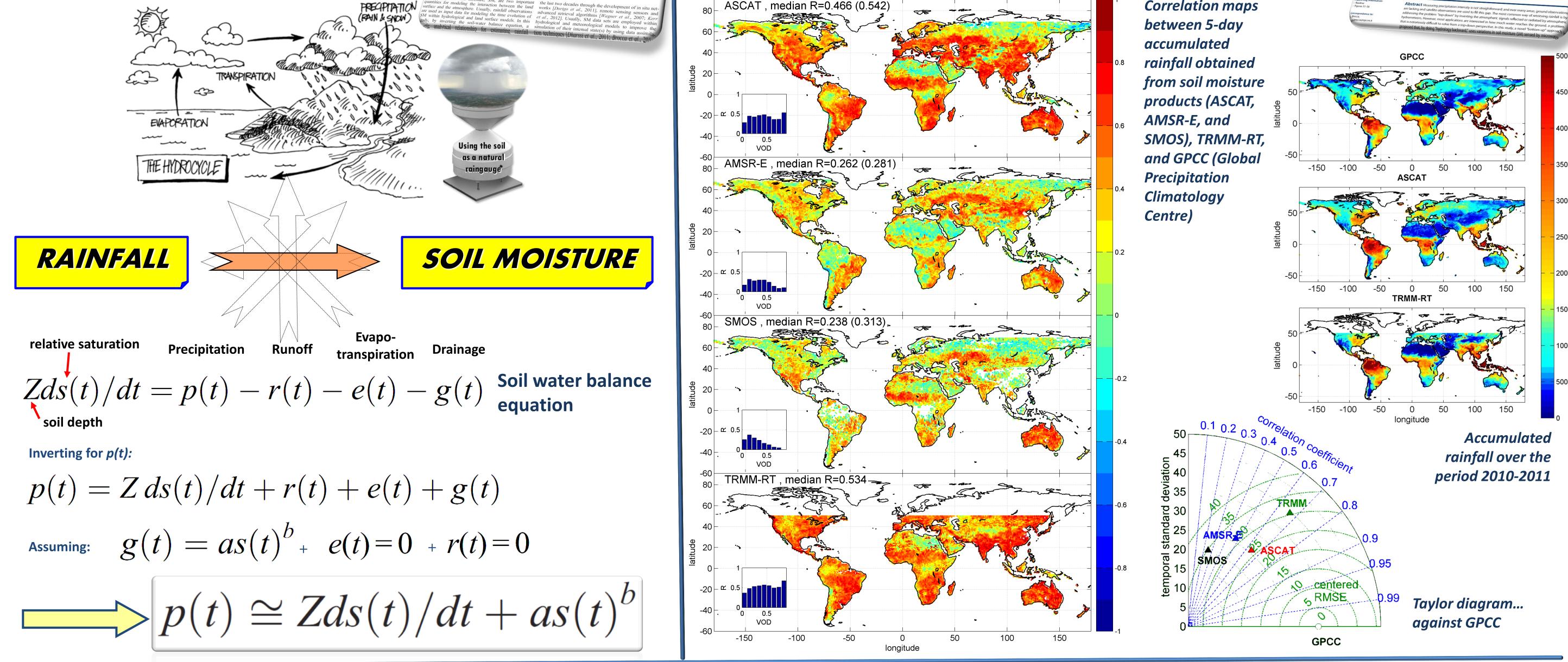
L. Brocca¹, L. Ciabatta¹, ESTIMATING RAINFAU FROM GLOBAU C. Massari¹, T. Moramarco¹, S. Hydrology Hahn², S. Hasenauer², W. Dorigo², R. Kidd², SATEUITE SOIL MOISTURE DATA: W. Wagner², **RECENT IMPROVEMENTS AND APPLICATIONS** V. Levizzani³ ISAC

