Newsbreaker
CALIFORNIA SHORE & BEACH PRESERVATION ASSOCIATION
July 2005

President's Message

by David Cannon

Over the past several years, this organization and many others, have been working to identify methods and funding sources to restore and continually nourish California beaches that have suffered or continue to suffer from erosion. We have worked at various governmental levels to obtain authorization for beach nourishment programs implemented through partnerships between local governments and the federal government (U.S. Army Corps of Engineers). In parallel with pursuing assistance from the federal government, we have developed opportunistic sand programs to place suitable sand, on appropriate beaches, that becomes available through local earthwork projects. There has been some progress made for both of these approaches, with several beach nourishment projects implemented as well as the development of a few opportunistic sand programs within southern California. However, there is still a long way to go in developing and funding the programs necessary to address the current beach erosion problems we face. It seems to me that we have an even longer way to go in developing and funding the programs needed to address the future beach erosion problems we are likely to face resulting from continued reductions in sand supplies, changes in wave climate, increasing sea level rise, and population pressures on these important recreational assets and storm damage attenuators.

Both of the approaches described above are based on the notion that we need to "engineer" the beaches in the same way that most human infrastructure is engineered (e.g., buildings and roads). In this sense, beach nourishment projects, whether constructed using targeted source sand or opportunistic sand, are designed to optimize net benefits to humans. This is done through a design process that is based, in part, on the placement of suitable sand at or near the locations that will provide the greatest benefits. Suitable sand means that the sand to be placed on the beach is similar in physical and chemical properties to the sand that is already there. Of course, Mother Nature does not segregate the sands before transporting them to the beach such that only beach-suitable sand can erode from the bluffs or be transported through the river systems to the beaches. Mother Nature transports all the sediment to the beach area and then natural processes winnow out the fine-grained material leaving

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2005 California State Science Fair Awards

by Phyllis Grifman

Joshua J. Compton, an 8th grader from Humboldt County, and Sarah Amiri, a high school senior from Santa Barbara, were presented with CSBPA's Outstanding Coastal Project awards at the California State Science Fair on May 24, 2005. Both of these students presented projects on coastal science and engineering that were impressive not only for their originality, but also for their scientific rigor. Both students conducted projects that were inspired by current events, intending – and succeeding – to provide meaningful research on difficult problems.

Joshua J. Compton's junior division project, "An Assessment of Barrier Designs in Minimizing the Impact of Tsunami Waves on Shorelines," won CSBPA's junior division award of $250. Timely and interesting, Joshua's project was inspired by the December 2004 tsunami in south Asia. Joshua's goal was to determine whether offshore barriers can minimize impacts of tsunami waves, and what kind of barrier design would work most effectively to reduce the amount of energy in the run-up area. Joshua built a wave tank out of Plexiglas, with a wave generator at one end and a simulated shoreline at the other end. Three different barrier shapes were used: triangular, circular, and elliptical.

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sand on the beach. Likewise, with respect to where the sands are deposited on the beach, Mother Nature does not deposit sand where it will provide the most benefit for humans but rather where natural processes dictate it should remain. Therefore, I propose that we adopt an approach that mimics, as much as possible, the natural processes at work in California.

Instead of, or in addition to, developing beach nourishment projects that involve the placement of sand on or near our beaches, let us consider the development of beach nourishment programs that involve the placement of suitable *sediment* at the outlets of our coastal rivers. The sand portion of the sediments would be transported via natural processes to the beaches while the fine-grained portion would be transported via natural processes to deeper offshore waters. Typically, the area in the immediate vicinity of the river outlets is a highly disturbed area, from a biological standpoint, because it is an area of active river scour, sediment transport, and sedimentation. Therefore, biological impacts might be easier to address. Under this approach (River Sediment Discharge Restoration?), the amount of sand reaching our beaches would be less than the amount typically involved in a traditional beach nourishment project such that the beaches so nourished would be narrower, on average, than with the traditional approach. This approach would lend itself to a management strategy that would involve frequent nourishment activities of smaller volumes compared to the traditional approach of infrequent large volume projects.

I present this idea for your consideration with the hope that some of you will provide ideas to: (i) build on this approach and/or (ii) tear this approach apart. I welcome your suggestions so please feel free to contact me at david.cannon@everestconsultants.com.

Offshore Earthquake Triggers Tsunami Warning

by Holly Celico-Lee

On June 14th at 7:50pm an earthquake, initially reported at magnitude 7.0, rocked the Cascadia Subduction Zone, about 3.5 miles below the surface, in an offshore area about 91 miles west/southwest of Crescent City. According to an article that was published in the *Crescent City Triplicate* (http://www.triplicate.com/news/story.cfm?story_no=1804), a series of earthquakes along the West Coast were reported that evening. The second largest was a 6.8 magnitude quake near Adak, Alaska.

