allowable loading of a specific pollutant to a waterbody consistent with maintaining or restoring its designated uses (e.g. fishing, swimming, non-contact recreation). Once a TMDL is determined, allocations are made among the various point sources and nonpoint sources contributing that pollutant to the designated waterbody. The allocations assigned to point sources are incorporated as numerical limits in their NPDES permits. Those allocated to nonpoint sources must be managed through local plans for nonpoint source pollution reduction.

The Regional Boards are responsible for developing and implementing TMDLs; implementation guidance is provided by the State Board. Under a consent decree between EPA, NRDC, Heal the Bay and Baykeeper, the Regional Board must adopt TMDLs for the Los Angeles Region by March 2012 on a prescribed schedule.

Several TMDLs have been set, and others are in development. A metal TMDL is in the final stages of implementation for Ballona Creek. In March 2004, a nitrogen TMDL went into effect, setting numeric limits for nitrogen compounds discharges into the Los Angeles River. In January 2001, the Los Angeles Regional Board approved a trash TMDL requiring the level of trash in the Los Angeles River and Ballona Creek to be reduced to zero. Through a ten year phased waste load allocation reduction, no trash from storm drains will be permitted in these waterways. The first compliance point will be September 30, 2006, at which time compliance will be evaluated based upon the total load discharged to the river from October 1, 2003 to

September 30, 2006. This TMDL has been vacated by a court in response to a challenge from a coalition opposed to its implementation. As of May 2005, the future of this TMDL is in the hands of the California Court of Appeals.

To comply with CWA §319, which requires creation of Nonpoint Source Management Programs, the California Nonpoint Source Program was developed by the Water Board, the Regional Water Boards and the California Coastal Commission (CCC). The program represents a significant commitment by the State to expand its efforts between 2000 and 2013 to reduce and prevent nonpoint source pollution. (Nonpoint pollution within this definition does not include any runoff covered by an NPDES permit, including any collected stormwater). However, this program has been criticized by several environmental groups for its lack of regulations allowing enforcement of its provisions.

C. State legislation / voter propositions

Two state laws were recently passed to address various aspects of water quality control. As of April 2005, the State Water Board has not implemented either bill. In addition, a recent statewide voter-enacted proposition will have an impact on funding for water quality protection.

California State Senate Bill (SB) 72, passed in 2001, requires the State Water Board and the Regional Boards to develop standardized monitoring requirements for municipalities and industries. The goal of SB 72 is to provide useful data to regulators and policy makers by providing the basis for accurate assessments of sources, loadings and control efforts. NPDES permittees do not conduct standardized monitoring. As a result, available data are not comparable, and status and trends are difficult or impossible to identify.

Currently, the Water Board requires commercial and multi-family units with septic tank owners to register their tanks and apply for a permit of operation. Assembly Bill (AB) 885, signed into law in 2000, requires State baseline regulations for onsite sewage treatment systems. The standards apply to any onsite sewage disposal system for new developments, for systems being replaced, systems that are subject to repair, systems that pool or discharge to the ground surface, or are considered to have potential to violate water quality standards. This law also includes a loan assistance program for repairs costing over 0.5% of property value. The State Board published a set of draft regulations based on this bill in April 2005.

Proposition 50, passed in 2002 with a 55% vote, allowed the state of California to borrow \$3.44 billion through the sale of general obligation bonds for a variety of water projects including coastal protection, the Bay-Delta Program, integrated regional water management, safe drinking water, and water quality. Over \$100 million (a minimum of \$20 million for the Santa Monica Bay Restoration Plan) is available for the restoration and protection of water quality in coastal, estuaries, bays and near-shore waters. In addition, there is \$200 million (\$40 million for the Santa Monica Bay and Ventura County coastal watersheds; and the San Gabriel and lower Los Angeles River watersheds) available for coastal watershed protection.

Funding from voter-approved mandates such as Proposition 50 and Measure O (discussed below) provide capital costs for runoff treatment devices. It is equally critical to fund proper maintenance of these devices, and long-term success of runoff management programs. Proposition 218, approved by voters in 1996, addresses funding of public works projects, such as storm water treatment devices. The intent of Proposition 218 is to ensure that all taxes and most charges on property owners are subject to voter approval. Under Proposition 218, a two-thirds vote is needed to approve these types of taxes.