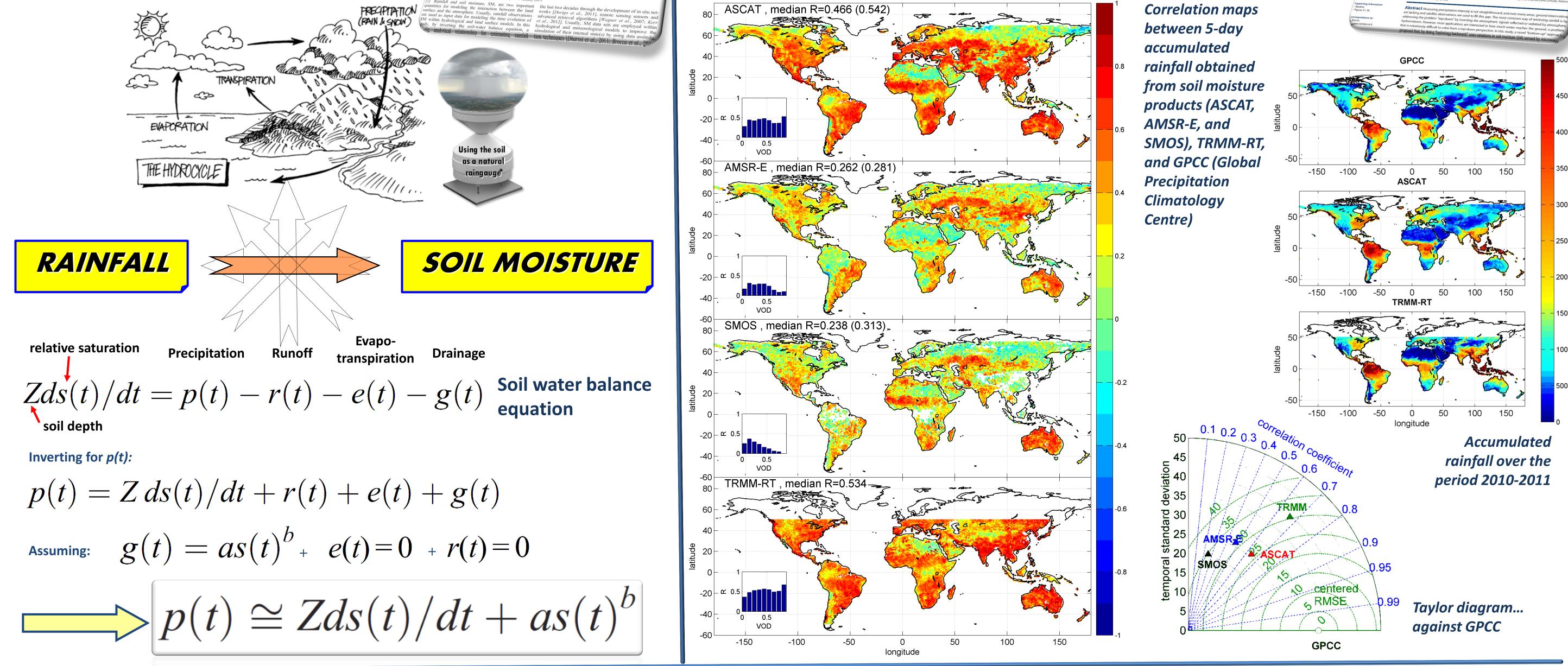
SM2RAIN: "detecting rainfall

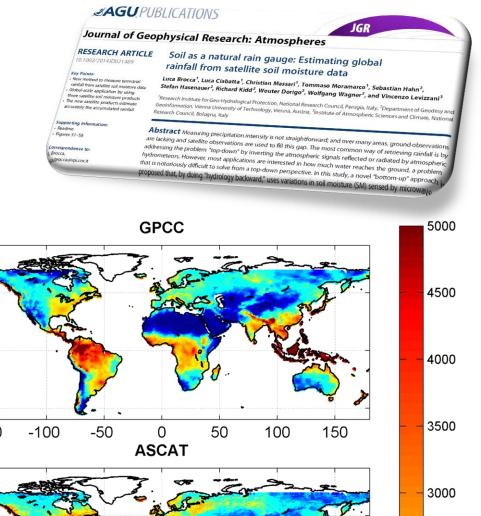
from the bottom up"



