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Earth Observation Water Cycle Multi-Mission Observation Strategy (WACMOS) - An overview

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Observing and monitoring the different components of the global water cycle and their dynamics are essential steps to understand the climate of the Earth, forecast the weather, predict natural disasters like floods and droughts, and improve water resources management. Earth observation technology is a unique tool to provide a global understanding of many of the essential variables governing the water cycle and monitor their evolution over time from global to basin scales. In the coming years an increasing number of Earth observation missions will provide an unprecedented capacity to quantify several of these variables on a routine basis. In this context, the European Space Agency (ESA), in collaboration with the Global Energy and Water Cycle Experiment (GEWEX) of the World Climate Research Program (WCRP), launched the Water Cycle Multi-Mission Observation Strategy (WACMOS) project in 2009. The project aims at developing and validating a novel set of geo-information products relevant to the water cycle covering the following thematic areas: evapotranspiration, soil moisture, cloud characterization and water vapour. The generation of these products is based on a number of innovative techniques and methods aiming at exploiting the synergies of different types of Earth observation data available today to the science community. This paper provides an overview of the major findings of the project with the ultimate goal of demonstrating the potential of innovative multi-mission based strategies to improve current observations by maximizing the synergistic use of the different types of information provided by the currently available observation systems.