D. Local government initiatives

A number of local agencies and municipalities have chosen to exercise their regulatory authority for specific projects through a collaborative approach. This type of approach incorporates community and business stakeholders, allowing for more effective policy development and for the integration of multiple objectives. In other cases, certain municipalities have taken a leadership role to implement state of the art technologies and practices, demonstrating their viability and practicality and providing models for other cities. Many of the following recent or ongoing initiatives address the issues of improved water quality and increased stormwater infiltration within a broader context that includes concerns for water supply, flood management, improved green spaces and community recreation needs. This type of approach builds community support while also making efficient use of available funds.

Measure O, passed by City of Los Angeles Voters in 2004, is a \$500 million general bond for treatment of polluted runoff. Measure O will provide initial funding to help Los Angeles meet new stormwater regulations by improving storm drain systems, creating new community parks, controlling pollution at its source and increasing and improving local water supplies.

The City of Los Angeles recently prepared an Integrated Resources Plan to address stormwater, groundwater and wastewater. This process involved an extensive outreach process to include numerous activists and community representatives. The final report was adopted unanimously, a major achievement for such a diverse group. Another example of a successful endeavor with strong community involvement is the Sun Valley project. A chronic flooding problem in a low-income neighborhood is being addressed at a watershed level through a combination of parks and other multi-use infiltration areas. This project increased community awareness and support of water quality issues, and could be used as a model for similar efforts throughout Los Angeles.

Development of the Los Angeles River Master Plan is the first step in a major urban river restoration project that could be a tremendous opportunity for community involvement and advocacy. This effort was initiated by the Los Angeles County Board of Supervisors and is overseen by a 50 member advisory committee which includes federal, state, city and local agencies as well as environmental and community groups. The overall goals are to achieve multiple objectives of environmental enhancement, recreational opportunities, and economic development, while maintaining the primary purpose of flood protection. There are opportunities to expand this revitalization effort to a broader area both within and beyond the Los Angeles River watershed.

The City of Santa Monica has made a strong commitment to improving water quality and controlling runoff. The Santa Monica Urban Runoff Recycling Facility (SMURRF) was built to treat dry weather urban runoff, which had previously drained directly to the bay. The Santa Monica Green Building Program establishes requirements and recommendations for new construction, including runoff mitigation plans to maximize permeable surface area, management practices for protecting topsoil and trees during construction, and guidelines for installing optional gray water reuse systems. The City itself is installing Portland Cement Pervious Concrete Pavement gutters on several streets to manage dry-weather runoff and first-flush pollution. All of these activities are consistent with Santa Monica's Sustainable City Program that addresses environmental health, resource conservation and open space and land use among its goals.

E. Non-governmental initiatives

Similar in many ways to the agency initiatives discussed above, non-governmental projects also incorporate multiple stakeholders. In Los Angeles, these projects typically involve improving water quality and quality of life through creation of open space. Other programs attempt to improve water quality through public education. Several successful projects started by non-profit organizations are described below.

Many organizations work on projects to improve water quality into rivers and storm channels through creation of open space. For example, the Los Angeles and San Gabriel Rivers Watershed Council is currently conducting a Water Augmentation Study designed to explore the potential for increasing local water supplies and reducing urban runoff pollution by increasing infiltration of storm water runoff. One aspect of this study is to determine the impact on groundwater quality of the contaminants carried in storm water runoff from various land uses. Treepeople is involved in many pilot projects to capture, infiltrate, and re-use water. These projects have multiple benefits including decreasing amount of discharge, and thus pollutants into storm drains, creation of open space, and community enhancement.

Environmental education programs are another strategy initiated by non-profit organizations to improve Bay health. The Santa Monica Bay Restoration Project and Heal the Bay teamed to create the Storm Water Environmental Educational Partnership (SWEEP), which is aimed at increasing public awareness about pollution and urban runoff. The coalition trained junior high and high school students who then made presentations to community groups and distributed flyers. Suggestions from a Chesapeake Bay education program designed to minimize nutrient runoff would also be useful for reducing nutrient input into the Santa Monica Bay (Appendix B).

These projects can also target source reduction of pollutants. For example, Sustainable Conservation, an environmental non-profit, is facilitating the Brake Pad Partnership. This stakeholder group includes representatives from manufacturing, water quality regulators and stormwater managers conducting studies to elucidate the contribution of metals from brake pads and to develop solutions. The focus of source identification studies seems to be primarily the Bay Area, but results should be applicable statewide.

