California's Coastal Natural Hazards

Lesley Ewing and Douglas Sherman
Editors

University of Southern California Sea Grant Program
CALIFORNIA'S
COASTAL NATURAL HAZARDS

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PROCEEDINGS FROM THE CONFERENCE HOSTED BY THE
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THE URBAN OCEAN PROGRAM
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INTRODUCTION

The “Urban Ocean” is the theme of the University of Southern California Sea Grant Program. Under this rubric, the program's resources are focused on the opportunities and challenges arising from the juxtaposition of concentrated human development and coastal and marine ecosystems. The theme is readily applicable to the field of natural hazard studies, where the greatest risks are usually associated with the concentrations of human settlement or development. The California Shore and Beach Preservation Association (CSBPA) is concerned with the proper management of the state’s beaches as a resource. The missions of the two organizations have converged on the theme of this conference, “California’s Coastal Natural Hazards.”

In the summer of 1996, Dr. Douglas Sherman, Director of USC Sea Grant, came to a CSBPA Board meeting and proposed that the Sea Grant Program and CSBPA begin working together on a conference to update the conference on “California’s Battered Coast: A Conference on Coastal Erosion” which was convened in 1985. As a result of this collaboration CSBPA and USC Sea Grant held a joint conference in Santa Barbara, California, November 12 - 14, 1997 and these proceedings are a lasting record of that event.

What has changed since the 1985 first “Battered Coast” Conference? One of the most noticeable changes relates to El Niño. It was during and after the 1982/83 El Niño winter that El Niño became a household term. Very few people recognized in 1982 that conditions were developing in the eastern Pacific that could lead to the sequence of storms that battered California in late 1982 and early 1983. The enormity of these storms spawned extensive study of El Niño, Southern Oscillation and global ocean/atmosphere climate modeling. The 1985 conference was a follow-up to the dramatic coastal changes and coastal damage that occurred during the 1982/83 El Niño. By 1997 when this conference was held, we were anticipating an El Niño winter that could be of a similar magnitude as the 1982/83 event. Dr. Reinhard Flick spoke at the opening session of the conference about the various climatic indicators for El Niño, comparing the ocean temperatures and atmospheric conditions in the fall of 1997 with the fall and winter of 1982. He noted that the question at that time was only how significant it would be; there was no question about whether it would occur. With the new awareness of El Niño and detailed monitoring of ocean and atmospheric conditions, we can better anticipate El Niño events and are now far better equipped to undertake pro-active, rather than re-active storm protection.

A second change since the original Battered Coast Conference is the growing number of people who live, work and recreate along California’s coast. As noted in the presentation by Dr. Gary Griggs, the population of California is expected to reach 50 million by the year 2020. At the conference, Dr. Karl Nordstrom and Dr. Griggs both discussed some of the ways humans have altered the coast and the constraints and challenges that this poses for coastal management. Dr. Nordstrom focused on the physical alteration of coastal landforms and the issues involved with accommodating human uses of the coast while “retaining an image of the coast that reflects the natural processes which provide its
special appeal.” Dr. Griggs focused on the hazardous conditions which are inherent to most of the California coast, the extent of storm damage which has arisen from earlier El Niño and non-El Niño winters and concludes in, “California’s Coastline: El Niño, Erosion and Protection,” that “significant changes are needed in how we approach and deal with coastal hazards and the continuing pressure to develop in oceanfront areas.”

A third change since the Battered Coast Conference is the heightened interest in beach nourishment. At the Battered Coast Conference, there were a number of discussions of sand budgets and changes in littoral sand supplies. Katherine Stone and Benjamin Kaufman presented a paper at the conference about a new concept of Sand Rights -- a legal system for maintaining the supplies of sand which are necessary for beach preservation. While David Potter discussed the feasibility of sluicing sand from dams, James Walker and Amy Tatami discussed the use of perched beaches and submerged breakwaters to protect beach areas.

By the 1997 conference, beach nourishment was a common focus of more than half the presentations. In the morning session, Dr. Richard Seymour discussed the findings of the National Research Council’s Committee on Beach Nourishment and Protection, and concluded that properly engineered beach nourishment had been found to be a valuable and viable technique for beach protection. Orville Magoon and Dr. Billy Edge presented a paper which reintroduces the issue of Sand Rights and proposed statements for both sand rights and sand responsibilities. Kim Sterrett provided the results of a needs survey for coastal communities, which found that of the 120 miles of shoreline which was in need of some type of protection, beach nourishment was the preferred approach for over 40 miles of coast. On the same topic, Chris Webb, Keith Till and Steve Badum discussed a recently completed beach nourishment at Seal Beach; then Howard Cumberland, Mitch Perdue and Lawrence Honma presented a paper about a beach nourishment study for the Navy Homeporting project in San Diego. Moi Arzamendi and Mike Hemphill presented an analysis of the geotechnical concerns of using dredge material for beach nourishment and lagoon enhancement; and Kenneth Lilly and Don Kingery discussed the design of shoreline protection at Ocean Beach and a method for beach construction seaward of a geotextile revetment. Finally, Paul Jenkin’s presentation discussed the opportunity to use beach nourishment to protect the bike path at Surfer’s Point, downcoast of the Ventura River.

