

THE SATELLITE IMAGE CHART OF THE PARANA STATE - BRAZIL

CELSO GONÇALO DIAS JUNIOR

IPARDES - Instituto Paranaense de Desenvolvimento Econômico e Social  
Rua Marechal Hermes, 999 - Centro Cívico  
80530 - Curitiba-Paraná-Brazil

FRANCISCO L. P. LANGE JUNIOR

GISLENE LESSA

ITCF - Instituto de Terras, Cartografia e Florestas  
Rua Desembargador Motta 3384 - Mercedes  
80410 - Curitiba- Paraná- Brazil

ABSTRACT:

The purpose of this work is the study of the potential of use of advanced space technology and the results which are easily identified by the population in general. This work is meant to provide the public with images obtained by LANDSAT TM 5 satellite in a didactic way, so as to allow a complete visualization of the physical space where they live.

KEY WORDS: Cartographic, Education, Image Interpretation, Thematic, Visualization.

1. INTRODUCTION

Today there is not any Atlas project in Brazil which use satellite images and systematic cartography. The use of techniques in planning of Digital Cartography has been proved highly effective in the space performance, allowing generation of updated information, as well reducing costs and substantially land work.

According to D'Alge et all (1990) Brazil still uses manual digitizing in order to obtain digital maps. This is due to the fact that this work is very recent in our country although a number of pioneer institutions in this area have been

drawing Digital Maps using unusual methods.

Despite that few writings come from the blending of Cartography and Satellite Images for the making of Satellite Images Charts. Several methods have been used to interpret orbital images and digital analysis has proved the most precise. (Disperatti, 1981.).

Thus the main goals of this paper are:  
1)- to make up Satellite Images Chart of the State of Paraná, using traditional cartographic products (systematic cartography) blended with LANDSAT TM 5 Satellite Images. 2)- to develop specific

methodology, software included, to make Image Charts together with INPE. 3)- to contribute to spread the satellite image and its use as a teaching factor for the public in general, mainly as source of information about the physical space where they live. (Lange Jr. and Maximiano,1991).

This project covers the whole area of the State of Paraná in a total of 20.120.300 ha., in the Southern Part of Brazil between the States of São Paulo and Santa Catarina between latitudes of 22° 29' 30'' and 26° 42' 59'' S & between longitudinal areas of 48° 02' 24'' W and 54° 37' 38'' W.(Fig. 1)



This research allows us to obtain update data about the situation of the jungle in the area, to contribute to projects of use of the soil and the use of the forests, and to start a monitoring process through Satellite Images Charts, and to contribute as multiplying agent of new techniques of use for an updated Cartography and destroy the myth about

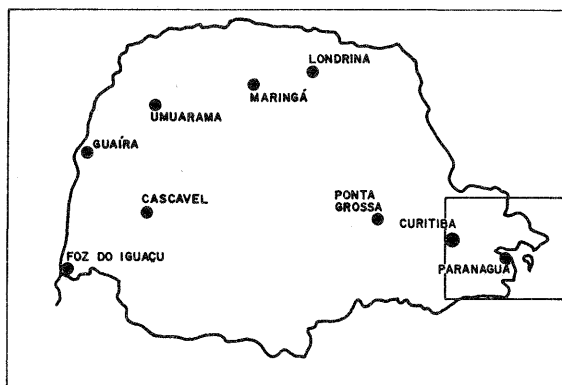
the using of satellite images.

This work intends to be an introduction to a series of future projects which will include Systematic Cartography plus LANDSAT TM 5 Satellite Images in a joint action including ITCF, IPARDES, INPE, UFPR, the City Administration among others.

## 2. METHODOLOGY AND MATERIALS

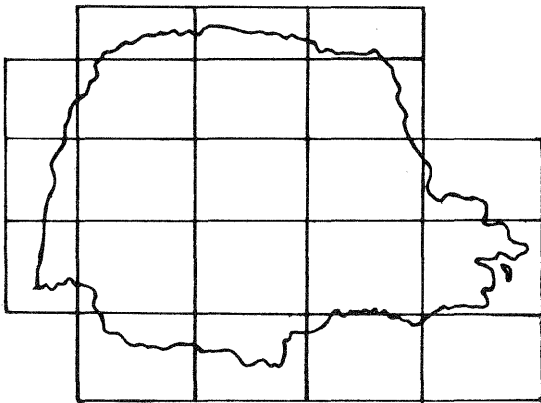
### 2.1. Area of Study

One of the wonderful regions of Paraná's East, was chosen as a Pilot Area comprising the seaside and the first plateau. This region is one of the best preserved areas in terms of natural forests in the South of Brazil where a number of Parks and Ecological Sites (reservations) are practically untouched by men although located close to great urban centres like the Metropolitan Area of Curitiba, the State Capital City where a million and half people live.(Fig.2).