IV. RECOMMENDED ACTIONS FOR IMPROVING WATER QUALITY

This report's recommendations address four broad areas of action. The first area focuses on strengthening the existing permit and regulatory framework through enforcement and the enhancement of agency implementation practices. The second area involves expanding the existing framework to capture under-regulated threats to water quality. The third area is dedicated to actions that will reduce runoff volumes by increasing watershed infiltration. The final area addresses several underlying actions, or tools, which will facilitate implementation of actions in all other areas.

The report's authors recognize that Santa Monica Baykeeper has been active and successful in a number of these areas, and that some of the recommendations below will build on Baykeeper's and similar organizations' accomplishments.

A. Support and implement existing permit and regulatory system

1. Continue to enforce and defend current laws and permit provisions

The work of government agencies and citizen enforcement organizations is essential to ensuring compliance with the Clean Water Act. However, because of lack of resources and disparate and inconsistent enforcement, many businesses in violation of such permits continue to fly “under the radar.” Inconsistent and/or delayed enforcement creates an incentive for facilities to continue their noncompliance with the regulations. Citizen enforcement can target individual businesses or municipalities failing to comply with their permit provisions or the agencies that have failed to enforce the law against violators. Since its inception, Baykeeper has been working at the forefront of effort to develop permits and other regulations that protect the environment, to defend those permits and regulations, and to enforce their provisions in court where necessary. Baykeeper should consider the following strategies for the future.

- *Continue citizen enforcement suits against individual dischargers and join with other nonprofit environmental organizations when appropriate and beneficial.*

With respect to some individual dischargers, the threat of civil litigation may be sufficient to encourage permitted facilities that do have permits to comply, and to encourage unpermitted facilities to obtain valid permits. It may be effective to take high-profile actions against particularly egregious violators. However, many of these facilities are sophisticated and some have a plethora of resources to fight such a suit. Baykeeper will need to be prepared to follow through on its threats in order to retain its credibility and the effectiveness of the tactic of threatening litigation. Baykeeper has limited resources that can be strained by fighting multiple violators on multiple fronts. Even in the case of a victory, private citizens or citizen groups are not entitled to a private action to recover damages, though they often recover attorneys’ fees. This is where collaboration may prove crucial to success. In pursuing litigation, it might prove much more effective to have multiple organizations and groups supporting the effort. Should a business or facility decide to engage in an adversarial battle, Baykeeper could share the burden and cost associated with litigation against multiple organizations.

- *Identify and publicize cities that are failing to develop and implement BMPs to meet receiving water standards, and advocate continued action by the Regional Board either to bring these municipalities into compliance or to take enforcement action against them.*

By making compliance more profitable to dischargers than noncompliance, advocating enforcement action with stiff penalties may be an effective means to ensure that cities are motivated to comply. These fines can be used to increase monitoring and regulation.

- *Support efforts by the Regional Board to enforce stormwater permits and advocate to the Board to step up enforcement in areas where enforcement is lacking.*

Enforcement of municipal stormwater permits provides a major opportunity to control multiple contaminants. Also important is enforcement of discharge requirements for smaller industries, such as auto dismantlers and scrap metal recyclers, which may be significant sources of metals and other toxins. While refineries and other major industrial sources are already closely monitored, it is critical to maintain this monitoring and ensure continued compliance. Currently the Regional Board appears to be making serious efforts to ensure municipal stormwater permits are being enforced. Baykeeper should continue to be vigilant in ensuring the Regional Board continues to enforce stormwater permits. It is also critical to support the Regional Boards

budget, thereby giving them the continued resources necessary to enforce permits. Supporting the work of the Regional Board is important and can be accomplished by awards from Baykeeper or other non-profits, or editorials in local and regional press.

- *Continue to defend in court the Regional Board's authority to regulate dischargers and to force municipalities to take responsibility for stormwater management.*

Continued legal defense of the MS4 program and other permitting efforts, the Regional Board's efforts to enforce the law against violators, and the TMDL program will be critical in ensuring improved water quality. Baykeeper has a history of successfully intervening in litigation where necessary, often in collaboration with other environmental advocacy groups such as NRDC and Heal the Bay, to ensure proper protection of water quality, and should continue to do so.

