

Los Angeles Section

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PRESIDENT'S MESSAGE

Michael Thornton, P.E.
Los Angeles Section President

VOL. XLXV NO. 6

In This Issue	<i>page</i>
PRESIDENT'S MESSAGE	1
100 YEARS OF RUN-OFF	2,4-5
CENTENNIAL CELEBRATION DONORS	6-7
STUDENT NEWS	8
ARTICLES	9
PROFESSIONAL DIRECTORY	12



The Society Report Card, Part 2

Last month I discussed the Society's grades, or at least the first half including Aviation (D), Bridges (C+), Dams (D), Drinking Water (D), Energy (D+), Hazardous Waste (D), Inland Waterways (D-), and Levees (D-). Here is the remainder of ASCE's Society grades:

1. Ports (C)-the US Army Corps of Engineers estimates that more than 95% of the overseas trade produced or consumed by the United States moves through our ports. In the Los Angeles Section, we have 2 major ports – Los Angeles and Long Beach – of which are some of the busiest ports in the world. Another interesting development related to ports is the Panama Canal. Construction of the Canal upgrade will soon be completed that will accommodate much larger ships. Ship traveling from Asia will now be able to utilize the Canal and East Coast ports. Many ports along the East Coast have been reinvesting in ports to accommodate these large vessels.

The State report card determined that California ports are a B-. Not much better than the Society grade and with the significant enhancement ongoing in the East, a greater investment to remain competitive is needed. The State report card indicates a \$10.7 billion investment is needed over the next 10 years.

2. Public Parks and Recreation (C)-ASCE indicates that popularity of parks and outdoor recreation areas in the United States continues to grow, with over 140 million Americans making use of public parks and recreation facilities as part of their daily lives. In addition, these activities contribute \$646 billion to the nation's economy, supporting 6.1 million jobs. Local unmet needs are estimated at \$18.5 billion and the National Park Service indicates that its maintenance backlog at about \$11 billion.

Many consider our National Parks national treasures. Think of some of the best vacations that you experienced over the years. Many likely include National Parks. I fondly remember trips to Yosemite and the Grand Canyon as well as our National Mall and Smithsonian in Washington DC.

3. Rail (C+)-ASCE indicates that railroads are experiencing a competitive resurgence. I can attest to that living near an at-grade crossing (3 sets of tracks) that I use several times per day and there always seems to be a train there. Since 2009, capital investment from both freight and passenger railroads has exceeded \$75 billion. Rail seems to be on track, pun intended.

continued on page 3



100 Years of Runoff Management in Southern California

By John Hogan, P.E. — Past-President, LA Section and Member, 2013 Centennial Committee

Civil Engineers help build a better world. The work we do directly improves the quality of life within the communities we serve. That statement has never been more resoundingly true than in the category of Runoff Management. Over the past century, Civil Engineers have planned, designed, built, and operated the dams, channels, basins, and storm drains that have made it possible for over 20 million people to live, work, and play in towns and cities within the Los Angeles Section largely without fear or danger of flooding. This is an amazing accomplishment considering the rapid pace of population growth and development and the flood prone nature of our region. Yet in more recent times, our runoff management systems have been criticized as being too singularly focused on flood control to the detriment of other aspects of the region's quality of life.

In this article, we take an abbreviated look at the past 100 years of runoff management in Southern California and the slow but perceptible trend away from simply building dams and flood control channels toward a more comprehensive and integrated approach that addresses environmental, aesthetic, and recreational concerns within our watersheds.

Controlling Floods – Our First Priority

Southern California has always had a problem with either too little or too much water. The Los Angeles Section is within a semi-arid region that receives between 10 and 20 inches of rainfall annually. However, the average consists of numerous very dry years interspersed with a few very wet years. This year (2012-13) has been one of the driest on record with a rainfall total of only 5 or 6 inches in many places. Conversely, during an extremely wet year, 6 inches can be recorded in a single day. (Talk about having to design for range of conditions!)

