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SWAT Modeling of the Arroyo Colorado Watershed

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A model setup of the Soil and Water Assessment Tool (SWAT) watershed model was developed to simulate flow and selected water quality parameters for the Arroyo Colorado watershed in South Texas. The model simulates flow, transport of sediment and nutrients, water temperature, dissolved oxygen, and biochemical oxygen demand. The model can also be used to estimate a total maximum daily load for the selected water quality parameters in the Arroyo Colorado. The model was calibrated and tested for flow with data measured during 2000–2009 at two streamflow-gaging stations. The flow was calibrated satisfactorily at monthly and daily intervals. In addition, the model was calibrated and tested sequentially for suspended sediment, orthophosphate, total phosphorus, nitrate nitrogen, ammonia nitrogen, total nitrogen, and dissolved oxygen, using data from 2000–2009. The simulated loads or concentrations of the selected water quality constituents generally matched the measured counterparts available for the calibration and validation periods. Two watershed scenarios were simulated for the years 2015 and 2025 after estimation of land cover maps for those years. The scenarios were intended to identify a suite of best management practices (BMPs) to address the depressed dissolved oxygen problem in the watershed.

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