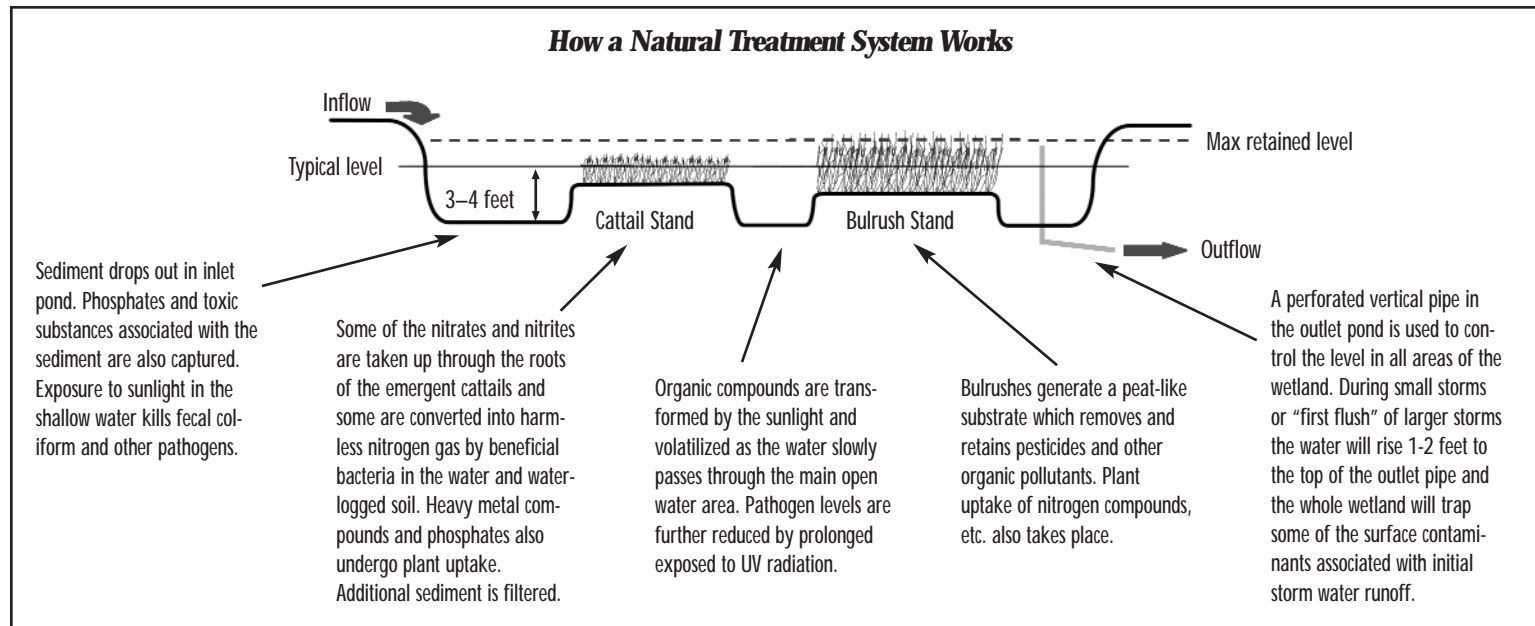


Natural Treatment System

Although sediment is arguably the Bay's biggest threat, there are other pollutants that we need to be concerned about. These include nitrates and nitrites—compounds of nitrogen—that are used as fertilizer. Why are the nutrients in fertilizer considered pollutants? Because, in high concentrations, they stimulate too much growth of algae in the water. Thick mats of algae can sometimes form which can cover mudflat and make feeding difficult for birds. But the biggest problem comes when the algae dies off. Bacteria feeding on the large supply of dead algae multiply to such an extent that they consume all of the oxygen in the water causing the fish and other organisms in and below the water to die. Significant strides have been made in the last 10-20 years to reduce the amount of nitrogen compounds entering the Bay, by measures such as detaining and re-using nutrient-rich irrigation water at nurseries. But the nitrogen load is still too high according to the Regional Water Quality Board which sets limits for UNB in the form of a Total Maximum Daily Load (TMDL) for each listed pollutant in order to comply with the federal Clean Water Act.

