



## **Evaluation of the SWAT model by bathymetric measures in a Sicilian reservoir**

Feliciana Licciardello, Attilio Toscano, Giuseppe L. Cirelli, Simona Consoli, and Salvatore Barbagallo  
Università di Catania, Department of Agri-foof and Environmental Systems Management, Catania, Italy (flicciar@unict.it)

This study aims to demonstrate that the SWAT model together with field surveys, can be an effective tool to help decision makers in the assessment of large catchments with reservoirs in semi-arid Mediterranean environments by comparing long term (over 46 years) bathymetric surveys carried out in a Sicilian reservoir and SWAT simulations of sediment yields from the contributing catchment. The mean sedimentation volume evaluated by bathymetric measurements in the reservoir during the period 1960-2009 was 51,000 m<sup>3</sup>/year. Field surveys and collection of spatially distributed databases of soil, topography and climate were carried out in order to characterize the contributing catchment. SWAT model was applied to simulate sediment deposition volumes from 1960 to 2009 as well as water flow volumes reaching monthly the reservoir from 1963 to 2008. The performance of the hydrological and erosion components of the model was evaluated by a combination of both summary and difference statistical measures applied to the chosen calibration and validation periods. The model was able to simulate observed runoff volumes, during both calibration and validation periods at annual and monthly scale without calibrating the CN values suggested in the model manual. The mean sedimentation volume simulated by SWAT during the whole period was 66 • 10<sup>3</sup> t, 8.3% lower than the value obtained by the bathymetric measurements (equal to 72 • 10<sup>3</sup> t); the efficiency coefficient values were satisfactory.