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Land surface temperature responses to land use land cover dynamics (District of Taroudant, Morocco)

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Outlines

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- Study area
- Materials & Method
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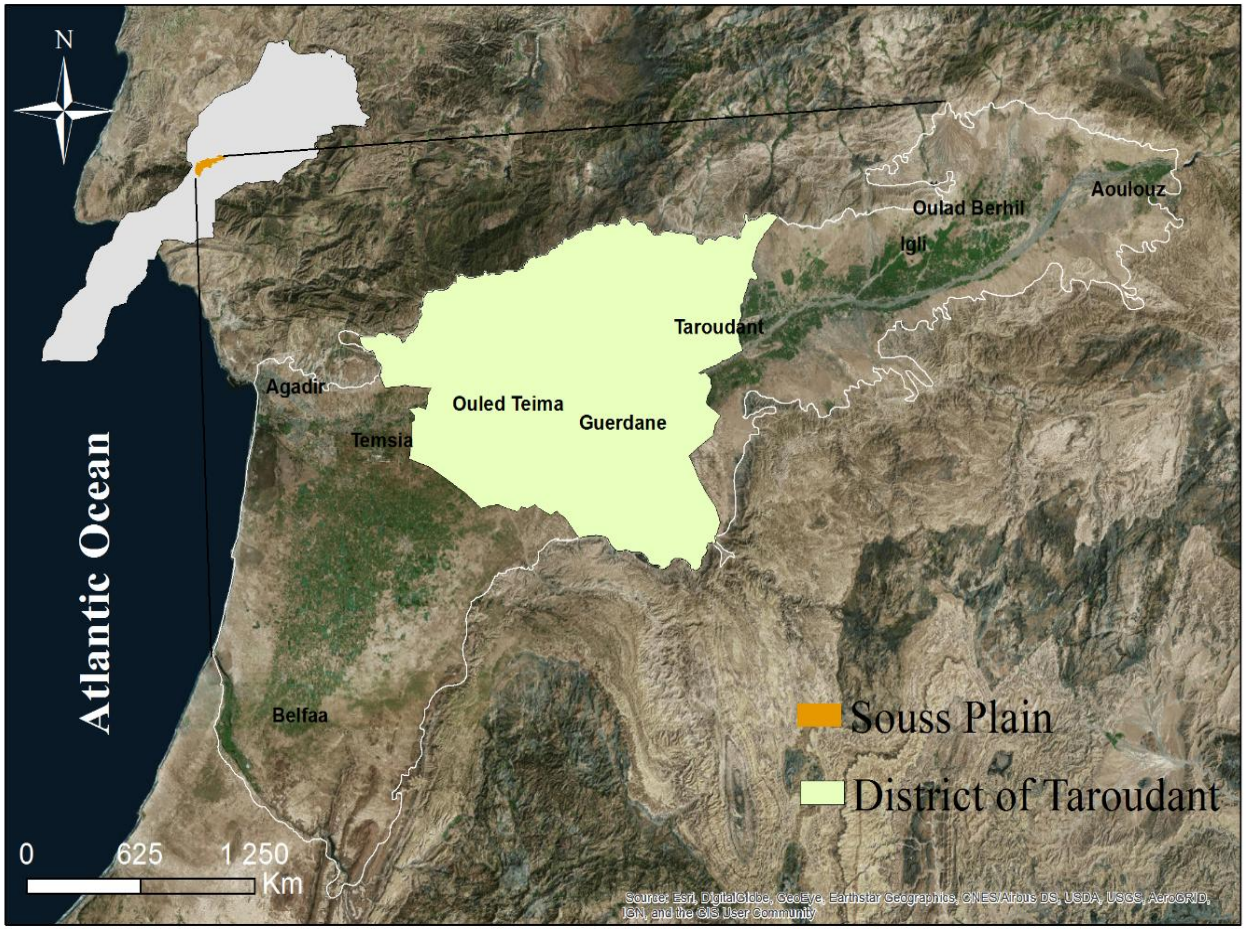
Introduction

