

Bolsa Chica Lowlands Restoration Project

Beach Monitoring Plan

9 November 2001



Introduction

A component of the Bolsa Chica Lowlands Restoration Project is to construct a 366.5-acre tidal basin with a possible future restoration extending tidal influence to an additional 252 acres. To restore the most valued habitat, a new ocean inlet must be constructed. This proposed ocean inlet will be located near the southern boundary of Bolsa Chica State Beach and will be about 350 feet wide between stabilizing jetties. The jetties are anticipated to be of rubble-mound construction, extend from the tidal basin, under Pacific Coast Highway (PCH) and onto the beach terminating at the approximately current Mean Lower Low Water beach elevation. The creation of the new inlet and tidal basin will affect nearshore littoral processes; specifically, alongshore currents will be influenced by the tidal flow and the resulting sediment transport causing the formation of both ebb and flood shoals. Of particular concern are the impacts of this morphological change to adjacent beaches and the regional sediment resource. The EIR/EIS for the Bolsa Chica Restoration Project (April 2001) documents the analyses of predicted impacts and describes mitigation measures for unwanted beach response, ie. erosion. These mitigation measures includes: 1) pre-filling of a the predicted ebb bar shoal utilizing excavated sediments from the tidal basin in a beneficial use; 2) beach replenishment on a periodic basis with dredge material from the flood shoal; and 3) beach monitoring to compare actual beach response to the expected bounds of predicted behavior and to provide guidance for future beach replenishment needs.

Purpose and Scope

This Beach Monitoring Plan describes historical data and studies available for the area, and provides definition of monitoring activities and analyses that are expected to assure adverse impacts to area beaches are mitigated. The plan does not include analyses to validate previous or future predictive models of shoreline evolution or does it outline specific remedial action plans.

Prior and Ongoing U.S. Corps of Engineers Studies

The Bolsa Chica Lowlands Restoration Project jetties will be located within the limits of the San Gabriel River to Newport Bay Shore Protection Project of the U.S. Army Corps of Engineers (USACE), sometimes referred to as the Surfside-Sunset Beach Nourishment Project. This shore protection project periodically (about every five years) constructs a feeder beach at Surfside-Sunset to provide sand for beaches between Anaheim Bay and the Newport Pier. The project also includes the west Newport Beach groin field and has periodically placed sand at west Newport Beach. In addition, the project monitors beach widths on a monthly basis, occasionally performs beach profiles and has recently performed a lidar – helicopter borne laser survey utilizing real-time-kinematic differential global positioning-- topographic survey of the sub-aerial beach. Beach width measurement and recent profile locations in the vicinity of the proposed ocean inlet are shown on Figure 1.

The Coast of California Storm and Tidal Wave Study for Orange County included a field data collection activity of surveys and wave gages for the years from 1992 to 1995 for all of Orange County Between Seal Beach and Dana Point. This study analyzed the time series of beach profiles and provides quantitative measures of the historic variation in beach width and profile volumes.

A Feasibility Study of the erosion problem at Huntington Bluffs is currently being conducted which will include mapping of the Huntington Bluff top and the analysis of historic a

projected bluff retreat rates.

Monitoring Activities

The Bolsa Chica Lowlands Restoration Project will monitor seven profiles between Warner Avenue and Huntington Pier, and 7 beach width locations, in addition to monitoring activities of the USACE, Los Angeles District. This monitoring shall continue for the life of the project or 1) until there are sufficient data on the beaches in this area to indicate that the system has reached a new equilibrium, 2) that the project is not having an adverse impact on adjacent beaches and 3) the Commission agrees, through a formal amendment request, to modifications to the monitoring.

The beach widths will be monitored monthly, typically around the 20th of each month to complement the USACE data set. Six of the seven beach will be measured at the same locations as the profiles. The beach width will not be measured at the Huntington Cliffs location (378+29; the beach width location for this section of beach will be measured at “The Ramp” (approximately Station 360). The final locations precise locations will be defined during the final design phase of the project.

The seven profiles will be measured from the back shore through the nearshore (to –35’ or 40’ MLLW) twice a year in the spring and fall, generally May and October, to correspond to the historic data set and capture typical post winter and post summer profile conditions. Final locations of the profiles will be selected during final design to coincide with historic profile locations, such as those shown on Figure 1. The tentative locations for the profiles will be at:

- Station 249+30
- Station 311+22
- 750’ north of the centerline of the new channel inlet
- 750’ south of the centerline of the new channel inlet
- Station 350+71
- Station 378+29
- Station 423+84

As a task during construction, a hydrographic survey of the pre-construction bathymetry and post-construction bathymetry in the region of the ebb shoal will be obtained. The detailed quantitative monitoring of the geomorphic evolution of the ebb shoal will not be obtained, however, it is expected that several beach profiles will transect the constructed ebb shoal and provide qualitative information on re-distribution of the pre-fill sediments. The primary monitoring effort is focused on the sub-aerial beach that is more easily measured and has a more direct connection to recreational beach use and coastal storm damage protection.

