

Incorporating an operational satellite-derived leaf area index into a computationally efficient semi-distributed hydrologic modelling application (SMART)

Seokhyeon Kim^{1*}, Hoori Ajami² and Ashish Sharma¹

seokhyeon.kim@unsw.edu.edu

¹School of Civil and Environmental Engineering, University of New South Wales, Sydney, Australia

²Department of Environmental Sciences, University of California Riverside, Riverside, CA, USA

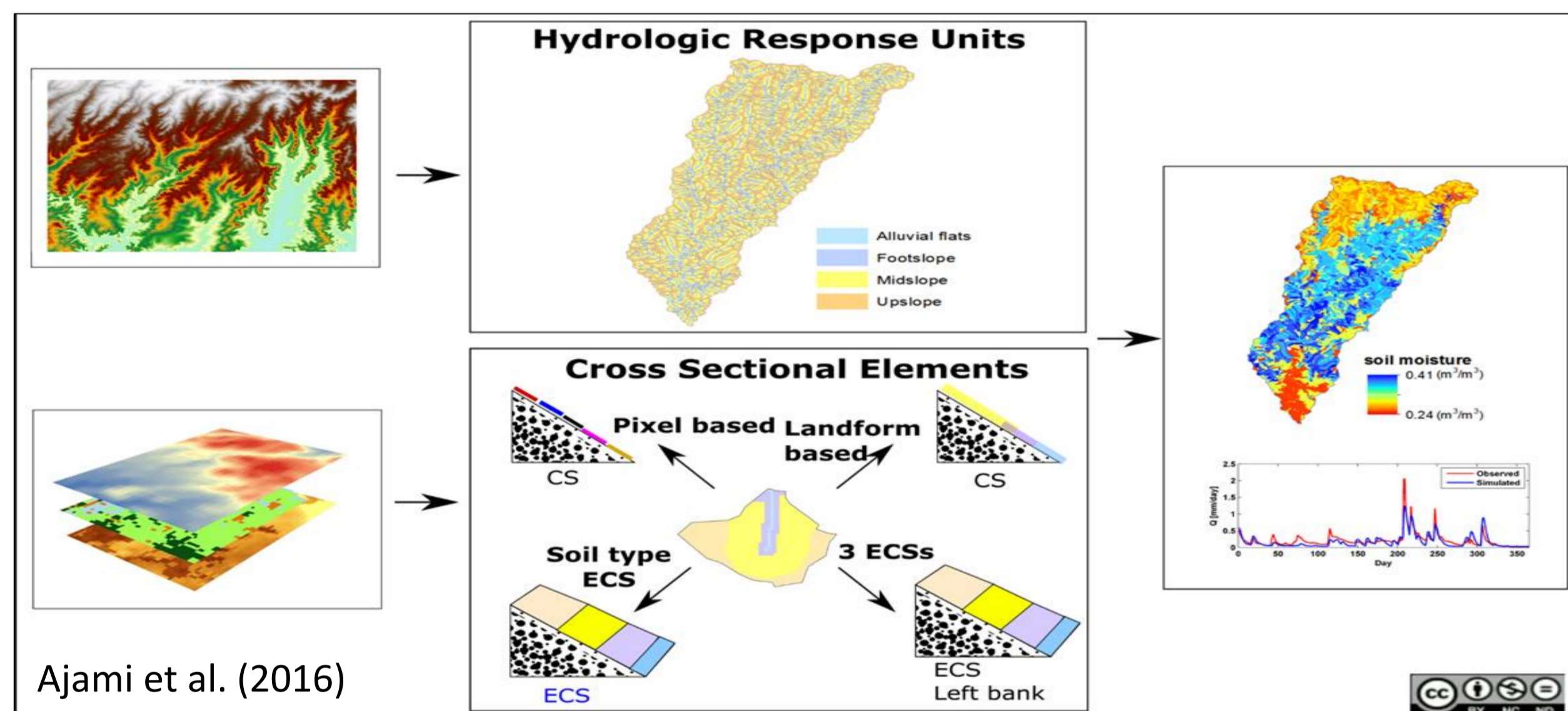