In pre-development days, runoff from these major storms had wild consequences on the area's topography. For example, the "Great Flood" of 1861-62 resulted in the mouth of the Los Angeles River shifting from Venice to Wilmington. The plains of Los Angeles County were extensively flooded and formed a large lake system where the stronger currents cut new channels to the sea. The Los Angeles, San Gabriel, and Santa Ana Rivers converged, forming a solid expanse of water from Signal Hill to Huntington Beach. Runoff transformed much of what is now Orange County into an inland sea that was 4 feet deep in places that were 4 miles from the Santa Ana River.

In the late 19th and early 20th centuries, during the 20 to 30 years between flood producing storms, prosperous farms and towns developed across the dry alluvial plains of the region's rivers. Then, in 1914 and again in 1938, intense storms deluged the Southern California mountain ranges with 20 inches or more of rainfall in 4 day period. The consequences were overflowing streambanks, devastating levee failures, highway, railroad and utility washouts, flooding of low lying businesses and residences and numerous fatalities.

The 1914 flood brought a public outcry for action to address the recurrent flooding problems. To provide a governmental approach to protecting developed property from disastrous floods, the state legislature authorized creation of flood control districts. Flood control



1914 Flooding in Arroyo Seco

districts were given specific limited powers to provide works of improvement, and authority to submit bond propositions to the voters for bonds to finance construction. Property taxes could be levied to pay off the bonds, and for the operation and maintenance of the constructed facilities.

In 1915, the first such district in the state, the Los Angeles County Flood Control District, was formed and empowered to provide flood protection, water conservation, recreation and aesthetic enhancement within its boundaries. Early flood control efforts included some channelization and reservoirs. Taxpayers approved bond issues in 1917 and 1924 to build the initial major dams. However, taxpayers were not willing to provide enough funds for substantial infrastructure downstream of the dams. It usually would take another flood event before funding would be approved for additional improvements.

The story is similar within the other counties in our region. Orange County established its Flood Control District in 1927, San Bernardino County in 1939, and Riverside and Ventura Counties in 1944. The Districts were formed to provide control and conservation of flood and storm waters and to protect watercourses, watersheds, public highways, life and property from damage or destruction from these waters.



Bridge collapse on the Santa Ana River in 1916

In the midst of the Great Depression, the federal government began to play a role in public works construction. The Federal Flood Control Act of 1936 authorized the Army Corps of Engineers to undertake

4. Roads (D)-ASCE indicates that 42% of American's major urban highways remain congested, costing the economy an estimated \$101 billion in wasted time and fuel annually, ouch! The Federal Highway Administration estimates that nearly \$80 billion shortfall in capital investment annually. The state report indicates that a need of \$10 billion more per year is needed to improve our transportation grade from a C- to a B which includes roads.

As I travel my neighborhood, the lack of road maintenance is clear. Many roads are in such poor condition that some would say it compares to third world conditions. Not long ago, I read in the paper in the letters to the editor, "A miracle had occurred, all of the potholes on [a particular street] had been filled, it rained." Clearly, we can all attest that greater investment is needed.

5. Schools (D)-ASCE indicates that almost half of America's public schools were built to educate the baby boomers. Experts indicate that an annual investment of \$270 billion is needed to modernize and maintain our nation's schools. Today, the federal government invests less than \$10 billion annually.

I, as essentially all of us, benefited from the public school system. As a graduate of California State Polytechnic University, Pomona (BS) and Long Beach State University (MS), I received a foundation to build a career. The public educational system provided us with the opportunity to receive an education and career that we will forever be indebted.

6. Solid Waste (B)-ASCE indicates that America generated 250 million tons of trash in 2010 of which 85 million tons were recycled. My how things have changed! Due to "Go Green" policies, we will continue to improve recycling. In California, according to our state report card, nearly 65% of waste is recycled. Our state grade is a B and to maintain that grade, we need to continue investing at a level of \$8 billion annually over the next 10 years. Kudos to the Solid Waste Management Engineers; you are leading the way in changing the public's behavior for trash management.

7. Transit (D)-ASCE indicates that public transit is experiencing increased ridership with declining funding. It has often been said that we cannot build freeways fast enough to meet demand. The solution is all modes of transportation including transit. Transit is not a viable transportation option in many areas but is in the most congested areas. Again, according to ASCE, deficient and deteriorating transit systems cost the US economy \$90 billion in 2010.

