



## Best Management Practices for sediment control in a Mediterranean agricultural watershed

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Soil erosion can lead to severe destruction of agricultural sustainability that affects not only productivity, but the entire ecosystem in the neighboring areas. Sediments transported together with the associated nutrients and chemicals can significantly impact downstream water bodies. Various conservation and management practices implemented individually or integrated together as a system can be used to reduce the negative impacts on agricultural watersheds from soil erosion. Hydrological models are useful tools for decision makers when selecting the most effective combination of management practices to reduce pollutant loads within a watershed system.

The Annualized Agricultural Non-point Source (AnnAGNPS) pollutant loading management model can be used to analyze the effectiveness of diverse management and conservation practices that can control or reduce the impact of soil erosion processes and subsequent sediment loads in agricultural watersheds. A 506 km<sup>2</sup> Mediterranean medium-size watershed (Carapelle) located in Apulia, Southern Italy was used as a case study to evaluate the model and best management practices (BMPs) for sediment load control. A monitoring station located at the Ordona bridge has been instrumented to continuously monitor stream flow and suspended sediment loads. The station has been equipped with an ultrasound stage meter and a stage recorder to monitor stream flow. An infrared optic probe was used to measure suspended sediment concentrations (Gentile et al., 2010).

The model was calibrated and validated in the Carapelle watershed on an event basis (Bisantino et al., 2013), and the validated model was used to evaluate the effectiveness of BMPs on sediment reduction. Various management practices were investigated including evaluating the impact on sediment load of: (1) converting all cropland areas into forest and grass covered conditions; (2) converting the highest eroding cropland areas to forest or grass covered conditions; and (3) utilizing a crop rotation of wheat and forage crops (Abdelwahab et al., 2014).

Further evaluations include scenarios with additional improvements in the input data, in particular better reflecting the management operations within model input parameters used to represent the current conditions applied in the watershed, and the study of the efficiency of the model in predicting runoff and sediment loads at a monthly and annual scale using un-calibrated parameters. The effect of riparian buffers as a natural trap that reduce runoff and increase the in-situ sediment deposition are also investigated.

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