

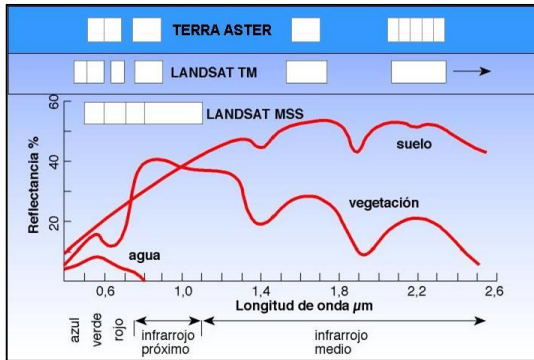


WORKS IN GEOLOGY

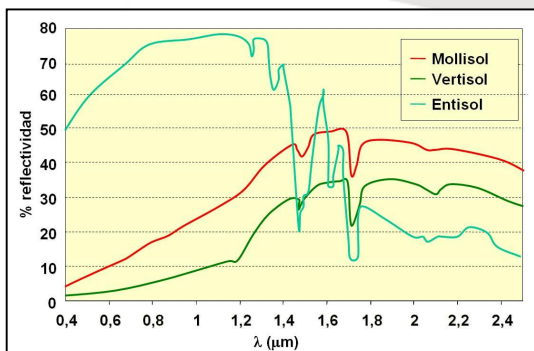
Introduction

Remote Sensing is a powerful tool to study geology.

To the ability of obtaining information from anywhere all over the Earth, it is joined the capability to acquire stereoscopic and multispectral satellite images.



In the Landsat satellite series, to the initial design, it was joined the band 7 (2.08 – 2.35 microns) by request of the Geological Community, due to the differential spectral response of the different soil materials in this spectral range.



Special mention to radar images, in the microwave region, that allow obtaining geological information in areas with persistent cloud cover and wide vegetative cover (tropical forest).

These radar images are being widely used for hydrocarbon exploitation.

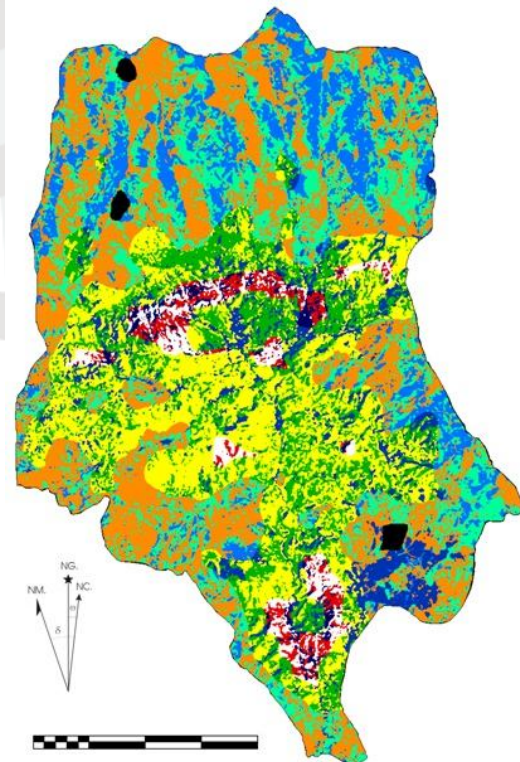
Our experience

Throughout these years, in the field of Remote Sensing applied to geology, we have worked on three different themes:

Desertification

In 1995, Dr. Salomón Montesinos defended his doctoral thesis *"Methodological development for risk mapping of hydrological erosion in the Mediterranean area, using remote sensing techniques and GIS"*, held within the project called: *Study of erosion and sedimentation processes using satellite data (1988-1990)* of the EU FWP.

This study, still current today, developed and implemented a methodology based on the potentialities of Spatial Remote Sensing for risk mapping of hydrological erosion in arid and semi-arid areas.



Mining exploration

Satellite images can be used along the different phases of mining activity: Exploration, Monitoring and Restoration.

