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Special Section Guest Editorial: Advances in Agro-Hydrological Remote Sensing for Water Resources Conservation

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Remote sensing technology has enhanced our ability to monitor and manage our agriculture, ecosystems, and water resources at different scales.

However, in spite of significant progress in recent years in the development of sensor technology and satellite systems, there are still many areas of application where the potential of remote sensing has not fully been realized.

This special section focuses on the use of remote sensing tools in some of these areas, including monitoring the volume and turbidity in lake fresh water resources, retrieving soil organic matter from spectral information with particular attention to abandoned croplands and areas affected by wildfires, and identification and monitoring of natural and agricultural vegetation through emerging techniques such as shallow and deep learning algorithms. These data mining and analysis approaches are particularly promising and include convolutional neural network and the application of back propagation neural network algorithms for soil water content monitoring and the extraction of other canopy information.

The papers herein give an assessment of the advances in physical modelling and data analysis and contribute towards improving our knowledge of water resources, food security, and ecosystems processes.

We would like to extend our appreciation to the authors who submitted their research for inclusion in this issue. Our thanks also go to the efforts of the many reviewers for their critical comments in ensuring the highest quality of the research presented.

Antonino Maltese received a master's degree in civil engineering and a PhD degree in hydraulic and environmental engineering from the University of Palermo (Italy) in 1999 and 2008, respectively. He is a conference chair and editor of the Proceedings of the Remote Sensing for Agriculture, Ecosystems, and Hydrology Conference within the SPIE Europe Remote Sensing Symposium from 2009. He is currently leader of the Vegetation Monitoring working group of the European COST Action HARMONIOUS (Harmonization of UAS techniques for agricultural and natural ecosystems monitoring). In 2015, he received the Tison Award 2015 for the paper "Critical analysis of thermal inertia approaches for surface soil water content retrieval. Maltese et al. (2013)."

Christopher M. U. Neale is director of research for the Robert B. Daugherty Water for Food Global Institute at the University of Nebraska, where he oversees the institute's research programs. He has over 30 years of experience in irrigation engineering and water management as well as applied airborne and satellite remote sensing to agricultural and natural resources. He is presently the chair of the SPIE Remote Sensing Symposium 2018 and 2019.