California has often led the way on transit and in 2010, the voters approved a \$10 billion investment in High Speed Rail. It has been under attack since the votes were counted but is another tool as a future transportation system. With its hopeful implementation; California will lead the country into the transportation future yet again.

8. Wastewater (D)-ASCE indicates that pipes are in the largest need, comprising of $\frac{3}{4}$ of the total need of \$298 billion over the next 20 years. Fixing and expanding pipes will address sanitary sewer overflows and other pipe related issues. The state report card gave wastewater a grade of C+ but indicated that to increase our grade to a B will require an additional annual investment of \$4.5 billion.

Projects that I have the privilege to provide engineering services includes sewer projects that convert on-site disposal system to regional system for enhanced treatment prior to release to the environment. In many communities, these projects are still needed. According to the US EPA, the cost to prevent pollution is 1/10 to 1/100 the cost to clean up contaminated groundwater. With advanced technologies, comprehensive collection and treatment will result in enhanced water quality. Once again, the engineers continue to achieve greatness!

For more information, please review the society website.

In summary, the grades are simply stated, poor. Current trends of lack of proper investment will lead to poorer grades. ASCE continues to argue that infrastructure is the foundation to economic prosperity with our failure to act series. Increased investment at every level of government is needed. So, what is our role? Each of us needs to be an infrastructure champion. I ask that all of us do so by educating local and state leaders on infrastructure conditions and need for investment. On May 17th, ASCE made our pitch to state legislators. I ask you to attend your local city council or board meetings to educate them. Request that they make infrastructure investment the highest priority. Local governments are responsible for drinking water, wastewater, roads, parks and recreations, and schools; all grades that can need significant improvement.

Further, reach out to the local press advising of our report cards and conditions of infrastructure and the changes that local community leadership can make. Improvement to our infrastructure starts with us; one meeting or one call at a time!



a nationwide program of construction, including projects within our region. However, before any of the federal projects could be started, another devastating flood occurred in March 1938. The so-called "Flood of the 20th Century" inundated over 250,000 acres in Orange, Riverside, San Bernardino, Los Angeles, and Ventura Counties. In just three days, rainfall in downtown Los Angeles totaled 6.74 inches. The death toll exceeded 200. The flooding stimulated demand for more flood control construction and prompted Congress to take immediate action to authorize funding. Among the projects constructed were Prado Dam on the Santa Ana River and the channelizing and concrete lining of the Los Angeles River.



Santa Ana River - Flood of March 1938

Today, the Los Angeles Section includes two of the most extensive flood control systems in California—the Los Angeles County Drainage Area (LACDA) Project, and the Santa Ana River Orange County (SAROC) system, which includes the Santa Ana River Project and the Santa Ana Main Stem Project. The region has 34 flood control reservoirs, including 5 on the LACDA system and 7 on the SAROC system, many



1938 Flood - LA River near Victory Blvd

several detention basins, levees, channel improvements, and bypasses.

Civil engineers have had prominent roles in both of these projects, as well as with countless other

projects, both regional and local, that have steadily harnessed and contained flood flows throughout the region.

Shifting Attitudes and New Regulations

The traditional approach to runoff management viewed urban runoff as a flood management problem where water needed to be conveyed as quickly as possible from urban areas to waterways in order to protect public safety and property. Consequently, rainfall runoff in the urban area was been viewed as a waste and not a resource.

The traditional approach (i.e., channelization, dams, and reservoirs) had consequences that were not always popular. A proposed dam at Whittier Narrows would have required much of the City of El Monte to be flooded. The citizens and leaders of El Monte, after a great

deal of political haggling, managed to get the proposed dam moved to another location. The issue of El Monte was an important turning point in the history of the flood control plan, as it was the first time that public opinion had any effect on it.

In the mid-1960's, environmental concerns about the LA County flood control plan started to come to light. The City of Sierra Madre wanted the stream that flowed through it to look natural, not encased in concrete. In 1980's, concerns over the deterioration of water quality in Santa Monica Bay gave birth to Heal the Bay. Later, in the 1990's, activist groups pushed for a "regreening" of the concrete-lined Los Angeles River. The people living near the river were, however, less interested in returning it to its natural state and more interested in its recreational potential, such as using the surrounding land for parks and playgrounds.