Acknowledgement

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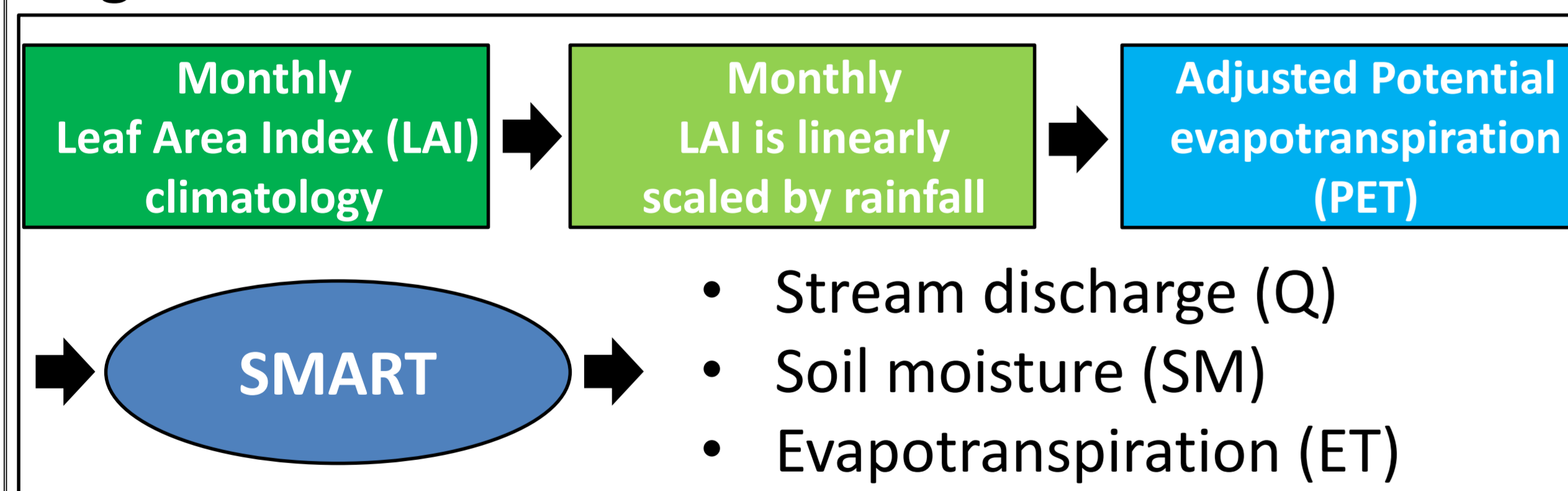
1. Introduction

Soil Moisture and Runoff simulation Toolkit (SMART)

- A GIS-based semi-distributed hydrologic modelling framework designed for large catchment scale simulations
- Computational efficiency is achieved by delineating topologically connected Hydrologic Response Units (HRUs) and series of equivalent cross sections (ECSs)