The 7.0 earthquake, which lasted about seven seconds, shook Crescent City but fortunately caused no damage or injuries. It did, however, trigger the tsunami warning system, and sirens began to sound at 8:04 and didn't relent until 8:50pm. Four thousand Crescent City residents were evacuated successfully from the area and although some traffic accidents were reported, the evacuation progressed smoothly. Two aftershocks, a 3.7 at 8:17 p.m. and a 3.5 at 8:37 p.m., that both originated just south of the major quake, added to the evening's drama.

According to the aforementioned article, the evacuation was a useful exercise for

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We welcome your contributions to the *Newsbreaker*! Please submit articles to Holly Celico-Lee at holly@coast.ucsd.edu according to the following 2005 publication schedule:

October issue deadline: Sept. 26

USFWS Analyzes Costs of Protecting Vernal Pools

From Steve Aceti's CalCoast Update, June 29, 2005

Protecting seasonal pools that are home to tiny shrimp and other endangered species will cost California almost $1 billion in lost opportunities to build homes, condominiums and golf courses over the next 20 years, according an analysis issued Monday by the U.S. Fish and Wildlife Service.

Comments on the proposed critical habitat or the draft economic analysis may be submitted to: fw1_vernalpool@fws.gov or by fax to: 916-414-6710, or by mail to: Field Supervisor, Sacramento Fish and Wildlife Office, U.S. Fish and Wildlife Service, 2800 Cottage Way, Suite W #2605, Sacramento, CA 95825 Copies of the analysis may be obtained by downloading it from http://sacramento.fws.gov.

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Offshore Earthquake Triggers Tsunami Warning

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area residents, given that the only known fatal tsunami to hit the lower 48 states struck Crescent City in 1964. That tsunami, which killed 11 people and washed away 29 city blocks, was triggered by a 9.2 magnitude earthquake in Alaska.

The *San Diego Union-Tribune* reported (http://www.signonsan diego.com/news/science/20050615-1551-wst-quake-tsunami warning.html) that the West Coast & Alaska Tsunami Warning Center issued a tsunami warning from Mexico to Canada, as is the practice when earthquakes of magnitude 7.0 or greater occur at such proximity to the coast. A tsunami watch was issued for parts of southeast Alaska. Although the response in Crescent City was immediate and residents took the situation seriously, the *Union-Tribune* indicated that Costas Synolakis, director of the Tsunami Research Center at the University of Southern California, expressed concerns over the more "wait and see" attitude taken by residents in other coastal areas.

All in all, this whole string of events had a very positive outcome: in reality, the earthquake truly did generate a tsunami . . . of one centimeter. The *Union-Tribune* article indicates that the wave wasn't detected by shore equipment, "but registered on an ocean pressure-measuring buoy located about 350 miles off the coast of California." Synolakis was quoted saying, "This was the perfect tsunami – it was small and it tested the system."

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Joshua ran ten experiments for each barrier shape, measuring run-up, wave speed and wave level. He sought advice on energy formulas from an oceanography professor at Humboldt State University, and used the formulas to calculate wave amplitude, height, energy and energy fluctuations from his data. He found that the elliptical barrier was the most effective for minimizing the impact of the waves and dissipating wave energy. He discovered that when the waves hit the elliptical barriers, energy was transferred into smaller waves that collided with one another, reducing energy and run-up. He concluded that the placement of elliptical shaped barriers along the shoreline could help prevent the loss of life and destruction from tsunami waves.

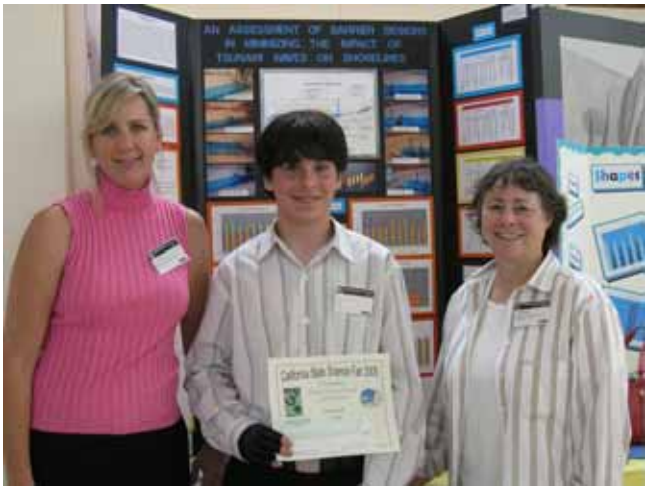
Sarah Amiri, a senior at San Marcos High School in Santa Barbara, was awarded CSBPA's senior division prize of $500 for her research on toxic algal blooms. Her project, "The Effects of Upwelling, Eutrophication, and Trace Metals on the Bloom Dynamics of Pseudo-nitzschia," also earned her the title of California State Science Fair Student of the Year, the prestigious John D. Isaacs Scholarship awarded by California Sea Grant, and first place in the Senior Life Science Division of the Santa Barbara Science Fair held in April.