Meanwhile, in 1972, Congress passed the Clean Water Act, which introduced the National Pollutant Discharge Elimination System (NPDES) and forever altered the approach to runoff management. In 1990, the US EPA published regulations requiring NPDES permits for certain industrial, construction and municipal sources of storm water runoff and fundamentally changing the way storm water runoff is regulated at the state and federal levels. These regulations required permits for operators of MS4s ('municipal separate storm sewer systems'), consisting primarily of city and county government agencies responsible for storm water. The permit regulations generally require MS4s to reduce discharges of pollutants to the maximum extent practicable and to prohibit illicit discharges to the MS4. Later versions of the permits seek to prevent hydro-modification by encouraging Low Impact Development. Permit elements address public education, agency/municipal maintenance activities, new development, construction, industrial/commercial facilities, illicit discharges and improper disposal, monitoring and reporting.

These regulations and concerns about the water quality impacts of urban runoff have led to a transformation of the approaches to control runoff and provide other benefits. Traditional approaches have given way to watershed approaches. This has resulted in urban runoff management now being linked to other resource management strategies including pollution prevention, groundwater recharge, habitat restoration, and recreation.

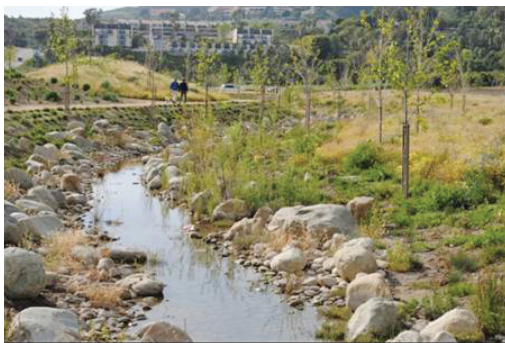
A watershed approach for urban runoff management tries to emulate and preserve the natural hydrologic cycle that is altered by urbanization. The watershed approach consists of a series of best management practices (BMPs) designed to reduce the pollutant loading and reduce the volumes and velocities of urban runoff discharged to surface waters. These BMPs may include facilities to capture, treat, and recharge groundwater with urban runoff, public education campaigns to inform the public about storm water pollution, and storm water pollution prevention training.

As an example of how the focus has shifted, in 2003, Ventura County changed the name of its flood control district to the Ventura County Watershed Protection District. The name change reflects changes in community values, regulatory requirements, and funding opportunities. The name change also reflected the District's desire to emphasize integrated watershed management and solve flood control problems with environmentally sound approaches.

In recent years, we have seen an uptick in multi-faceted drainage

projects - projects that seek to achieve a balance between flood control, habitat preservation, recreation, and groundwater recharge. A prominent case in point is Malibu Legacy Park, which ASCE Region 9 selected as the 2011 Project of the Year for California. Legacy Park is a project that is the embodiment of the principles of the watershed approach to runoff management.

Those of us whose careers began during the era of the traditional approach can attest to the added complexities of the watershed approach and the challenges of complying

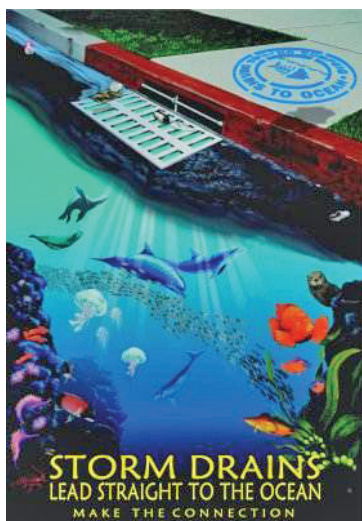


Malibu Legacy Park

with the increasingly more stringent NPDES regulations. We also appreciate that, while more complicated and costly, the outcomes are superior systems of runoff management that will further enhance our region's quality of life.

The Future of Runoff Management

Despite our best efforts, it is clear that natural events, such as floods, cannot always be perfectly predicted or managed by human actions. We are also finding that engineering solutions must take into account the opinions of the environmental organizations, community groups, and others who might be affected by any changes made in the flood control system.



