Thermal Data for Surface Characterization and Public Health Application

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SPACE-EARTH INTERACTIONS

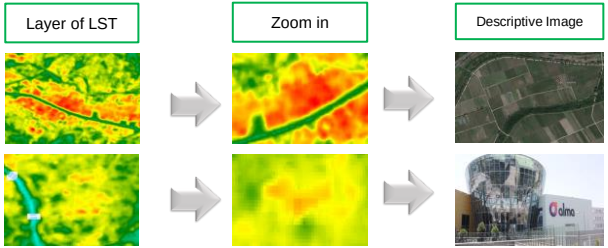
Background

The Land Surface Temperature - LST - is a determining parameter for understanding the dynamics of the Earth's surface. Is being increasingly recognized and there is a strong interest in developing methodologies to measure LST from space.

The extensive urban expansion and population growth have triggered a series of environmental problems, such as resource crises, local climate change, air pollution, traffic congestion, among others. These variations of the LST offer a number of applications related to the earth's surface processes, such as climate monitoring, hydrological cycle, model evaluation and data assimilation.

$$LST = A_i \frac{Tb}{\varepsilon} + \mathrm{B_i} \frac{1}{\varepsilon} + C_i$$

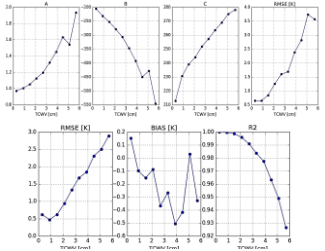
Results



Methodology

The first thing to do was to create the calibration database a then do the validation of the same data, to provide great algorithm variability (Statistical Mono-Window), this was do using RTTOV transfer model.

The second step was made using Google Earth Engine where the objective was to use the data from Landsat 8 and the ASTER to create a function that would allow me to generate a layer referring to the algorithm, at Coimbra city.



Conclusions/Impact

The urban thermal environment is a system influenced by many favors, both in its formation and in its development.

A better understanding of the mechanisms behind the UHI effect can improve knowledge on how to reduce impacts on the urban environment. This study aimed to analyze these impacts through an algorithm, and then through a cloud computing - GEE - fundamental to speed up research and data availability.

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