Forest Fire Assessment Through Satellite Remote Sensing

AMIT KUMAR (12006)
AMIT YADAV (12007)
PRATEEK YADAV (12040)
SEMESTER-VII|B.TECH(IT&MI)

Dr. DORJE DAWA
Dr. ASANI BHADURI
CLUSTER INNOVATION CENTRE
DELHI UNIVERSITY

ABSTRACT

In this project We present a regionally adaptable semi-automated approach to mapping burned areas using Moderate Resolution Imaging Spectroradiometer (MODIS) data. This is a flexible remote sensing/GIS-based algorithm which allows for easy modification of algorithm parameterization to adapt it to the regional specifics of fire occurrence in the biome or region of interest.

INTRODUCTION

This research aimed to evaluate MODIS time series spectral indices for mapping burned areas in the municipality of border area of Maharashtra ,Telangana and Chhattisgarh to determine their accuracy in the different types of land use/land cover during the period 2012–2021.The MODIS sensor on board the Terra and Aqua satellites was designed to enhance fire mapping capabilities and to improve land surface monitoring. A suite of global MODIS products includes a burned area product, however, the multiyear record has not yet become available. MODIS is presently the only moderate resolution instrument which allows for DNBR derivation.

METHODOLOGY

The input data for the algorithm include the MODIS Surface Reflectance 8-Day Composite product and the MODIS Active Fire product. The approach is presented in three-part procedure. The first part involves image processing and analysis of potential fire. The second part deals with thresholds based on ecosystem and The third part includes a GIS-based analysis of active fire Detection

1. Land Use Land Cover Using Land Sat
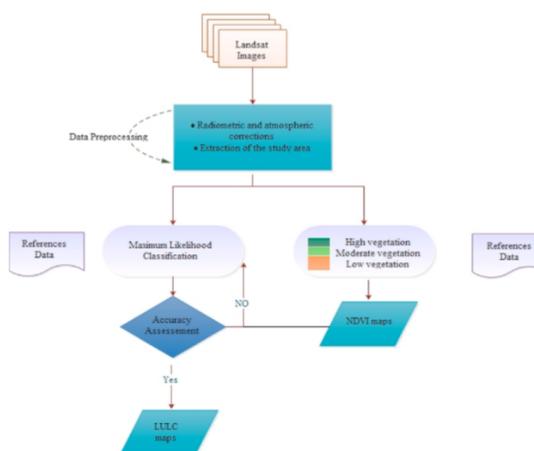
2.Land Surface Temperature Estimation using Land Sat

3.DNBR based algorithm burned area

RESULTS

India's Map with forest fire Zones

Land Use Land Cover & Urbanisation Impact Chattisgarh, Maharashtra and Telangana Border Areas

