INTERNATIONAL SOIL AND WATER ASSESSMENT TOOL CONFERENCE

at 11.41

BCKU

SWAT 2019

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17–19 JULY VIENNA, AUSTRIA BOOK OF ABSTRACTS



The Soil and Water Assessment Tool (SWAT) is a public domain model jointly developed by USDA Agricultural Research Service (USDA-ARS) and Texas A&M AgriLife Research, part of The Texas A&M University System.

SWAT is a small watershed to river basin-scale model to simulate the quality and quantity of surface and ground water and predict the environmental impact of land use, land management practices, and climate change. SWAT is widely used in assessing soil erosion prevention and control, non-point source pollution control and regional management in watersheds.

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Foreword

The organizers of the 2019 International SWAT Conference want to express their thanks to the organizations and individuals involved and their preparation and dedication to coordinate a successful conference. We would also like to thank the Scientific Committee for their support in preparing the conference agenda and allowing for scientists and researchers around the globe to participate and exchange their scientific knowledge at this conference.

A special thank you to the University of Natural Resources & Life Sciences (BOKU) along with Prof. Dr. Andreas Klik, Dr. Bano Mehdi, and the rest of the local organizing committee in Vienna for their countless hours and efforts to host the SWAT Community. On behalf of the SWAT Community, we extend our sincere gratitude to you and your university for the kind invitation and welcoming hospitality.

The following Book of Abstracts contains abstracts for presentations covering a variety of topics including but not limited to large scale applications; climate change applications; model development; database and GIS application and development; environmental applications; hydrology; best management practices (BMPs); sensitivity, calibration and uncertainty; and more.

The Conference Organizers hope you enjoy the conference and continue to view these SWAT gatherings as a positive opportunity for our international research community to share the latest innovations developed for the Soil and Water Assessment Tool.

Local Organizing Committee

Local organizing committee members are with University of Natural Resources & Life Sciences (BOKU), Vienna, Austria.

- Prof. Dr. Andreas Klik
- Dr. Bano Mehdi
- Prof. Dr. Karsten Schulz
- Prof. Dr. Christine Stumpp
- Mr. Dietmar Fellner
- Ms. Patricia Romanofsky
- Ms. Doris Steinbauer
- Ms. Nives Balenovic
- Mr. Gunther Liebhard
- Ms. Lisbeth Lolk Johannsen
- Ms. Elizabeth Odusanya
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- Ms. Cong Wang

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Analysis of climate scenarios and effects on water availability for irrigation in Río Dulce irrigation system, Santiago del Estero, Argentina

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Abstract

Climatic change has already altered hydrological cycles and will undoubtedly alter availability of water for irrigation during the coming decades. The objective of this study was to quantify future water balance and availability of water for irrigation under different climate change scenarios in the upper Salí-Dulce watershed located in northern Argentina. This basin is home to one of the most important irrigation systems in Latin America actually covering about 82000 hectares located entirely in Santiago del Estero province. In order to generate tools for sustainable agricultural development, future analysis of water balance and water availability for irrigation, the SWAT model was used and linked with projections from nine models that participated in the Coupled Model Intercomparison Project Phase 5 (CMIP5) and downscaled to Salí-Dulce catchment. The simulation was carried out for four futuristic periods: P1(2020-2039), P2 (2040-2059), P3 (2060-2079) and P4 (2080-2099) under two Representative Concentration Pathways RCP 4.5 and RCP 8.5 and was contrasted with a baseline scenario simulated for a period of 50 years (1968-2017) on a monthly scale. Monthly model calibration approaches gave good results based on a statistical fit with Nash Sutcliffe Efficiency (NSE) and Coefficient of Determination (R²) of 0.7 and 0.71 for calibration period (1988–1999), and 0.68 and 0.69 for validation period (2000-2008), respectively. The CC projections show an increasing trend in precipitation and discharge throughout the basin of 8% and 11% and an increasing trend in ET of 12 and 14% for both CC pathways respectively (RCPs 4.5 and 8.5) throughout the basin. Outcomes of this study give insight on future evapotranspiration, water balances and availability of water for irrigation and possibility to increase irrigated area to system potential of 120000 hectares. It is also an important tool during the decision-taking process to sustainably develop this watershed's irrigation system taking into account all different interests of all involved actors and by this means assure productivity for future generations.

Keywords

Climate Change; SWAT; Irrigation; Scenarios; Argentina