

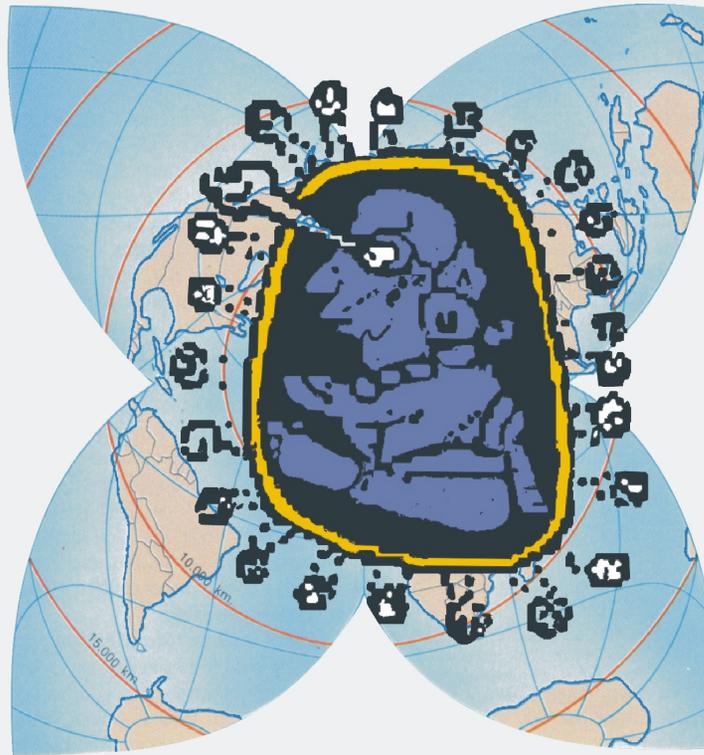


# STATE GOVERNMENT OF VERACRUZ

## PAPALOAPAN DEVELOPMENT COUNCIL

### GIS AND REMOTE SENSING LABORATORY

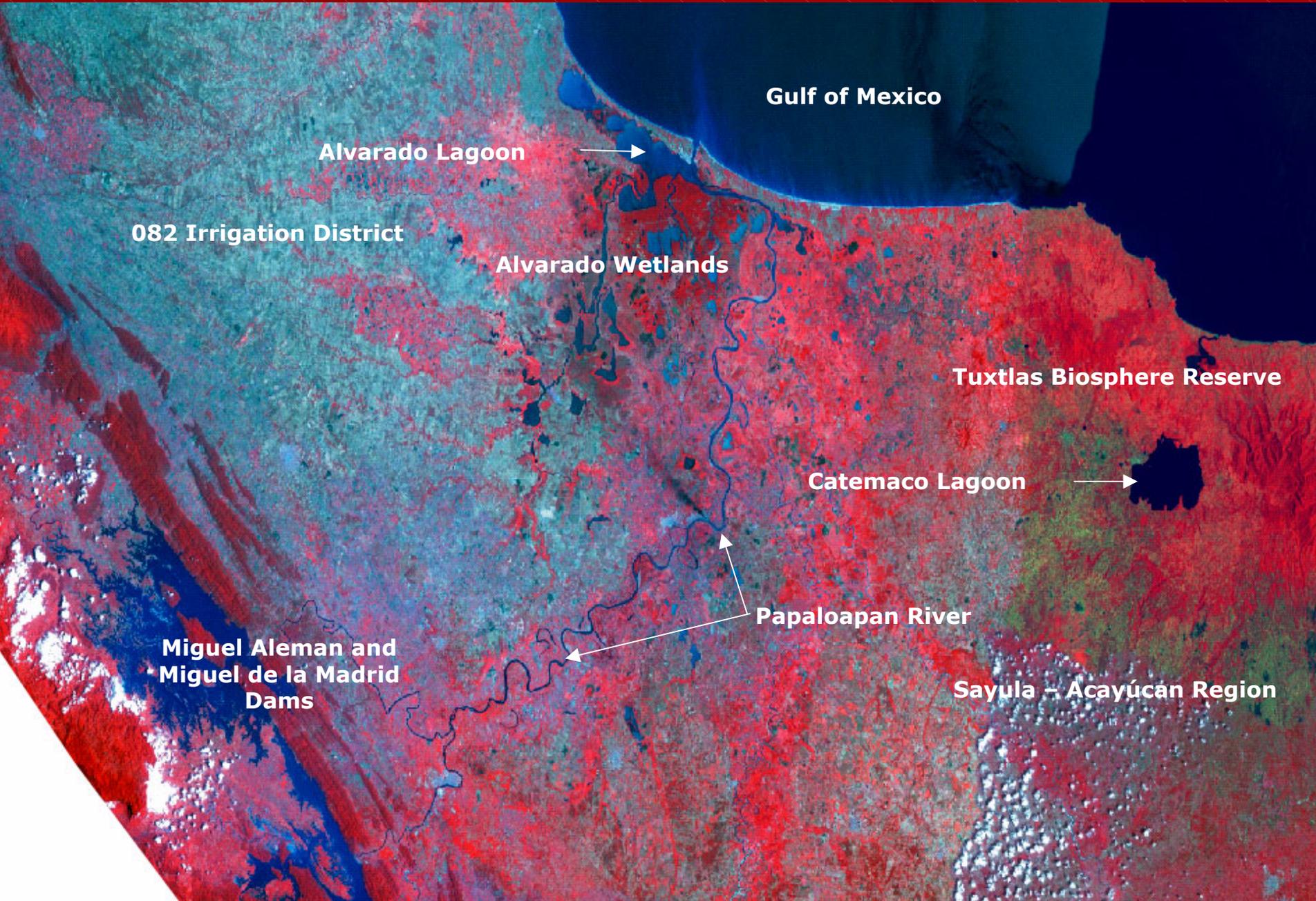




## **LABORATORIO DE SISTEMAS DE INFORMACION GEOGRAFICA Y SENSORES REMOTOS DEL PAPALOAPAN**

**Objective:**Digital information analysis of environmental factors such as water, soil, vegetation, climate and topography using GIS and remote sensing to support project development in the areas of irrigated agriculture, reforestation, aquaculture and for the monitoring and prediction of factors that affect marine resources in the Papaloapan river basin region.

# Zone of Influence (43 Municipalities of Veracruz)



# **The GIS & RS Lab of the Papaloapan Basin is integrated with:**

## **a) Digital información, software and equipment:**

- 1. Satellite imagery, total coverage of various spatial resolutions of the Papaloapan river basin region.**
- 2. Digital cartography at 1:200,000 and 1:50,000 scales covering 43 municipalities of the Papaloapan basin within the Veracruz area.**
- 3. GIS & RS software: ARCGIS, ERDAS, ENVI.**
- 4. Georeferentiation systems.**

## **b) Spatial and statistical modelling techniques:**

- 1. Soil potential maps elaboration through climatic modelling.**
- 2. Watershed delimitation and runoff-area location.**
- 3. Location of susceptible areas for reforestation and monitoring of ongoing reforestation programs through biomass percent determination.**
- 4. Red Tide monitoring on affected regions (in process).**

