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### Contaminants of emerging concern in municipal wastewater effluents and marine receiving water

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#### ABSTRACT

The occurrence and concentrations of contaminants of emerging concern (CECs) were investigated in municipal effluents and in marine receiving water. Final effluent from four large Publicly Owned Treatment Works (POTWs), seawater collected near the respective POTW outfall discharges and a reference station were collected quarterly, over a year, and analyzed for 56 CECs. Several CECs were detected in effluents; naproxen, gemfibrozil, atenolol, and TCPP were the compounds most frequently found and with the highest concentrations (>1 µg/L). Gemfibrozil and naproxen had the highest seawater concentrations (0.0009 and 0.0007 µg/L) and also were among the most frequently detected compounds. Effluent dilution factors ranged from >400 to ~1000. Fewer CECs were detected, and at lower concentrations, in seawater collected from the reference station than at the outfall sites. Effluent concentrations for some CECs (e.g., pharmaceuticals) were inversely related to the degree of wastewater treatment. This trend was not found in seawater samples. Few temporal differences were observed in effluent or seawater samples. Effluent CEC concentrations were lower than those currently known for chronic toxicity thresholds. Nevertheless, the evaluation of potential chronic effects for CECs is uncertain because aquatic life toxicity thresholds have only been developed for a few compounds. Additional data are needed to further understand the significance of the CECs presence and concentrations in marine environments.

#### Full Text

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