

Water-balance response to climate variability, a small-to-large scale Italian dataset

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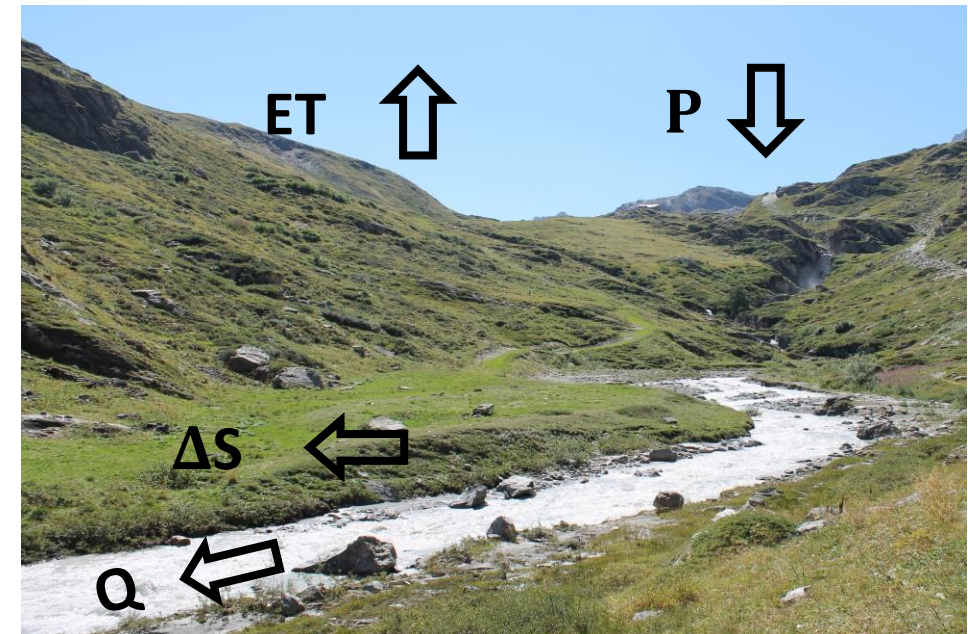
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BACKGROUND

A water-balance approach can help to better understand the disconnection between meteorological and hydrological droughts (e.g. Teuling et al., 2013, Bales et al., 2018).

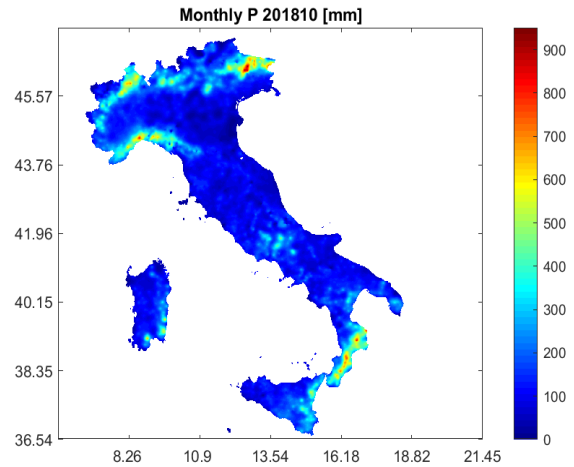
To pursue such an approach, accurate estimates of each component of the water-balance equation are required, possibly over different catchments types and climates.

$$P = Q + ET + \Delta S$$

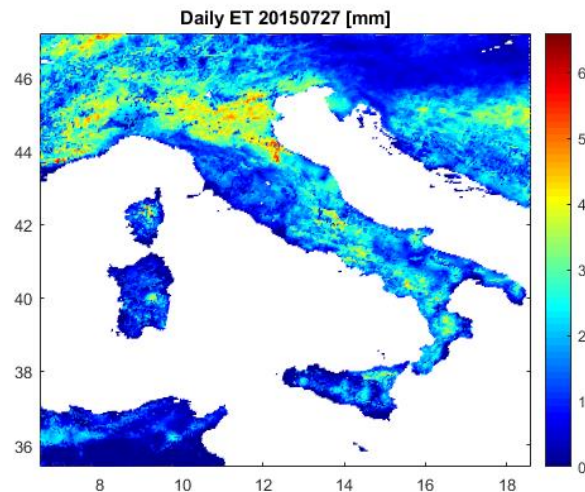


$$P = Q + ET + \Delta S \rightarrow \Delta S \text{ as annual residual}$$

Daily catchment-average **P** from Italian hydromet. regional offices and the Italian Civil Protection Department