Los Angeles County DPW Poster

Concern about our region's waterways is growing. In Southern California, untreated dry weather and stormwater flows ultimately reach the ocean, sometimes causing violations of beach water quality standards. Coastal waters then become unsafe for swimming. Fish are deemed unsafe for eating. Moreover, because dams block sediment that rivers would otherwise deposit on beaches, many beaches suffer serious erosion thereby reducing their recreational value.

The threat that water quality and beach erosion pose to the tremendous economic benefits brought by tourism and recreation, coupled with the pride that most Southern Californians take in their coast, has fostered the growing interest in the water quality of urban runoff. Also, as opportunities for importing water decline, Southern Californians are realizing that not only must they conserve water at home and work, but the region can no longer afford to waste water by simply shunting stormwater

to sea. Increasingly, the approach to runoff management is shifting to ways in which stormwater can be used to recharge groundwater aquifers and increase drinking water supplies.

In addition, in this highly urbanized environment, people are seeking opportunities for outdoor recreation. To many people, corridors along rivers and streams are seen as ideal for a wide array of recreational and interpretive activities that can contribute greatly to the quality of life enjoyed by those in surrounding communities.

The State has encouraged local agencies to adopt Integrated Water Management (IWM) approaches to runoff management and flood control. In the Los Angeles Section area, billions of dollars of future flood management projects are planned. Many of these will use an IWM approach that will provide multipurpose outcomes, including flood control, sedimentation balance and control, water quality improvement, land use management, groundwater recharge, ecosystem mitigation and restoration, and recreational opportunities.

These projects will not be simple, nor will they be inexpensive. It is challenging and costly to retrofit a balanced runoff management system within a densely developed area. Funding sources must be found. Virtually everyone is in favor of improved water quality but enthusiasm wanes when it comes time to discuss how to pay for it. Recently, public opposition led Los Angeles County authorities to pull back efforts to generate funding through a property tax assessments.

On the other hand, the City of Santa Monica has had a storm water utility fee in place since 1995. These funds are used for various programs to reduce or treat runoff. The culmination of the city's program is the \$12 million Santa Monica Urban Runoff Recycling Facility (SMURRF), a joint project of the cities of Santa Monica and Los Angeles. The SMURRF project is a state-of-the-art facility that treats dry weather runoff water before it reaches Santa Monica Bay. It has helped in the dramatic cleanup of Santa Monica Bay by decreasing the amount of polluted runoff by 90%.



The SMURRF in Santa Monica

As we move into the Los Angeles Section's second century, Civil Engineers who are active in the field of runoff management are going to be busy. If the past is any indication

of the future, our profession will play a leadership role in successfully addressing the many challenges presented by runoff management. And once again, civil engineers will demonstrate their important role in building a better world.



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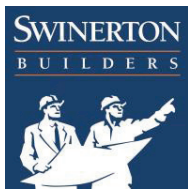


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Student News

By Gregg L. Fiegel, PhD, PE, GE, M.ASCE, Vice President, Student Activities



Students and student chapters within the Los Angeles Section were recently recognized by ASCE for their outstanding efforts. Each year, student chapters are required to submit a 100-page annual report to ASCE, highlighting their previous year's activities, events, and projects. The students also use these reports to summarize important goals and continuous improvement efforts carried-out by the chapter leaders.

ASCE reviews these reports as a basis for national awards. The Los Angeles Section is proud to report that the student chapters at CSU Long Beach (Most Improved Award and Certificate of Commendation), Cal Poly, Pomona (Certificate of Commendation), and Cal Poly, San Luis Obispo (Region 9 Distinguished Chapter Award, Letter of Recognition for Community Service, and Ridgway Award Finalist) were all honored for 2013.

In early April, three of the Section's student chapters (USC, LMU, and Cal Baptist) teamed to host the Pacific Southwest Conference. Events were held at USC. The conference teams from San Luis Obispo (1st), Pomona (2nd), and UCLA (3rd) bested other schools from throughout the southwest U.S. for the overall conference championship. The concrete canoe teams from San Luis Obispo and Pomona qualified for the National Concrete Canoe Competition in June. In addition, the steel bridge teams from Northridge and San Luis Obispo qualified for the National Student Steel Bridge Competition in late May. The Section congratulates all of the participants. Planning and hosting this conference requires tremendous effort, as over one thousand civil engineering students participate from 18 universities. The conference organizers and volunteers from USC, LMU, and Cal Baptist are commended for their efforts. Nice work!