- *Litigate against state and local agencies if and when those agencies are failing to fulfill their regulatory obligations.*

Baykeeper may have the ability to file a lawsuit against the municipalities or counties in violation of the Act pursuant to 33 U.S.C. § 1365. When municipalities fail to develop BMPs, or if BMPs are not implemented in accordance with the CWA, litigation may be necessary. In the event that the regulatory philosophy of the Regional Board and State Board changes such that the state agencies systematically fail to fulfill their regulatory responsibilities, Baykeeper will need to consider a strategy that would involve litigation against those agencies on a case-by-case basis. Litigation should generally be avoided when the agencies appear to be working in good faith to protect the environment, even if they are not able to succeed in every aspect. However, in some cases the agencies will need a litigation push from the environmental community in order to fulfill their obligations.

2. Implement and enforce recent legislation

Two pieces of legislation that have not yet been implemented by the State Water Board include SB 72 and AB 885.

- *Support the development of standardized monitoring protocols, as required by SB 72, and their enforcement through the NPDES permit system.*

This will allow data to be comparable, facilitating trend analysis and source identification.

- *Support implementation and enforcement of California State Bill AB 885*

The recent issuing of draft regulations to implement AB 885 presents an opportunity for Baykeeper to continue to work to ensure that AB 885 is implemented. Implementation of AB 885 will lead to better-controlled residential septic systems, which are believed to be significant contributors to pathogens impacting Malibu lagoon and beach.

B. Strengthen and expand permit and regulatory system

The need for *numeric* limits on stormwater discharges was cited by a number of interviewees as a necessary change from the status quo. The TMDL process will lead to the development of numeric limits which support water quality goals.

- *Provide input into the development and enforcement of TMDLs by assisting and directing scientific research in a way useful to policy maker; advocate strict standards and adherence to deadlines in TMDL development.*

Baykeeper should continue its work in court and in front of administrative agencies to defend the TMDL program and specific TMDLs. This may require intervening in lawsuits to protect established TMDLs, and enforcing settlement agreements where necessary to ensure the Regional Board, State Water Board and EPA properly set TMDLs.

Baykeeper should also provide political support for development of appropriate waste load allocations and encourage modification of stormwater permits as quickly as possible to incorporate load allocations as numeric limits in order to make these permits more enforceable. It is important to encourage the setting of interim limits where the science is well developed but not 100% complete. Supporting further research and ensuring that waste load allocations, especially for nutrients and metals, are developed based on a strong understanding of inputs from atmospheric deposition are also critically important as research may highlight the need to address air emissions of these contaminants. Development of load allocations will also trigger requirements to address nonpoint sources within an enforceable context.

- *Continue to advocate for a General Industrial Permit that will incorporate numeric effluent standards.*

Baykeeper, along with other environmental groups, has been advocating for several years that the State Board issue a new General Industrial Permit that would impose specific numeric standards on industrial stormwater effluent. Imposing and enforcing such standards would likely improve water quality downstream from industrial polluters. Such a permit would also be easier for Baykeeper and other environmental advocates to enforce through citizens' suits than the current general industrial permit.

- *Consider advocating that the Regional Board issue tailored municipal stormwater permits for municipalities not working to solve stormwater pollution problem to ensure water quality standards are met.*

Some environmentalists believe individualized permits are necessary to avoid back-end negotiations that allow municipalities to avoid meeting the regulatory standards. As demonstrated by interviewees' responses, citizen groups may not have the power to ensure municipalities' obligations are met through the "iterative process" since good faith participation in the process is all that is necessary to be in compliance. If, over time, the current process proves unsuccessful, Baykeeper should consider advocating for city-specific permits that would impose specific numeric requirements on particular municipalities. Such permits would facilitate enhanced enforcement by the Regional Board and would also be easier to enforce through citizens' suits than the current municipal permit.

- *Support statewide development of an enforceable nonpoint source control program.*

The California Nonpoint Source Program does not contain enforcement mechanisms. Baykeeper could work with other non-profit groups to advocate for the adoption of enforceable performance standards for areas outside permitted stormwater collection areas. It is important to recognize that diffuse pollution sources present in a watershed can be difficult to regulate because they may include individual residences, businesses, and commercial areas. Dealing with pollutants such as pathogens, nutrients, pesticides, and trash may require looking at areas

like individual households, and recreational areas such as golf courses. It is also important to examine impacts of pesticide and fertilizer application from landscaped areas of commercial, multi-family, and residential areas. Understanding the impacts of conventional practices in the up-stream area of the watershed on down-stream areas can lead to effective watershed management plans encouraging alternatives.

