SCCWRP #0744

Annual and seasonal evaluation of reproductive status of hornyhead turbot at municipal wastewater outfalls in the Southern California Bight

Kristy L. Forsgren[1], Steven M. Bay, Doris E. Vidal-Dorsch, Xin Deng[1], Guanghua Lu[2], Jeff Armstrong[3], Joseph R. Gully[4] and Daniel Schlenk[1]

[1]*University of California, Riverside, CA*

[2]*Hohai University, College of Environmental Science and Engineering, Nanking, People's Republic of China*

[3]*Orange County Sanitation District, Fountain Valley, CA*

[4]*Sanitation Districts of Los Angeles County, Whittier, CA*

ABSTRACT

Treated wastewater effluent containing endocrine-disrupting chemicals is discharged into the coastal waters of the Southern California Bight (SCB) daily. The present study investigated changes in indicators of reproductive health and environmental estrogen exposure in hornyhead turbot (*Pleuronichthys verticalis*) near wastewater outfalls. Fish were collected from discharge areas, farfield stations, and a reference location in the SCB to examine spatial and temporal patterns. Fish from the Orange County outfall farfield site were younger and less sexually mature than fish from other sites. The sex ratio was skewed in some fish from outfall sites as well as from the Dana Point reference site. However, no consistent pattern in sex ratio was present over time. Low-level induction of vitellogenin was frequently observed in male fish from all sites, suggesting widespread exposure to estrogenic compounds, but did not appear to impact reproductive function as there was no incidence of gonad abnormalities (ova-testis). Analysis of historical hornyhead turbot trawl data indicated that populations are either increasing or stable in the SCB; thus, environmental estrogen exposure was not adversely impacting fish abundance. Additional research is needed to determine the cause of the estrogenic response in hornyhead turbot and whether the source of the estrogenic compounds is a consequence of historical contamination or of ongoing sources or representative of baseline characteristic of this species.