In March as part of the Section's annual scholarship program, four outstanding young civil engineering students were honored for their academic efforts and involvement in ASCE. Student members Rosa Lau (USC), Billy Basuni (Long Beach), Michael Mondragon (San Luis Obispo), and Elise Takebayashi (USC) will receive funding to support their school activities during the 2013-14 academic year. Congratulations to the students, and special thanks to all those Section members who helped review the scholarship applications. The scholarship program is described on the Section's website.

Finally, the Section would like to congratulate two individuals for their outstanding work and commitment to ASCE. Ms. Sabrina Rivera, current President of the Long Beach student chapter, was honored

by ASCE under its "New Faces of Civil Engineering-College Edition" program. The Society selects only ten students each year based on academic prowess, extracurricular community involvement, professional attitude, and commitment to the profession. Congratulations Sabrina! Additionally, Ms. Alicia Welling, current officer in the San Luis Obispo student chapter and concrete canoe team captain, was honored by ASCE under its "Student Leadership Award" program. This award is based on nominations received by the ASCE Committee on Student Members. Ms. Welling also received the annual ASCE Region 9 Outstanding Student Award, which was presented during the Infrastructure Symposium and Awards Dinner in March. Congratulations Alicia!

ARTICLE

ASCE's Career Fair-in-a Box: All you need for an exhibit!



ASCE's Career Fair-in-a Box is perfect for times when you have been asked to present to a group of students at an exhibit-style event, and need supplies in a hurry! Show your enthusiasm for civil engineering with a brightly colored display that includes interesting table-top posters, handouts and give away items that are sure to please every audience. Combine the kit with one of ASCE's fun educational outreach activities or use it as a stand-alone exhibit. Bring lots of engineers into the mix to ensure a successful event! To order visit <http://www.asce.org/precollege-resources/>

Life Member Forum Tribute



The Life Member Forum, on behalf of the LA Section, honored Walt Preston (fourth from right) at a luncheon near his home at the Talega Golf Club. Andy Machen read and presented to Walt an official proclamation from the LA Section celebrating his life achievements. Walt is pictured with his wife Mary Jane surrounded with LMF members. Walt represents nearly seventy five years of continuous service to ASCE.

Nominations Announced for L.A. Section Officers; Terms to Begin in October

The Los Angeles Section Nominating Committee has made the following recommendations to the Board of Directors for the slate of officers for the term beginning October 2013:

President-Elect (for a three-year term; President-Elect, President, and Past President):

- Kenneth H. Rosenfield, P.E., Director of Public Services, City Engineer, City of Laguna Hills

Treasurer (for a two-year term):

- Diego Cadena, P.E., Geosyntec Consultants

Vice President Student Activities (for a two-year term):

- Prof. Nazaret Dermendjian, Ph.D., P.E., Chair, Department of Civil Engineering & Applied Mechanics, California State University, Northridge

In accordance with Article 4, Section 4.3.6, of the current Los Angeles Section Bylaws,

Additional nominations for each office to be filled may be made by a petition signed by no less than fifty (50) Voting Members of the Section provided that such a petition is accompanied by a written acceptance of the nomination by the nominee and is filed with the Incumbent Section Secretary within 30 days after the announcement of the nominees.

The Voting Member grades, as defined in the Los Angeles Section Constitution, Article 2, Section 2.2.1, are Associate Member, Member, Fellow Member, and Distinguished Member, whose dues are current or who are granted a Section dues exemption.

Petitions are due within 30 days of the distribution date of this announcement and should be submitted to:

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Publisher

ASCE LA Section
Gayle Stewart
1405 Warner Ave., Suite B
Tustin, CA 92780
Phone (714) 258-8306
Fax (714) 258-8391
E-mail: GStewart@associationplanet.com

Editor

Dr. Cris B. Liban, P.E.
LACMTA
One Gateway Plaza
Mail Stop 99-17-2
Los Angeles, CA 90012
Phone (213) 922-2471
FAX (213) 922-6875
E-mail: cliban@alumni.ucla.edu
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