Our experience is primarily in the exploration phase in developing countries, where cartography, aerial photography and data are scarce or nonexistent.

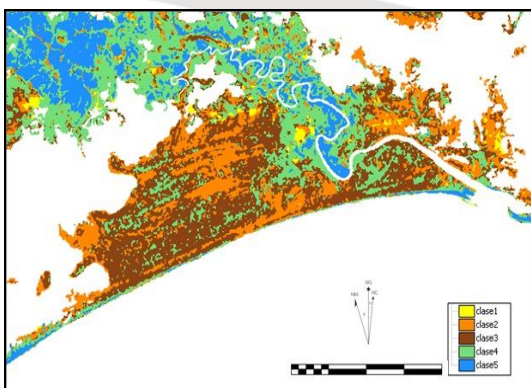
Satellite Remote Sensing is a data source that allows to obtain planimetric and altimetric mapping anywhere in the world.

From satellite images it is possible to obtain thematic maps of the territory (land uses, lithology...) from reconnaissance scales (1:200,000) to detail scales (1:5,000).

There are sensors, like Landsat-TM/ETM or Terra-ASTER, with specific spectral bands for lithology study purposes.

This spectral capability results in the possibility to carry out multispectral classifications, by digital image processes, for the zoning of the territory in areas with high probability to find a specific mineral or a particular lithology or structure.

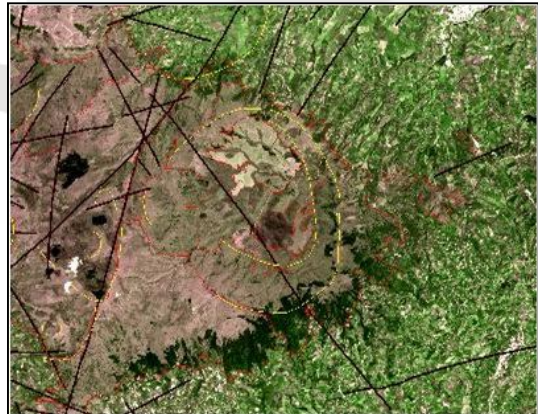
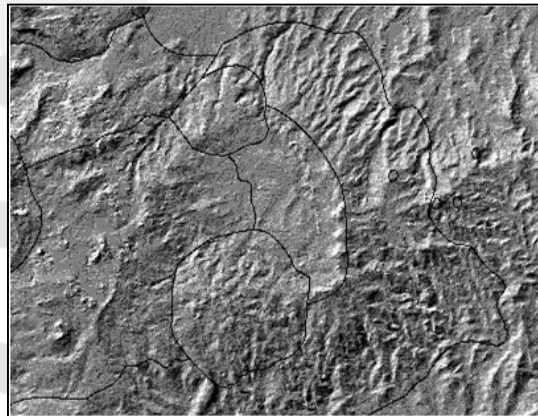
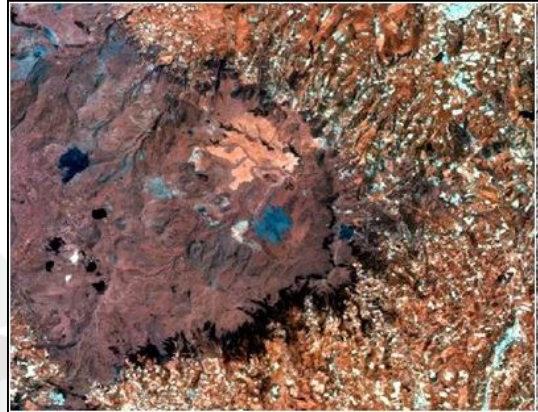
These classes have a significant probability of having a similar composition or geological characteristics.



Map of areas with homogeneous spectral response in sandy soils.

Geothermal

Satellite Remote Sensing gives us lithological and structural information on a georeferenced base and a suitable map projection for the detection of thermal anomalies.



ASTER image (above), DEM (middle) and Landsat image (below) from which were obtained structures and thermal anomalies.

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