



Web-based interactive access, analysis and comparison of remotely sensed and in situ measured temperature data

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Numerous datasets providing temperature information from meteorological stations or remote sensing satellites are available. However, the challenging issue is to search in the archives and process the time series information for further analysis. These steps can be automated for each individual product, if the pre-conditions are complied, e.g. data access through web services (HTTP, FTP) or legal rights to redistribute the datasets. Therefore a python-based package was developed to provide data access and data processing tools for MODIS Land Surface Temperature (LST) data, which is provided by NASA Land Processed Distributed Active Archive Center (LPDAAC), as well as the Global Surface Summary of the Day (GSOD) and the Global Historical Climatology Network (GHCN) daily datasets provided by NOAA National Climatic Data Center (NCDC). The package to access and process the information is available as web services used by an interactive web portal for simple data access and analysis.

Tools for time series analysis were linked to the system, e.g. time series plotting, decomposition, aggregation (monthly, seasonal, etc.), trend analyses, and breakpoint detection. Especially for temperature data a plot was integrated for the comparison of two temperature datasets based on the work by Urban et al. (2013). As a first result, a kernel density plot compares daily MODIS LST from satellites Aqua and Terra with daily means from GSOD and GHCN datasets. Without any data download and data processing, the users can analyze different time series datasets in an easy-to-use web portal.

As a first use case, we built up this complimentary system with remotely sensed MODIS data and in situ measurements from meteorological stations for Siberia within the Siberian Earth System Science Cluster (www.sibessc.uni-jena.de).

References:

Urban, Marcel; Eberle, Jonas; Hüttich, Christian; Schmullius, Christiane; Herold, Martin. 2013. "Comparison of Satellite-Derived Land Surface Temperature and Air Temperature from Meteorological Stations on the Pan-Arctic Scale." *Remote Sens.* 5, no. 5: 2348-2367.

Further materials:

Eberle, Jonas; Clausnitzer, Siegfried; Hüttich, Christian; Schmullius, Christiane. 2013. "Multi-Source Data Processing Middleware for Land Monitoring within a Web-Based Spatial Data Infrastructure for Siberia." *ISPRS Int. J. Geo-Inf.* 2, no. 3: 553-576.