Center of Excellence
ETEMPS
Telesensing of Environment and Model Prediction of Severe events

UNIVERSITÀ DEGLI STUDI DELL'AQUILA

LARES

I WEBINARi DEL GIOVEDÌ

Soil moisture: key variable for flood and landslide prediction.

Luca Brocca

(IRPI - CNR)

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Diretta Streaming sul Canale YouTube UNIVAQ

https://www.univaq.it/live

ABSTRACT

Soil moisture is widely recognized as a key parameter in the mass and energy balance between the land surface and the atmosphere and, hence, the potential societal benefits of an accurate estimation of soil moisture are immense. Recently, scientific community is making great effort for addressing the estimation of soil moisture over large areas through in situ sensors, remote sensing and modelling approaches. The different techniques used for addressing the monitoring of soil moisture for hydrological applications will be briefly described. Moreover, examples in which in situ and satellite soil moisture data are successfully employed for improving hydrological monitoring and predictions (e.g., floods, landslides, and precipitation) are presented. Finally, the open issues and the future opportunities given by the increased availability of soil moisture measurements are outlined.

BIOGRAFIA

Luca Brocca received the Master and the PhD degree in Civil Engineering in 2003 and 2008, respectively. Since (2009) 2019 he is (Researcher) Director of Research at National Research Council, Research Institute for Geo-Hydrological Protection of (CNR-IRPI) in Perugia. Luca Brocca is author and co-author of 130+ journal referred papers, 74 papers in the last 5 years (2015-2019) and 70+ papers in peer-reviewed conference proceedings/book chapters. His work has been cited 7000+ time, with H-index=44 with Google Scholar. He has published 10 regional and global datasets of soil moisture and rainfall, and 8 software for hydrological applications. He has held 50+ presentations at conference and workshops (22 as invited speaker), and he serves as chairman at international conferences. He serves as frequent reviewer for several (50+) international journals and organisations (e.g., USDA, EUMETSAT, BELSPO, Swiss National Science Foundation), details on Publons. He is (has been) part of the Editorial Board for: Journal of Hydrology, Scientific Reports, Geoderma, Frontiers in Water, Hydrology, Remote Sensing, and Sci. Luca Brocca actively participates as Principal Investigator (PI) and co-PI to several research projects in the frame of Italian and European programs (LIFE+, HORIZON2020), and funded by International Space Agencies (European Space Agency, ESA; European Organisation for the Exploitation of Meteorological Satellites, EUMETSAT, and National Aeronautics and Space Administration, NASA). Among others, in 2012, he received the "Early Career Research Excellence" award by iEMSs society, in 2018 he has been the winner of the Copernicus Masters competition "BayWa Smart Farming Challenge", and in 2019 he has been nominated "Highly Cited Researchers" by Web of Science Group – Clarivate. The main research interest of Luca Brocca lies in the development of innovative methods for exploiting satellite observations (soil moisture, rainfall, river discharge) for hydrological applications (floods, landslides, rainfall, droughts, irrigation, water resources management). He developed the algorithm SM2RAIN, a novel concept for estimating rainfall from soil moisture observations (Soil as a natural rain gauge: estimating global rainfall from satellite soil moisture data). He implemented the SM2RAIN algorithm also for estimating irrigation water from space. Additional research interests are: 1) use of remote sensing observation for hydrological and agricultural applications, 2) geo-hydrological hazards assessment, 3) hydrologic and hydraulic modelling, and 4) assessment of climate change impact on natural hazards such as floods, drought, and landslide. To support the research, an experimental activity for the monitoring of hydro-meteorological quantities is carried out. More detailed information can be found at: http://hydrology.irpi.cnr.it/people/luca-brocca