Abstract

This study intends to investigate the role that evapotranspiration has in influencing groundwater levels in Bay County, Florida. Bay County, Florida experienced a large loss of vegetation caused by Hurricane Michael in 2018 and has since been frequented by flooding. Through the use of a integrated surface water-groundwater model, this research will be used to determine the effect of ET on the water table in areas that have experienced large vegetation loss.

First, historical data trends in precipitation, groundwater levels, and reference evapotranspiration ( RET) was analyzed to confirm ET’s ability to deplete groundwater. The correlation between precipitation and groundwater depth was found and then the relationship between groundwater depth and RET was determined. Finally, to quantify the impact vegetation loss has on ET and groundwater recharge simulations were used with multiple precipitation scenarios.

Findings of this study did conclude that ET does contribute to increased groundwater levels. This finding confirms the importance of considering ET in hydrological studies, especially in areas where disruptive vegetative changes have occurred. This research can be used to provide insight into how vegetation loss can influence interactions between ET, precipitation, and groundwater levels. This insight can used to improve strategies for groundwater management, especially when trying to mitigate the effects of vegetation changes on ground water resources.