Analyses and Reporting

Beach monitoring (profiles, beach width and ebb bar) will be documented in annual reports submitted to CCC and the USACE, Los Angeles District (Attn: Coastal Engineering Section). The initial report will include the pre and post-construction hydrographic surveys of the ebb shoal area, and data on the as-built quantity and sediment grain size distribution of material placed in the pre-filled ebb shoal. Surveys and as-built data will also be provided on direct beach replenishment to areas adjacent to the jetties with materials excavated from the new ocean inlet.

Monthly beach width time series will be plotted and analyzed for trends. Anomalous and or unexpected changes in beach width will require the evaluation of other regional data to glean the separation of project induced effects from regional anomalies. The expected normal variation in beach widths and multi-year trends are represented in the 20-year record of beach widths shown in Figure 2 and statistically characterized in Table 1. Higher deviations resulting from direct on beach nourishment and re-distribution of the ebb shoal pre-fill should be anticipated, however, a running average of minimum beach widths below the historically observed values will be an indication of adverse project induced effects.

Beach profiles will be plotted to overlay with historic profiles, and the sub-aerial beach volume and shore-zone beach volume computed, as defined in Figure 3 and the Coast of California Storm and Tidal Wave Study, South Coast Region, Orange County, Chapter 4, Beach Width and Profile Volumes (draft) December 1999. The time series trend of these values will identify changes in availability of available littoral drift. Historic time series for Profiles in the Bolsa and Huntington Bluffs area are shown on Figures 4 and 5.

Commitments to Address Erosion

The monitoring plan will be used to determine the disposal locations for the periodic inlet and flood shoal dredging that is proposed for this project as well as to determine whether there are any unmitigated adverse impacts to the adjacent beaches. The final monitoring plan will develop clearly defined triggers and indicators of concern. The preliminary plan has identified the following actions:

1. If there are no indicators of erosion on adjacent beaches, the dredge disposal material will be spread on adjacent beaches within economical transport distant (within 5000 feet of the inlet location)
2. If there are indicators of erosion on adjacent beaches, dredge material, and other offshore sediment shall be used to address this erosion, regardless of location or economical transport concerns. Two erosion triggers have been developed now; additional triggers can be developed in the final plan.
 - a. Acute Erosion: Any beach is found to be narrower than 50', based on two consecutive monthly beach width measurements.
 - b. Chronic Erosion: Any 12-month rolling average of beach widths which deviate more than 2 standard deviations from the mean beach width, using 20 year historic record to establish these means and standard deviations (see Table 1)
3. If periodic monitoring indicates either acute or chronic erosion (based on the above triggers or other triggers developed in the final plan), a meeting shall be convened within one month of the identification of concern and shall provide for participation by all interested parties, including but not limited to the California Coastal Commission, the U.S. Army Corps of

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Engineers, the City of Huntington Beach and project managers. Within two months, the project managers shall have developed and be in the process of implementing all necessary steps to address the identified erosion.

Table 1 Historic Beach Width Statistics

Beach Width Statistics for Period Jan 1980 to Jan					
Station	192+96	247+88	307+88	424+44	502+87
Mean (feet)	317	210	109	172	284
Maximum (feet)	442	343	192	266	385
Minimum (feet)	144	156	40	60	209
Standard Deviation	78	25	24	34	33