One means of drastically reducing the nitrogen load and also capturing a significant amount of other contaminants including pathogens, sediment, phosphates and heavy metals is called a Natural Treatment System (NTS). An NTS is a carefully-constructed wetland that uses wetland plants such as cattail and bulrush and other features to clean the water passing through it. These wetlands can be created in flood control channels or adjacent to them. In the latter case, dry season and small storm flows would be diverted into the wetland and returned to the main channel after treatment.

Irvine Ranch Water District (IRWD) already successfully operates several important NTS facilities, including the San Joaquin Marsh adjacent to San Diego Creek about half a mile upstream of UNB. and is Lead Agency for the construction of a network of additional in-line, off-line and combination facilities throughout the 122 square mile San Diego Creek Watershed. A total of 31 facilities, including existing ones, ranging in size from less than an acre to 56 acres is anticipated.



Adaptive Management and the Lemonade Stand

Nearly every kid with a lemonade stand understands and follows adaptive management principles. If orangeade is selling and lemonade isn't, she makes more orangeade. So why is it that adaptive management is still not widely practiced when it comes to natural resource protection?

Government entities by nature are not very adaptive. A certain amount of bureaucracy is needed to provide the checks and balances to avoid hasty, inappropriate actions. But this leads to an environment in which data and decision can and does become increasingly decoupled. For some, no decision is often safer than a decision one way or another and thus data is always lacking (or seems to be lacking) and more study is needed. For others, fuzzy or obsolete data allows an out if the decision is later second-guessed. However, for the most part, decision-makers are simply faced with making decisions on too many issues with too many constraints and they will naturally focus on those items where they have a clear understanding of costs/benefits (financial, social, etc.).

Unfortunately, all too often: the right data isn't available to the decision-makers at the right time in a readily-understandable format.

Thus we hear:

"Hey Mom, Mrs. Smith says that last Saturday the four-hour moving average on my orangeade sales peaked at 2.7 liters per hour at 4:30 PM with a closure factor of 0.6. Can I make more?"
 "I'm too busy to think about that now, dear. Let's talk about it tomorrow."

instead of:

"Hey Mom, people are coming back for the orangeade. Can I make some more?"
 "Of course, dear."

Let's get the data part right first and then work on the decision-making (and decision-changing) mechanisms to allow adaptive management to take place.



NEWPORT BAY NATURALISTS AND FRIENDS

Protecting Newport Bay Upstream

A June–August 2007
Tracks Special Report

Integrated, Adaptive Management in Newport Bay Watershed

The previous issue of *Tracks* (available on our website at newportbay.org/track2q7.pdf) addressed the ecological significance of Upper Newport Bay (UNB) as the largest protected estuary in southern California, and the important first step that will be taken towards holistic, adaptive management of UNB through the development of a single Comprehensive Resource Management Plan (CRMP) for the entire Upper Bay. However truly holistic management of UNB can only occur as part of the holistic management of the Newport Bay Watershed, since most of the current threats to the ecosystems of UNB arise in the watershed. And truly holistic watershed management can only occur if

urban planning and development are integrated with natural resource protection.

A nearly \$40 million dredging project is currently taking place in UNB primarily to remove sediment washed into UNB from its watershed. But dredging remediates rather than solves the problem. To solve the sedimentation problem (and minimize future dredging), erosion must be prevented and other community-wide measures adopted to prevent the generation and/or transport of sediment.

Various committees, agency partnerships, etc. have tried to address watershed issues over the past 30 years. Each has focused on specific regulatory compliance issues, and has produced reports and action plans in response to the regulations. NBNF has been a strong participant in the Newport Bay Watershed Management Committee for many years and is encouraged by the recent moves to address watershed issues more comprehensively through the development of an Integrated Regional Water Management Plan (IRWMP) as a starting point for sustained adaptive management on an even broader scale.

continued inside

San Diego Creek enters Upper Newport Bay



Think globally, act locally

Does it bother you to see landscape sprinklers operating when it is raining? Good! This practice not only wastes water, it contributes to storm water runoff that creates ugly erosion and landslides, and contributes to the sediment washed into Upper Newport Bay (UNB) and other water courses. We would therefore like to thank residents, businesses and organizations doing their part to conserve water and protect the environment by installing satellite-controlled irrigation systems. A shining example is the Eastbluff Homeowners Association (HOA) which irrigates over one million square feet of landscaping on the east side of UNB, mostly on slopes that drain readily to the Bay.

