Fall 2005

The California Runoff Rundown

A newsletter of the Water Education Foundation

The Ahwahnee Water Principles:
Embedding NPS in Community Development

By Glenn Totten

The intermittent nature of nonpoint source water pollution, its ever-changing volume and composition, presents tough challenges for cities and local governments facing explosive growth and water quality problems. Is there a way to balance the demands of California's mushrooming population and increasingly expensive real estate while at the same time dealing with difficult urban runoff problems?

Regional and local planners believe they have found such a way in the Ahwahnee Water Principles for Resource Efficient Land Use, a set of guidelines adopted in early 2005 by the Local Government Commission (LGC).

The Water Principles emphasize more compact urban development that makes use of natural and planned features to manage urban runoff, improve and enhance groundwater resources and promote efficient use of water resources. Cities, counties and regional planning agencies are incorporating concepts embodied in the Water Principles into their development plans, and the State Water Resources Control Board (State Water Board) may make the Principles part of its program of grants and loans for water infrastructure projects.

Some of the key features of the Water Principles are use of paving

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Dear Readers,

Urban areas across California are implementing programs to reduce runoff, which has emerged as the most serious water quality problem for many communities. Not only can runoff contribute to flooding, but in picking up a host of contaminants, some of them toxic, as it flows across streets and building surfaces, runoff poses a hard-to-solve pollution threat to rivers, creeks and beaches.

With California's growing population making water supplies tighter than ever, urban areas are looking toward a new development model that can allow them to accommodate growth and address some of their runoff problems. Part of the answer lies in the Ahwahnee Water Principles, profiled in this issue. The Water Principles have gotten a good deal of attention from local and regional planning agencies as a low-impact development strategy that can address problems posed by urban runoff and enhance water supplies through groundwater recharge.

In this issue of *The California Runoff Rundown*, you'll find examples of practical projects that have demonstrated innovative ways of building runoff management features into urban landscapes. If you have an example of a successful urban runoff project, we hope you'll share it with your peers through *The California Runoff Rundown*. ◆

Email your story ideas to Glenn Totten, gtotten@watereducation.org

State Water Board Sends Back San Francisco Bay Mercury TMDL

The State Water Board voted 4-1 Sept. 7 to send a mercury TMDL back to the San Francisco Bay Regional Water Board for additional review. The Regional Water Board will have nine months to review and amend the TMDL to meet conditions outlined by the State Water Board.

Presented with three options for dealing with the San Francisco Bay mercury TMDL, the State Water Board chose Option 2, which gives the San Francisco Bay Regional Water Board nine months to revise the TMDL to address issues identified by the State Water Board and by the U.S. Environmental Protection Agency. The first of the two other options (Option 1) would have approved the San Francisco Bay Regional Water Board's mercury TMDL; the third option would have approved it with nonbinding recommendations that the TMDL be "corrected" to address specific issues.

The resolution approved by the State Water Board stopped short of calling inadequate the Regional Water Board's mercury TMDL approved in September 2004, but it identified several issues it said needed to be addressed before the TMDL can be approved. Those issues included an absence of specific monitoring requirements for methylmercury, waste load allocations that failed to account for variations among dischargers and a failure to identify all sources of mercury that may affect San Francisco Bay.

Option 2 approved by the State Water Board was supported by the board's staff and by environmental and fishing groups, who said addressing the issues raised by the board would result in faster removal of mercury from the Bay and reductions in mercury in wildlife, including fish. The State Water Board agreed to clarify language in the resolution to ensure that disposal of dredged material containing mercury complies with provisions of a long-term management strategy for mercury.

Opponents of Option 2 included the San Francisco Bay Regional Water Board, refineries and sanitation agencies that operate wastewater treatment plants that discharge into the Bay. They argued that adoption of Option 2 would be costly to implement and result in only marginally faster attainment of water quality objectives for mercury. The Regional Water Board projects its TMDL would achieve water quality objectives in 120 years.

San Francisco Bay is listed under the federal Clean Water Act as impaired by mercury. The largest single source is mercury mined and used during the Gold Rush era. As much as 8 million pounds accumulated in Bay sediments from mercury mines in the San Francisco Bay Area or mercury-laden sediments that drained into the bay from Central Valley rivers. Bed erosion in the Bay accounts for almost 40 percent of mercury released into the Bay each year, compared with about 15 percent per year from urban and non-urban runoff. Municipal and industrial wastewater discharges account for less than 2 percent.

Mercury is a particularly difficult pollutant to deal with because it can convert to an organic form, methylmercury, which is highly toxic and accumulates in food web organisms. Elevated mercury levels in fish have prompted advisories from public health agencies for sport and subsistence anglers who regularly catch and eat Bay fish.

Exposure to mercury can cause neurotoxic effects on the brain and spinal cord such as abnormal sensory function. It also is linked with birth defects and developmental impairments in children.

EPA has objected to certain parts of the TMDL. It supported Option 2 because it said that option aggressively targets legacy mercury pollution, ensures that point sources do not increase discharges, establishes numeric targets and improves monitoring for methylmercury. In addition to the State Water Board, EPA must approve the Regional Water Board's mercury TMDL.

The specific numeric targets in the TMDL are to reduce average mercury concentrations in Bay fish tissue by about 40 percent to 0.2 parts per million (ppm), reduce mercury in wild bird eggs by more than 25 percent to 0.5 ppm and reduce mercury in suspended sediment by about half to 0.2 ppm. During implementation, the TMDL will be reviewed regularly to fine-tune targets and allocations as new information becomes available.

