

Foreword from the Project Director

“The next six months promises to be an exciting period for the GlobTemperature project. We look forward to the launch of the Sea and Land Surface Temperature Radiometer on Sentinel-3 in the last quarter of this year, which follows calibration at the Rutherford Appleton Laboratory in the UK. This will result in a busy time for LST experts as the instrument is commissioned in orbit and initial validation performed. The cloud clearing round-robin for ATSR-type instruments has made use of hyperwall technology at the University of Reading to define test scenes and will provide quantitative comparisons of techniques for ATSR-type instruments. The team is working hard on single sensor, merged and prototype climate data records. The data portal is becoming more sophisticated and I strongly recommend that you try it and give us feedback. Finally, away from the project itself, I wanted to point to the likely upcoming call by the European Space Agency for an Earth Explorer 9 mission. Land surface temperature

and emissivity measurements could form an important core to such a mission and we should gather our thoughts as a community. “

John Remedios (Project Director)

Recent Highlights

- 3rd User Consultation Meeting attended by 64 participants



- Improved functionality in the GlobTemperature Data Portal to allow geographical selection
- Release of new datasets (ATSR-2, external datasets). Cutting-edge LST products under development (Merged Product and Climate Data Record)
- A dedicated website for the International LST and Emissivity Working Group (ILSTE-WG) has now been created (www.ilste-wg.org).

New Datasets Available

ATSR-2

The GlobTemperature Along Track Scanning Radiometer-2 (ATSR-2) product extends the availability of LST data available from GlobTemperature back to 1995. It provides data on LST (Figure 1) for the period 01/06/1995 – 22/06/2003.

The Level-2 product (GT_AT2_2P) is available at 1 km, and the Level-3 product (GT_AT2_3P) is available at 0.05° on a daily basis.

Key strengths of the dataset are:

- Extension of the ATSR long time-series
- Full uncertainty budget derived from first principles
- Enhanced cloud detection
- Sea-ice retrievals

External Datasets

Access to the first external datasets from the Data Portal:

- ASTER Global Emissivity Database (ASTER GED) developed by NASA-JPL
- Lake surface water temperatures of European Alpine lakes developed by University of Bern

GlobTemperature Data Portal

A set of new functions was implemented prior to UCM #3 in response to recommendations made by the users. These functionalities aim at facilitating the use of the portal and improve the users' experience.

First, it is now possible to make the selection of the data according to geographical criteria. A graphical and interactive interface allows anyone to draw a rectangle to indicate the region of interest over which he would get the products (Figure 1). Once the rectangle is drawn, it is possible to refine the geographical coordinates

by entering the exact number. Of course, the selection of the area can be done also by entering the exact geographical coordinates of the box.

Linked to this new possibility to search data, we have implemented the possibility to record various configurations. This is particularly useful if you regularly want to get data over the same site(s). It is easy, once the selection has been done once, to record and to label it. It is possible later to upload these recorded configurations, avoiding the necessity to enter again the coordinates of the regions of interest. It is of course possible to manage these configura-

tions (update of the coordinates, removal, etc).

The data portal now allows any registered user to share his/her tool(s) with the community. The process is straightforward through the "Tools" menu. The "Submit a tool" button opens a form to be filled in by the user. The form allows to have a synthetic datasheet describing the key elements of the tool. Then, once submitted, the tool (and the datasheet) is checked by the GlobTemperature management team and then published on the portal.

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Figure 1: Example of the use of the Geographical Selection functionality now available on the GlobTemperature Data Portal to improve data access



LST products under developments

Development on two cutting-edge LST products to address user requirements is progressing, and these will shortly be made available on the GlobTemperature Data Portal.

Merged LST Product

To maximise exploitation of LST data, development of a first satellite LST product which resolves the diurnal cycle at a global level is under way. The GlobTemperature Merged LST Product is different from other LST global products because reference data is used as a common denominator between instruments to remove systematic differences. This Merged LST Product combines the benefits of LST data from Geostationary and Low Earth Orbit satellites (Figure 2).

