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APPLICATION OF EARTH OBSERVATION TECHNOLOGIES FOR RURAL WATER MANAGEMENT IN LOWER AUSTRIA

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ABSTRACT:

Irrigated agriculture is the main user of freshwater resources (30% in Central Europe, 60% in the South). Efficient water management is therefore of essential importance, especially where water scarcity and water quality are becoming severe challenges. To achieve a successful and effective use of resources, farmers and water managers require easy-to-use decision support tools and reliable information.

In this context, various satellite-based irrigation advisory services and geo-spatial technologies have been proposed. These tools can help farmers and decision-makers to apply and manage water according to real crop water requirements and thus, to optimize production and cost-effectiveness. However, several technical and economical factors have to be considered before a full integration into day-to-day irrigation management practices can take place.

This paper reports the experience carried out in a regional based implementation of irrigation advisory services in Lower Austria. It includes aspects related to validation and adaptation of remote sensing methodologies to local agricultural conditions, but also the user´s perspective in regard to geo-spatial technologies and a detailed cost-benefit analysis for the use of satellite data.

The presentation provides overview of the project covering the technical and socio-economic components and then focuses on the validation of satellite time series data used to produce crop water requirement maps. In particular, we report the comparison of the Landsat surface reflectance products (CDR dataset) – automatically processed with the Landsat Ecosystem Disturbance Adaptive Processing System (LEDAPS) – and a time series (2010-2014) of Landsat and DEIMOS corrected with ATCOR-2 using ground data. Results showed a very good fit of the surface reflectance in each of the six spectral channels ($R2 > 0.9$; residuals $\leq 10\%$). Our results confirm previous findings and suggest that automatic atmospheric procedures are mature enough to be used in operative applications that require atmospherically corrected data.

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