Copies of the San Francisco Bay Water Board's TMDL documents are available at *www.waterboards.ca.gov/sanfranciscobay/fbaymercurytmdl.htm*. ◆

Garcia River TMDL:
Watershed with a Warranty

The relatively small Garcia River watershed in southwestern Mendocino County is shaping up as a big player in the implementation of Total Maximum Daily Load (TMDL) standards on more than two dozen other rivers in the North Coast region. The successful implementation of a TMDL for sediment in the Garcia River Watershed "bodes well" for similar TMDLs being developed by the North Coast Regional Water Quality Control Board, say two of those who have worked closely on the TMDL.

"I think it's a successful program over all; it bodes well for the future," said Jonathan Warmerdam, an environmental scientist for the North Coast Water Board. Craig Bell, Garcia River Watershed Coordinator for the California Department of Fish and Game, agreed, calling the Garcia River "the watershed with a warranty," thanks to the TMDL.

Like other North Coast rivers that empty into the Pacific Ocean, the Garcia is impaired by sediment discharges mostly attributable to historic and ongoing timber harvesting operations. The sediment has contributed to loss of suitable habitat and elevated temperatures in the river that adversely affect several species of salmon.

The Garcia River originates in the rugged Coast Range just west of Yorkville, in Mendocino County, and empties into the Pacific Ocean about 50 miles west near Point Arena. The sparsely populated, 73,000-acre watershed has been home to timber operations for decades as well as some agriculture.

The work that led up to the adoption of the Garcia River TMDL in 2002 dates back to the mid-1990s. It has involved a variety of stakeholders such as timber companies, farmers, conservation groups and regulators. About 20 landowners' properties that make up approximately 75 percent of the watershed are currently developing or implementing erosion control plans and management plans to comply with the Garcia River TMDL, Warmerdam said.

Timber harvesting is a major source of sediment in the Garcia River watershed.

A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources in the watershed. The Garcia River has been identified as impaired by sediment discharges from various sources, mainly unpaved roads (including skid trails from logging operations) and timber harvesting operations. The Garcia River Water Quality Attainment Action Plan, which includes the TMDL, is at *www.waterboards.ca.gov/northcoast/programs/tmdl/garcia/garcia.html*).

Annual average sediment load in the Garcia River is estimated at 1,380 tons per year. The two biggest sources are fluvial erosion and mass wasting (e.g., landslide).

Under development since 1997, the Garcia River TMDL is the first of its kind in the six-county North Coast Region, and gives landowners three compliance options:

- Option No. 1 - Comply with the Garcia River Watershed Waste Discharge Prohibition, which applies to all landowners and bans the controllable discharge of soil, silt, bark, slash, sawdust, or other organic and earthen material from logging, construction, gravel mining, agricultural or grazing activities;
- Option No. 2 – Develop an Erosion Control Plan and Site-Specific Management Plan; or
- Option No. 3 – Develop an Erosion Control Plan and comply with the Garcia River Management Plan, which specifies general land management measures for unstable areas and riparian areas and for areas related to roads, skid trails, landings, near-stream facilities and gravel mining.

Unpaved roads are sources of sediment.

The North Coast Water Board has encouraged landowners to choose Options No. 2 or No. 3. Both options require development of an Erosion Control Plan to control existing sources of sediment and a management plan to prevent future sources of sediment and improve the watercourse conditions on the property. The North Coast Water Board's executive officer is in charge of approving the compliance documents.

The Erosion Control Plan includes the following elements: an inventory of sediment-delivery sites, a sediment reduction schedule, an assessment of unstable areas and a monitoring plan to evaluate sediment-control efforts. Warmerdam described sediment-delivery sites as human-caused sources that have the potential to deliver 10 cubic yards of sediment or more over the 40-year life of the TMDL. The major sediment-delivery sites typically are associated with roads, skid trails, watercourse crossing and old culverts, he explained.

Landowners must agree to follow a "management plan," which includes a series of land management measures to prevent future sediment discharges associated with land use activities, as well as to improve the watercourse conditions on their property. These land management measures include such things as stream bank protections, filtering of eroded material before it enters a watercourse, protection and avoidance of unstable areas and recruitment of large woody debris to the watercourse channel and floodplain. Landowners can choose to develop their own site-specific management plans (Option No. 2) or follow the set of best management practices (BMPs) called the Garcia River Management Plan (Option No. 3) provided in the Garcia River TMDL.

"Salmon populations have really declined over the last couple of decades," Warmerdam said, noting that rebuilding habitat for salmon and steelhead is the main focus of the Garcia River TMDL. One species that uses the Garcia River, Coho salmon, is listed as a threatened species under the federal Endangered Species Act (ESA) for several North Coast rivers and was listed in March 2005 as endangered under the California ESA for the Garcia River area.

Salmon Rebound

The TMDL has been in effect since 2002, and improvements to fish-spawning habitat already have been documented, said Bell. Coho salmon, the most sensitive of the salmonid species that visit the Garcia River, have returned for six years straight, he noted. The hardier steelhead trout has shown increases in the last five years, and pink and Chinook salmon were reported in 2003 in numbers not seen in more than 20 years, he said.

The improvements are partly the result of 15 years of work involving regulators, landowners and stakeholders, but three recent major land

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Broken culverts contribute to sediment discharge.