We can estimate rainfall from satellite

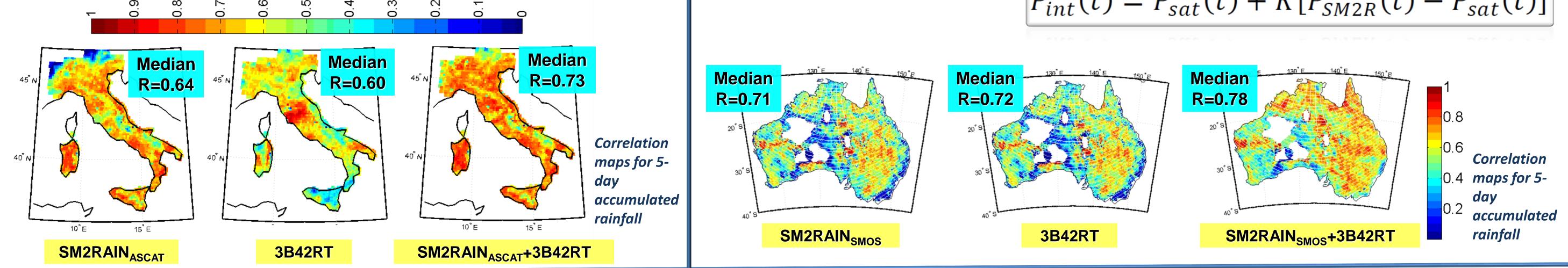
soil moisture data





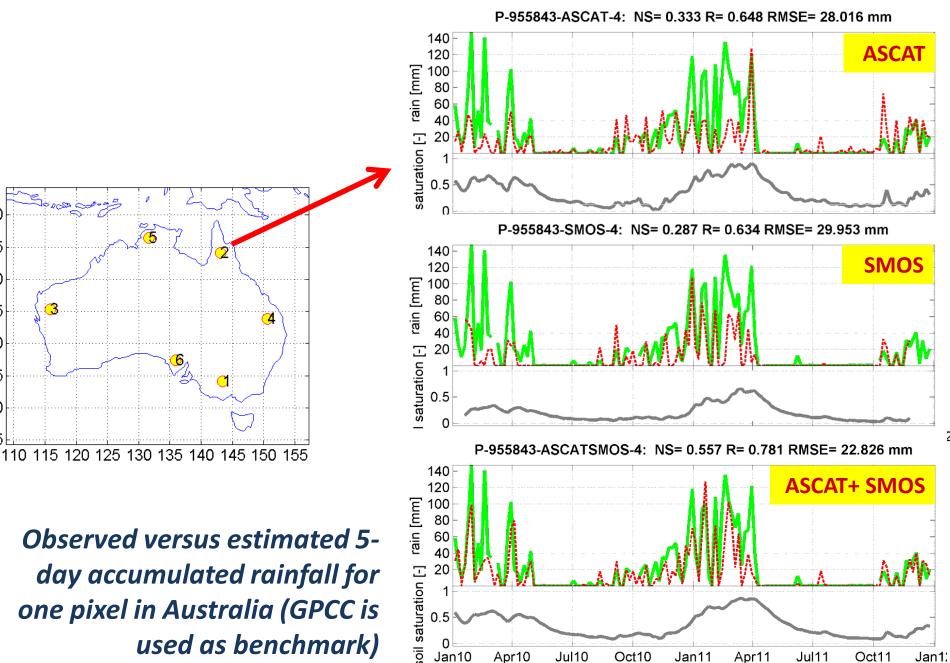
... improving state-of-the-art satellite rainfall products ...

The SM2RAIN-derived and the state-of-the-art (e.g. TMPA 3B42RT) rainfall products shows complementary characteristics. Therefore, their integration through a simple nudging scheme is implemented and the results are compared with high-quality ground observations in Italy (by using ASCAT) and in Australia (SMOS). The integrated product, P_{int}, shows improved performance, even better than the TMPA gauge-corrected product.