In 2005 the Eastbluff HOA installed a satellite-controlled system to irrigate according to the predicted weather for Eastbluff. Instead of being turned on and off by a timer, each sprinkler valve is turned on and off by an electronic controller programmed to deliver water to each area based on the slope, soil and plant characteristics of the area covered, and the predicted temperature, humidity, wind, and solar radiation for that location for the coming 24 hours. How often the sprinklers come on and for how long may both vary. The controller receives wireless signals from the supplier of the satellite-controlled system who has used weather data from numerous government weather stations to determine local conditions within an area of less than a square mile.

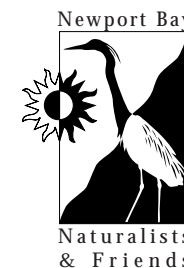
The Eastbluff HOA had been looking at its water usage for some time. Water bills accounted for the second largest line item in its entire budget. So when the HOA learned about a rebate program that the Municipal Water District of Orange County (MWDOC) was offering to encourage commercial and HOA use of satellite controls, it was eager to proceed. Because of the number control valves to be included in the rebate (over 100), special approval was needed from the City of Newport Beach Utilities Department which retails water supplied by MWDOC. But, according to HOA Past President Barry Eaton, "everyone saw the benefits to the health of the Back Bay and the good publicity that a voluntary conversion of this size would generate, so everyone worked together to make it happen."

The Eastbluff HOA ended up spending about \$10,000 on its conversion and received about \$6,000 in rebates. As a result, in 2006 it reduced its water consumption by 20 to 30 percent resulting in lower water bills as well as reduced slope erosion. The HOA is happy, MWDOC is happy and NBNF is happy. A win-win-win.

MWDOC is still offering the rebate. Go to <http://www.mwdoc.com/SmarTimer/index.html>. The City of Newport Beach and Irvine Ranch Water District are just two of the many MWDOC water providers participating in the program.

NBNF Mission:

- To **preserve** and **restore** the ecosystems of Upper Newport Bay.
- To **educate** the public about the ecological value of the Bay and its watershed and help ensure compatible public use.



PO Box 10804
Newport Beach, CA 92658
www.newportbay.org

Integrated, Adaptive Management *cont.*

Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs.

Without an operational program there is no adaptive management. Without defined outcomes there is no adaptive management. Without learning there is no adaptive management. It is not enough to know that we have succeeded or failed, we need to know why. How else can we improve? Unfortunately we live in a complex world in which our actions sometimes have unintended consequences. Everything is connected and there are often competing priorities. Measures to protect one endangered species may conflict with measures to protect another. Tradeoffs may be necessary. Integrated adaptive management involving multiple stakeholders is hard to achieve. But the alternative is a mass of disjointed efforts at the ground level with conscientious organizations and/or individuals within those organizations reacting to immediate problems to the extent that they can within the bounds of their authority. Adaptive management takes time and effort, but is ultimately beneficial to all stakeholders. A good example of a functioning adaptive management program is the Central and Coastal Orange County Natural Community Conservation Plan (NCCP). We would like to see this emulated on a wider scale across the watershed.

Programs start with plans. A key step forward has been the creation by the US Army Corps of Engineers, Los Angeles District Planning Division of a draft Watershed Management Plan (WMP) describing an overarching vision for organizing all activities that have an impact on the Newport Bay Watershed and defining the problems that must be overcome. This visionary document defines long-term goals in six key areas:

- Management Structure
- Data Management
- Urban Design
- Policy
- Finance
- Communication

In each case the WMP identifies a number of concerns and lists specific objectives to address each concern. The objectives are then used to define a single goal in each area that will guide the efforts to achieve the objectives.

