

The 36th International Symposium on Remote Sensing of Environment

Najlaa Fathi

Research Group on impact, Vulnerability
and Adaptation to Climate Change in Morocco
(GRIVAC), LHEA , **Faculty of Sciences Semlalia**,
Marrakesh. BP 23 90, Morocco.
[\(+212\) 652 92 97 27](tel:+212652929727)
f.najlaae@gmail.com

Supervisors:

Dr. Mohammed Messouli: Université Cadi Ayyad FS Semlalia ;Research
Group on impact, Vulnerability and Adaptation to Climate Change in Morocco
(GRIVAC), LHEA , **Faculty of Sciences Semlalia**, Marrakesh. BP 23 90, Morocco.

messouli@gmail.com

Dr Lahouari Bounoua: Nasa Goddard Space Flight center Biospheric Sciences
Laboratory 8800 Greenbelt Road ,Greenbelt MD 20771.

Lahouari.Bounoua@nasa.gov

Abstract

Subject: Remote sensing and quantification of the Urban Heat Island in Morocco; Impact on Climate Surface

Urbanization is a major form of land use that affects surface energy, carbon and hydrology in a way that alters local-to-regional climate. It changes the natural land surface by reducing the fraction of vegetation which induces a reduction in photosynthesis and transpiration and thus leads to a surface warming.

The building material such as masonry, asphalt and concrete affects the local energy balance by absorbing, storing, and reradiating more solar energy than vegetation and natural soil typical in rural areas creating thus the so-called ‘urban heat island’ (UHI), which is a differential heating generated by building material within the city core as compared to the surrounding vegetated area. This urban heat, combined with warming due to climate may have impacts in term of energy use and human health.

During the last decades, the world has experienced unprecedented urban expansion and Morocco has experienced demographic increase such that the majority its population lives in urban areas. In 2013, about 57% of the total population lived in cities and this rate is expected to reach 75% within the next 10 years.

In this study we will use MODIS land surface temperature (LST), normalized vegetation index NDVI and the land cover and land use in a spatial analysis to assess the urban heat island generated by buildups, its amplitude, its size and its relationship to different ecological setting for most populous cities in morocco between 2000 and 2014. We will also explore the relationship between the UHI and the shape of the urban settlement. A temporal analysis will then be performed to quantify how change in climate may exacerbate urban heat islands.

The results of this study will facilitate the development of a set of mitigation and adaptation measures for decision makers and urban planners to create socially and environmentally sustainable cities.