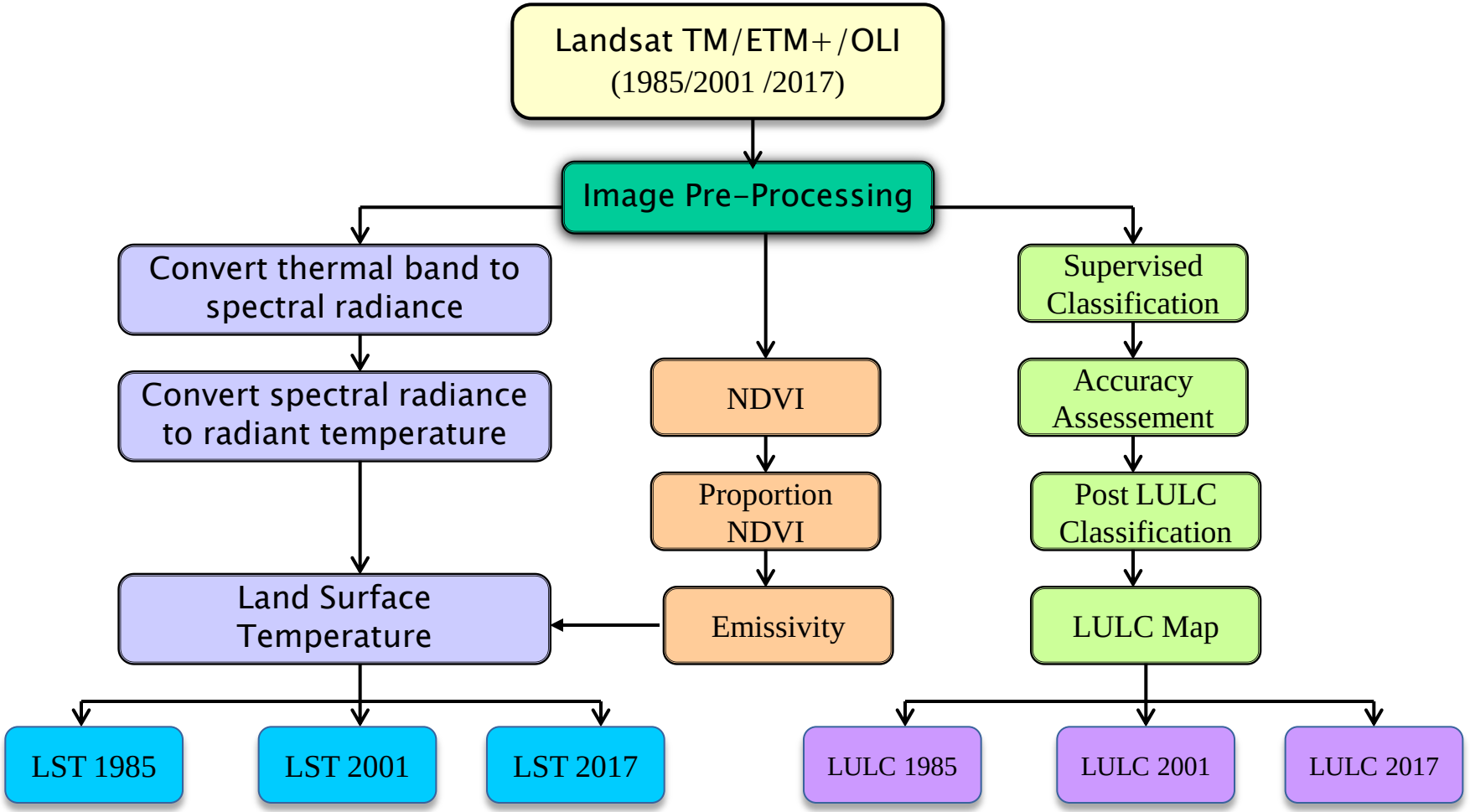
The studies on the land use and land cover change are very important because they allow us to know the current trends in the processes of deforestation, degradation, desertification, and loss of biodiversity in a determined region. These changes are usually caused by various natural factors, such as climate, wind, rain, etc., or anthropic factors such as the artificialization of natural areas.

This study aims to detect and map significant changes in land use from satellite and multi-temporal data and assess their impact on surface temperature in the Taroudant region between 1985 and 2017.

