

SCCWRP #0745

Evaluation of reproductive endocrine status in hornyhead turbot sampled from southern California's urbanized coastal environments

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ABSTRACT

As part of a regionwide collaboration to determine the occurrence of contaminants and biological effects in coastal ecosystems offshore of urban southern California, the present study characterized the reproductive endocrinology of an indigenous flatfish, the hornyhead turbot (*Pleuronichthys verticalis*), and compared groups sampled from different study sites representing varying degrees of pollution to screen for potential endocrine disruptive effects. Turbot were sampled from locations near the coastal discharge sites of four large municipal wastewater treatment plants (WWTPs) located between Los Angeles and San Diego, California, USA, and were compared with fish sampled from three far-field reference locations in the region. Despite environmental presence of both legacy contaminants and contaminants of emerging concern and evidence for fish exposure to several classes of contaminants, both males and females generally exhibited coordinated seasonal reproductive cycles at all study sites. Patterns observed included peaks in sex steroids (17 β -estradiol, testosterone, 11-ketotestosterone) in the spring and low levels in the fall, changes corresponding to similarly timed gonadal changes and plasma vitellogenin concentrations in females. Comparisons between fish captured at the different study sites demonstrated some regional differences in plasma levels of estrogens and androgens, indicative of location-associated effects on the endocrine system. The observed differences, however, could not be linked to the ocean discharge locations of four of the largest WWTPs in the world.

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