Vegetation Effects on Water Balance in SMART



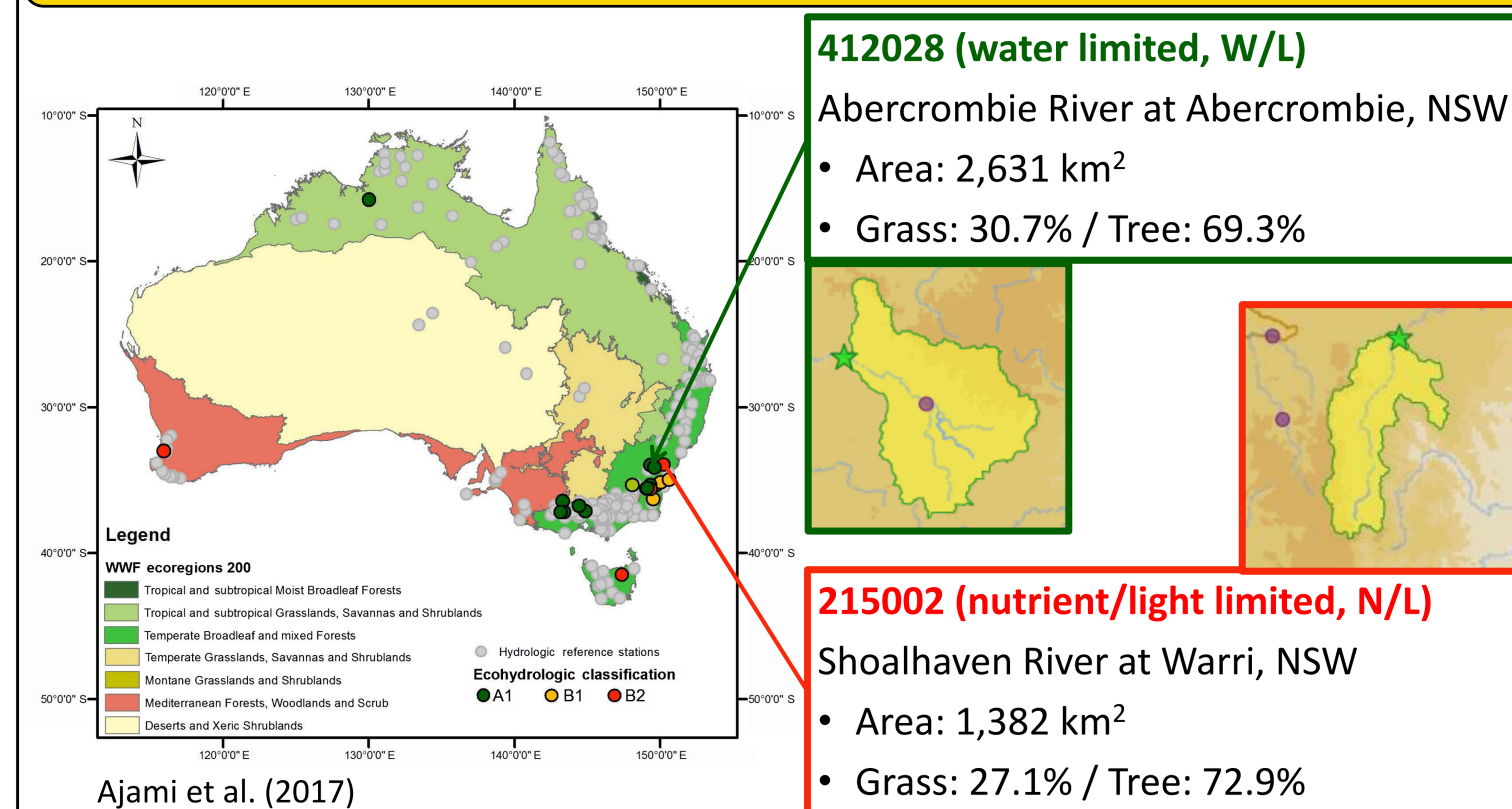
Can satellite-derived LAI replace monthly LAI scaling in SMART?

References

Ajami, H., Khan, U., Tuteja, N. K., & Sharma, A. (2016). Development of a computationally efficient semi-distributed hydrologic modeling application for soil moisture, lateral flow and runoff simulation. *Environmental Modelling & Software*, 85, 319-331