Ahwahnee Water Principles

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materials that allow runoff to soak into groundwater, landscaped swales (shallow vegetated depressions) that filter sediments and pollutants from runoff and encourage infiltration to groundwater and recognition that natural features such as wetlands, recharge zones and riparian areas can be assets for flood protection, water quality improvement and groundwater recharge.

"The Ahwahnee Water Principles address every one of our major goals and objectives at the Water Board," said Celeste Cantú, executive director of the State Water Board.

Some of the principles seem at first glance to be a radical departure from California's traditional sprawl development pattern, but advocates believe they may offer a way to accommodate California's skyrocketing population growth while also protecting precious water resources. "You just can't continue with patterns of the past," says Jake Mackenzie, mayor of the City of Rohnert Park, about 50 miles north of San Francisco, and an enthusiastic supporter of the Water Principles.

"This whole notion of stormwater management and urban nonpoint source runoff has to be incorporated into growth and development if we are going to be successful," said Mark Pisano, executive director of the Southern California Association of Governments (SCAG). Agreeing with Mackenzie, Pisano said the Water Principles need to be incorporated into city and county general plans and into project development plans, as well.

At the state level, the State Water Board is taking a close look at the Water Principles and considering how to build incentives for following them into grants and loans issued by the board for water infrastructure projects. "The Water Board is looking to see where we can incorporate [the Water Principles] and . . . ask the recipients of our money to take responsibility for their actions and to be accountable to future generations," Cantú said.

Proponents believe the Water Principles hold a key to the way California will grow now and in the future, focusing on low-impact growth that uses land and natural resources efficiently and that works with natural processes rather than subjugating them. "The dispersed development of the last 50 years is going to be equally matched by a more focused development in the next 50 years. The Water Principles will be part of that new growth," Pisano said.

The approach also dovetails with the growing density of development in California's urban areas. With real estate values skyrocketing, infill development projects are reclaiming former industrial properties for other purposes such as housing and commercial uses.

Permeable paving materials filter runoff.

Water Principles in Action

The Water Principles are too new for many local governments or regional planning agencies to have formally adopted them, but there are many examples of development across California that reflect concepts embodied in the Principles.

The San Francisco Bay Area has been especially active. There the San Francisco Bay Regional Water Quality Control Board's approval in 2001 of an amendment to the Santa Clara Valley Urban Runoff Pollution Prevention Program (Santa Clara program) permit triggered a review of local design standards for a variety of housing, public and commercial developments. The revised design standards follow practices very similar to those recommended in the Ahwahnee Water Principles.

A common thread running through those standards is planning of new development to mitigate the water quality impacts of stormwater runoff. For many urban areas, stormwater runoff is the most serious water pollution and water quality problem they face.

Projects cited in *A Guidebook of Site Design Examples* issued by the Santa Clara program take advantage of natural site topography, cluster development in less sensitive portions of a site to preserve environmentally beneficial features and use design techniques to minimize impervious surface area to encour-

"The Ahwahnee Water Principles address every one of our major goals and objectives at the Water Board."

– Celeste Cantú, Executive Director, State Water Board

age infiltration of runoff.

Specific practices cited in the *Guidebook* include reducing street and right-of-way widths (consistent with fire protection needs), installing curb cuts to allow for stormwater drainage into swales and landscaping, using grading and drainage practices that direct runoff to detention basins, swales and vegetated channels and promoting alternatives to automobiles. Some examples:

- A San Jose apartment complex is designed to allow stormwater runoff to enter a rocky swale, where it is filtered before entering the storm drain. The project reduces the velocity of runoff and provides some natural treatment before runoff enters the storm drain.
- A commercial development in Palo Alto used a constructed, vegetated "bioswale" to provide natural treatment of runoff, reduce the volume and velocity of runoff and reduce pesticide use. The same project features a parking area made with permeable pavers that allow runoff to infiltrate and provide natural treatment.
- The Santa Clara Valley Water District headquarters building in San Jose uses curb cuts in its parking lot to direct runoff to vegetated swales that provide natural treatment of runoff and reduce impervious surface areas. The building also connects rooftop downspouts to landscaping to treat runoff from that source.

More examples of projects that incorporate runoff management features are summarized in the Santa Clara program *Guidebook*, which is posted on the Bay Area Stormwater Management Agencies Association website at *www.basmaa.org/resources/files/SCVURPPP_Site_Design_Examples.pdf* Related documents are available at *www.scvurppp.org*

The Low-Impact Development Center, Inc., reports that a porous paving system coupled with a swale can achieve 91 percent removal of total suspended solids from runoff and 75 percent to 92 percent removal of metals (copper, manganese, iron, lead and zinc). Other studies of permeable paving systems with swales have reported significant reductions in nitrates, nitrites and phosphorus, as well as reductions of up to 90 percent in runoff volume because of infiltration (see *www.lid-stormwater.net/permeable_pavers/permpavers_benefits.htm* for details).

In southern California, there has been similar interest in building

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Infiltration units under construction at Sun Valley filter and store runoff.

runoff management features into new development, according to Pisano. The organization TreePeople has worked with the City of Los Angeles and other partners on projects that follow concepts outlined in the Water Principles.

"You just can't continue with development patterns of the past."

– Jake Mackenzie, Mayor of Rohnert Park

One such project is in Sun Valley, a community of 71,000 in the northeast San Fernando Valley that is notorious for intersection flooding during storm events because it was built without storm drains. TreePeople is collaborating with the Los Angeles County Department of Public Works on a series of projects in Sun Valley Park that will capture runoff and direct it to treatment devices that remove sediment, trash and metals. Two underground infiltration basins can hold up to 2.25 million gallons of treated runoff for groundwater recharge. Inflow is irregular, but storage is temporary and infiltration is continuous. Besides cleaning the runoff, the project will reduce area flooding and improve park facilities.