Sarah's marine science project investigated the causes and cures for toxic algal blooms, a very troubling phenomenon that occurs off the California coast. Algal blooms are sudden explosions in the populations of microscopic, single-celled organisms. Sarah studied blooms of a kind of algae, called diatoms, that produce the toxin domoic acid. This acid causes amnesic shellfish poisoning in people who eat contaminated seafood and can be deadly to marine life. In fact, her interest in studying toxic blooms was sparked by mass strandings of sea lions near her home in Santa Barbara. "There were hundreds of dead sea lions," she said. "Most of them were pregnant. It was a terrible thing going on in our city. I wanted to solve the problem and propose a solution to the county."

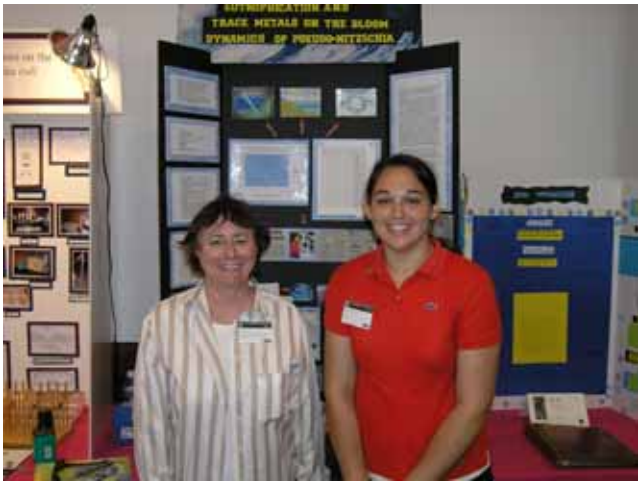
Sarah's research has indeed furthered scientists' understanding of these seemingly random toxic events. One of her main findings was that eutrophication, caused by excess nutrients in runoff from streams and storm drains, plays a role in triggering algal blooms. This discovery led her to look at ways to reduce coastal runoff. For a year, she worked with watershed managers to restore native plants around ten creeks in Santa Barbara County. She demonstrated that the return of native plants to Coal Oil Point helped reduce irrigation runoff by an impressive 30 percent.

This is the second year that CSBPA's senior coastal project award winner was also selected for the Isaacs Scholarship. Sarah will receive a $12,000 college scholarship, paid over four years. She plans to attend UC Santa Barbara this fall, where she wants to pursue a double major in marine biology (or microbiology) and quantum mechanics, her second passion. This summer, she has a very busy volunteer schedule. Sarah is passionate about her environmental activities: She volunteers with the Santa Barbara Watershed Resource Center, Sea Center, Marine Mammal Center and the UCSB Marine Science Institute. She has also participated in the teen science program, "Quasars to Sea Stars," at the Santa Barbara Museum of Natural History since the eighth grade.

CSBPA congratulates both winners for their remarkable achievements.



Susan Brodeur (left) and Phyllis Grifman (right) present Joshua Compton (center) with CSBPA's $250 junior division award.



Phyllis Grifman (left) presents Sarah Amiri (right) with CSBPA's $500 senior division award.

Fisheries Habitat Characterization of the California Continental Margin

H. G. Greene
Center for Habitat Studies,
Moss Landing Marine Laboratories

R. Kvite, J. J. Bizzarro, C. Bretz, and P. Iampietro
Seafloor Mapping Lab,
California State University, Monterey Bay

California Sea Grant College Program
Publication No. T-053 ($15)

This set of four DVDs and one CD distinguishes marine benthic habitats along the California continental margin from previously proprietary industry data. The DVDs contain GIS data and user notes covering selected areas in northern, central and southern California. The CD contains the researchers' narrative report and a PowerPoint presentation that explains how the researchers interpreted source data and created the maps. It can be used for educational purposes.

The data set resulting from this project makes up the initial stages of building both a database and a series of habitat maps that can be used by fishery scientists, policy makers and resource managers for planning and implementing fish habitat programs. Invaluable information is provided on the conditions of the seafloor in areas of interest for fisheries management and both living and nonliving resource evaluation. This data set forms the base maps upon which all other parameters may be overlaid and compared.

Cost: $15 includes postage and sales tax. Make check payable to University of California Regents. Send request with name and address to:

California Sea Grant Communications
University of California
9500 Gilman Drive
La Jolla, CA 92093-0232

Questions: Contact Gretchen Frederick at gfrederick@ucsd.edu or at 858-534-4446

The Wave of the Future - Shoreline Preservation Technology and Strategies

Sponsored by San Diego County Supervisor Pam Slater-Price

August 3, 2005
8:00 am to 12:00 pm

2005 Headwaters To Ocean (H2O) Conference

Sponsored by CSBPA, CalCoast and the Southern CA Wetlands Recovery Project

October 26-28, 2005
Orange County

http://www.coastalconference.org/