C. Reduce runoff volumes through increased infiltration

Reducing runoff volume is a critical strategy underlying almost all other efforts toward improving water quality and aquatic ecosystem health. A major paradigm shift will be required in the thinking of flood control districts, land use planners, and developers. Rather than a focus on rapidly conveying water to the storm sewer system, the objective should be one of on-site retention and infiltration, while still meeting public safety and Federal flood control mandates. In addition to enforcing runoff control regulations (covered under section IV-A), the following are some other avenues through which this objective can be pursued.

- *Evaluate benefits and costs of expanding runoff controls to include smaller development projects; advocate for regulatory changes as appropriate.*

Numerous small development projects taking place throughout Los Angeles are likely to have significant cumulative impact on overall imperviousness. For example, in some neighborhoods, older homes with large garden and lawn areas are being replaced by multi-unit dwellings that maximize the available building area. If cost-effective solutions can be identified to achieve reduced runoff for these types of projects, a case could be made for including them in the Development Planning Program required under LA County's Permit.

- *Advocate for economic incentives to increase use of infiltration and retention technologies and practices.*

For new developments not captured within the regulatory system, and for existing properties, economic incentives could encourage builders and owners to take action to reduce runoff. Technologies such as porous pavement or rainwater cisterns, and practices such as native-plant stormwater gardens, could be encouraged through tax rebates, competitive grant programs, or other economic mechanisms. For example, the Metropolitan Water District has a competitive City Landscape Grant program that funds public agencies and non-profits serving the public to install low water, native landscaping. Similar programs could be developed by Baykeeper and others to encourage developers to adopt similar practices.

- *Evaluate the benefits of mandating retrofits of existing developments as a condition of property transfer.*

Although current regulations cover redevelopment, as well as new projects, many property sales do not involve any modifications or construction. Absent voluntary retrofits brought about from the incentives discussed above, these existing impervious land surfaces will continue to generate large amounts of runoff to the storm system. Baykeeper should consider the merits of supporting mandated retrofits, above some reasonable size threshold, when properties are sold. Standards for these retrofits may be the same as for new developments, or something less stringent.

- *Encourage and participate in watershed-scale projects involving land purchases and river restoration which holistically incorporate infiltration, flood control, ecological and recreational needs.*

The LA River Master Plan is a key opportunity for Baykeeper to support a vision of integrated watershed management in support of improved water quality and healthy aquatic ecosystems. The success of this project will encourage other municipalities to initiate similar efforts and will heighten citizen awareness and financial commitments.

D. Other critical tools for achieving pollutant reductions

1. Maximize funding commitments and use

- *Work with governmental and non-profit organizations to purchase, conserve, and restore natural watershed functions.*

As mentioned above, improving infiltration improves overall watershed health. Efforts to purchase and conserve open spaces, restore wetlands, and increase the natural functioning watershed can be funded by the private sector or the government. Successful land purchases, including the \$35 million purchase in 2005 of lands owned by SOKA University, provide an example of non-profit organizations and government agencies working collectively to identify and conserve open space.

Opportunities exist for Baykeeper to work with NGOs such as the Nature Conservancy, the Santa Monica Mountains Conservancy, the California Coastal Conservancy, the Wildlife Conservation Board, the National Park Service, and the Santa Monica Bay Restoration Commission to identify and purchase open space critical to watershed health. Input from Baykeeper could be instrumental in helping to allocate funds towards purchase and protection of open space critical to the health of Santa Monica Bay's watershed.

- *Support public funding for maintenance and upkeep of runoff treatment and capture projects.*

Capital costs related to runoff treatment device installation are funded under state and local propositions such as Proposition 50 and Measure O. Currently, there are no mechanisms or funding for maintenance of these devices. There is need for long-term funding for maintenance of runoff treatment devices, sewage systems, and runoff management programs. Currently, in order to increase taxes, a two-thirds majority is necessary. A constitutional amendment to Proposition 218 would allow voters to increase taxes and fees for storm water pollution and flood control with a simple majority rather than a two-thirds vote.

