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Studies in parts of Europe and the United States have suggested that wastewater treatment plants (WWTPs) fail to completely remove estrogen and estrogen like compounds (xenoestrogens) from wastewater effluent, thereby releasing them into rivers. We were interested in determining whether measurable amounts of estrogenic compounds could be found in river water downstream of WWTPs in the Broad River basin of South Carolina. As well, we wanted to assess if estrogen levels compounded downstream when WWTPs flow into the same river in close proximity to one another. The Broad River basin differs from previous estrogen detection studies because the city sizes whose treated wastewater flows into the Broad River basin are all smaller than cities previously examined. In addition, several of the WWTPs in the Broad River basin are in very close proximity, with three of the smallest plants being found within one river mile of each other. We tested for estrogen using a recombinant yeast that had the human estrogen receptor inserted into its genome. In the presence of estrogen the yeast secretes β -galactosidase in proportion to the estrogen concentration, causing a graded colorimetric change that can be detected with a spectrophotometer. We tested river water upstream and downstream of five WWTPs in addition to testing their effluent. Results indicate that detectable levels of estrogen are associated with WWTP effluent in the Broad River basin. However, estrogen levels decline once effluent is discharged into the river, suggesting that estrogen levels do not compound downstream of WWTPs in this system.