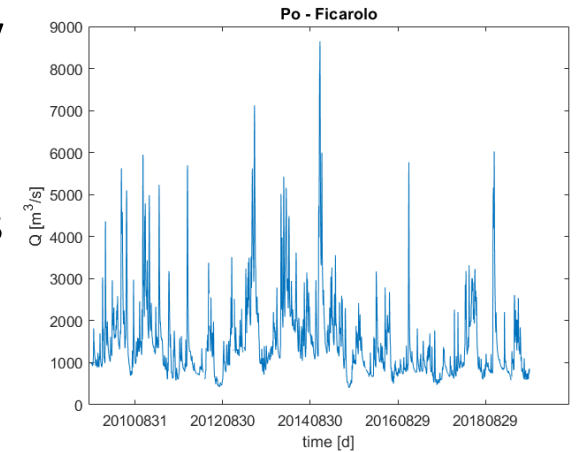


Daily catchment-scale **ET** from the LSA SAF MET v2 product (EUMETSAT, 2016)



METHODS and DATA

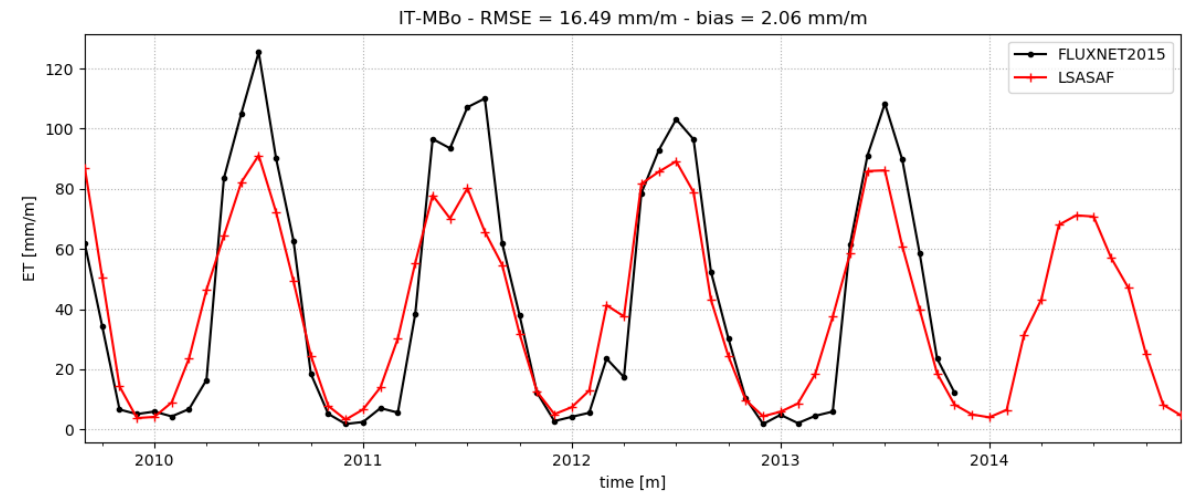
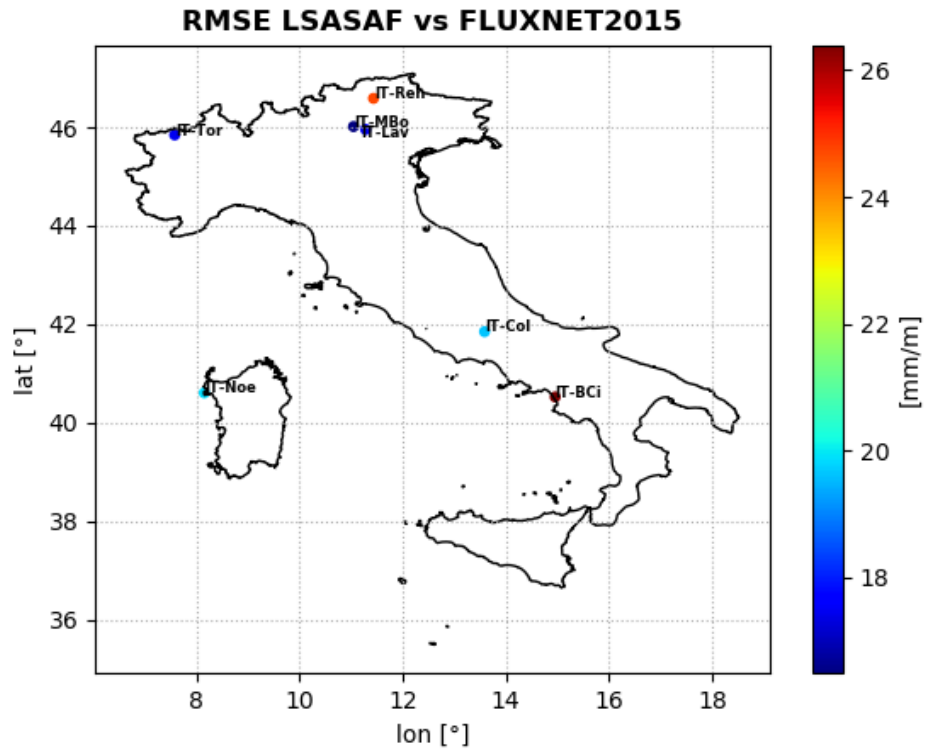
Quality-checked daily mean **Q** from Italian hydromet. regional offices and the Italian Civil Protection Department