Study area

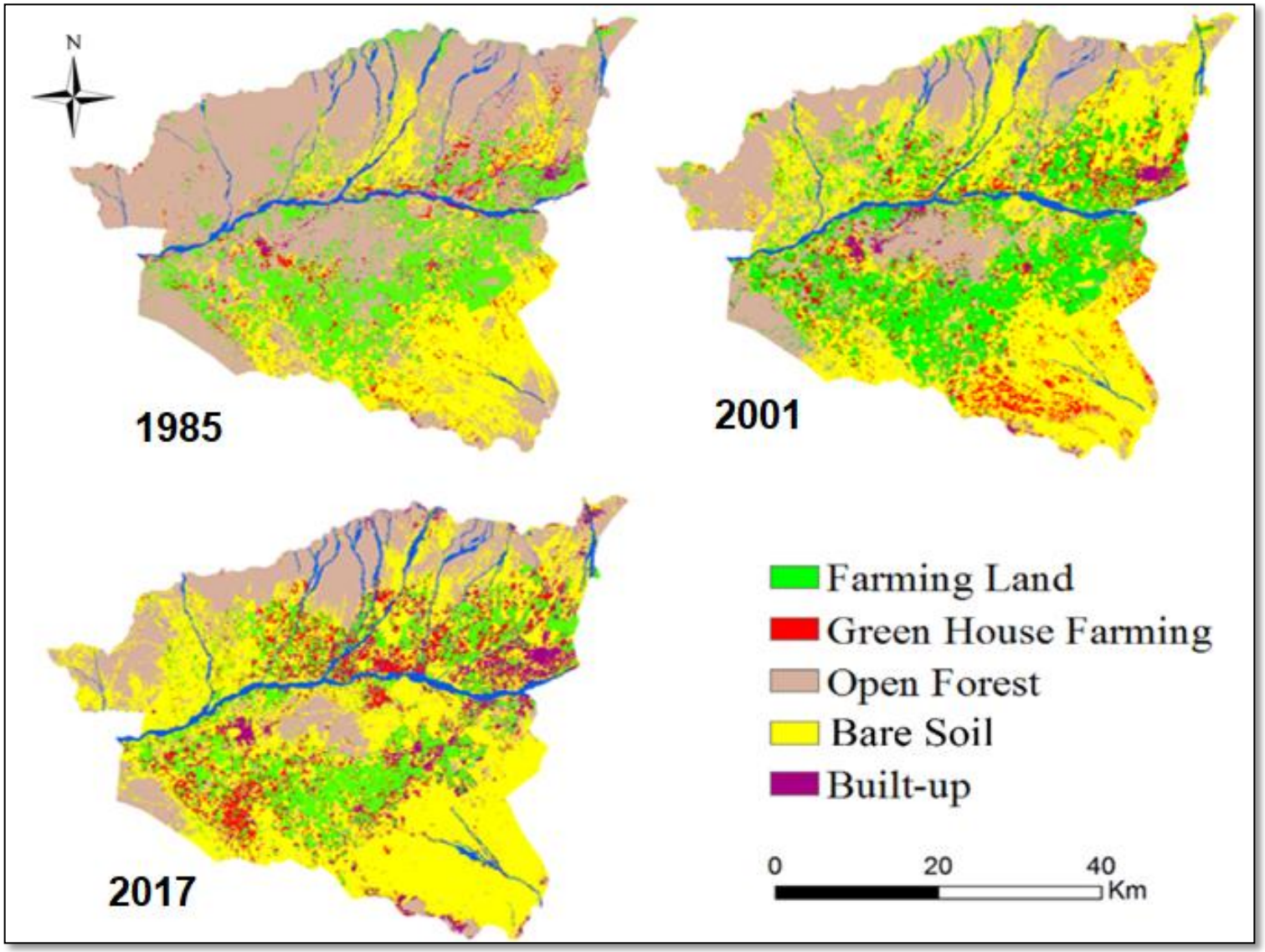

N
Atlantic Ocean
Aoulouz
Oulad Berhil
Igli
Taroudant
Agadir
Ouled Teima
Guerdane
Temsia
Belfaa
Souss Plain
District of Taroudant
0
625
1 250
Km
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Materials and Method



