Ground-Based Observations for Validation of Copernicus Global Land Products: Land Surface Temperature

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The Copernicus Global Land Service provides a wide range of satellite and earth observation derived products focused on monitoring of the terrestrial environment. For these products to be of use for environmental decision-making they must be validated using independent data sources to ensure they are of high quality and consistency.

Validation of satellite-derived products has traditionally been through intensive field campaigns, which enable the spatial variability of the variable of interest to be well-characterised over a particular site but are limited in time and space. In recent decades, numerous ground-based monitoring sites have been established as part of several wider ground-based observation networks. The spatial variability is not as well-characterised for these sites, but they provide a better sampling of data and provide useful information in terms of temporal consistency of products.

The Ground-Based Observations for validation of Copernicus Global Land Products (GBOV) project aims to develop and distribute robust in-situ datasets from these ground-based monitoring sites for a systematic and quantitative validation of all seven Copernicus Global Land Products (CGLPs). In GBOV, observations from identified monitoring sites are processed into various point-scale reference measurements and then upscaled in order to be more representative of the equivalent CGLP pixel, which will cover a much wider spatial area.

Here we present the methods used to upscale in situ Land Surface Temperature (LST) data for validation of the Copernicus Global Land Service LST product. We describe the derivation of in situ LST data from radiometric observations at several ground-based monitoring sites. We then outline the upscaling method used to estimate LSTs which are equivalent to a CGLP pixel from the derived point-scale in situ LSTs. We also present results comparing the validation of the Copernicus Global Land Service LST product with upscaled LST data instead of point in situ LST data.