2. Change individual behavior

- *Lobby elected officials to consistently enforce existing laws designed to curtail individual littering, require recycling of motor oil, pick up of pet droppings, and other individual sources on nonpoint source pollution.*

Certain types of individual behaviors contribute to degrading Bay water quality are difficult to control at the municipal level. Some of these behaviors are subject to existing laws. It is important to enforce these laws to minimize such behavior. One such example is littering. Municipalities cannot unilaterally eliminate trash. Laws that deter the community from littering,

either intentionally or accidentally, are of equal importance. Although there are current laws imposing fines on those who litter, there seems to be a consensus that such laws are not enforced sufficiently. Enforcement, alongside education efforts, is the most significant littering deterrent. The existing laws are sufficient, but lack of enforcement renders them ineffective. A key area of focus, therefore, may be to encourage law enforcement officers to be more consistent and widespread in enforcing litter laws.

- *Work with government agencies and non-profits to educate the public about their connection to their watershed and the coastal ocean, including Baykeeper's role in cleaning up and protecting the Santa Monica Bay.*

Public education and outreach are critical to the successful protection of the Bay. Education should be aimed not only at individuals, but at businesses, government agencies responsible for enforcing the laws, and public schools. Conducting a coordinated public education effort, in order to gain public support for and involvement in Baykeeper projects would create constituencies who understand the value of clean water. As a result, educated constituencies may be more willing to put their money behind water quality conservation measures. Through education, constituencies will learn how to take accountability for maintaining a healthy watershed, wherein all aspects of the landscape are managed to minimize pollution. Focusing educational efforts on the watershed as a whole is essential to controlling point and nonpoint source pollution. The best way to conduct public outreach is to unite existing efforts under one umbrella to achieve a collaborative effort by citizen groups, environmental non-profits, and local, state, and federal governments. In implementing educational programs and campaigns increasing awareness, Baykeeper may wish to utilize community groups as liaisons to disseminate its message.

For instance, education efforts similar to the State Board's *Erase the Waste* campaign may help to reduce residential fertilizer use and littering. Encouraging people to use landscaping that does not require pesticides may be an effective way to communicate potential health risks. Additional education focus areas may include proper automotive maintenance and proper disposal of automotive fluids and lubricants, or encouraging citizen enforcement procedures to ensure the proper disposal of used motor oil. Developing coalitions with the Metropolitan Water District's education programs may also be a cost effective method of educating the public and conducting public outreach concerning the Bay. Similarly, Baykeeper may choose to educate septic pumpers to handle waste in a safe way.

Finally, it is imperative to increase awareness about how the harmful effects of littering directly impact the Santa Monica Bay. A more traditional approach to increasing community awareness of the effects of littering may involve a community program that motivates the public to clean up the streets, such as the "adopt-a-highway" and "adopt-a-waterway" programs. The resulting media coverage and publicity aimed at exposing people's connection with the issue of littering and their individual accountability in solving the issue will also increase public awareness and community involvement.

Although discussion of the creation and protection of marine protected areas is beyond the scope of this report, it is important to note that Baykeeper education efforts should include informing the public about the need for creation and enforcement of marine protected areas. Messaging consistent with the work of other non-profits (such as Heal the Bay) to create Marine Protected Areas is important to overall coastal ocean health.

3. Prioritize threats through improved monitoring and research

- *Support continued scientific research and work with scientists to design and implement monitoring programs relevant to policy makers.*

Although many threats to water quality are well defined and are being remediated, further research is necessary to further define and prioritize threats. For example, this would include research on the use, discharge and impacts of newly identified chemicals found in flame-retardants, beauty care products, pharmaceuticals, and other consumer products.

It is critical to improve sampling and analysis programs under the existing permit system in order to be consistent and representative, thereby allowing for comparison across sources and time, and for trend analysis. Well-designed research is necessary to inform long term monitoring programs and development of public policy.

- *Support and monitor progress of research on consumer and commercial products that may be significant sources of metals to urban runoff.*

Continued research needs to be conducted concerning the amount and bioavailability of metals from sources such as brake pads, galvanized fencing and roofing, and options for mitigation including regulation or market-based incentives. Results of the Brake Pad Partnership's work in the Bay Area should be reviewed for applicability to Los Angeles and recommendations adopted where applicable.

4. Address consumer products that are significant pollutant sources

Consumer products can be major contributors to water quality degradation. Further research needs to be conducted concerning the amount and bioavailability of metals from such sources, and options for mitigation such as regulations or market-based incentives for replacement. The Malibu ordinance banning Styrofoam has sparked discussions about other potential solutions to trash issues negatively affecting local beaches. Other municipalities will likely need to consider these and similar ideas when they are forced to meet TMDLs.

