



Variation in fecal coliform concentrations in response to climate change in a rural watershed

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Climate change influences on water quality and quantity in a watershed. Microbial water quality in stream waters may be affected by climate change. The objective of this work was to predict the variation in fecal indicator bacteria concentrations in response to climate change in a rural watershed. The soil and water assessment tool (SWAT) model, which was modified by Kim et al. (2010) and Cho et al. (2012 and 2014) was used to simulate climate change impacts. Kim et al. (2010) considered fecal indicator coliform release from streambed sediments and its deposition. Cho et al. (2012) added the solar intensity-associated bacteria die-off in-stream bacterial algorithm and Cho et al. (2016) modified 'bacteria.f' submodule to apply seasonal variation in bacteria in soil depending on soil temperature change. We used 5-year water quantity and quality data for constructing the modified SWAT model in a rural watershed. Climate change scenarios projected by general circulation models were applied to the SWAT model. The results showed that the modified bacteria module in SWAT indicated reasonable prediction of fecal coliform fate and transport in current conditions and in future conditions. The modified SWAT will provide predictive and scientific information for simulating microbial water quality in terms of climate change.