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Flow changes at the annual versus seasonal scale following wildfire in the American West

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Wildfires pose a large threat to human property and life, especially as the wildland-urban interface expands. In their aftermath, they also post a threat to human health, by threatening water security and the provision of treatable drinking water to many communities. Like past research into the hydrologic effects of forest harvesting, large scale studies have recently found that wildfires in forested watersheds can result in either an increase or decrease in annual flow, and an increase or decrease in the average concentrations of many water quality continents relevant to drinking water treatment. In cases where there is little apparent change of water quantity or quality on the annual scale, we suggest that changing seasonal behavior of each may still represent a challenge to water treatment. We use publicly available data from the Western United States and remotely sensed data to examine shifting river behavior and regional climatic conditions to infer changes at the watershed scale. Since water treatment plants respond to changes at the daily and sub-daily timescales, shifts in source water quantity and quality at these timescales are important for managers and informative to our understanding of changing watershed function after disturbances like wildfire. Changes in functions like evapotranspiration, infiltration, or subsurface storage will have large implications for both source water quantity and quality.