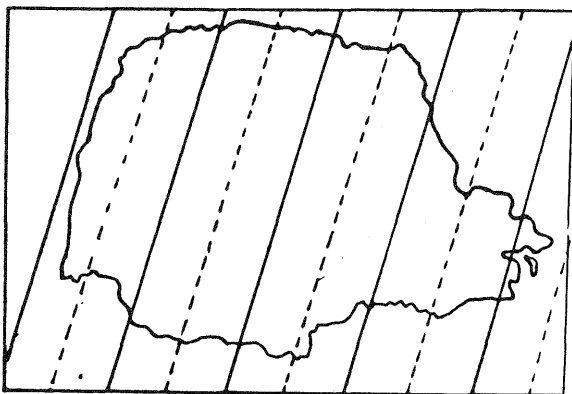


## 2.2. Materials used

In order to develop this paper, Charts of Topography were used; scale 1:250.000 out of Brazil Systematic Cartography DSG/IBGE, for space articulation of the State of Paraná. (Fig.3)



And, images of colour paper of LANDSAT TM 5 Satellite were used; scale 1:250.000 in several orbit-points, got at INPE to be supportive to articulate the Topographic Charts. ( Fig. 4).



ITCF Charts of 1:50.000 were used as well. They were useful in order to compose the cartographic background of

the county's boundaries, and the location of the Parks, Reservations, Roads, Dams and Cities.

A PC-AT type microcomputer, SITIM-150 software, digital table plus Scanner Selector of Laser Colours Hell 345.

## 2.3 Methodology Used

The method of work comprised basic mapping recorded on transparent film-paper including county boundaries, parks, land reservations limits, city toponomy, dams, roads, UTM and geographic coordinates all necessary technical references for the making of a satellite image chart.

An image of LANDSAT TM 5 point-orbit 220/78 dated March 1, 1990 was chosen, of 3,4 and 5 bands on its most recent passage and having the smallest mount of clouds over the area of interest.

In the sequence the superposition of the mask over the satellite image to adjust and correct possible distortions was made as an attempt to create a product which would clearly represent the actual region. Further, colour selection on the scanner was done to provide LANDSAT TM 5 photolytic image with high resolution.

Using photolytic satellite image a reliability test was performed using the

reading of 20 identifiable point both on the original image and the photolytic film generated by the scanner. The test meant only to compare the image and the photolytic film coordinates.

Lastly based on the tests, prints of the pilot test of the satellite image were made by print experts.

### 3.RESULTS

An Image Satellite Chart of the Metropolitan Area of both Curitiba and Coastal Lines of Paraná, was thus obtained through the above described methodology. This Chart was most welcome by the great public who showed interest in the subject thus allowing the project to be successful.

### 4. CONCLUSION AND RECOMMENDATION

This work was basically a pilot-test which included teaching goals and has reached the goal of providing the ordinary people with to the results of the satellite images usage, namely the products of LANDSAT TM 5 in the making of the satellite image charts as an essay to build an Atlas.

The results obtained in this project had a great impact on the media and the Brazilian scientific community as well opening one more reference point concerning topical mapping.

Popular reaction to the results surpassed any optimistic expectations. Their curiosity was aroused in a sort of awe as they noticed the image obtained through an artificial satellite.

This experiment has already reached the fourth edition in a total of 3.500 printed samples distributed.

This satellite image chart has been widely used as support and reference for further work.

The Satellite Image Chart Atlas to be done by an agreement with INPE should use automatized techniques in the generative process of adjusting the image to be the cartographic information.

A two-dimensional seam-point searching software in digital image mosaicking should be developed for image-mosaicking for different orbits.

A method of automatic recording and direct photolithographing using PC-AT microcomputer should be developed in order to prevent possible distortions in the generation of the photoliths.

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