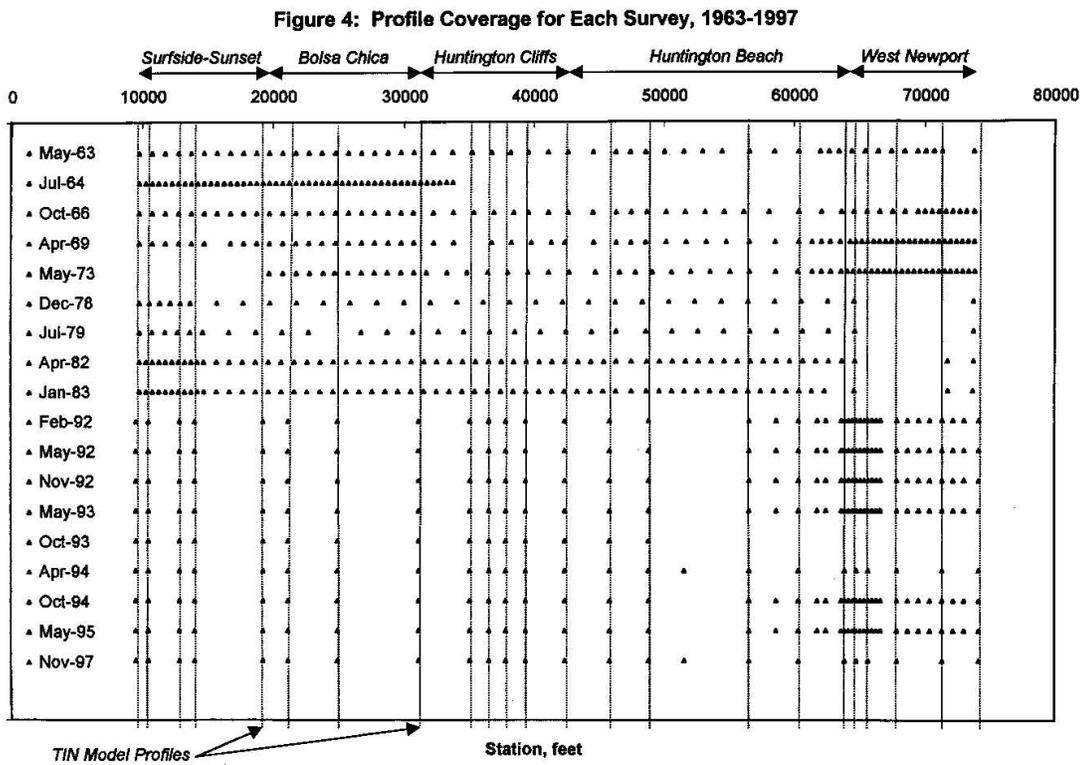


Figure A Historic Profile Coverage



Figure 1 Beach Width and Profile Location

Figure 2 Beach Width Time Series

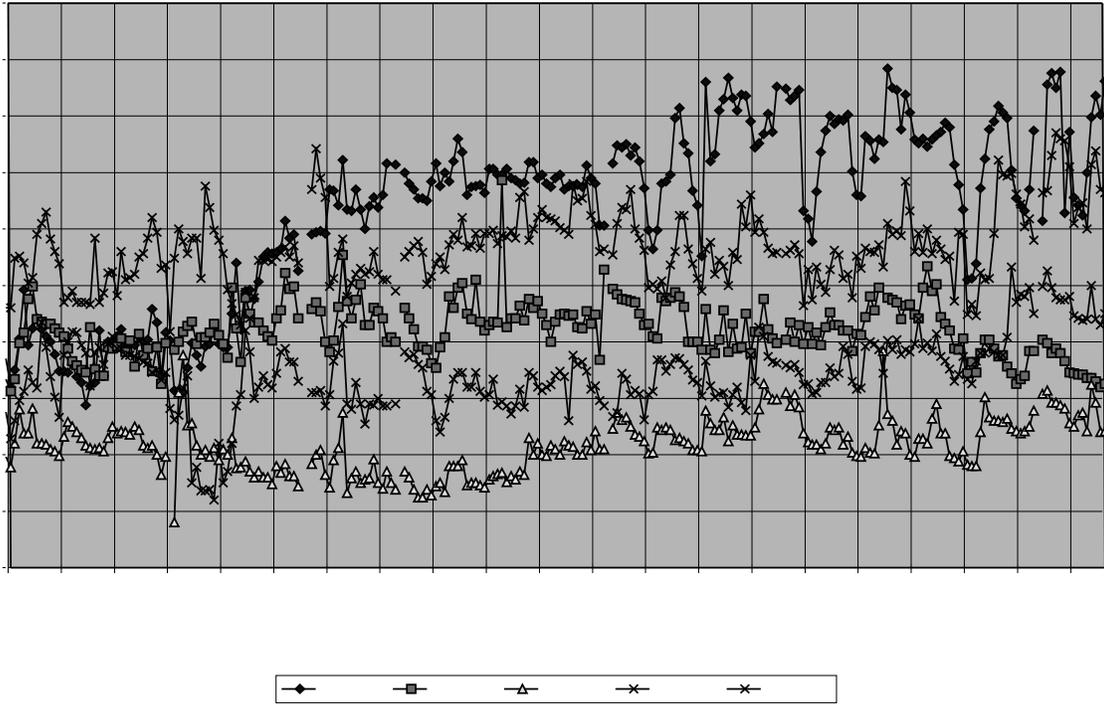
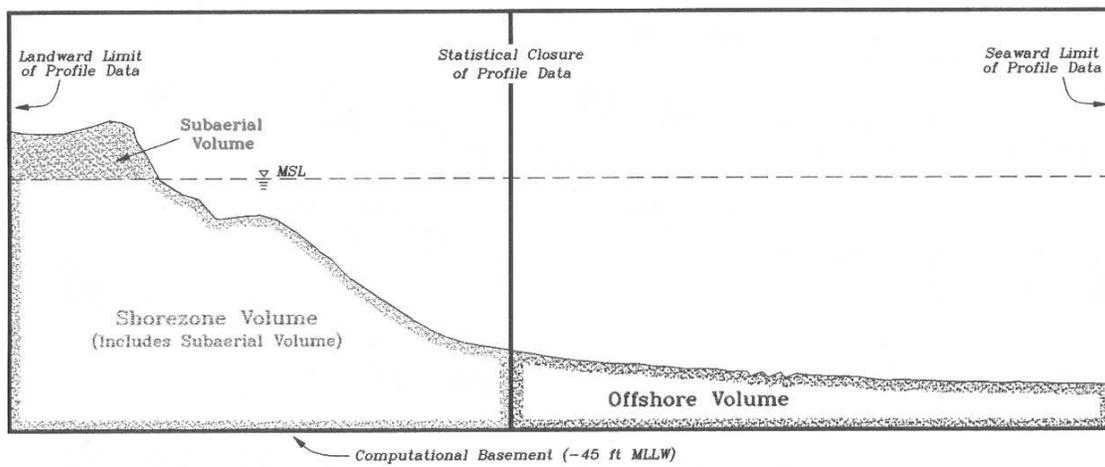


