



## **A Fully Distributed Model for Water Management and Flood Forecasting exploiting Satellite Observations**

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Complete and distributed models, based on physical equations, can be very useful in hydrology as they can be applied in different contexts and for a wide range of purposes: flood forecast, water management, drought forecast, prediction of impact on the hydrologic cycle due to natural and human changes of the territory. Since they must mimic a variety of processes they can end up to be very complex and with a high degree of parameterization. These kind of models can be designed in order to assimilate data of different nature detected by ground stations and remote sensors.

In this work a model that balances the need of reproducing the physics of the processes and the practical goal of avoiding over-parameterization is presented. The model is developed to be easily applied in different contexts even in data scarce environments. All main hydrological phenomena are modeled in a fully distributed way. Complete mass balance and energy balance are introduced with the capability of soil surface temperature estimation.

Particular attention is set on the comparison between simulated soil temperature and LST from remote sensors, pinpointing the feedbacks that satellite data have in constraining hydrological models for better flood forecasts.