- *Consider encouraging municipalities surrounding the Santa Monica Bay to pass consumption taxes on disposable goods and packaging that may contribute to litter impacting the Bay.*

Imposing a ban or tax on the use of particular consumer products or packaging may limit the use of those products and subsequent contributions to the trash TMDL. If not carefully crafted, there is a risk that local ordinances banning the use of a consumer product may be considered unconstitutional and ruled invalid based on violations of the Equal Protection Clause or the Commerce Clause of the Constitution. Nonetheless, bans or taxes may be a component of overall trash and toxicity reduction. Baykeeper should consider unintended consequences of such actions, including potential public backlash from consumers or pro-business groups that do not want products restricted or taxed. It is worth continuing to track current efforts, such as Malibu's Styrofoam ban, here, in order to learn from their example.

5. Create San Pedro Baykeeper

- *Create a San Pedro Baykeeper to work closely with the Ports and community groups to focus on water quality issues in San Pedro Bay.*

Two of Los Angeles' major rivers, the Los Angeles and the San Gabriel, drain into San Pedro Bay, home to the nations largest port complex. Given this unique situation, there is a need and opportunity for Baykeeper to focus additional attention on this area through the creation of a San Pedro Baykeeper. Priority activities for this organization would include collaborating with the Ports of Los Angeles' and Long Beach's environmental affairs department to continue to minimize runoff, and supporting watershed education programs provided by the Cabrillo Marine Aquarium and the Aquarium of the Pacific.

V. CONCLUSIONS

Improving water quality in the watershed and coastal zone of the Santa Monica Bay in an environment of increasing population and urbanization is a daunting but achievable goal. Continued improvements require a multi-faceted approach to the problem. It is critical to continue successful programs while at the same time modify some approaches and consider new tactics.

It is beyond the scope of this project to prioritize the recommendations made in this report. There is a clear need for continued compliance enforcement, as well as oversight of the regulatory development process. However, our team also believes that some of the most pressing problems will be resolved only through a collaborative effort between government and non-governmental agencies, and the promotion of an integrated coastal management approach to reducing pollution. For example, regional water agencies have no jurisdiction over air emissions sources of metals that impact water quality. In order to address this issue, it is critical to increase the level of coordination among government agencies, and to educate and build coalitions among stakeholders. It is also likely that involving more stakeholders in policy development will reduce the resources required later for litigation to enforce compliance.

In the research arena, coalitions between scientists and policy makers are also necessary; and Baykeeper can and should support such coalitions. For example, a coalition of atmospheric scientists, oceanographers, and airshed and watershed managers is necessary to identify where and when excess nutrients negatively impact the bay, and how to control those nutrients at their source.

As with the Santa Monica Baykeeper, a San Pedro Baykeeper could become a model for effecting change through collaborations with existing government and non-governmental groups with the ability to improve water quality through education, permit enforcement, and implementation of other water quality control measures.

VI. REFERENCES

- Anderson, J.W., D.J. Reish, R.B. Spies, M.E. Brady, and E.W. Segelhorst. 1993. Human Impacts, in M.D. Dailey, D.J. Reish, and J.W. Anderson (eds.), Ecology of the Southern California Bight A Synthesis and Interpretation, University of California Press, pp. 682- 766.
- California State Water Resources Control Board, 2002. CWA Section 303(d) List of Water Quality Limited Segments.
- California State Water Resources Control Board, Construction Stormwater Program, available at www.swrcb.ca.gov/stormwtr/construction.html, last visited May 22, 2005.
- City of Santa Monica, Santa Monica Urban Runoff Recycling Facility, available at santa-monica.org/epwm/smurrf/smurrf.html, last visited on May 22, 2005.
- City of Santa Monica, Green Building Program, available at greenbuildings.santa-monica.org/index.html, last visited on May 22, 2005.
- Concrete Network, "Where Pervious Concrete is Being Used," available at www.concretenetwork.com/pervious/being_used.html, last visited May 22, 2005.
- Environmental Defense Fund website, available at www.edf.org. last visited May 22, 2005.
- Foster, J. 1999. Variability of roof runoff quality, Water Science and Technology, Vol 39 No 5 pp 137–144.
- Los Angeles Regional Water Quality Control Board, Permit Search Tool, available at www.waterboards.ca.gov/losangeles/html/permits/permits.html, last visited May 22, 2005.
- Los Angeles Department of Public Works, Los Angeles River Master Plan, available at ladpw.org/wmd/watershed/LA/LA_River_Plan.cfm, last visited on May 22, 2005.
- National Oceanic and Atmospheric Administration et al. 2001. Montrose Settlements Restoration Program. Natural Resource Trustees Announcing the initiation of public scoping for a restoration plan /environmental impact statement.
- San Diego Regional Water Quality Control Board, 2000, Draft Source Analysis, TMDL for Chollas Creek Watershed Metals.
- Santa Monica Bay Restoration Commission, State of the Bay 2004 Progress and Challenges.
- SCCWRP. 1999. Study of the Impact of Stormwater Discharge on Santa Monica Bay
- SCCWRP. 2004. Atmospheric Dry Deposition of Trace Metals in the Los Angeles Coastal Region.
- Schiff, K and J. Allen. Chlorinated Hydrocarbons in Flatfishes from the Southern California Bight, USA. Environmental Toxicology and Chemistry. 19(6) 1559-1565.