A similar system for directing runoff to a storage unit was built at Open Charter School in Santa Monica. Runoff infiltrates through athletic fields and landscaped areas into a 110,000-gallon cistern, which removes sediment and other contaminants, making the treated water available for reuse to irrigate landscaping instead of flowing untreated into Santa Monica Bay.

For more information on these projects, visit *www.treepeople.org*.

Principled Growth

The Water Principles are advisory, but Judy Corbett, executive director of LGC, says they are gaining support from key local, regional and state agencies that regulate development and allocate grant funding for water infrastructure construction and improvements. The Regional Planning Committee of the Association of Bay Area Governments (ABAG) in the nine-county San Francisco Bay Area has adopted them. SCAG, ABAG's counterpart in the Los Angeles area, hasn't formally adopted them, but a number of developments in the region have followed concepts listed in the Principles, Pisano said.

The Ahwahnee Water Principles are grouped into nine "community principles" and five "implementation principles." They are designed to complement a broader set of community-development principles adopted by LGC in 1991. Both sets of principles are named for the Ahwahnee Hotel in Yosemite Valley, where they were drafted.

Five of the nine "community principles" directly address urban nonpoint source runoff. They stress more compact development, multiple uses of natural water features such as wetlands and open space to manage runoff and improve water quality and use of landscaping and permeable surfaces to promote infiltration of runoff rather than quick disposal through storm sewers.

The "implementation principles" encourage early involvement of water agencies in land use decision-making and collaborations on water resources planning among local officials, special districts, stakeholders and others on a watershed basis.

The Water Principles follow the format and content of the 1991 community-development principles. Intended to promote growth that is less automobile-dependent, the 1991 principles encourage more compact, resource-efficient development. Many cities in California have adopted and implemented the 1991 principles, including Santa Monica and Cathedral City in California, according to Corbett and Mackenzie.

Advocates of the Water Principles say they are not anti-growth. "The Ahwahnee Water Principles are not a no-growth scenario; this is a low-impact growth scenario," Cantú said.

Embedded in Planning

Local governments can adopt the 1991 Principles and/or the Water Principles or tailor them to suit their needs, Corbett said. Mackenzie said the key to using the Water Principles as a tool to manage urban runoff is to get them embedded in general plans adopted by cities and counties. "The general plans are critical because once you get these Principles into counties' general plans, everything that follows must be compatible and consistent," he said, calling general plans the "constitution" for growth in California.

Rohnert Park updated its general plan in 2000, but is preparing to revisit it in the next fiscal year, Mackenzie said. When Sonoma County did its most recent analysis of available water supplies to accommodate projected future growth, it identified recycling of highly treated wastewater as a water resource along with traditional sources such as surface water and groundwater, he said.

Asked if it's a hard sell to convince local governments to adopt the Principles, Mackenzie said many are realizing that in order to accommodate California's projected population growth, a new development model is an imperative, not an option. "We're strongly suggesting that in the 21st century, to accommodate the 500,000 to 600,000 new Californians each year, we've absolutely got to adopt these Principles," he said.

Pisano said skyrocketing housing costs and lack of infrastructure resources to service the needs of sprawling communities "are causing

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Nonpoint Source News

Central Valley Ag Waiver Updates

The Central Valley Regional Water Quality Control Board's conditional agricultural waiver program (see *The Runoff Rundown*, Spring 2005) is undergoing some changes. On Aug. 5, the Regional Water Board approved amendments to the waiver that clarify procedures for inspections of private property and protection of technical reports that may contain trade secrets. Both changes came in response to a court ruling in May that largely upheld the waiver program but sent three issues back to the Central Valley Water Board for revision. A third issue, defining agricultural-dominated waterways and constructed ag drains as surface waters of the state, was scheduled for consideration at a Sept. 15-16 meeting of the Central Valley Water Board.

On Aug. 15, the Central Valley Water Board's executive officer issued revised monitoring and reporting requirements for coalition groups. One change requires a coalition group to report within the next business day if it determines that a water quality objective has been exceeded in a runoff sample. The coalition group must make the determination of whether a water quality objective was violated within five business days of receiving the laboratory analytical report. For copies of all the changes to the Central Valley Water Board's ag waiver regulations, go to *http://www.waterboards.ca.gov/centralvalley/programs/irrigated_lands/index.html#News* ◆

Fees for Ag Waiver

Growers who participate in any of the agricultural waiver programs to reduce runoff from irrigated lands soon will begin paying a fee to cover costs of administering and enforcing the programs. The State Water Board approved emergency regulations June 16 under which it plans to collect about $1.9 million to fund 22 positions.

The amount a grower pays depends on acreage and whether a grower participates in the conditional waiver program individually or through a coalition group. For coalitions or groups that collect fees from participating growers, the fee is $100 per coalition or group, plus $0.12 cents per acre. For coalitions or groups that do not collect fees, each participating grower pays a base fee of $100, plus $0.20 cents per acre. For individual growers, there is a base fee of $100, plus $0.30 cents per acre. Several coalition groups offered alternative proposals.

