

Salam Abbas<sup>1</sup>, Dr. Yunqing Xuan<sup>2</sup>, Professor Dominic Reeve<sup>3</sup>  
[802170@swansea.ac.uk](mailto:802170@swansea.ac.uk)<sup>1</sup>, [Y.Xuan@swansea.ac.uk](mailto:Y.Xuan@swansea.ac.uk)<sup>2</sup>, [D.E.Reeve@swansea.ac.uk](mailto:D.E.Reeve@swansea.ac.uk)<sup>3</sup>  
 Zienkiewicz Centre for Computational Engineering/ College of Engineering / Swansea University

## Introduction

Among many challenges, Iraq also faces a serious problem of water resources shortage, as the country relies heavily on surface water from two main international rivers whose limited flows are further complicated by the fact that no international agreements have been reached to share the water wisely.

Consequently, Iraq's water resources vary from one year to another. It has been also projected that the flow of Tigris and Euphrates rivers will continue to decline with time and they will be totally dry in 2040.

## Objectives & Challenges

This study aims to present a preliminary estimation of the performance of modelling of complex watershed in estimating water flow on the Euphrates River in Kufa basin, Iraq.

The modelling of this catchment area is considered to be complex due to :

1. The local topography is very flat ;
2. The local semi-arid climate (around 160 mm annual precipitations);
3. The lack of data also makes modelling very challenge;
4. There are a human activities in study area , such as water supply plants, agricultural area and Industrial uses;
5. It is considered very stress water region.

