IRIDA

Innovative remote and ground sensors, data and tools into a decision support system for agriculture water management

Efficient agriculture water use is of crucial importance for water resources management. Consequently, accurately determining evapotranspiration (ET) is the first step for improving irrigation efficiency and productivity and for quantifying the ecosystem water balance. Several approaches for determining ET have been proposed in literature, but the relation between high and low spatial resolution methods still remains unresolved in irrigation studies and water management planning. The present proposal will create a mixed model where isolated actual ET and soil moisture measurements, obtained in the representative areas within a plot, can be correlated with actual ET results obtained by means of low-resolution methods. In this sense, the combination of on-the-ground high-resolution ET methods with the analysis of thermal and hyperspectral imagery provided by unmanned aerial vehicle (UAV/RPAS/UAS) (at plot scale), manned vehicles and satellites (at catchment scale) should ease the mixing performance and solve the upscaling. The proposal will integrate the methodologies and routines into a decision support system (DSS) that will serve to manage the large amount of inputs (Big Data Analysis) and to provide simple irrigation recommendation to the end-users. At a single plot level, IRIDA will set, by means of the analysis of high-resolution thermal and hyperspectral imagery provided by UAVs, the range of variability to detect water stressed zones within. This information will be used to decide the exact location for installing on-ground sensors to increase the spatial representativeness of the ET. At a catchment scale, and under conditions of varying land use as in northern Europe, the evaluation of satellite remote sensing will allow increasing the accuracy of the ecosystem water balance determination, improving flood predictions and the water footprint assessment. The obtained results will be disseminated at a scientific level and an initial market exploitation study will be carried out by the publicprivate partnership from 4 different countries representing the great diversity of agro-systems and their water management in Europe.