Many issues and paper topics that were included in the Battered Coast Conference are repeated in the 1997 conference. The three main topics from the Battered Coast Conference were: 1) examination of shoreline types; 2) discussion of the structural versus non-structural approaches to shoreline management; and 3) the government’s roles in shoreline management. The 1997 conference included a session on the science and engineering for coastal hazard reduction that examined shoreline types and presented new approaches for studying shoreline types. Deidre Scholar and Gary Griggs presented a paper on the general dynamics and concerns for pocket beaches, and Peter Gadd discussed field work on sediment dynamics for a pocket beach in Crescent Bay, Laguna Beach. Mark Capelli and Jim Baillard both discussed the Santa Barbara and Ventura coast, with Mark Capelli discussing the Isla Vista area and Jim Baillard discussing coastal dynamics and the results of his field research in the two county area. Chris Flynn discussed
the dynamics of river mouths and David Skelly and Michelle Kremer presented a proposed surf enhancement reef that may be constructed in El Segundo. Benjamin Benumof, Laura Moore and Gary Griggs assessed the uses of soft copy photogrametry in determining coastal erosion, and Anders Rindell and James Hollman analyzed the use of CCD Digital Video for studying beach width.

The issues of structural versus non-structural solutions and the government’s role in coastal management were tied together in the discussion by Jon Moore, in which he concluded that we will continue to have piecemeal structural responses to erosion as long as government leaves the responsibility for erosion response to the individual property owner. Jon Moore posed two challenges: to the engineering profession, for creating approaches to shoreline hazards, and to government for more responsibility in the overall management of the shoreline. David Fischer and M. Concepción Arrendondo then presented a survey of communities in Southern California in which they found that the governance of coastal hazards tends to be reactive: “not nearly enough is being done [by municipalities] to protect the Southern California coastline...[and] municipalities are taking inconsistent approaches to local coastal planning and protection.” Some of these ideas were echoed by Ventura County Supervisor John Flynn as he introduced his visions for regional coastal management and the innovative ways for local governments to fund shoreline enhancement projects; and by Pedro Nava in his discussion on the role of regulatory policy in shoreline management. Finally, these ideas were discussed by Steve Sachs in his discussion of what the San Diego area had and had not been able to accomplish through the shoreline committee of the San Diego Association of Governments. Gary Magnuson discussed some of the opportunities for getting involved in federal shoreline management policy, Howard Marlowe discussed the role which the American Coastal Coalition has developed for shaping federal shoreline policy, and Robert Eichblatt and Bob Fisher presented the idea of CalCoast, coalition of California coastal communities which could voice coastal concerns to the state legislature.

The 1997 conference concluded with a half-day long Workshop on Beach Nourishment. Douglas Sherman presented results of his research on the effects of introducing a large volume of fines into the nearshore environment, Steve Jantz and Chris Webb discussed a program which the city of Carlsbad is developing to use inland sources of sand for beach nourishment, and Steve Aceti discussed San Diego County’s plans to expand the Carlsbad program county-wide. These presentations were followed by a general discussion of beach nourishment.

The 1985 Battered Coast Conference followed one of the most devastating periods of coastal storm damage in California history. Over $100 million in damages occurred in January 1983 -- 3000 homes and 900 businesses were damaged; 27 homes and 12 businesses were destroyed and 11 coastal counties were declared disaster areas. The 1985 conference brought together coastal geologists, coastal engineers and people in government hoping to, as Mel Nutter, Chairman of California Coastal Commission said, “set the framework for cooperative efforts to plan our shoreline,” especially in determining “the physical and the political framework of California’s shoreline erosion response.” Since 1985, there have been several positive changes in the physical framework. We have learned a lot more about the California coast and the storm conditions, which cause much of the major coastal damage. We have developed or applied new tools to study
coastal processes and coastal change and have recognized better the differences between shoreline protection and beach protection. The positive changes to the political framework are less easy to identify. The growing role of regional governments in shoreline management and the increasing interest in regional responses to shoreline erosion through beach nourishment are positive changes, as is the creation of state and federal coastal coalitions.

Perhaps the most lasting benefit to the physical and political framework of shoreline erosion response is in that at the 1997 conference, it was sometimes difficult to distinguish among arguments made by coastal geologists, engineers, and people in government. The discussions which started with the original Battered Coast Conference have continued in many different forums; the groups who were viewed in 1985, as being different or even adversarial, in 1997, have developed open lines of communication and often, have joined forces to find the best approaches for managing our Battered Coast.