# Comparison of Three Different Spatial Resolutions from Satellite Imagery



**LANDSAT 7 (30 m)**



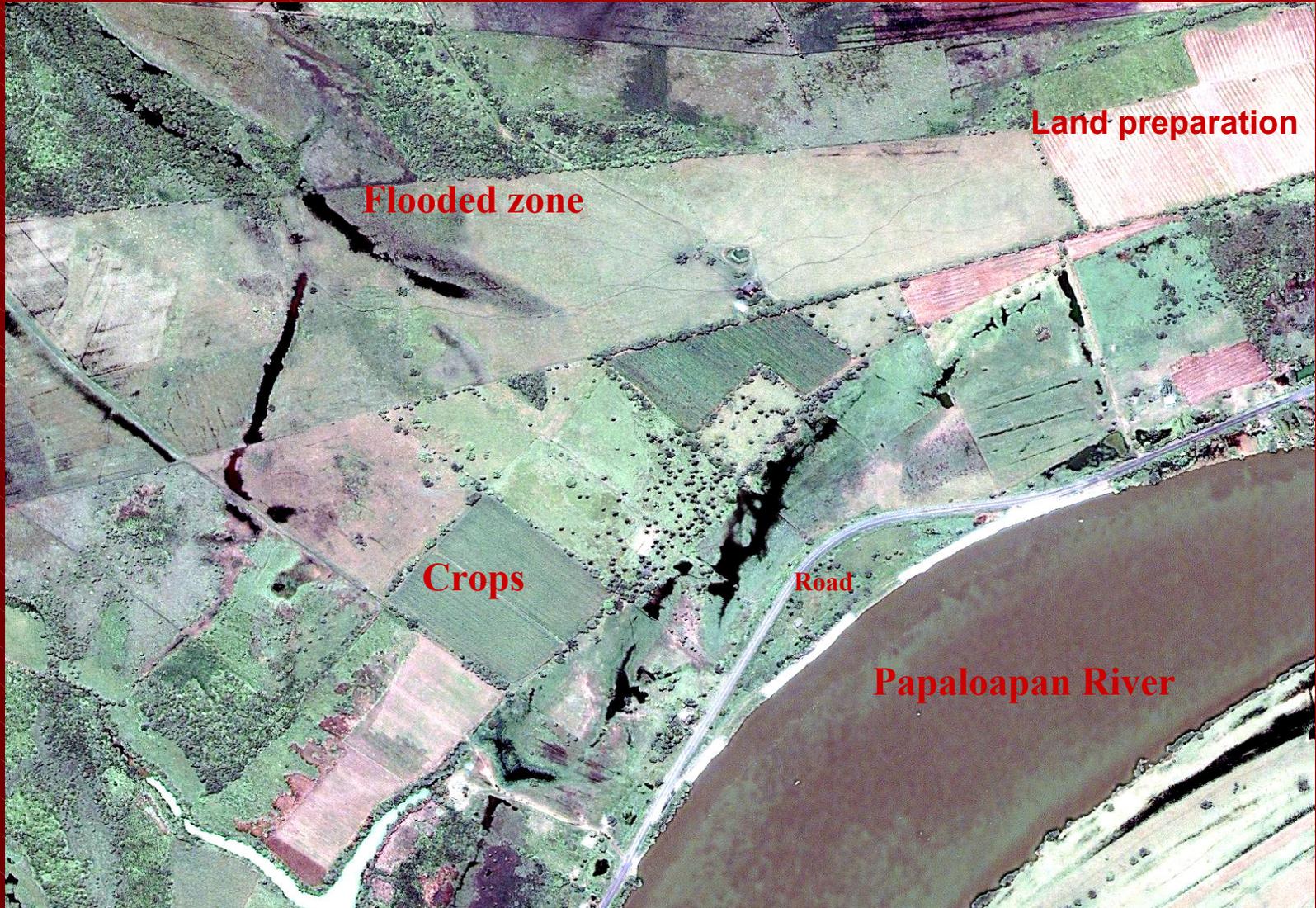
**IRS (5.8)**



**IKONOS (1 m)**

# High-resolution Ikonos image processing to map present soil use and potential to individual plot level.

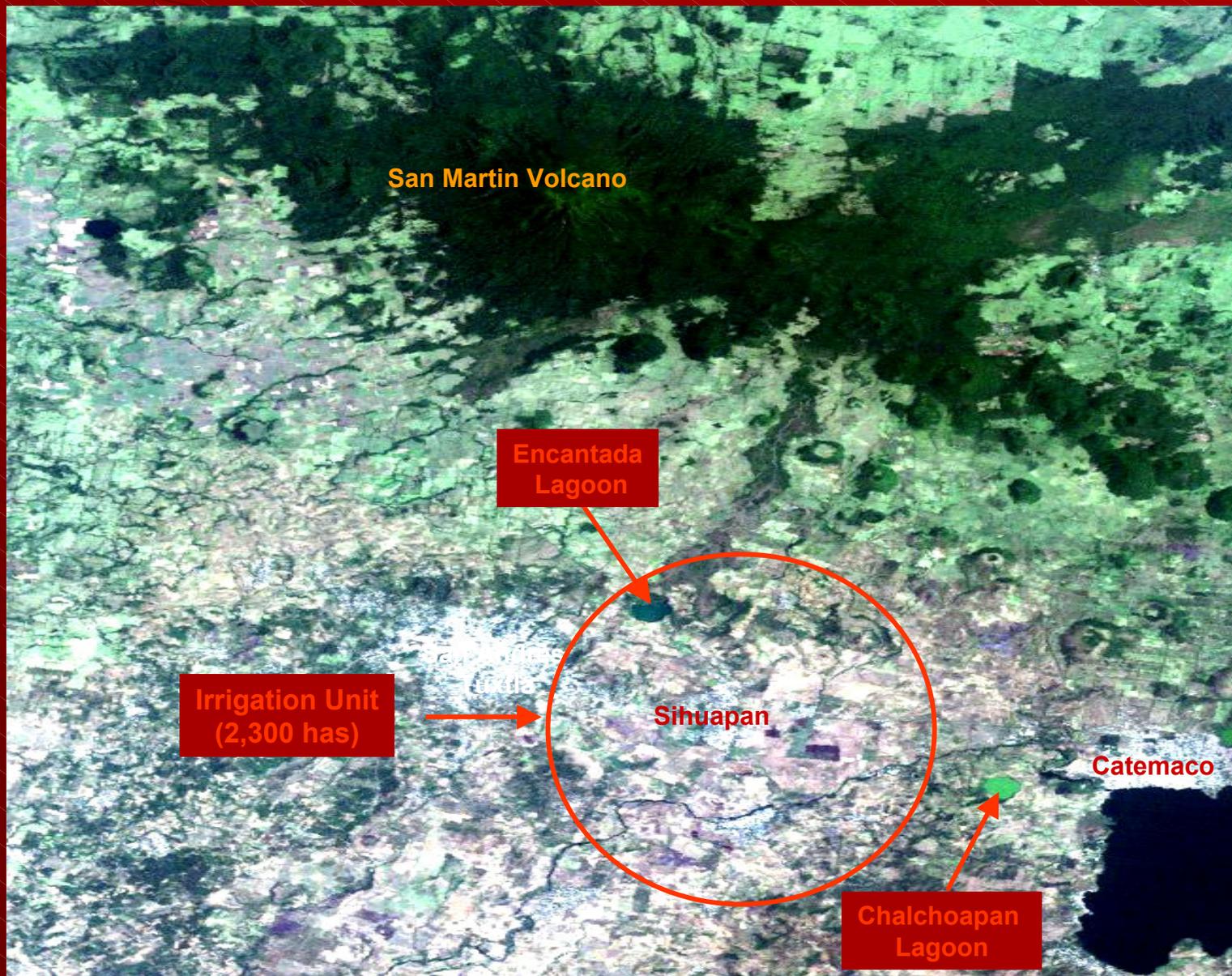
Visible-Color Composite



# Infrared-Visible Composite



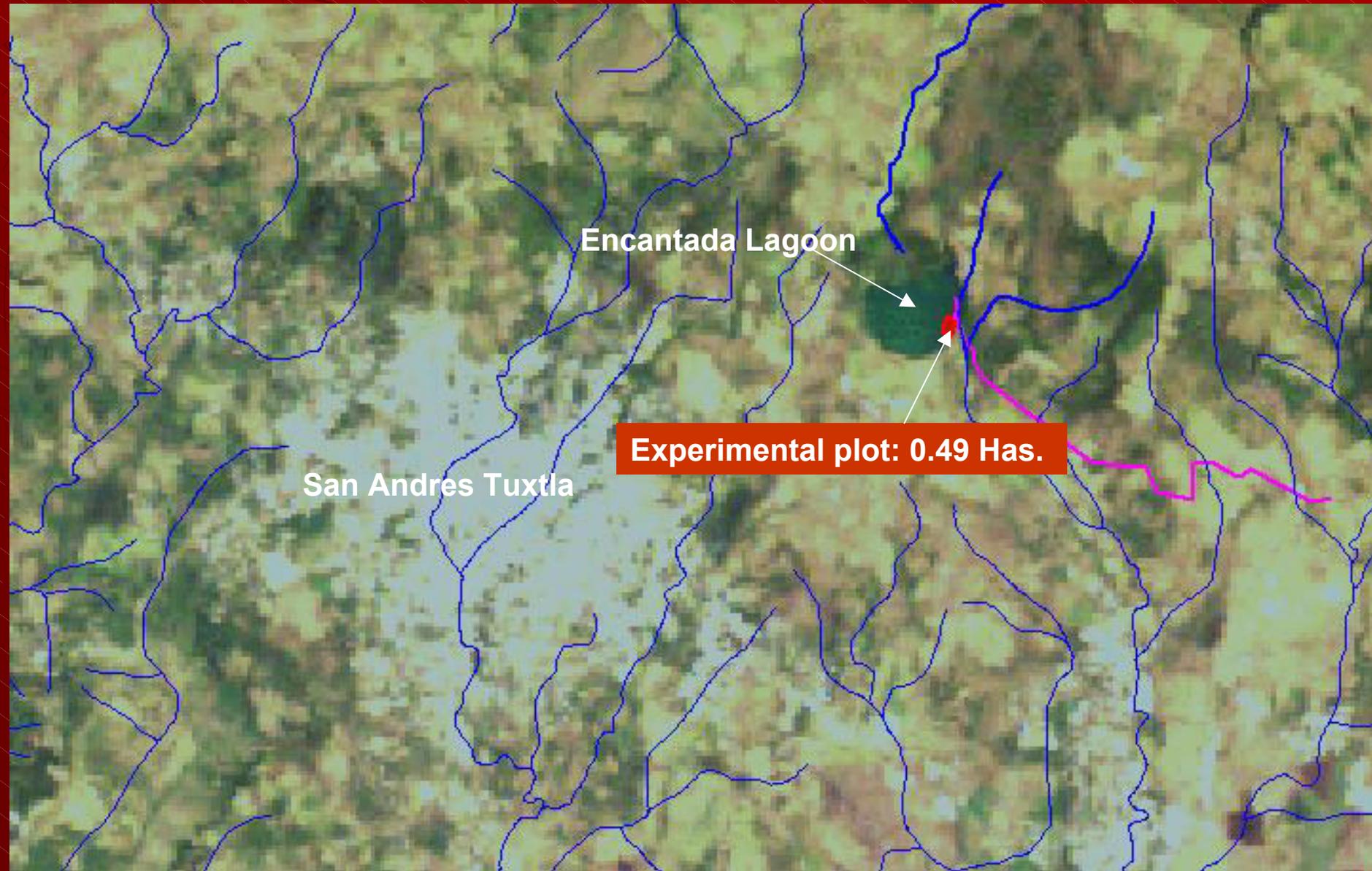
The use of satellite imagery and digital cartography allow watershed delimitation, as in this case, for the Laguna Encantada Irrigation Unit.



# **Native Species Reforestation Pilot Project at the influence zone of Laguna Encantada Irrigation Unit**

- 1. Plant nursery and germoplasm bank facilities for native forest species with high potential for wood and fruit production, in collaboration with the National University of Mexico Tropical Biology Station, located at the heart of Tuxtla Biosphere Reserve.**
- 2. Site selection to establish an experimental reforestation plot.**
- 3. Plot establishment with native species of rapid growth with potential for the production of wood, fruits, condiments and medicinal herbs of commercial value.**
- 4. Elaboration of a Practical Handbook for farmers for field identification, management and use of native species.**
- 5. Training of local forestry technicians and farmers.**