Land Surface Temperature Estimation Chattisgarh, Maharashtra and Telangana Border Areas
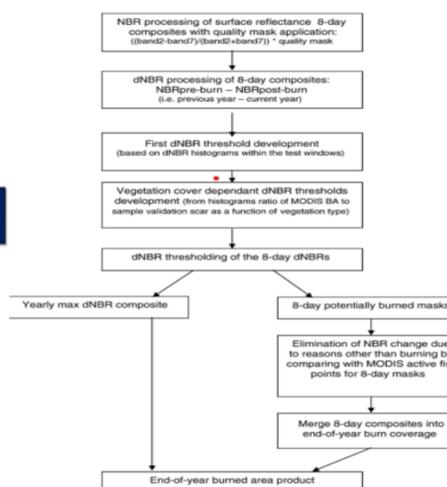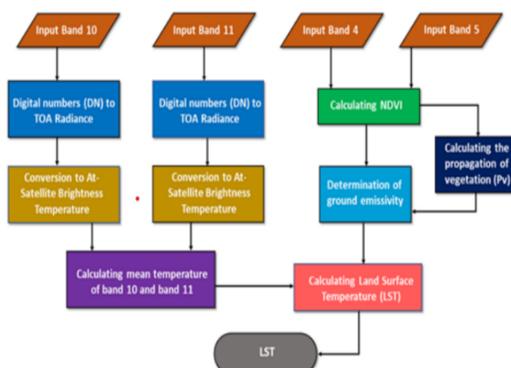
Normal Burned Ratio Index Chattisgarh, Maharashtra and Telangana Border Areas
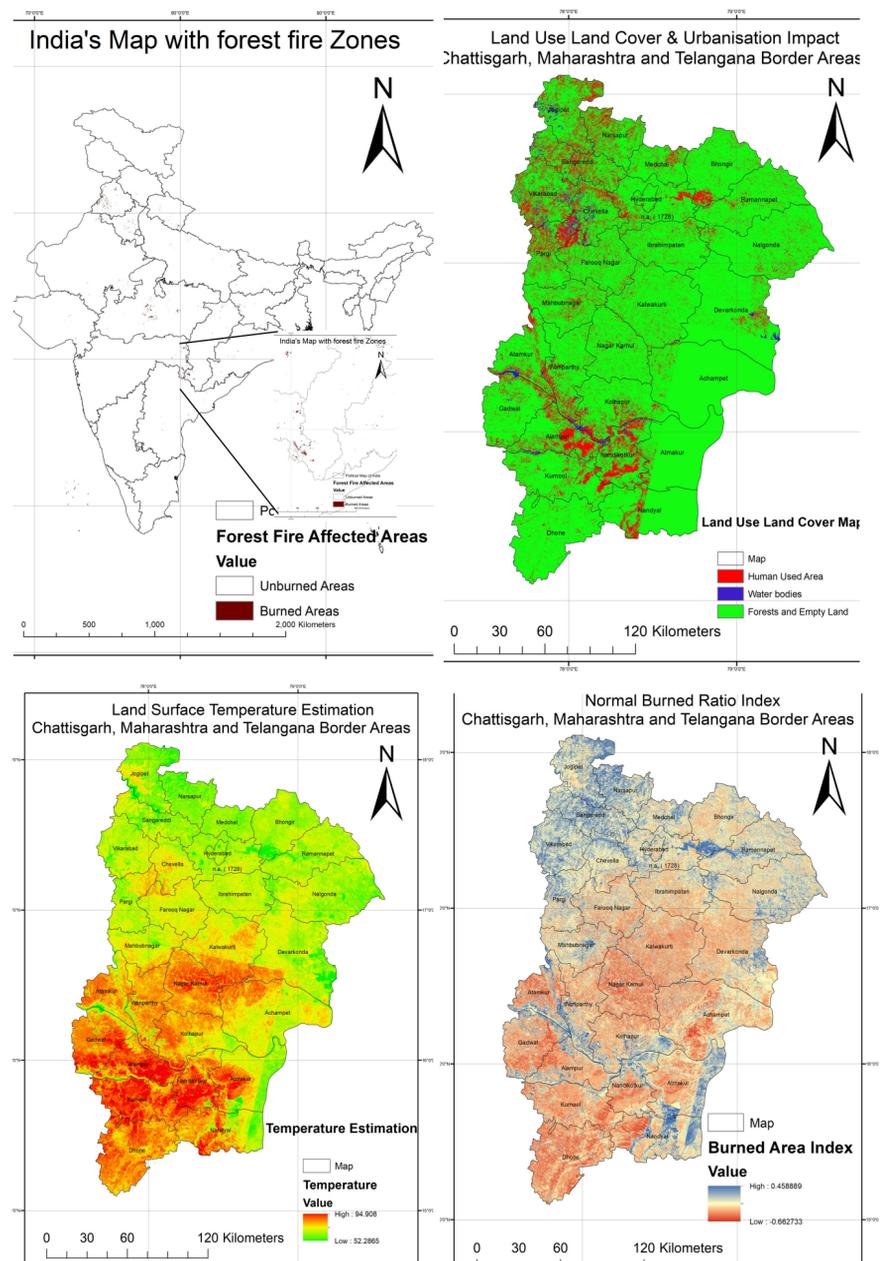
CONCLUSION

Nearly 4 % of the country's forest cover is extremely prone to fire, whereas 6 % of forest cover is highly prone. Thus about 10% of forest cover in the country is exposed to a very high threat of forest fire. In all, over 36 % of the country's forest cover is prone to frequent forest fires.As per data from FSI 2021 report, while the total forest cover in India increased by 0.48% between 2013 & 2021 forest fire detection went up by 186% in the same time period. Also, Global attention to forest fires has increased recently due to their major long-term threat to forest habitats and public safety, as well as shorter-term risks to property and human lives.

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