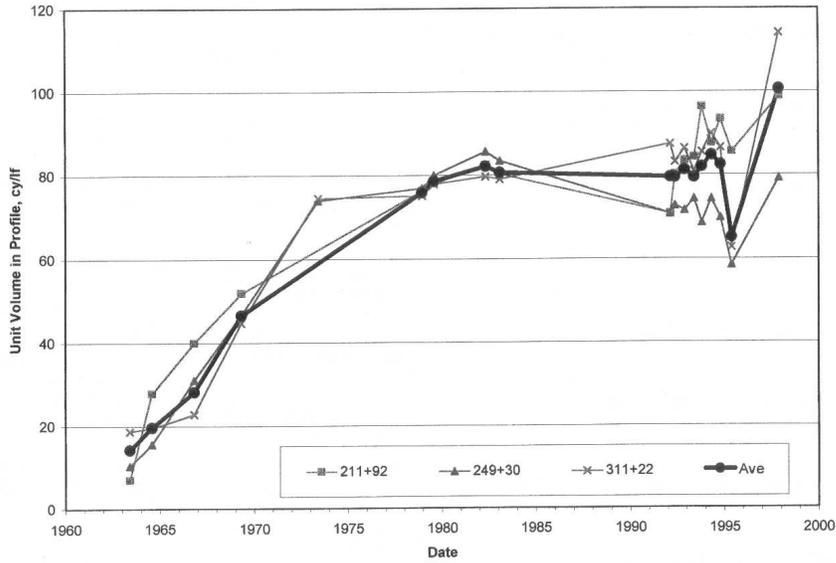
Figure 3 Cross-Shore Regions for Profile Volume Computation



(CCSTWS, Figure 7, p.21)

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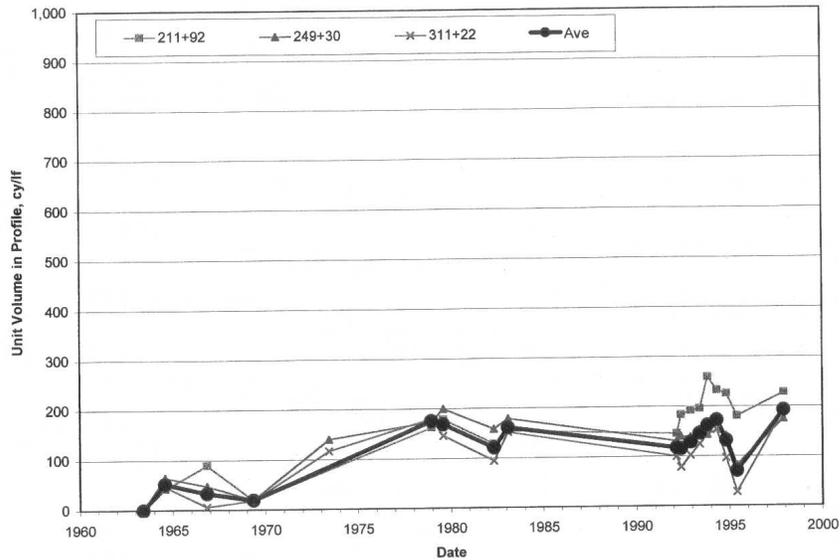
Figure 22: Subaerial Unit Volume History, 1963-1997
Bolsa Chica



Note: Subaerial Volume lies seaward of the landward limit of profile data, above the plane of MSL (Figure 7).

