

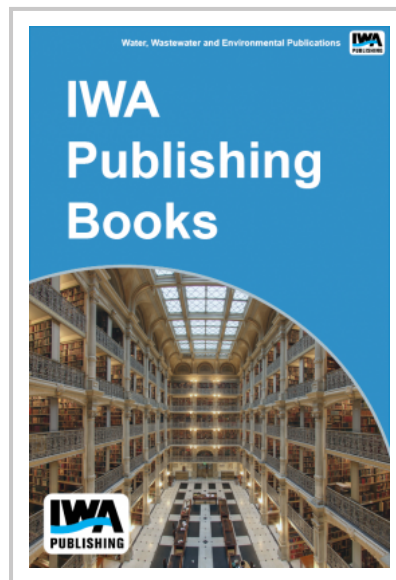
Evaluating Endocrine Disruption in Receiving Waters

In recent years, concerns have been raised that low concentrations of chemicals may alter the normal functions of the endocrine system, resulting in potentially significant adverse effects on growth, reproduction, and/or development. For domestic wastewater discharges to surface water bodies, estrogenic activity of effluents has been suggested by chemical analysis, biomarkers, and /or in vitro assays.

- **Chemical Measurements.** Using sensitive analytical techniques, natural or synthetic hormones and chemicals that mimic estrogen, have been detected in some domestic wastewater effluents and associated watersheds at low concentrations.
- **Biomarkers.** Several studies have demonstrated physiological changes in fish that may be attributed to exposure to estrogenic compounds. These include the presence of vitellogenin protein in male fish and/or intersex conditions.
- **In vitro assays.** The Yeast Estrogen Screen (YES) has been used to characterize estrogenicity of effluents, influents, biosolids and surface waters.

This two-year WERF project explored approaches to evaluate the potential for biomarker formation as a result of effluent exposures, and the subsequent relevance of the emerging assays and physiological measurements on potential adverse impacts to individuals or populations of fish in the receiving streams.

The endocrine system is complex, and many factors can influence the physiological measurements, including methods, sex, age, reproductive status, seasonal and circadian rhythms, diet, temperature, etc. and produce transient changes in physiology but no significant effect on the individual.



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