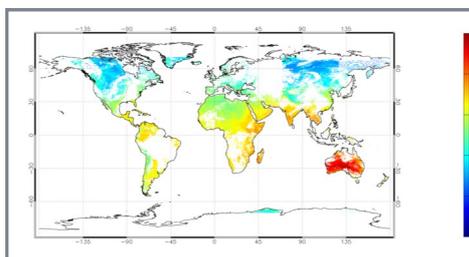


Figure 2: Prototype Merged GEO + LEO product at 09:00 UTC on 1st January 2011

Three types of products will be made available to the user community:

- Merged GEO products at UTC times
- Merged LEO products at local time
- Merged GEO + LEO products at UTC times

Key strengths of the dataset:

- Inter-calibration of LST data across sensors
- Angular correction of LST data
- Consistent uncertainty budget

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Climate Data Record

A further advancement is the development of a first prototype long and stable LST time record for climate (climate data record) from single sensor types. The GlobTemperature Prototype ATSR climate data record provides monthly data on LST over land, lakes and sea-ice and its associated uncertainty with a consistent algorithm and cloud detection (Figures 3 and 4). A critical consideration has been to

harmonise the temporal differences between instruments through analysis of the overlap period for the respective missions.

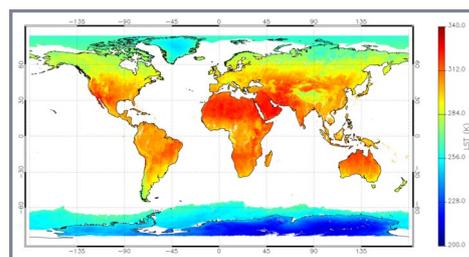


Figure 3: Prototype ATSR CDR for September 2002

Key strengths of the dataset:

- Homogenisation of brightness temperatures
- Consistent LST algorithm and cloud masking
- Full uncertainty budget derived from first principles

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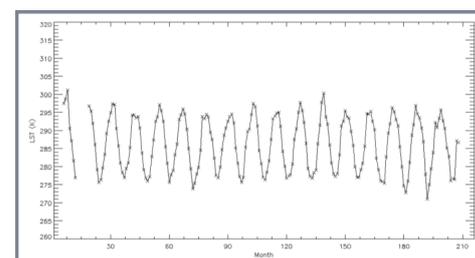


Figure 4: Time Series of ATSR CDR LST data for the UK from 1995 - 2012

UCM #3: 64 participants

The 3rd User Consultation Meeting (UCM #3) was held at the University of Reading, UK on 11th to 12th June 2015. The meeting provided a forum for the community to review recent developments in satellite retrievals while sharing knowledge on challenges such as how to derive and exploit LST product uncertainty information.

UCM #3 was well attended by users and data producers across four continents; and was collocated with both the 4th EarthTemp Network Meeting and the 6th LSA SAF Workshop. Participants contributed 8 oral and 29 poster presentations which are all available at: www.globtemperature.info.

UCM #3 was followed by the 3rd General Meeting of the ILSTE-WG which focussed on the challenge to ensure LST is accepted by GCOS as an Essential Climate Variable (ECV).

ILSTE-WG Activities

As this group continues to grow into a truly international group of experts and users we can an-

nounce the opening of a dedicated online home for the Group (www.ilste-wg.org). This will be a repository for all information pertaining to the challenge of improving global LST and Emissivity products, and a forum for sharing knowledge and experiences.

Much activity has centred on the drive to ECV status for LST with the ILSTE-WG leading this effort. The establishment of a harmonised data format is also gaining momentum; while key challenges in the near future include securing long-term sustainability.

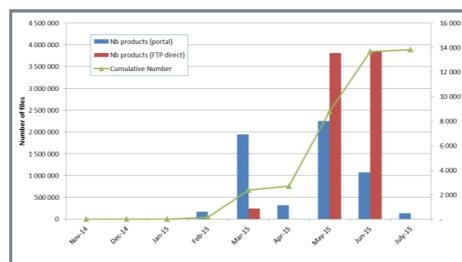
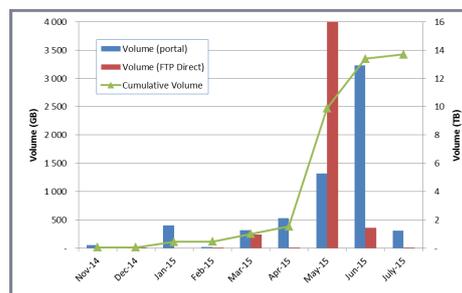
Upcoming Events

Sentinel-3 is due for launch by the end of 2015. One of the main mission objectives is to measure LST with high accuracy and reliability in support of environmental and climate monitoring. The Sea and Land Surface Temperature Radiometer (SLSTR) builds on the heritage of the ATSRs and GlobTemperature partners will be actively involved in SLSTR LST data activities.

GlobTemperature is pleased to support the "Taking the temperature of the Earth: Long term trends

and variability across all domains of Earth's surface" session at the AGU Fall Meeting in San Francisco 14-18th December 2015.

Data Portal Statistics



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