Blending ground-based and remote-sensed data can provide a consistent dataset over Italy and water years 2010 – 2019.

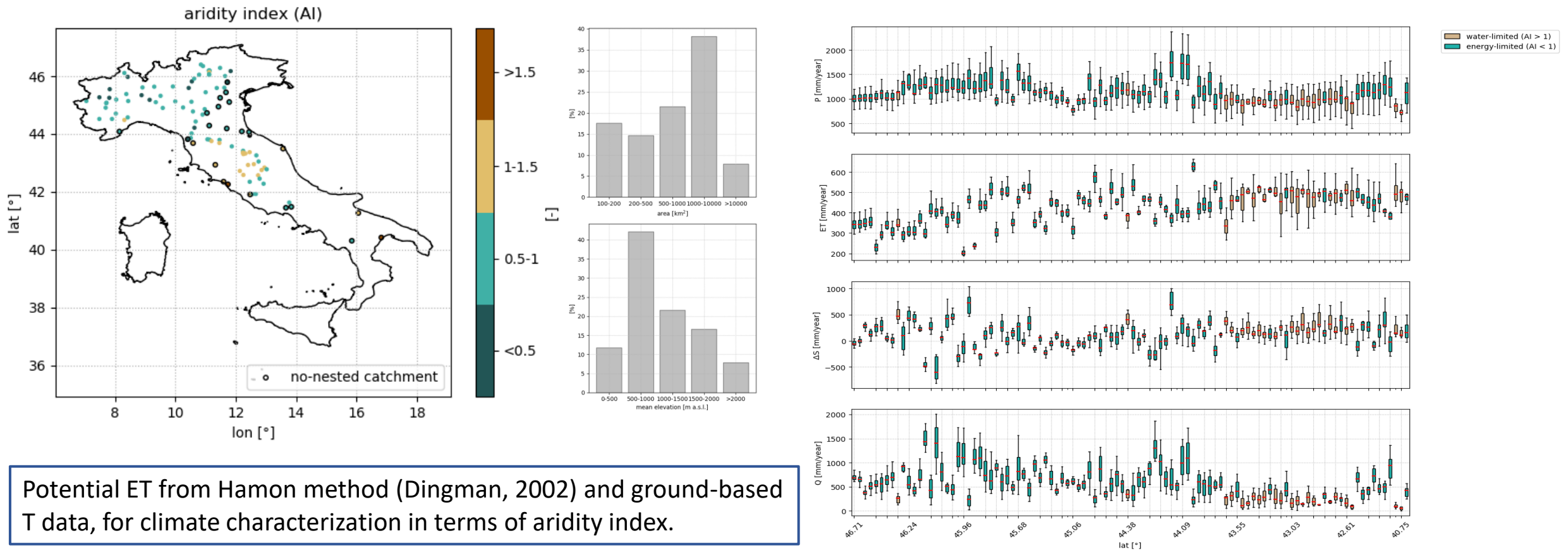
METHODS and DATA

Comparison between ET from LSASAF product and FLUXNET2015 dataset (Pastorello et al., 2020)



PRELIMINARY RESULTS

According to data availability and quality, the annual water balance can be assessed for 102 catchments, covering a wide range of size, morphologic and climatic features and including Italian major river basins.



DISCUSSION AND OUTLOOK

- Annual carryover in catchment storage is on order of 10 % of precipitation on average.
- This dataset is a strategic source of information for catchment-scale analysis of Q, ET and ΔS response to P deficit across different climates and landscapes.

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