

The College of Graduate Studies and the College of Humanities and Social Science Cordially  
Invite You to a

**PhD Dissertation Defense**

Entitled

*APPLICATIONS OF LAND SURFACE TEMPERATURE FROM SATELLITE REMOTE SENSING OVER  
THE UNITED ARAB EMIRATES (UAE)*

by

Abduldaem Saeed Farea Qasem Alqasemi

Faculty Advisor

Abdelgadir Abuelgasim, Department of Geography and Urban Sustainability  
College of Humanities and Social Science

Date & Venue

14:00

Wednesday, 11 November 2020

Abstract

In cities worldwide, increasing urbanization causes major land use and land cover changes on the surface of the Earth. It has been identified as being one of the most important anthropogenic effects on the climate. As a result, rapid population growth and the rise in industrialization in the United Arab Emirates (UAE) may have created substantial environmental stress and consequence for life quality. Remote sensing-based Land Surface Temperature (LST) is significantly essential for different studies. Satellite images obtained by the Moderate Resolution Imaging Spectroradiometer (MODIS) are used to retrieve LST. This research consists of five components of some MODIS LST application over the UAE: (1) detect the thermal anomaly for groundwater flow after rainy day; (2) investigate the relationship between soil salinity and LST; (3) estimate the air temperature; (4) study the night Surface Urban Heat Island (SUHI); (5) detect the effect of the lockdown of COVID-19 on air pollutants and SUHI. The results demonstrate that the thermal anomaly was identified following a rainy day, which can be utilized to predict the optimal groundwater resources. The salinity of the soil showed a high correlation with MODIS LST at night. In addition, the air temperature estimation study indicated the significance of the MODIS LST as a credible proxy for air temperature. As regards the SUHI over the city of Dubai, it has risen gradually with the growth of the city. Furthermore, the increased amount of SUHI is mostly concentrated in high and dense buildings. Further, the maximum SUHI intensity was registered by Dubai International Airport. In comparison, due to the COVID-19 pandemic lockdown in the UAE, SUHI and air pollutants have declined.

**Keywords:** Remote Sensing, MODIS, LST, Thermal Anomaly, Soil Salinity, Air Temperature, SUHI, COVID-19.