The **Management Structure Goal** is “Coordinate and integrate management across stakeholders in order to create the capacity for a more strategic, appropriate and effective response to the multi-jurisdictional, multi-disciplinary and cross-sectoral nature of watershed issues.”

The **Data Management Goal** is “Coordinate the collection, use, and availability of data to support watershed analysis capabilities and create a common basis of information for all stakeholders.”

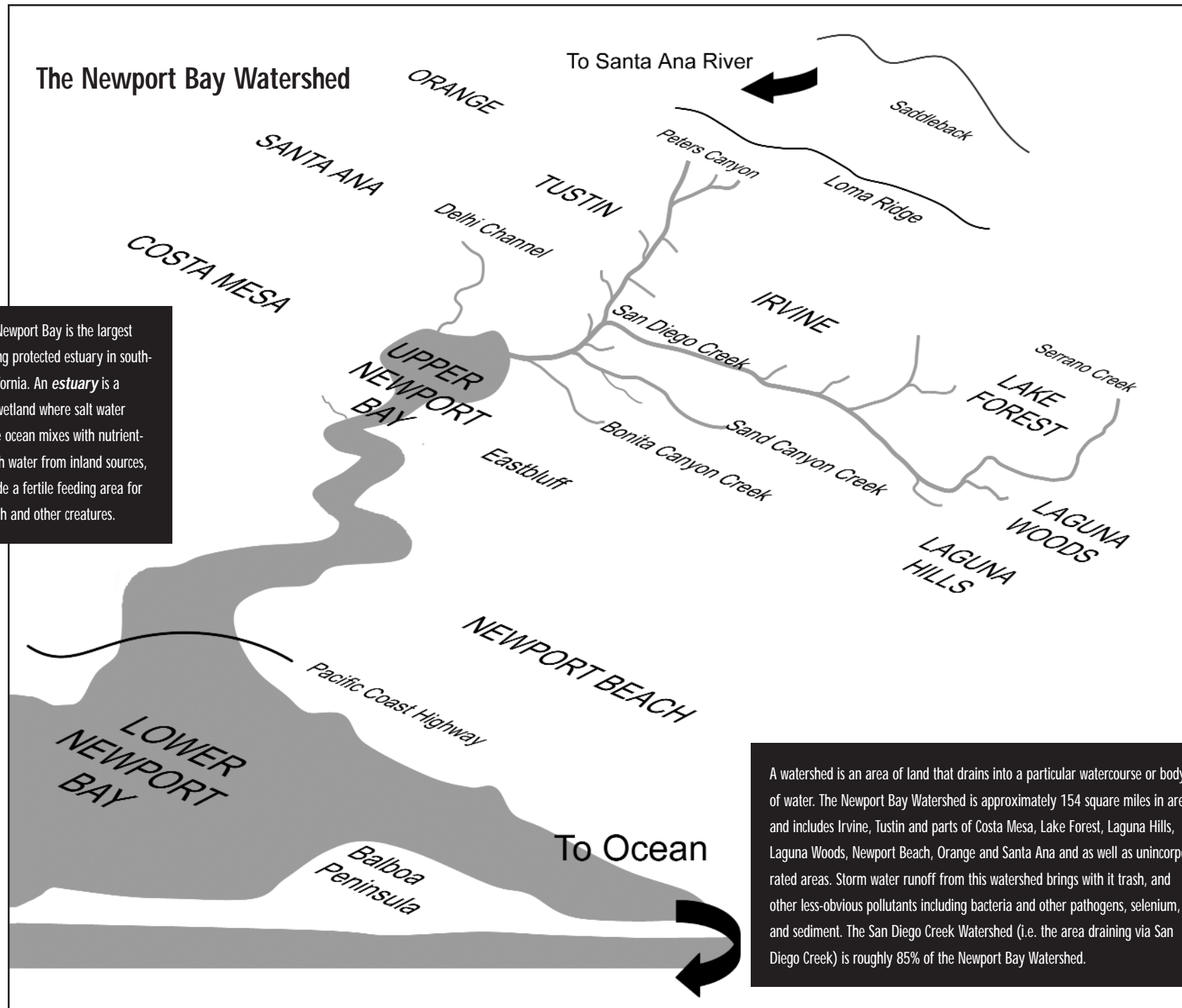
The **Urban Design Goal** is “Integrate ecological functions into the design and development of the built environment in order to create an environmentally, socially and economically sustainable urbanized watershed.”