Figure 4 Sub-Aerial Unit Volume History, 1963-1997, Bolsa Chica

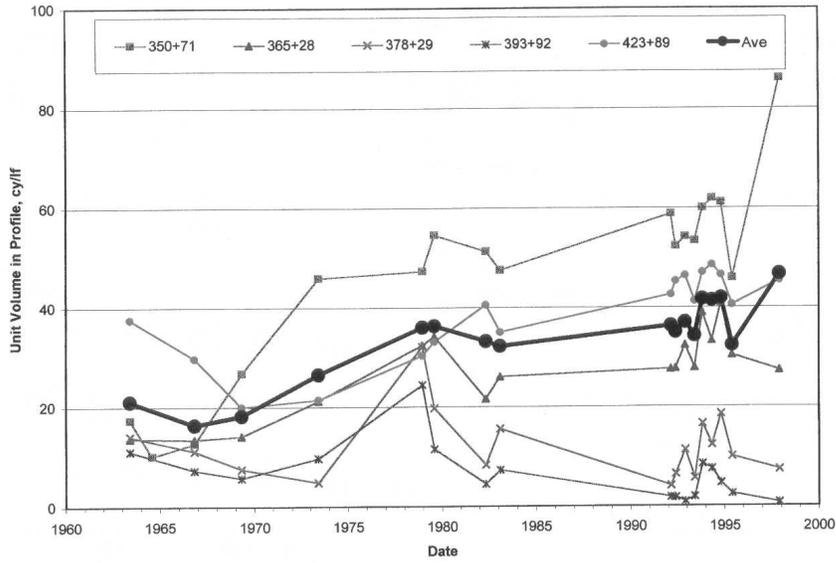
Figure 23: Shorezone Unit Volume Relative to 1963
Bolsa Chica



Note: Shorezone Volume lies between the landward limit of profile data and the point of statistical closure, above an arbitrary basement of -45 ft MLLW (Figure 7).

Figure 5 Shore-zone Unit Volume History, 1963-1997, Bolsa Chica

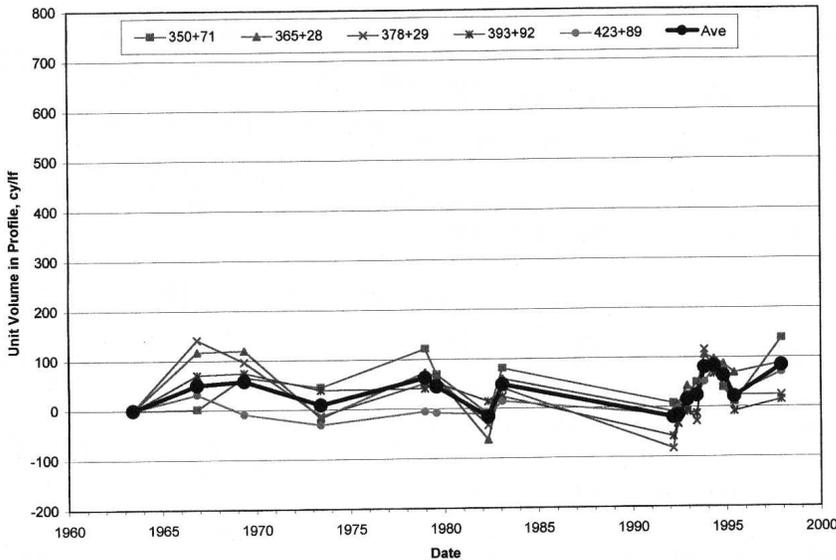
**Figure 28: Subaerial Unit Volume History, 1963-1997
Huntington Cliffs**



Note: Subaerial Volume lies seaward of the landward limit of profile data, above the plane of MSL (Figure 7).

Figure 6 Sub-Aerial Unit Volume History, 1963-1997, Huntington Bluffs

**Figure 29: Shorezone Unit Volume Relative to 1963
Huntington Cliffs**



Note: Shorezone Volume lies between the landward limit of profile data and the point of statistical closure, above an arbitrary basement of -45 ft MLLW (Figure 7).

**Figure 7 Shore-zone Unit Volume History, 1963-1997,
Huntington Bluffs**