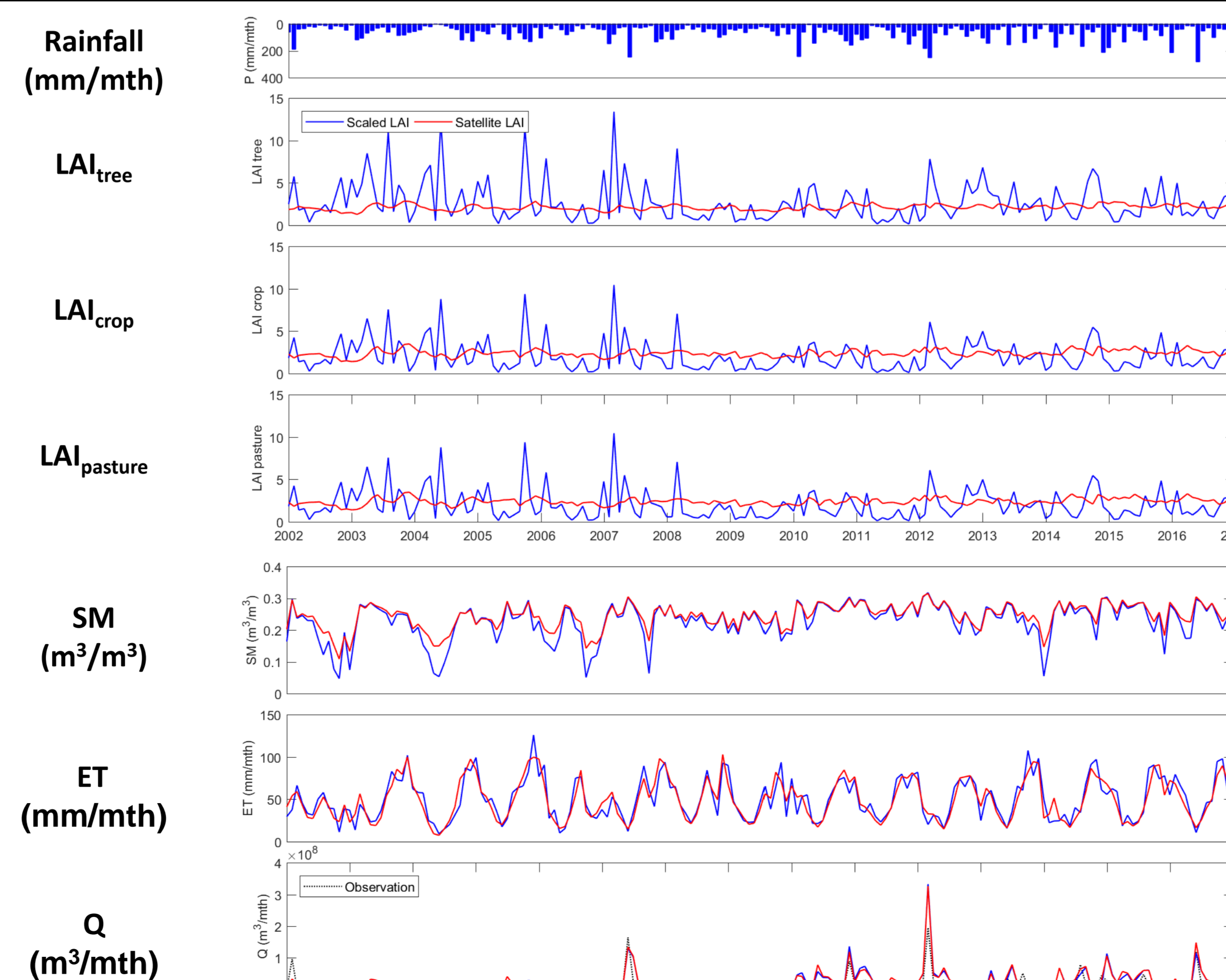
Ajami, H., Sharma, A., Band, L. E., Evans, J. P., Tuteja, N. K., Amirthanathan, G. E., & Bari, M. A. (2017). On the non-stationarity of hydrological response in anthropogenically unaffected catchments: an Australian perspective. *Hydrol. Earth Syst. Sci.*, 21(1), 281-294