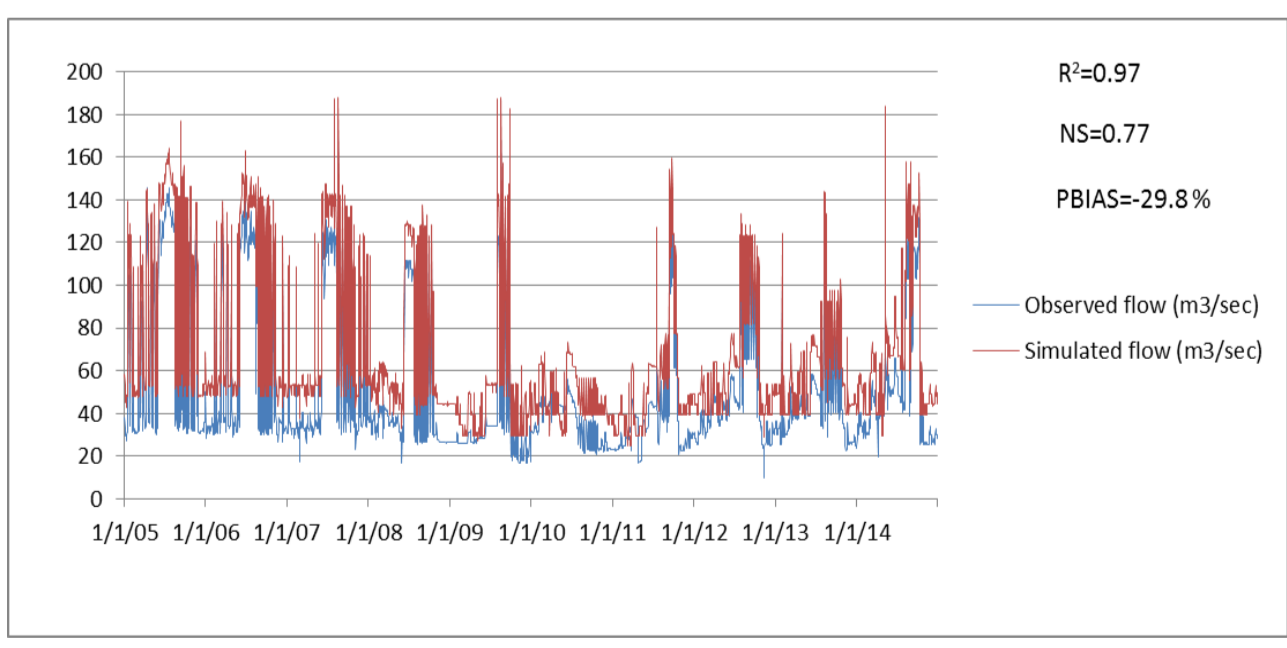
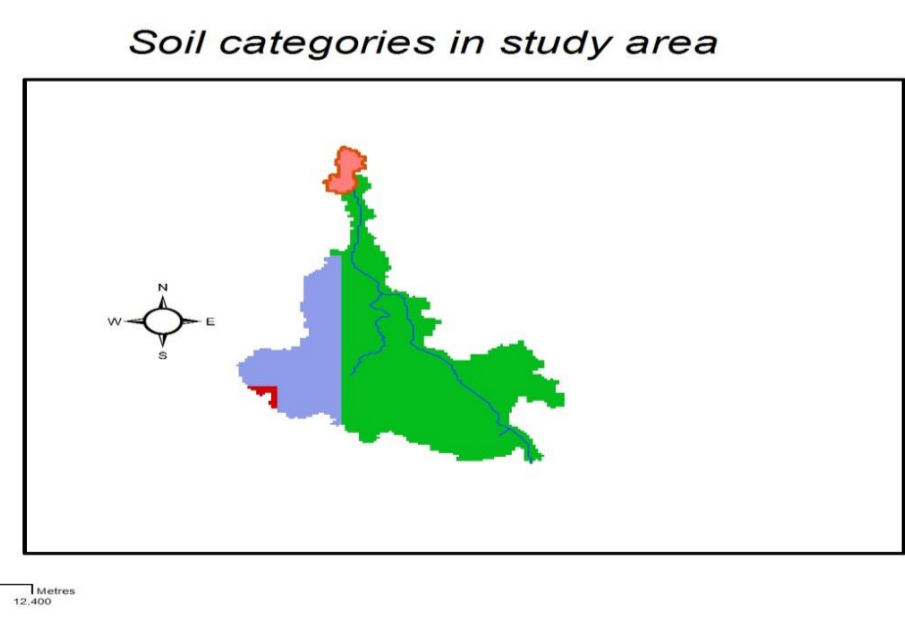
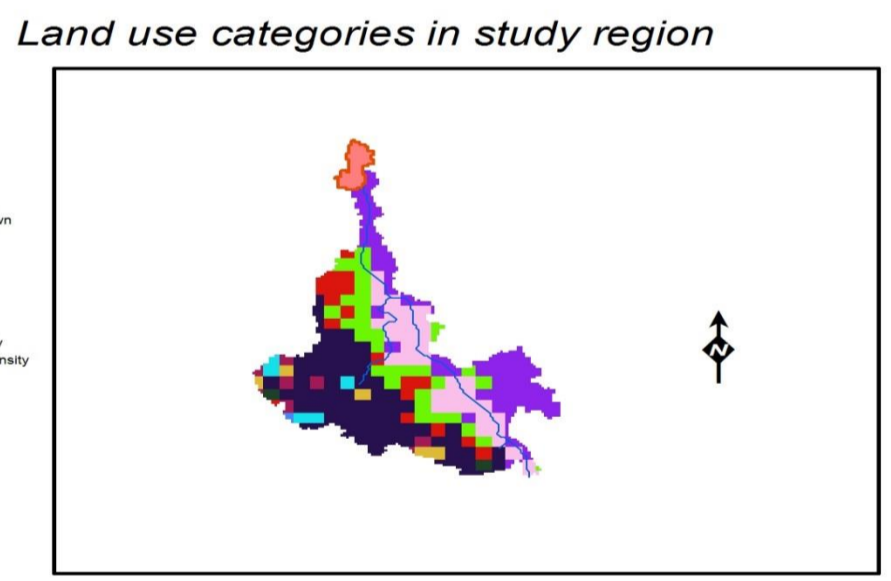
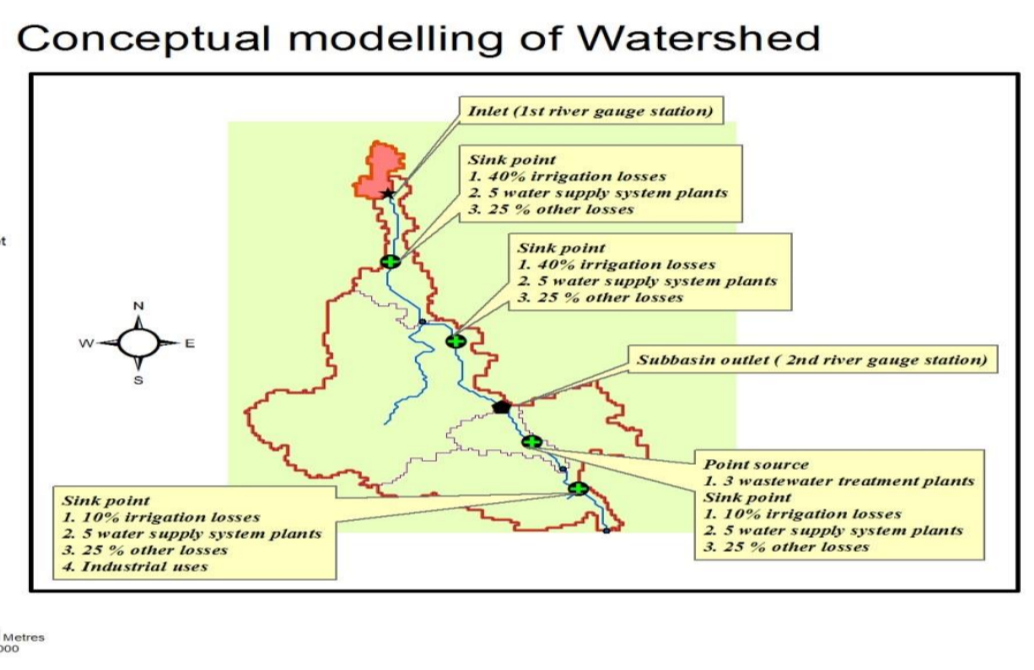
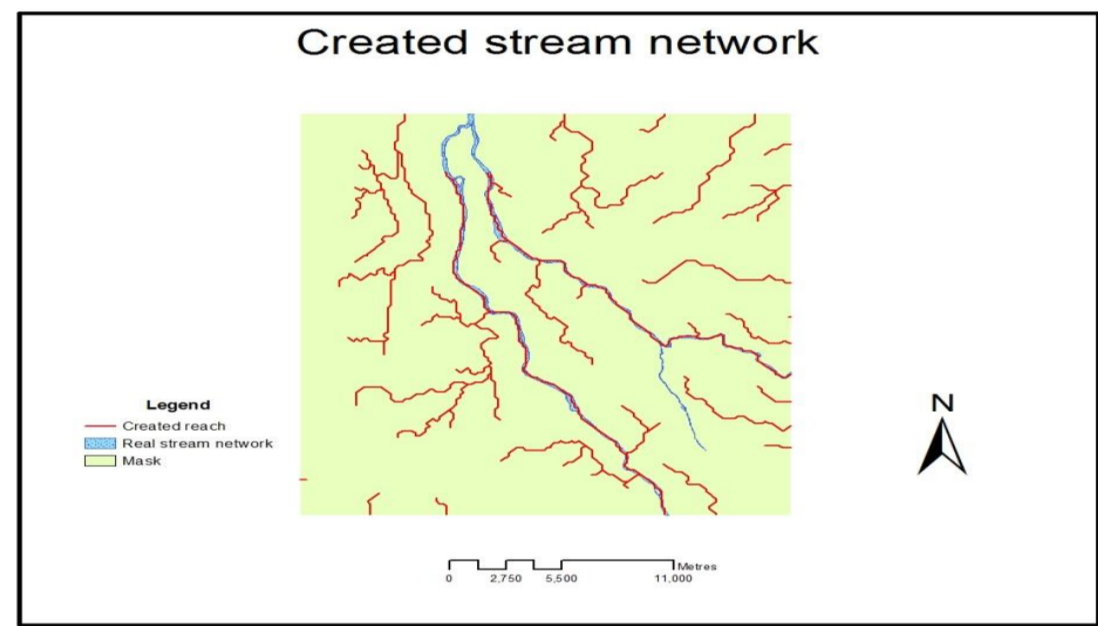
## Methods

The model of stream flow has been constructed by utilising Soil and Water Assessment Tool (SWAT), package (ArcSWAT).

A special procedure has been applied to improve the catchment delineation generated by the ArcSWAT.

The SWAT model is then calibrated and validated using flow data collected locally over the period of 2005-2014.

## Results



## Discussion and Acknowledgement

The preliminary results show that the model was able to capture the flow pattern although more vigorous calibration is needed to further improve the model performance. It is envisaged that the SWAT model when fully examined and approved, will be used to couple with a MODFLOW based ground water modelling component, package (mflab) to support a systematic study of water resources management for the region.

This project is sponsored by Iraqi government through the programme of the higher committee for education development in Iraq.