The State Water Board also approved a memorandum of understanding with the Department of Pesticide Regulation for a pilot program in Glenn and Butte counties under which two field staff will be hired to support implementation of the irrigated lands program through public education, inspection of watershed monitoring locations and assisting in identification of sources of water quality problems. The agreement is ex-

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2005 Biennial Nonpoint Source Conference

"Measuring Water Quality Improvements" is the theme of this year's Third Biennial California NPS Conference, to be held in Sacramento November 7-9. The conference will highlight specific projects and practices that successfully address California's leading cause of water quality impairments – nonpoint source pollution.

The focus of the conference will be on the importance of designing projects to achieve measurable water quality improvements and on techniques for monitoring improvements. It will offer an opportunity to learn about the numerous NPS pollution control projects that have been supported by state and federal funds, especially Clean Water Act (CWA) Section 319 and Bond Propositions 13, 40 and 50. It will promote technology transfer by examining on-the-ground examples related to agriculture, forestry, urban development, marinas and boating, hydromodification and habitat alteration, abandoned mines and other land use activities that affect water quality.

Concurrent session topics include the following:

- Assessing and evaluating project success;
- TMDL implementation;
- Community group involvement and public participation experiences;
- Reports on vegetated treatment systems;
- Agricultural management practices;
- Bioassessment techniques; and
- Developing and implementing watershed plans.

On the closing day, conference participants have the option of attending two full-day workshops: one monitoring design and data quality concepts, or a second workshop on performance measurement design. Also available is a choice of two full-day field trips: one covers the history of Cache Creek and efforts to preserve and protect its water quality; the other field trip will visit the Mokelumne River watershed to observe completed and ongoing projects to enhance overall riparian habitat and water quality.

Registration for the Third Biennial California NPS Conference is $125 if postmarked by Sept. 23, $150 if postmarked later, and includes all materials, two continental breakfasts, two lunches and a poster session. Field trips are $25 extra and include a box lunch. Detailed information on the conference, including a complete agenda and registration forms, is available at *http://www.swrcb.ca.gov/nps/fall2005.html*.

For general conference information, contact Kim Wittorff of the State Water Board at (916) 327-9117 or *kwittorff@waterboards.ca.gov*, or Tina Yin of U.S. EPA at (415) 972-3879 or *Yin.Christina@epa.gov*. ◆

Updated Calif. NPS Encyclopedia

An updated *California Nonpoint Source Encyclopedia* (NPS Encyclopedia) is now available from the State Water Board. This condensed, quick-reference guide provides an entry point to information on nonpoint source management practices in California, including brief discussions and the intent of 61 nonpoint source management measures for each of the six nonpoint source categories (agriculture; forestry; urban areas; marinas and recreational boating; hydromodification and wetlands; riparian areas and vegetated treatment systems).

The *NPS Encyclopedia* describes management practices and how they can be used to meet each management measure, along with their applicability to various situations and their cost-effectiveness in different climatic and land use settings. The information is intended to assist state agencies, regional water boards, local agencies and nonpoint source practitioners in identifying and implementing practices to protect high-quality waters and restore impaired waters.

To download the newest edition of the Encyclopedia, visit the State Water Board's NPS website at *www.waterboards.ca.gov/nps/index.html*. ◆

EPA Releases Improved Stormwater Management Model

An improved computer program for planning, analyzing and designing urban stormwater drainage and sewer systems is available from U.S. EPA. The updated version (Version 5.0.005b) of the open-source StormWater Management Model (SWMM) includes a modern graphical interface and a more intuitive modeling approach. SWMM simulates single event or continuous stormwater quantity and quality primarily for urban areas.

The runoff component of SWMM simulates the operation of drainage areas that receive rainfall and generate runoff that may include pollutants. A routing component simulates transport of runoff through a system of pipes, channels, storage/treatment devices, pumps and regulators.

The free program, including tutorials, can be downloaded from *www.epa.gov/ednnrmrl/swmm*. ◆

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TMDL Roundup

San Francisco Bay (Region 2)

Project report for pathogens in Napa River released June 30
Contact: Peter Krottje, 510/622-2382; project summary available at *www.waterboards.ca.gov/sanfranciscobay/napariverpathogentmdl.htm*

Project report for sediment in Napa River released June 28
Contact: Michael Napolitano, 510/622-2331; project summary available at *www.waterboards.ca.gov/sanfranciscobay/napariversedimenttmdl.htm*

Proposed TMDL and Implementation Plan for Diazinon and Pesticide-Related Toxicity in San Francisco Bay Area Urban Creeks released August 5, 2005
Contact: Bill Johnson, 510/622-2354; project summary available at *http://www.waterboards.ca.gov/sanfranciscobay/urbancrksdiazinontmdl.htm*

Central Coast (Region 3)

State Water Board approved May 19 Central Coast Region's TMDL for pathogens in San Luis Obispo Creek
Contact: Christopher Rose, 805/542-4770; staff report available at *www.waterboards.ca.gov/centralcoast/TMDL/303dandTMDLprojects.htm*

Los Angeles (Region 4)

Adopted TMDL June 2 to reduce metals in Los Angeles River and tributaries
Contact: Jenny Newman, 213/576-6808

Adopted TMDL June 2 to reduce metals in Ballona Creek
Contact: Rebecca Christmann, 213/576-6757

Adopted TMDL June 2 to reduce toxic pollutants in Ballona Creek Estuary
Contact: Rebecca Christmann, 213/576-6757

Colorado River (Region 7)

