

# DIFFUSION OF REMOTE SENSING TECHNIQUES IN SCHOOL

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### ABSTRACT:

This paper discusses a project on Remote sensing diffusion through the capacity increase of teachers, developed by a specialised team from INPE. It involves a course, preparation of didactic materials, guidance of school projects and workshops for the evaluation of results.

## 1. INTRODUCTION

The new curriculum parameters of elementary teaching are enhancing the importance of using new technologies, such as Remote Sensing. From Remote sensing image it is possible to obtain a wide variety of information that can be used in different subject areas. This resource date has been the great and powerful technical instrument for teachers explore in class. Unfortunately elementary and secondary Brazilian teachers do not have knowledgeable about it.

Since 1994 INPE has participated in some projects of environmental education, all based in Remote sensing - jointly to the municipality of São José dos Campos and Santo André – both from São Paulo State – Brazil. These areas present typical environmental degradation problem of big cities, related to social-economic problems, as a result of non-adequate land use. The results obtained from the accomplishment of such projects encouraged us to keep it.

The purpose of this article is to report on a project developed by the Remote Sensing Department on that involving a course to enable teachers from different subject areas of the elementary and secondary teaching; the preparation of didactic material to help them in that way; supporting the development of school projects directed to studies of the local reality; monitoring them all; as well as the evaluation of results obtained.

This interdisciplinary teacher training course is at its 5<sup>th</sup> version (2002). It is offered every July – during the vacation month – to teachers from all the country. Its' main objective is to diffuse Remote sensing knowledge and its content using as a didactic resource in school teaching. Considering all the orientations expressed in the last national curriculum parameters we propose to teachers to become agents or facilitators to spread the knowledge acquired among their colleagues and in their classes.

## 2. METHODOLOGY

The development of the project involves the preparation of didactic material for the improvement of capacities of teachers, courses for teachers of different specialities at the elementary

school, help to the development of school projects directed to the study of the local reality; attendance to school projects and evaluation of results obtained.

The increase of capabilities from teachers is part of conceptual and methodological discussions about environmental education, contemporary social/environmental questions as well as an introduction to Remote sensing and cartography.

The duration of this course is of 40 hours and includes the following topics: Introduction to Remote sensing; Remote sensing applications; Cartography; Maps and image interpretation; Field work; Geographic Information Systems; Remote sensing education; Suggestions about how Remote sensing images can be used in classroom; How to develop a project with students.

The methodological approach which conducts the development of the projects from the schools, allows the students to:

- **understand** the environment where they live;
- **think** and to question about this reality;
- **look for** forms to intervene/solve the social/environmental problems found, using the resources available, with the objective of improvement of life quality as well as citizenship.

In order to develop these projects, the participating schools receive free-of-charge, Landsat-TM colour prints, from different times and scales, using literature released during the course. The trainers responsible for the projects receive orientation and attendance by telephone, E-mail and monthly meetings.

The results obtained after the development of projects in schools are presented in a workshop, held at the end of the school term. The objective of this meeting is to exchange experiences and a joint evaluation of the projects presented.

## 3. RESULTS

Below are some examples of projects developed at schools arising out of this course: "The temporal analysis of the Baixada Santista estuarine complex, using LANDSAT-TM images" (Escola Estadual Luiza Macuco, Santos-SP); "Environmental study of the Cohatrac creek valley", (Complexo Educacional

Professor Barjonas Lobão, São Luís-MA); “Rational use of water and land use”, (Escola Municipal Vila Carmela, Guarulhos-SP); “Project Our Woods” (Escola Agrícola de Jacareí, Jacareí-SP); “Learning and teaching ecology using Remote sensing” (Escola Elza Regina Beviláqua, São José dos Campos-SP).

The results from the projects mentioned above, were presented in workshops and proposals were made, taking into account the continuity and improvement of the activities. The students, under supervision of the respective teachers, did show their comprehension about the themes presented through different types of mock ups, drawings, posters, documentaries in video, photographs, booklets, and other means. Some schools made seminars with the local community to discuss the environmental issues affecting them, e.g. “A survey on the final deposition of garbage in São José dos Campos”, at “João Cursino” school.

For the near future, it is intended to develop teaching materials from these Projects on CD-ROM, but the main drawbacks have been: 1. High costs for edition and publication of such materials; 2. Shortage of funds for equipment in public schools, where there is the largest demand on such studies.

#### 4. CONCLUSIONS

Considering that the results presented still demonstrate a certain difficulty to explore appropriately the Remote sensing data, they also reveal a large potential for classroom interdisciplinary activities. Furthermore, these interdisciplinary works, connected to the social/environmental context, favour the understanding of the temporal and spatial relationship of local impacts and global implications.

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