

Drinking water treatment plant costs and source water quality: An updated case study (2013-2016)

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Watershed protection can play an important role in producing safe drinking water. However, many municipalities and drinking water treatment plants (DWTPs) lack the information on the potential benefits of watershed protection as an approach to improving source water quality. This study estimates the costs of water treatment as a function of water quality variables, presumed related to watershed properties, for a DWTP in the East Fork of the Little Miami River watershed, located primarily in Clermont County, Ohio. By doing so, we can estimate the potential cost savings from improving source water quality. Our previous study examined five years (2007-2011) of daily observations for the Bob McEwen Water Treatment Plant (BMWTP) to understand the relationship between treatment costs per 1000 gallons of finished water and independent variables such as turbidity, pH, total organic carbon (TOC), pool elevation, final production, and seasonal variables. Because of updates to the treatment process at BMWTP, including a new granular activated carbon building, we collected daily observations from 2013-2016 to see if the effect of source water quality leads to different results. With increased costs from utilizing the granular activated carbon building, we would expect to see changes in the effects of water quality compared to our previous model. Our analysis will estimate both long-run and short-run relationships using time series models. This means changes in one of the independent variables can have an immediate effect on treatment costs, a long-run effect, or both. Very few studies include these effects in their models. The presentation will provide an overview of time series modeling, results, and implications for future research.

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