

Chromium in the Southern California Marine Environment

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ABSTRACT

Chromium has received little attention in marine pollution studies. It is relatively abundant in the earth's crust, ranking fourth of the 29 elements of biological importance; in addition, it has a wide variety of industrial, medical, and domestic uses and is an essential trace element (National Research Council, 1974). It is also the second or third most abundant trace element in municipal wastewaters. In fact, at least 1100 m (metric) tons are discharged yearly via this route into U.S coastal waters (Southern California Water Research Project, 1975).

In 1972, the State of California established a limit of 5 ug/l total chromium for discharges into the state's coastal waters (50% of the time; 10 ug/l not exceeding 10% of the time. California State Water Resource Control Board, 1972). This concentration was considerably lower than levels in municipal wastewaters and lower than a previously established federal limit of 50 ug/l (as hexavalent chromium) for public drinking water (National Research Council, 1974).

A brief investigation indicated to us that data on ambient levels, forms, and toxicity of chromium in marine waters had not previously been brought together in a manner useful for evaluating safe levels. Data were deficient in critical areas including sublethal effects near discharge sites. Thus a "chromium committee" was formed among our staff of chemists and biologists, and a series of field and laboratory programs was initiated.

The principle question of concern to us was, What is the maximum permissible concentration of chromium in seawater near wastewater discharge sites that is not deleterious to marine life? This report summarizes what we have learned about ambient chromium levels in coastal waters of southern California, how municipal and other discharges affect those levels, and the kinds of biological conditions that accompany these changes.

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