SHui

WP1 has developed an open data platform (with minimum data requirements & quality control validation) comprising field plot & catchment data comprising 27 different soil/water management treatments implemented in over 13 sites & 5 different countries. The data allows project partners to calibrate & validate crop growth (*eg.* AquaCrop) & hydrology (*eg.* HYDRUS) models in WP2.

Following the beta-release and testing of AquaCrop 6.1, **WP2.1** has identified experimental data sets from 6 crops (cotton, maize, peanut, potato, tomato, wheat) across 5 countries to calibrate and validate. New elements have explored the effects of root distribution and stress hysteresis (when crops show different responses to soil moisture according to whether the soil is drying or re-wetting) to better simulate crop water use. Meanwhile, approaches to upscale the model to tree crops and to field/catchment scales are in progress.

Contact

https://www.shui-eu.org

@shui-eu

中欧SHUI合新研究平台

Dr Jose Alfonso Gómez Calero
Instituto de Agricultura Sostenible (IAS-CISC)
E: joseagomez@ias.cisc.es
T: +34 957 499210

Dr Weifeng Xu
Fujian Agriculture and Forest University (FAFU)
E: wfxu@fafu.edu.cn
T: +86 591 83737535

Prof. Ian Dodd
Lancaster University
E: i.dodd@lancaster.ac.uk

SHui

Managing Water Scarcity in European and Chinese Cropping Systems

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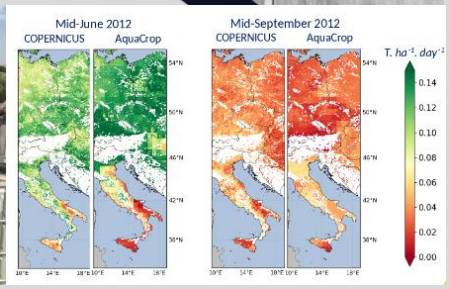
Scaling Up

WP2.2 has used soil moisture, runoff & sediment data sets from WP1, comprising 8 different sites across 5 countries to calibrate hydrological (HYDRUS, MIKE-SHE, SWAT) & soil erosion (CASE2, WATEM/SEDEM, CUSLE) models, allowing catchment / regional upscaling. This has required detailed spatial soil moisture monitoring at catchment-scale & rainfall simulation experiments on soils subjected to different management techniques.



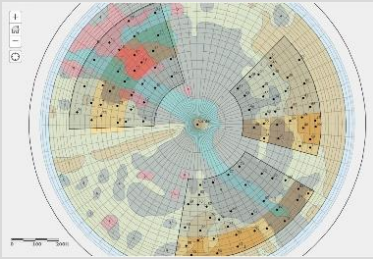
Using remotely sensed (satellite) biomass & surface soil moisture data at 1-km grid resolution, **WP3** has evaluated AquaCrop simulations over much of Europe. *In-situ* measurements have calibrated AquaCrop at two sites in China. While AquaCrop accurately simulates agricultural biomass, in-season remote sensing of crop canopy development will be integrated to improve the accuracy of crop simulations, providing better forecasts of yields to farmers.

Partners

- The European Comission
- Agencia Estatal Consejo Superior de Investigaciones Cientificas (CSIC)
- Agricultural Research Organization (ARO)
- Beijing Forestry University (BJFU)
- Beijing Normal University (BNU)
- University of Natural Resources and Life Sciences (BOKU)
- China Agricultural University (CAU)
- Changjiang River Scientific Research Institute (CRSRI)
- Hong Kong Baptist University (HKBU)
- Czech Technical University (CVUT)
- Fujian Agriculture and Forestry University (FAFU)
- Fondazione per lo Sviluppo Sostenibile del Mediterraneo (Fondazione MEDES)
- Catholic University of Leuven (KU Leuven)
- Nanjing Agricultural University (NAU)
- Northwest A & F University (NWAFU)
- Terra Noval Ltd
- TerraVision Lab
- Universidad de Córdoba (UCO)
- University of Göttingen (UGOE)
- Lancaster University (ULANC)

Local Action

WP4 has modelled the optimal in-field distribution of sampling location and/or proximal sensors (*e.g.* soil moisture monitoring) & evaluated data to delineate irrigation management zones. Machine learning can capture spatial & temporal variation in crop water stress to improve the models. Remote sensing of crop water stress was highly correlated with *in-situ* measurements, potentially saving the farmer time in implementing precision irrigation according to crop needs.



After analysing the socioeconomics & politics of on-farm strategies to sustainable water use, & various approaches to cost-benefit analyses to incorporate ecological indicators, **WP5** surveyed scientist & farmer views on soil/water management in 4 EU countries, Israel & China. This synthesis informs efficient water allocation within catchments, identifying win-win situations for economic-environmental outcomes to encourage stakeholders with different priorities to alter their management.