The organization of the conference, “California’s Coastal Natural Hazards,” and the subsequent production of this volume have required substantial time and effort from many individuals representing several organizations. Credit is due first to the Board and members of California Shore and Beach Preservation Association and its past president, Reinhard Flick (California Department of Boating and Waterways), whose enthusiastic support and participation enabled the conference to succeed. Thanks also to Gabriella Jimenez and Leslie Shea for the “on-the-ground” logistic efforts that made the conference flow smoothly. Thanks to Phyllis Grifman for overall conference and production supervision. Finally, a special acknowledgement is due of the efforts of Rick Hayduk and Jean Todisco from USC Sea Grant; Rick’s excellent design and publishing skills have allowed us to create a useful volume out of the conference papers, and Jean’s assistance on the paper references and attention to detail in the text has been invaluable.

Lesley C. Ewing
Douglas J. Sherman

October, 1998
CONFERENCE SCHEDULE

DAY ONE NOVEMBER 12, 1997

8:30    Plenary Session — Introduction

9:30 - 10:00   BREAK

10:00 - 12:00   Revisiting the Battered Coast (Chaired by Jim McGrath)

   Introduction to The Battered Coast — Gerry Kuhn

   Evaluation of Landforms on Human-Altered Coasts — Karl Nordstrom

   El Niño 97 — Reinhard Flick

   Beach Nourishment and Protection — Richard Seymour

   Beach Nourishment In San Diego — Howard Cumberland

   Perspectives on the California Coast Since 1985 — TBA

12:15 - 1:45   LUNCH — Denise Ducheny, Member, California State Assembly

2:00 - 3:30   Science and Engineering for Coastal Hazard Reduction (Chaired by Laura Moore)

   CDC Digital Video and Conventional Imagery Studies of the Beach Width and Shoreline Monitoring — Anders Rindell and James Hollarn

   Pocket Beaches of California — Deirdre Scholar and Gary Griggs

   Coastal Processes within a Small Pocket Beach, Crescent Bay, Laguna Beach, California — Peter Gidd

   A Protocol for River Mouth Breaching — Chris Flynn

   FEMA and State-of-the-Art Coastal Erosion Mapping Along the San Diego County Shoreline — Benjamin Beaumot and Laura Moore

3:30 - 4:00   BREAK

4:00 - 5:30   Case Studies (Chaired by George Domurat)

   Overview of Survey Demand for Coastal Protective Projects, Soft and Hard Alternatives — Kim Sterett

   Reducing Storm Damages and Increased Economic Benefits in Seal Beach through Beach Nourishment — Chris Webb, Keith Till and Steve Badum

   Geotechnical Engineering Considerations for the Bataquitos Lagoon Enhancement Project — Moi Arzamendi and Mike Hemphill

   Ocean Beach, San Francisco: Protection and Management of an Eroding Shoreline — Kenneth Lilly and Don Kingery

   Surfrider Foundation Surf Enhancement Project — David Skelly and Michelle Kremer

   Local Government Planning for Coastal Hazards — David Fischer

7:00 - 10:00   EVENING — NO HOST BAR
DAY TWO NOVEMBER 13, 1997

8:00 - 9:30  The Local Coast (Chaired by Steve Scholl)
  Introduction to Santa Barbara/Ventura Coastal Conditions — Jim Baillard
  Fear and Loathing in Isla Vista — Mark Capelli
  Growing the Beaches (a slide show) — A. Paul Jenkin
  Local Coastal Issues — Jon Moore
  Ventura Flood Control - Debris Basin Cleanout for Beach Nourishment — Karl Treiberg

9:30 - 10:00  BREAK (and Hotel Checkout for Wednesday Departures)

10:00 - 11:15  Linking Coastal Science to Public Policy and Decision making (Chaired by Tom Kendall)
  Maintaining the Federal Role in the Protection of California’s Shoreline — Howard Marlowe
  Task Force Update — Robert Eichblatt and Bob Fisher
  Sand Rights — Orville Magoon
  Two Successful Coastal Projects and a Third on the Way — Ann Kulchin

11:30 - 12:30  Panel Discussion on Redefining the Mission and Direction of Regional Coastal Management (Chaired by Karin Strasser-Kaufman)

John Flynn, Ventura County Board of Supervisors
Others TBA

1:00 - 5:00  BOX LUNCH AND FIELD TRIP ***
  Santa Barbara to Port Hueneme — Jerry Nowak

***Santa Barbara to Port Hueneme is a long stretch of coast to cover in a short amount of time. To get favorable tide conditions and to let people make outbound airline reservations, we must depart the hotel promptly at 1:00 PM. A box lunch will be served on the bus.

FRIDAY NOVEMBER 14, 1997

8:30 to 12:00  WORKSHOP ON BEACH NOURISHMENT

Many coastal communities in California are now viewing beach nourishment as an opportunity to enhance their recreational areas and avoid or minimize the need for seawalls or revetments. Due to the increased interest in Beach nourishment, the nature of beach nourishment in California is changing to expand the availability of acceptable material and acceptable receiver locations. Existing policies and regulations for beach nourishment do not fully address these changing situations.

Resources and regulatory agencies, local and regional governments, environmental organizations, property owners and interested individuals are invited to this workshop to participate in discussions about the regulatory framework necessary to address the evolving concerns of beach nourishment.

For more information on the workshop, please contact Walt Crampton at (619) 573-1777.