Calibration of the SWAT model using remote sensing-based ET data of an intensively used and irrigated agricultural lowland area of Lombardy, Italy

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Introduction and study area

Global change → water availability → hydrological model

AIM: calibrate with **actual evapotranspiration** (AET) remote sensing data a hydrological model in an area **free of natural streams** and complex from hydrological point of view.

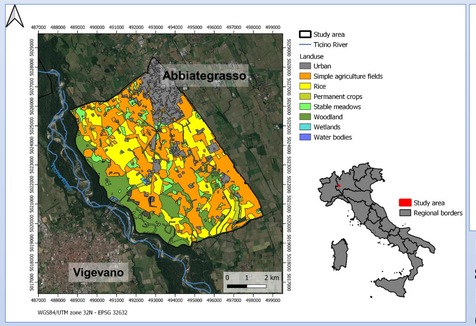

Fig. 1: Study area

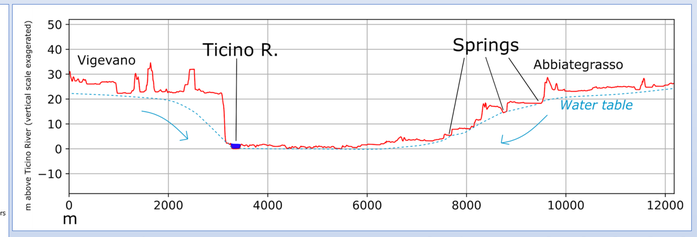

Fig. 2: Schematic representation of the **geohydrological settings** of the study area with the different orders of Ticino River terraces with the respective **springs** at their basis.(after CE4WE report, Pilla 2020)

Fig. 3: Network of **irrigation channels** that characterize the area

Methodology

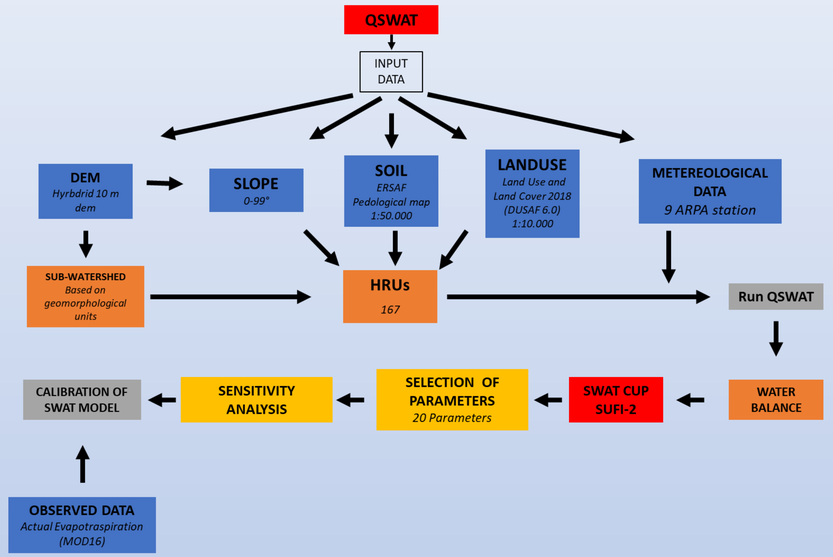

Fig. 4 Flowchart of the methodology

Results and discussion

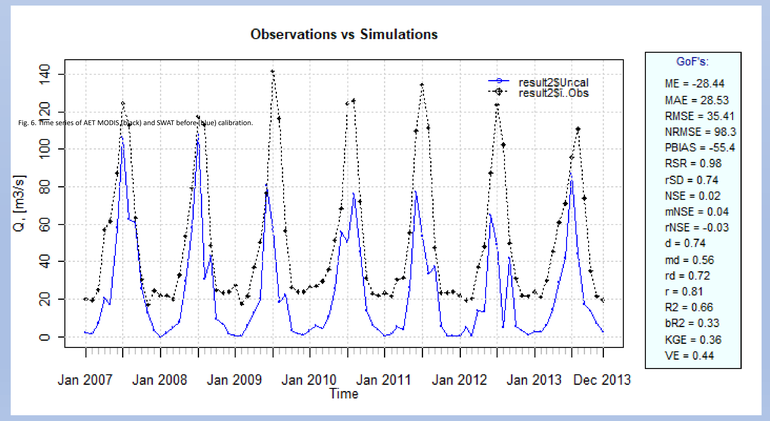

Fig. 5: Time series of AET MODIS (black) and SWAT before (blue) calibration.

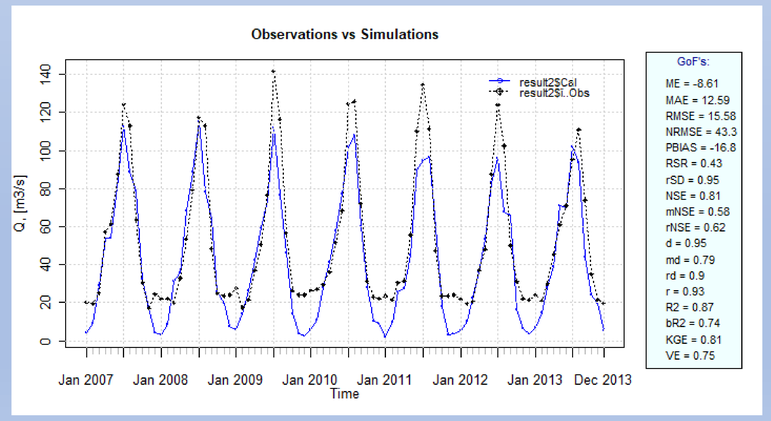

Fig. 6. Time series of AET MODIS (black) and SWAT after (blue) calibration for the period 2007-2013.

Despite the complexity of the area, it is **possible** to **calibrate** the model with **actual evapotranspiration (MOD16)** data

Differences are present between observed and simulated data, due to a **strong control** of the hydrological dynamics **by human activities**, as well as the **difference** in model **input data** and satellite data used for model calibration.

Conclusion and outlook

Model validation: → through on-site measured **water content** data installed in 3 different land uses and **AET MODIS** data.

The calibrated and validated SWAT model allows for a further hydrological analysis of a system altered by human activities in terms of **future scenarios.**