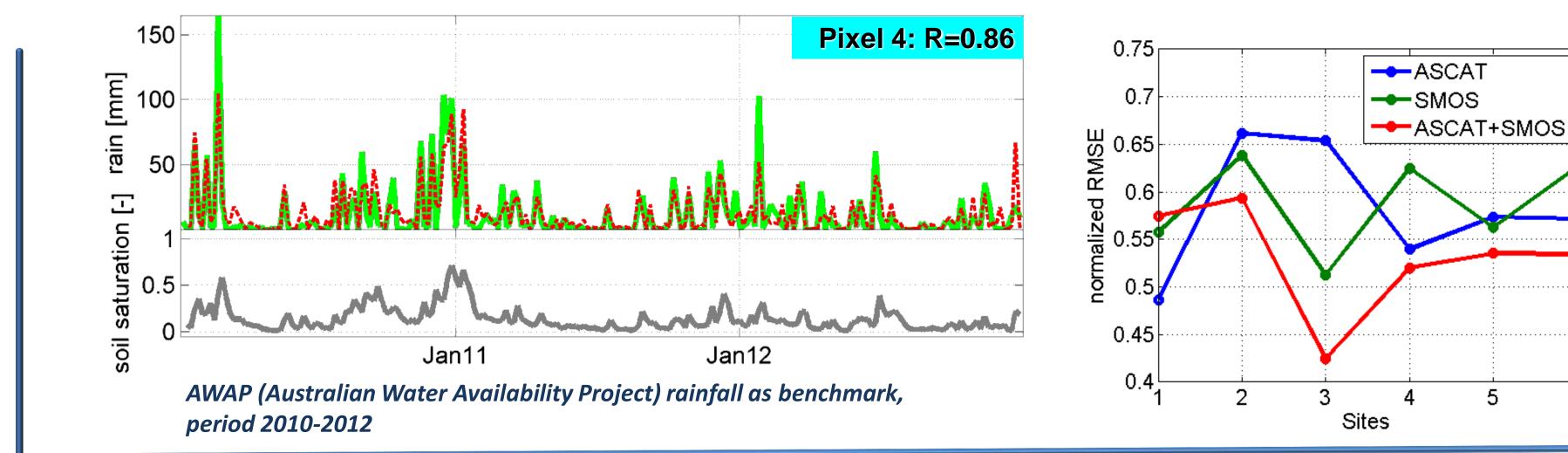


$P_{int}(t) =$	$= P_{sat}(t) +$	$K[P_{SM2R}(t) -$	$-P_{sat}(t)]$
C100 x 5	0.000		

... with better performance by merging multiple datasets.



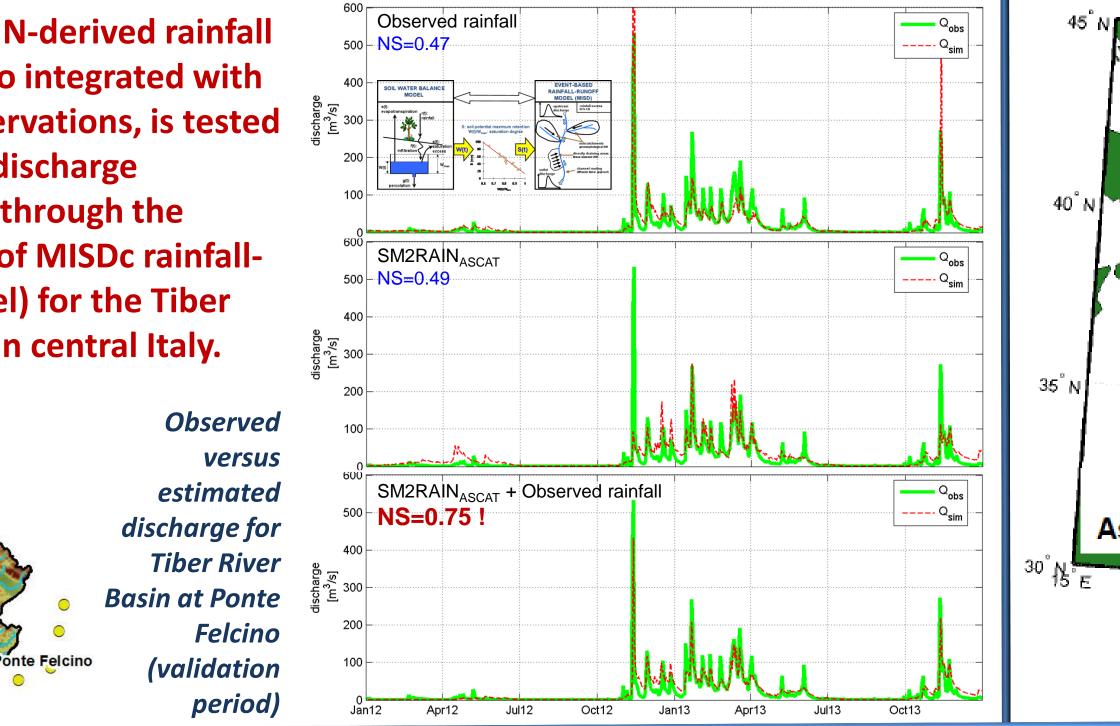
The temporal resolution of satellite soil moisture products is a critical issue for obtaining accurate rainfall estimates from SM2RAIN, mainly for daily (or sub-daily) time step. Therefore, first attempts are made to merge multiple satellite soil moisture products (ASCAT and SMOS) in Australia and very promising results are found.

