

THE APPLICATION OF MULTISPECTRAL AND FALSE COLOUR IMAGERY APPLIED TO LAND-USE ¹⁾

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The C.A.T.A.R.T. (Centro per l'Applicazione del Telerilevamento Aerospaziale alle Risorse Terrestri) is a section of the Institute of Aerodynamics of the University of Naples which uses various remote sensing platforms to integrate space-born platforms in the monitoring and study of earth resources.

Gathered data are processed by means of a complete aerophotogrammetric laboratory and of a digital computer connected with an interactive colour monitor and other peripheral units. The C.A.T.A.R.T. remote sensing analysis system consists of an integration of analogue and digital method.

This paper is intended to describe a short step of analysis which gives good results in obtaining land-use thematic maps at a scale of about 1:400 000.

Two days of analysis have been applied to an area about 280 km² wide in the north of Puglia using LANDSAT negatives taken in three different months (June, July, October 1975).

As a first step a SIGURD SØRUM colour additive viewer was used to obtain a "false-colour" quick-look of the original scene of 185 x 185 km, at a scale of 1:1 000 000.

In this way in a few minutes it is possible to check the quality of images and to identify precisely the area of interest. This system has the disadvantage of giving a fixed scale image that must be photographed in order to be enlarged and converted into prints or transparencies. Therefore the second step has been the enlargement at the prefixed scale of bands 5 (green, 0.6 - 0.7 μm) and 7 (0.8 - 1.1 μm near infrared) each in negative and positive, using a photographic enlarger and KODALITH emulsion.

The obtained films are then converted in coloured sheets using a DIAZO printer/developer and ENSCOCHROME colour films, available in yellow, green, magenta, brown, red, black, blue and cyan. This instrument consists of two units: a chamber with an ultraviolet lamp (to expose the ENSCOCHROME) and a chamber saturated with ammonia vapour to develop the emulsion. Different combination of coloured "sandwiched" sheets have been tried; the best combination of colours seems to be the following:

- band 5 (negative) \longrightarrow Red (or Magenta)
- band 5 (positive) \longrightarrow Yellow
- band 7 (negative) \longrightarrow Green
- band 7 (positive) \longrightarrow Blue (or Cyan)

The resultant image gives a good first approximation thematic map, as becomes evident when comparing with a CNR-TCI thematic map, that has been obtained in 1956 by conventional and expensive methods.²⁾ Besides it is possible to follow the wheat from maturation (June) to harvest. It is interesting to note that the surrounding area of S. Severo is always of a different colour than the adjoining area south: the main agriculture in the region is viticulture. The morphological pattern of the region in October is also

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²⁾ Unfortunately, several colour overlays of the original paper cannot be reproduced here.

quite evident: rivers and irrigation canals are well discriminated. Particularly interesting is a zone corresponding to a fluvial terrace of the Fortore river, extensively cultivated. The river is connected with a tectonic fault.

The actual development of our research is centered on a colorimetric key which allows the discrimination of various crops. This key will be completely published soon with a crops inventory of the Puglia region.

The method described in this paper is also used to get preliminary information extremely useful in the application of digital analysis.

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