Stenstrom, M.K., 1999, Stormwater Impact, in UCLA IoE, Southern California Environmental Report Card 1999.

Sutula, M, K. Kamer and J. Cable. 2004. Sediments as a nonpoint source of nutrients to Malibu Lagoon, California (USA). Southern California Coastal Water Research Project, Westminster, CA.

Trimble, S. W. 1997. Contribution of Stream Channel Erosion to Sediment Yield from an Urbanizing Watershed, *Science*, v.278, p.1442-1444.

Sustainable Conservation, "Brakepad Partnership," available at www.suscon.org/brakepad/index.asp, last visited May 22, 2005.

VII. APPENDICES

A. List of Interviewees

Name	Organization
Dr. Rich Ambrose	Professor, UCLA Env Science & Eng Program
David Beckman	Senior Attorney, NRDC
Susan Cloke	Chair, LARWQCB
Susan Dallman	Interim Executive Director and Manager of Stormwater Programs, LA / SG Rivers Watershed Council
Rebecca Drayse	Program Manager, TREES, Treepeople
Mark Gold	Executive Director, Heal the Bay
Dorothy Green	Board Member, Public Officials for Water and Environmental Reform; Los Angeles Regional Vice President of the Planning and Conservation League
Richard Katz	Member, SWRCB
Michael A.M. Lauffer	Office of Chief Counsel, SWRCB
Tom Leary	City of Long Beach, Stormwater Manager
Felicia Marcus	Trust for the Public Land, San Francisco
Jennifer Novak	Deputy Attorney General, California Attorney General's Office
Terry O'Day	Chief Operating Officer, Environment Now
Dr. Linwood Pendleton	Associate Professor, UCLA Env Science & Eng Program
Neal Shapiro	City of Santa Monica
Dr. Michael Stenstrom	Professor, UCLA Civil and Env Eng Department
Dr. Keith Stolzenbach	Professor, UCLA Civil and Env Eng Department
Xavier Swamikannu	LARWQCB Staff
Steve Weisberg	Executive Director, SCCWRP

B. Suggestions from the Chesapeake Bay educational program to reduce nutrients that may be applicable to the Santa Monica Bay watershed

1. Limit your fertilizer use and apply at appropriate times. Nutrients in chemical fertilizers can runoff yards into local waterways and eventually drain into the Bay. If you must fertilize, always follow the application instructions. Never overfertilize.
2. Control runoff and soil erosion. Reducing erosion and preventing runoff will reduce the amount of sediments and nutrients entering the watershed.
3. Start a compost pile and recycle yard waste. This will minimize the amount of trash your household produces. The compost can also serve as a natural fertilizer for your lawn.
4. Conserve water and energy. The more water we use, the more we must treat either through septic systems or water treatment plants. Repair leaking faucets, install low-flow faucets and toilets, and only wash full loads of laundry.
5. Plant trees. Trees filter polluted runoff, reduce soil erosion, and control runoff from your yard.

6. Maintain your septic system. Without regular pumping, septic tanks can fail, which not only harms the environment but can also contaminate drinking wells.
7. Drive less. Reducing the amount of miles driven means fewer polluting emissions. Nitrogen oxides from fossil fuel combustion are a major source of nitrogen entering the Bay.
8. Be a responsible boater and pump out wastes. Raw sewage causes pollution that harms human and aquatic health.