State Water Board approved July 21 a TMDL for sediment/siltation for three Imperial Valley drains that empty into the Salton Sea with numeric targets identical to TMDLs approved earlier for the New River and Alamo River; to view staff reports, visit *www.waterboards.ca.gov/coloradoriver/tmdl/TMDL_Status.htm*

Santa Ana (Region 8)

State Water Board approved May 19 Santa Ana Region's TMDL for nutrients in Lake Elsinore and Canyon Lake
Contact: Cindy Li, 951/782-4906 or Hope Smythe, 951/782-4493; staff report available at *www.waterboards.ca.gov/santaana/html/elsinore_tmdl.html*

San Diego (Region 9)

Adopted TMDLs June 29 for copper, zinc and lead in Chollas Creek tributary to San Diego Bay
Contact: James Smith, 858/467-2732; staff report available at: *www.waterboards.ca.gov/sandiego/rb9board/May5/item%208/EOSR.pdf*

'After the Storm' Video Available

Profiles of three major watersheds and how they are addressing the threat of polluted runoff are included in a 30-minute video program co-produced by EPA and The Weather Channel. EPA recently acquired full rights to After the Storm, making it available for broadcast and for use in classrooms, at conferences and other functions.

The program highlights three case studies – Santa Monica Bay, the Mississippi River Basin/Gulf of Mexico and New York City – where polluted runoff threatens watersheds highly valued for recreation, commercial fisheries and navigation. Key scientists and water quality experts offer insight into the problems as well as solutions to runoff challenges.

For more information about the program, visit *www.epa.gov/weatherchannel*, or call (513) 489-8190 to inquire about getting a free copy. Broadcast quality tapes also are available on loan for use by cable television stations and others. ◆

Fees For Ag Waiver

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pected to foster a closer working relationship between staff of the Central Valley Regional Water Board, agricultural commissioners in the two counties and farmers.

The conditional waiver program is intended to reduce runoff from irrigated agricultural lands (see the Spring 2005 issue of *The Runoff Rundown* at *www.water-ed.org/rundown.asp* for more information on the programs). In addition to the Central Valley waiver program, the Central Coast Water Board has a separate program, and the Los Angeles Water Board is scheduled to consider a waiver proposal in November. Updates on waiver programs are posted on the Southern California Agricultural Water Team web site at *www.scawt.com/index.php*. ◆

Garcia River TMDL

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transfers also are helping to meet the TMDL's goals. The Conservation Fund and The Nature Conservancy recently teamed up to purchase 23,000 acres of land used for timber operations that Warmerdam described as one of the biggest sources of sediment in the watershed. The two groups currently are inventorying the property for sediment sources.

A Louisiana Pacific timber operation was sold to Mendocino Redwood Co. Bell said the new owners have invested heavily in land restoration and have indicated they intend to pursue a conservation-minded approach that emphasizes sustainable forestry practices. A third tract of 1,200 acres in the Garcia River estuary, formerly a private ranch, has been purchased by the state. Bell said he expects that work to reduce sediment discharges in the upper watershed eventually will deepen the estuary, making it easier for salmon to access the river's upper reaches.

The North Coast Water Board's staff is studying the Garcia River TMDL as a possible model for TMDLs under development for other rivers in the region, Warmerdam said. Technical TMDLs have been completed for 14 rivers in the region, and 11 others are in development (to view a list of North Coast rivers and the status of their TMDLs, visit *waterboards.ca.gov/northcoast/programs/tmdl/Status.html#list*).

Warmerdam said the North Coast Water Board's staff recognizes that there are physical variations in each watershed, but many of the lessons learned with the Garcia River TMDL will be applicable to sediment and temperature problems in other rivers in the region. Bell said the growing numbers of fish returning to the Garcia River bodes well for the future of that river as well as others in the North Coast Region that follow its TMDL approach.

Bell credited the rebounding fish

numbers to years of work on the original Garcia River plan, but added that the TMDL played a crucial role by cementing in place key provisions of the plan and requiring participation by all landowners. The goal of the TMDL stated in the Garcia River TMDL implementation action plan is to reduce sediment in the Garcia River by 52 percent by 2049. "The TMDL assures, under a timeline, that in the whole Garcia River watershed, the erosion problems will be fixed comprehensively in 20 years. I call it the watershed with a warranty," he said. ◆

Ahwahnee Water Principles

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a whole different form of development model to become more viable." That model focuses on using land more intensively and locating housing and employment centers near transit corridors. "As we move forward on that effort, the Water Principles and the stormwater runoff [elements] are and will be part of that development pattern," he said.

The State Water Board is cautiously studying incentives to implement practices like those in the Water Principles that it could offer to local communities through its grant and loan programs, Cantú said. With control over grant and loan funding for projects such as construction and upgrades of sewage treatment plants and municipal storm sewers, the Water Board holds a large carrot to dangle before local communities in need of new or improved infrastructure.

One such carrot is the State Revolving Fund (SRF), which provides low-interest loans for wastewater treatment facilities, water reclamation facilities and implementation of nonpoint source projects or programs. Cantú said the Water Board is studying the SRF as a pilot program for encouraging low-impact development. Communities count on the SRF program to help them meet National Pollutant Discharge Elimination System (NPDES) requirements, she noted.

"You're seeing the evolution of a different urban development pattern emerging."

– Mark Pisano, Executive Director, Southern California Association of Governments

The State Water Board has proposed to amend its SRF policy to integrate the concept of sustainability into the policy by promoting infill development, protecting and enhancing natural resources such as wetlands, watersheds and open space, and by encouraging "efficient development patterns." The State Water Board also said it is planning to expand the SRF eligibility criteria to allow for use of permeable paving materials when existing paving is disturbed during installation of sewer collection systems.