The **Policy Goal** is “Integrate laws, plans, policies and regulations to mutually support a common environmental plan.”

The **Finance Goal** is “Create a financial strategy for achieving sustainable watershed management by identifying mechanisms that coordinate the use of funding, generate new sustainable sources of funding, and financially support innovative projects and land uses.”

The **Communication Goal** is “Provide a forum and support structure for improved communication, collaboration and coordination within and amongst stakeholders.”

NBNF whole-heartedly supports these goals and sees the accomplishment of the **Data Management and Communication Goals** as being a necessary precursor to even partially successful efforts to achieve the other four goals since nearly all the concerns identified in the other four areas stem from a lack of data and/or ineffective communication of the data.



Upper Newport Bay is the largest remaining protected estuary in southern California. An *estuary* is a coastal wetland where salt water from the ocean mixes with nutrient-rich fresh water from inland sources, to provide a fertile feeding area for birds, fish and other creatures.

A watershed is an area of land that drains into a particular watercourse or body of water. The Newport Bay Watershed is approximately 154 square miles in area and includes Irvine, Tustin and parts of Costa Mesa, Lake Forest, Laguna Hills, Laguna Woods, Newport Beach, Orange and Santa Ana and as well as unincorporated areas. Storm water runoff from this watershed brings with it trash, and other less-obvious pollutants including bacteria and other pathogens, selenium, and sediment. The San Diego Creek Watershed (i.e. the area draining via San Diego Creek) is roughly 85% of the Newport Bay Watershed.

True adaptive management is only possible where the necessary data is readily available to first define in measurable terms the intended outcomes and the factors that may influence the outcomes, and to then provide ongoing feedback to judge success or failure and the likely reasons for it. Too often the information is incomplete, disjointed, obsolete or not readily available to those who need it. Frequently different stakeholders are working with different data that paint different pictures, or paint different parts of the same picture. Without a common frame of reference it is hard to achieve common ground. And without that, the willingness to work together to adopt a holistic approach is likely to be lacking.

Data management itself must be adaptive. Information must obviously be continually validated and updated. Additionally different stakeholders may adopt different measures of success and new parameters may need to be included in the monitoring and assessment. Needless to say, data in support of an Integrated Plan must be integrated and serve the needs of the stakeholders of the Integrated Plan. That is the measure of its success.

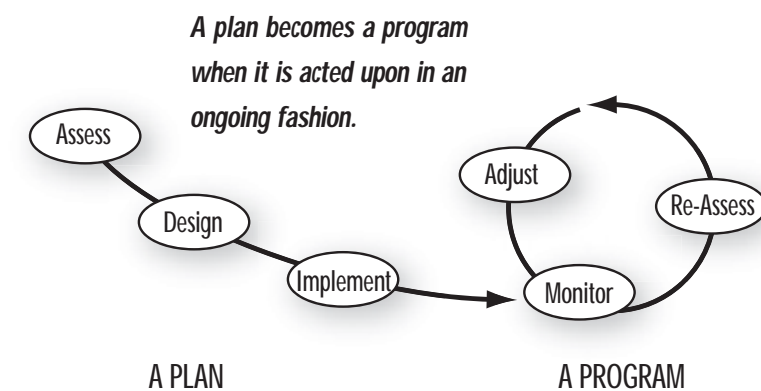
In reality there will not be one integrated plan but a set of inter-related and hopefully harmonized programs that together can be continually assessed and adjusted based on lessons jointly learned.