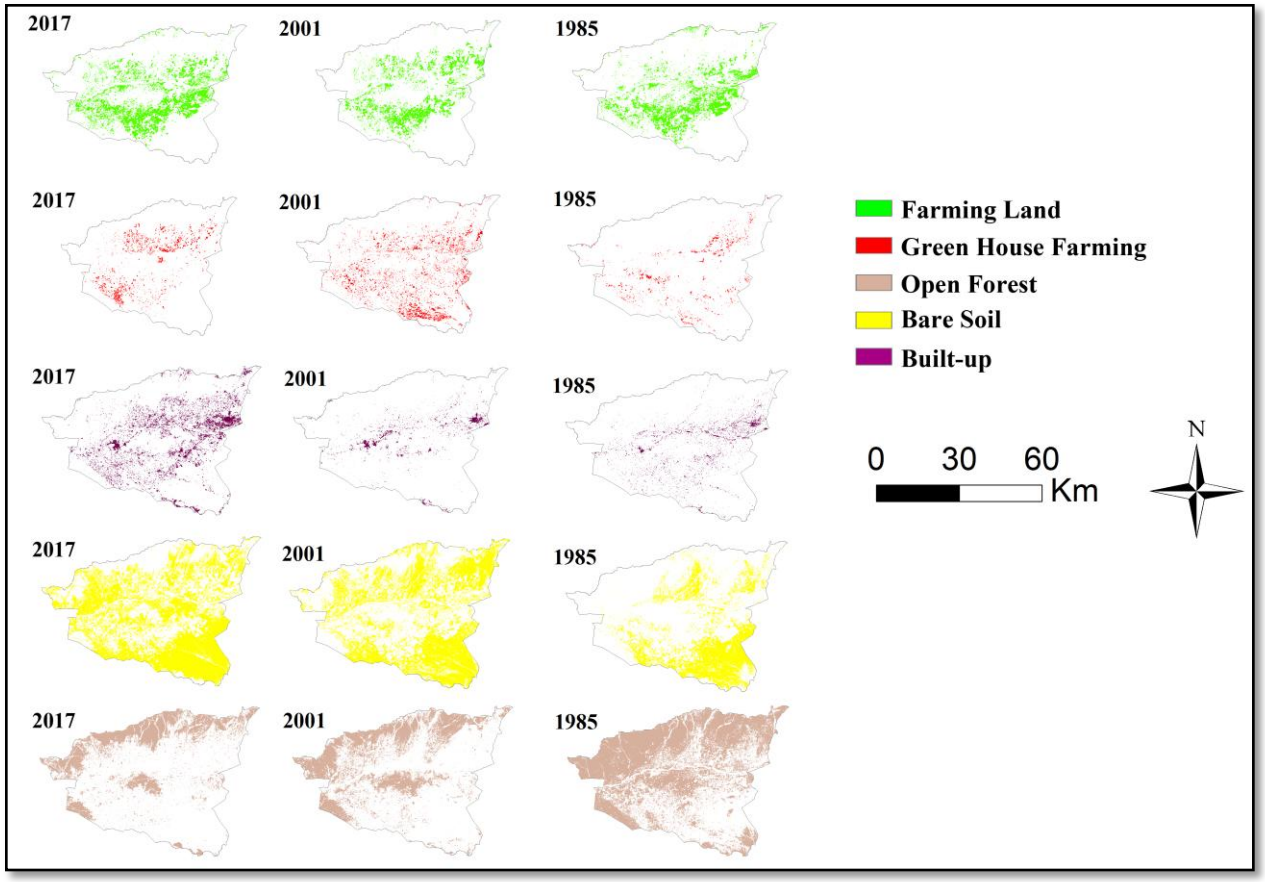
Results and discussions

Mapping and evolution of land use



Mapping and evolution of land use

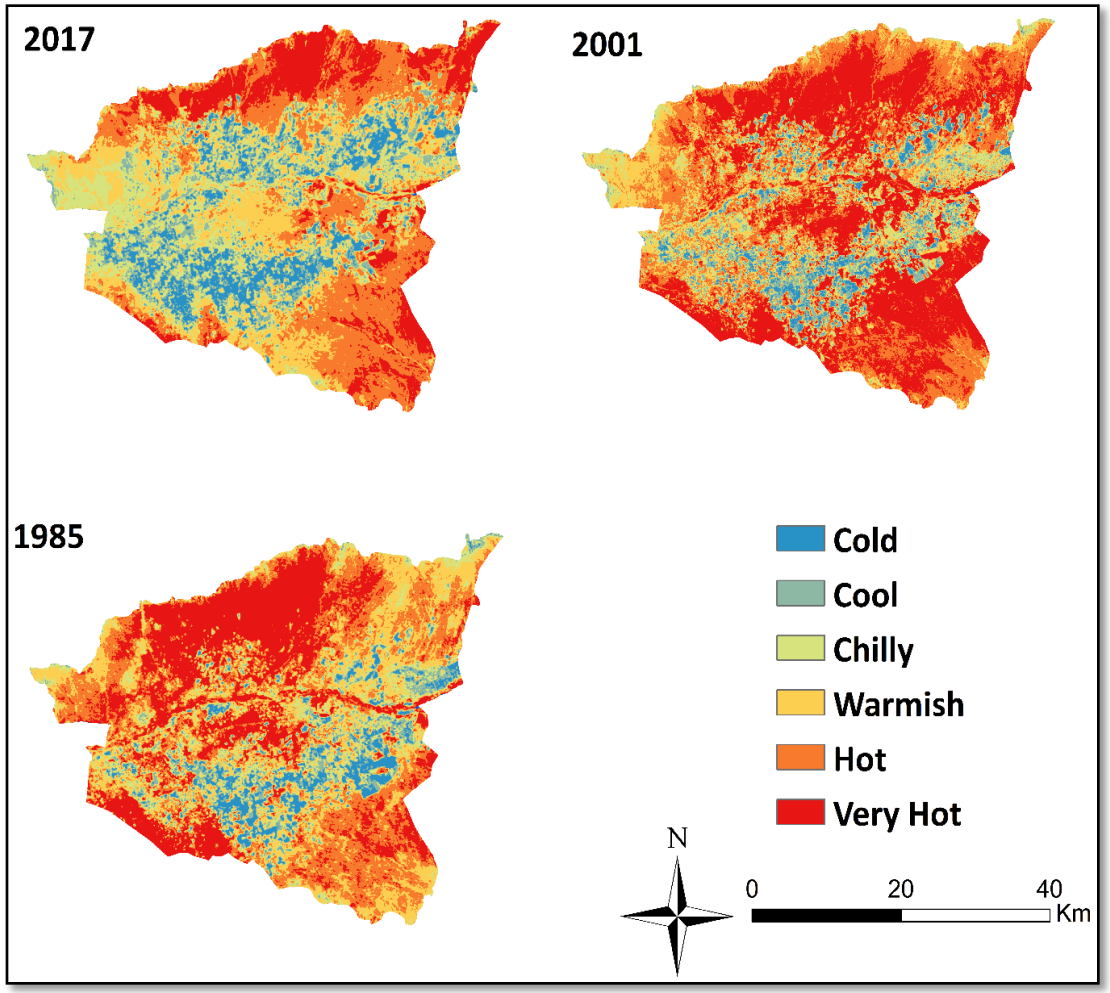
Land use classes



The maps of land use shows that the most significant change was recorded for the class of open forest, that changed from 993.28 km² in 1985 to 403.04 km² in 2017,

- The built-up area (BU) classes increased from 23.5% in 1985 to 46.3% in 2017,
- The class of bare soil (BS) increased from 2.35% in 1985 to 8.11% in 2017,
- The area of farming land increased by 14.8%,
- The area equipped with green houses farming experienced an increase of 242.55% between 1985 and 2001, followed by a decrease of -43.64% between 2001 and 2017.

Spatial distribution and changes of LST



The maps of surface temperature highlighted an average increase of 6°C between 1985 and 2017. These changes in surface temperature are generally controlled in addition to climate change by the changes that this region has experienced during this period (1985 to 2017).

Conclusion

This study, based on a series of digital processing of Landsat satellite images taken at different dates (1985, 2001, and 2017), allowed us to map the distribution of the various classes of land use and to follow their evolution between 1985 and 2017. It also permitted quantifying the surface temperature and its Spatio-temporal change.

It appears also in this study an increase in surface temperature of about 6°C. This increase, linked to land use and land cover changes, indicates the impacts of climate change marked essentially by years of accentuated drought, with the overexploitation of groundwater and in some places their depletion, which has caused the reduction of agricultural areas and consequently the increase in surface temperature.

Thank you