By using carrots such as the SRF, Cantú said the Water Board hopes to develop a policy that encourages local governments to look closely at land use decisions and ask if there are alternatives that can incorporate concepts from the Water Principles to help solve problems of runoff, water quality and even water supply.

SCAG has its own initiative, called Compass, to encourage its member agencies to adopt new development patterns consistent with the Water Principles. The theory behind Compass is that the way in which an entire region works can be transformed by changing just 2 percent of the urban area, Pisano explained.

A key to making the concepts in the Water Principles work is to get them incorporated into city and county general plans and into designs for specific projects, Pisano and Mackenzie said. "If we don't get it into our general plans and design of specific plans and budget plans, then I think this will be an uphill battle," Pisano said. The Compass initiative seeks to encourage developers to think of features like bioswales and permeable pavements as assets for marketing their products rather than as add-on features with extra costs. For more information on the Compass initiative, visit www.socalcompass.org/2percent/.

Mackenzie and Pisano think it will be easier than it seems to change the sprawl tendencies that have marked California's development for decades. Mackenzie said he is seeing recognition among local government officials that a new development model that blends growth with preservation of natural resources such as water is an imperative, not an option.

For Pisano, the driving forces are housing affordability and the cost of delivering community services to spread-out communities. "You're seeing the evolution of a different urban development pattern emerging," he said.

There is broad agreement that the Water Principles can be an important part of accommodating California's projected population growth while simultaneously helping to address its number one water quality problem, nonpoint source runoff.

More information on the Ahwahnee Water Principles is available at LGC's web site, www.lgc.org/. Download a copy of the Water Principles at www.lgc.org/ahwahnee/h2o_principles.html ◆

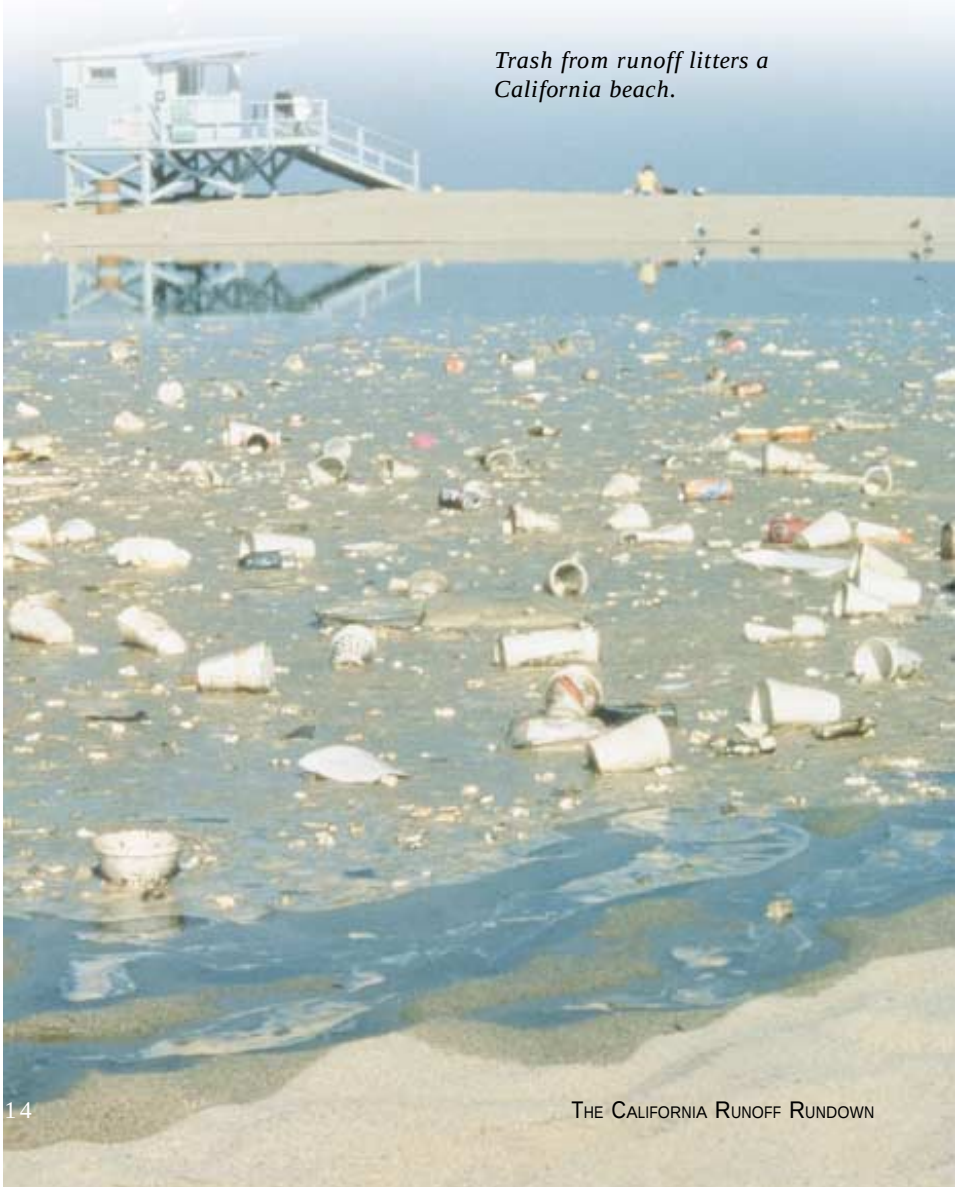
Latterday 'Imagineers' Re-Think Urban Runoff Management

By Gary Pitzer

Orange County's Disneyland famously employed "imagineers" to design and build its amusement park attractions. "Imagineering" of a different sort is still going on in Orange County, focused on creative ways of managing runoff during both dry and wet weather.