2. Study Area

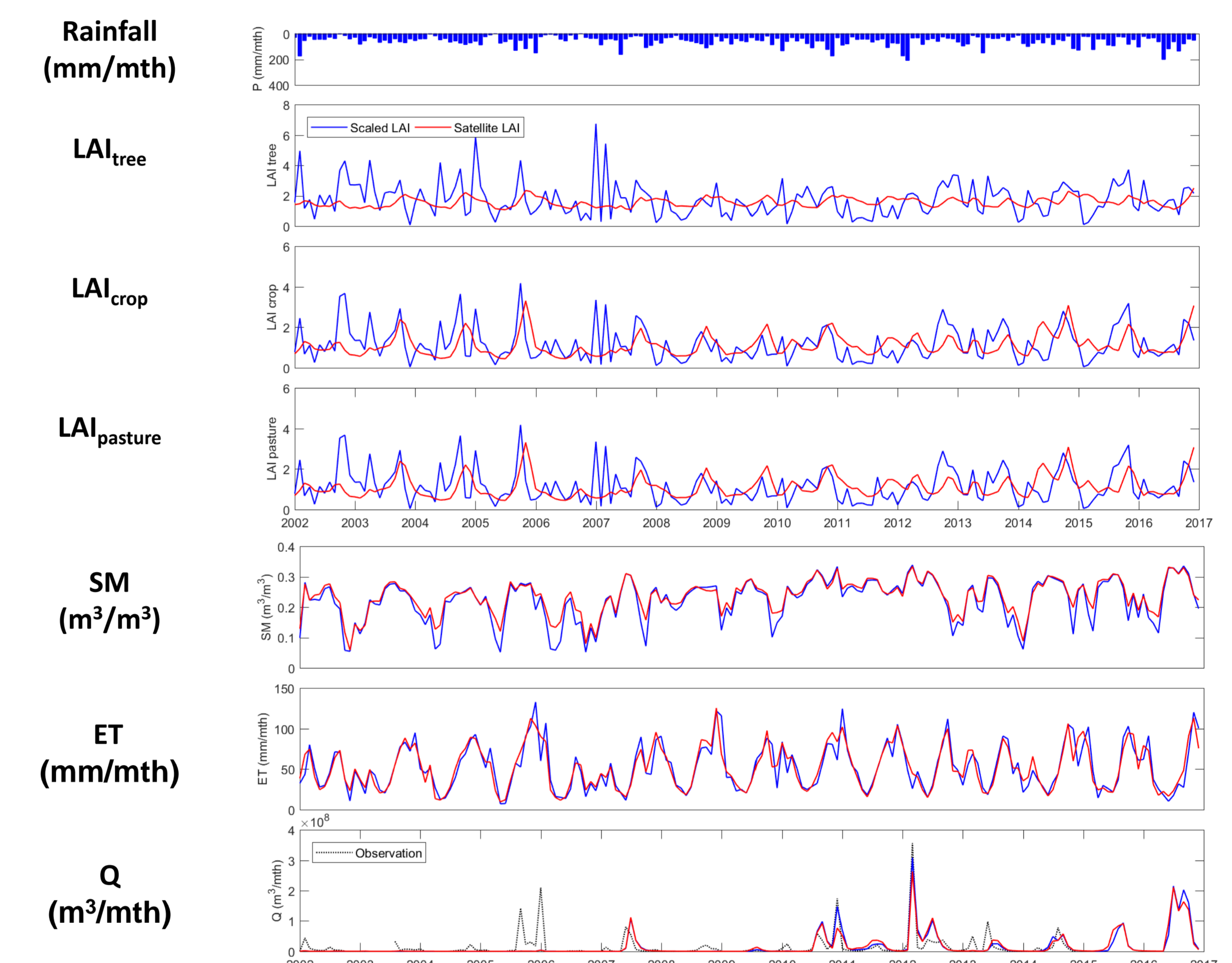


Can satellite-derived LAI improve simulating catchment water balance in SMART?

3-② Results: Monthly Simulation of 215002 (N/L)



3-① Results: Monthly Simulation of 412028 (W/L)



4. Discussion and Conclusions

	412028 (W/L)		215002 (N/L)	
	Scaled LAI	Satellite LAI	Scaled LAI	Satellite LAI
NSE (Q)	0.51	0.45	0.24	0.29
R (Q)	0.73	0.68	0.81	0.84

- Dynamics of scaled and satellite LAIs are significantly different over the two catchments
- Application of satellite LAI resulted in decreasing low and high peaks in SM and ET respectively, but its impact on Q was insignificant
- Application of satellite LAI decreased NSE and R of the water limited catchment but increased those of the nutrient/light limited catchment
- Further simulations over other catchments are necessary for confirming the findings