

# Land Surface Temperature

## ESSENTIAL CLIMATE VARIABLE (ECV) FACTSHEET



**GLOBAL CLIMATE OBSERVING SYSTEM**  
KEEPING WATCH OVER OUR CLIMATE



### ECV IN BRIEF

- Domain:** Terrestrial
- Subdomain:** Biology
- Scientific Area:** Energy and temperature
- ECV Stewards:** Darren Ghent
- Products:** Maps of land surface temperature



### Land Surface Temperature

The Land Surface Temperature (LST) is the skin temperature of ground. It is mainly a product of albedo, the vegetation cover and the soil moisture. From a climate perspective, LST is important for evaluating land surface and land-atmosphere exchange processes, constraining surface energy budgets and model parameters, and providing observations of surface temperature change both globally and in key regions.

### ECV Product<sup>1</sup>

PRODUCT	DEFINITION	REQUIREMENTS				
		FREQUENCY	RESOLUTION	REQUIRED MEASUREMENT UNCERTAINTY	STABILITY	STANDARDS/ REFERENCES
<b>Maps of land surface temperature</b>	<b>Aggregated radiometric surface temperature of the ensemble of components within the sensor field of view.</b>	3 hour	1 km	1K	<0.1K/decade	

### Data Sources<sup>2</sup>

- ▶ Copernicus Global Land Service providing bio-geophysical products of global land surface  
<http://land.copernicus.vgt.vito.be/PDF/portal/Application.html#Home>
- ▶ ESA DUE GlobTemperature  
<http://data.globtemperature.info/>

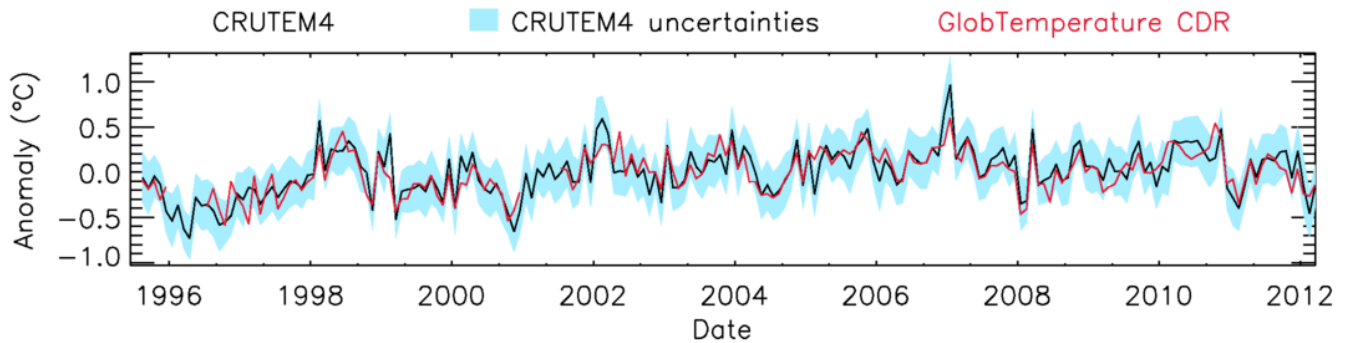
<sup>1</sup> Current Products and Requirements as in the Implementation Plan 2016 (GCOS-200). GCOS is reviewing and will update the requirements until 2022. More information on: [gcos.wmo.int](http://gcos.wmo.int) and [climatedata.wmo.int](http://climatedata.wmo.int).

<sup>2</sup> This list provides sources for openly accessible data sets with worldwide coverage for which metadata is available. It is curated by the respective GCOS ECV Steward(s). The list does not claim to be complete. Anyone with a suitable dataset who would like it to be added to this list should contact GCOS.



- ▶ CEOS Working Group on Calibration and Validation Land Product, Validation Subgroup  
<https://lpvs.gsfc.nasa.gov/>
- ▶ Satellite ECV Inventory by the CEOS/CGMS Working Group on Climate (WGClimate)  
<http://climatemonitoring.info/ecvinventory>

## Consistency with Air Temperature ECV



*Time series of globally averaged monthly anomalies (°C) for the ESA DUE GlobTemperature LST Climate Data Record (CDR) and CRUTEM4 surface air temperature data set*

Source: Good, E. J., Ghent, D., Bulgin, C., and Remedios, J. (2017), A spatiotemporal analysis of the relationship between near-surface air temperature and satellite land surface temperatures using 17 years of data from the ATSR series, *J. Geophys. Res. Atmos.*, 122, 9185–9210



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