In the past, drainage systems for residential developments shunted wet and dry weather flows away from the area as quickly as possible, through box culverts toward an ocean discharge. "Our design philosophy in the 1960s was to make it small, fast-moving and easy to maintain," said Alan Nestlinger, an Orange County hydrologic consultant who spent 35 years as a flood control engineer with the county.

That milieu has changed, however. Today, based on improved knowledge of hydrology as well as greater environmental awareness, engineers are designing new housing developments with drainage apparatus that takes a favorable view of runoff and the natural ability of landscape to deter pollutants from migrating downstream and contributing to degraded water quality. As opposed to years past, hydrologists today realize the fast-moving stormwater conduits "are conveying a lot of junk to the ocean," Nestlinger said.



Trash from runoff litters a California beach.

That realization, coupled with tighter regulatory limits on stormwater flows, has led to development of engineered systems that slow the pace of dry weather and stormwater flows by mimicking natural processes while still preserving and protecting lives and property. Instead of quick disposal, so-called "dry weather" flows are directed to engineered wetlands where pollutants are naturally biodegraded.

In Laguna Hills, Hasan Nouri directs Rivertech, a small consulting firm specializing in sediment transportation and water quality engineering. Nouri credits the region's flood control designers for doing a "fantastic job" in creating a system that rapidly diverted storm flows away from homes and toward ocean discharge, but said changing awareness of environmental impacts has required a reassessment of that strategy that returns water to alluvial streams.

"Society has demanded cleaner rivers, streams and oceans," he said. "In response to that demand the regulatory agencies established

Natural and constructed wetlands filter runoff.

[discharge] rules, and it is the job of us engineers to be in compliance with those rules."

As regulators began to clamp down on permitted discharges in the 1990s, Nouri engineered stormwater flows for exclusive, $1 billion developments in southern Orange County that ensured peak flows did not exceed pre-development rates while allowing the bypass of sand and gravel to downstream reaches and ultimately, beach sand nourishment. He acknowledged the plans require necessary acreage to facilitate runoff, but that the end result is "an amenity, not a liability" because the need to treat runoff to numeric standards is eliminated.

"I believe the dry weather flow is the biggest source of pollution to our streams, rivers and beaches."

– Hasan Nouri, Rivertech

Nouri said basins constructed in coastal parks and golf courses around Newport Beach more than 20 years ago successfully minimized the flood risk but did not address "first flush" and dry weather flows, which are the major sources of nonpoint source pollution. "I believe the dry weather flow is the biggest source of pollution to our streams, rivers and beaches," Nouri said. "When we have dry weather flow contributed by urbanized areas day after day, week after week and month after month we send lot of pollutant loads to the receiving waters."

While associated with the Orange County Flood Control District, Nestlinger said he saw the benefits of Nouri's approach after a structure was installed on a tributary of Santiago Creek that allowed sediment to move as part of the flow. "I was amazed at the performance of the structure," he said. "It not only stopped bank erosion, but the stream bed restored itself within a year or two. With that, I became an advocate of his approach."

The drainage solutions designed by Rivertech address the "contradictory requirements" of open space protection, flood protection and pollution control, Nestlinger said. He acknowledged the challenge associated with re-designed flow management, namely the fact that acreage is needed to facilitate the conveyance. Retrofitting existing sites "is never easy," requiring investment and the possible condemnation of private property, he said.

Environmentalists, who are happy to see developers take a more sustainable approach to runoff management, embrace Rivertech's approach. "In the beginning, we made our point via litigation," said Garry Brown, executive director of Orange County CoastKeeper. "Now, they've got the message."

Brown said the problem of polluted runoff became glaringly apparent in the summer of 1999, when officials were forced to close Huntington Beach for extended periods, damaging the reputation of "Surf City" and harming the local economy. The gravity of the situation has convinced developers to agree to comply with numeric pollutant standards as identified in the stringent California Toxics Rule.

"That's how much we've raised the bar in Orange County," Brown said.

A particularly noteworthy example of revised runoff management can be found at the Irvine Company's 115-acre Pelican Hill golf resort along the Newport Coast. Situated near Crystal Cove State Park, a sensitive marine environment, the project features a state-of-the-art water management system. Seven subterranean cisterns – each holding as much water as one-and-a-half Olympic-size swimming pools – capture and hold runoff that is mixed with reclaimed water and used for irrigation.

Brown said the mixture of reclaimed water with naturally treated runoff provides a "greater margin of safety" than use of reclaimed water alone for landscape irrigation. ◆

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Share Your Success

Have an interesting story to tell about your nonpoint source pollution control or stormwater program? Why not share your experience with others through *The Runoff Rundown*? One of the goals of *The Runoff Rundown* is to be a forum for sharing ideas that have successfully reduced nonpoint source or urban runoff. These can be programs or policies initiated by cities, local and regional agencies, regional water boards, or in the private sector. To share your story, contact Glenn Totten, Water Education Foundation, at (916) 444-6240, or send e-mail to *gtotten@watereducation.org*.

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