

SCCWRP Annual Report 2001-02

Characteristics of dredged material disposal to the Southern California Bight between 1991 and 1997

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ABSTRACT

Harbors in the Southern California Bight (SCB) are dredged annually in order to maintain shipping lanes and ensure navigability for recreational and economic purposes. There are several possible fates for dredged sediments, including their use for beach replenishment and disposal at upland sites; however, the majority of dredged sediments are discharged to the ocean at designated sites on the continental shelf of the SCB. These sediments may contain contaminants that have been deposited over time from a variety of sources, including runoff from surrounding watersheds. Consequently, it is important to understand whether dredged materials are a significant source of contaminants to the SCB, necessitating greater management concern.

The goal of this study was to evaluate pollutant loading to the SCB from the ocean disposal of dredged materials between 1991 and 1997, and to gauge the relative significance of contaminant inputs from dredged materials by comparison to discharges from large municipal wastewater treatment facilities (POTWs). Between 1991 and 1997, 2,681,247 cubic meters of sediments were dredged from southern California harbors and bays, and discharged to designated sites within the SCB. Of the 42 permitted dredging projects that contributed to this quantity, 14 conducted chemical analyses on the sediments disposed, representing 82% of the total volume discharged. Data from these 14 projects were used to estimate constituent mass emissions and average concentrations of the disposed sediments. Between 1991 and 1997, dredged materials contributed 0.03% of the discharge volume from large POTWs and dredged materials combined, while contributing over seven times the amount of solids that were discharged by large POTWs. Over the seven-year period analyzed, dredged materials represented a significant portion of the constituent load for several contaminants, including chromium, lead, mercury, PAHs, and PCBs. Furthermore, the relative dredged material contributions to the combined constituent load increased from the previous seven-year period between 1984 and 1990. Given that large POTWs have historically been the most significant point source of contaminants to the SCB, the comparability of contaminant inputs from dredged materials exemplifies the significance of dredged material disposal as a source of pollutant loading to the coastal environment.

Full Text

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