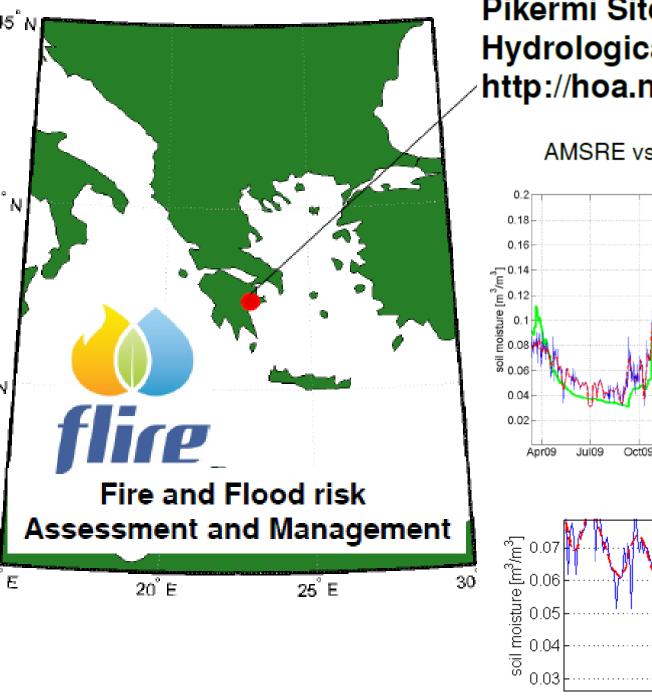


Gan we even improve rainfall-runoff modelling?

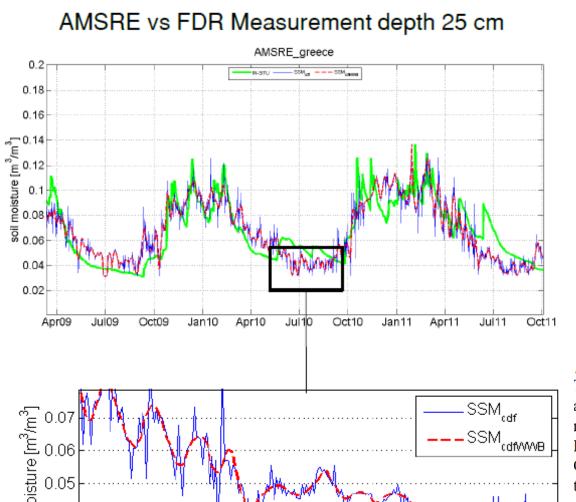
The SM2RAIN-derived rainfall product, also integrated with ground observations, is tested in terms of discharge estimation (through the application of MISDc rainfallrunoff model) for the Tiber **River basin in central Italy.**

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	Satellite signal			<i>In situ</i> vs satellite	
		statistic	·	Signal	
	Mean	Var	Skew	R_{CDF}	RMSD
Original	0.07	5.51e-4	0.39	0.81	0.014
Filtered	0.07	5.51e-4	0.39	0.83	0.013

The SM2RAIN-derived rainfall data are also used as input for an Early Warning System for Flood risk **Assessment in Greece within the EU Life+ Project FLIRE.**

Acknowledgements

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