Plans are just ideas on paper until they are implemented. A plan becomes a program when it is acted upon in an ongoing fashion. If

the plan does not include how, when, why and by whom the plan will be re-evaluated and updated, it likely is destined to be just another report gathering dust on someone's shelf or cluttering someone's hard drive. An ignominious end for any plan, but particularly an adaptive management plan.

Let's all work together to formulate workable plans and turn those plans into sustainable programs.

*Roger Mallett, Executive Director
Newport Bay Naturalists and Friends*



Glossary

Area of Special Biological Significance (ASBS)—Area (now known as a State Water Quality Protection Area) designated by SWRCB as a marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in water quality. The closest of these is Newport Beach Marine Life Refuge on the coast southeast of Lower Newport Bay.

Comprehensive Resource Management Plan (CRMP)—Plan for the holistic management of city, county and state open water, wetland and upland areas at Upper Newport Bay to best protect the native habitats and wildlife.

Drainage Area Management Plan (DAMP)—Document mandated by the NPDES permit that defines how Orange County will control storm water discharges. Each city creates a Local Implementation Plan specifying how it will implement the DAMP in its municipality.

Harbor Area Management Plan (HAMP)—Plan under development by the City of Newport Beach to address sediment management, water quality and other issues relevant to Upper and Lower Newport Bay in an integrated manner.

Integrated Regional Water Management Plan (IRWMP)—A document produced for the Newport Bay Watershed addressing water supply and water quality, flood protection and storm water management, wastewater and recycled water, watershed management and habitat protection and restoration in an integrated manner across multiple jurisdictions. The basis for funding of projects under the Prop 50 bond initiative.

Municipal Separate Storm Sewer System (MS4)—System operated by a public agency that collects/conveys storm water runoff and is not connected to a wastewater collection system or treatment plant.

National Pollutant Discharge Elimination System (NPDES)—A permit program specified in Section 402 of the federal Clean Water Act to control water pollution by regulating point sources that discharge pollutants into waters of the United States. Administered locally by the SARWOCB.

Natural Community Conservation Planning (NCCP)—A means specified by the California NCCP Act to provide comprehensive management and conservation of multiple animal and plant species in a given area, rather than preparing numerous individual plans on a species-by-species, project-by-project basis. There is a parallel federal process involving the development of Habitat Conservation Plans.

Nature Reserve of Orange County (NROC)—Roughly 37,000 acres of protected public and privately owned open space in central/coastal Orange County, and also the name of the non-profit organization managing the NCCP program for these lands.

Non-Point Source Pollution—Pollution emanating not from a specific source, but from a multitude of sources that are hard to identify and/or control. Oil, grease, etc. washed from streets into storm drains when it rains are considered non-point source pollution.

Point Source Pollution—Pollution from a single identifiable source such as a sewage-treatment plant discharge pipe.

Santa Ana Regional Water Quality Control Board (SARWOCB)—One of nine Regional Boards, it has jurisdiction over the north and central Orange County watersheds and issues municipal storm water permits.

State Water Resources Control Board (SWRCB)—Part of the California Environmental Protection Agency, it allocates water rights, adjudicates water right disputes, develops statewide water protection plans, establishes water quality standards, and guides the nine Regional Water Quality Control Boards located in the major watersheds of the state.

Total Maximum Daily Load (TMDL)—Term used to describe the maximum quantity of a pollutant that may be discharged into a lake, river, etc. and still maintain water quality standards. Units of measure may be tons/year, lbs./day, or other units appropriate to the pollutant considered.

Upper Newport Bay Ecological Reserve (UNBER)—Protected wildlife area of about 754 acres of mostly open water and tidal wetland at UNB managed by California Department of Fish and Game.

Upper Newport Bay Nature Preserve (UNBNP)—Protected wildlife area of about 140 acres of mostly upland at UNB managed by County Harbors, Beaches and Parks.

Water Quality Management Plan (WQMP)—A document produced for the Newport Bay Watershed per Section 208 of the federal Clean Water Act that specifies a pro-active approach to protecting water quality by controlling non-point source pollution.

**Terms are listed and defined in the context of this locale.*