# Landsat Satellite Image of Encantada Lagoon



**HIGH RESOLUTION SATELLITE IMAGE ON A DIGITAL ELEVATION MODEL OF ENCANTADA LAGOON, SAN ANDRES TUXTLA, VER.**

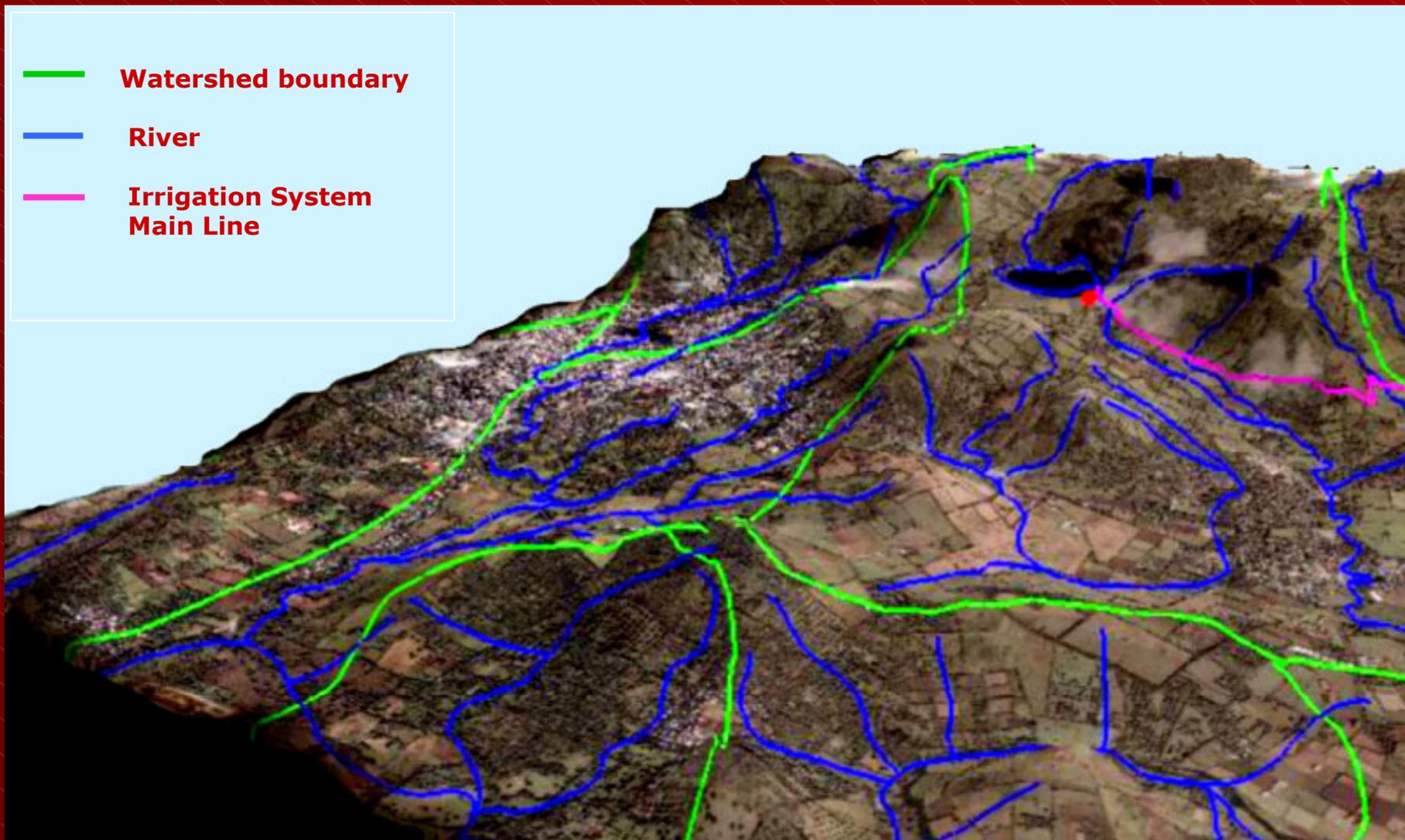


# Tridimensional Model of Encantada Lagoon Watershed in San Andrés Tuxtla, Ver.

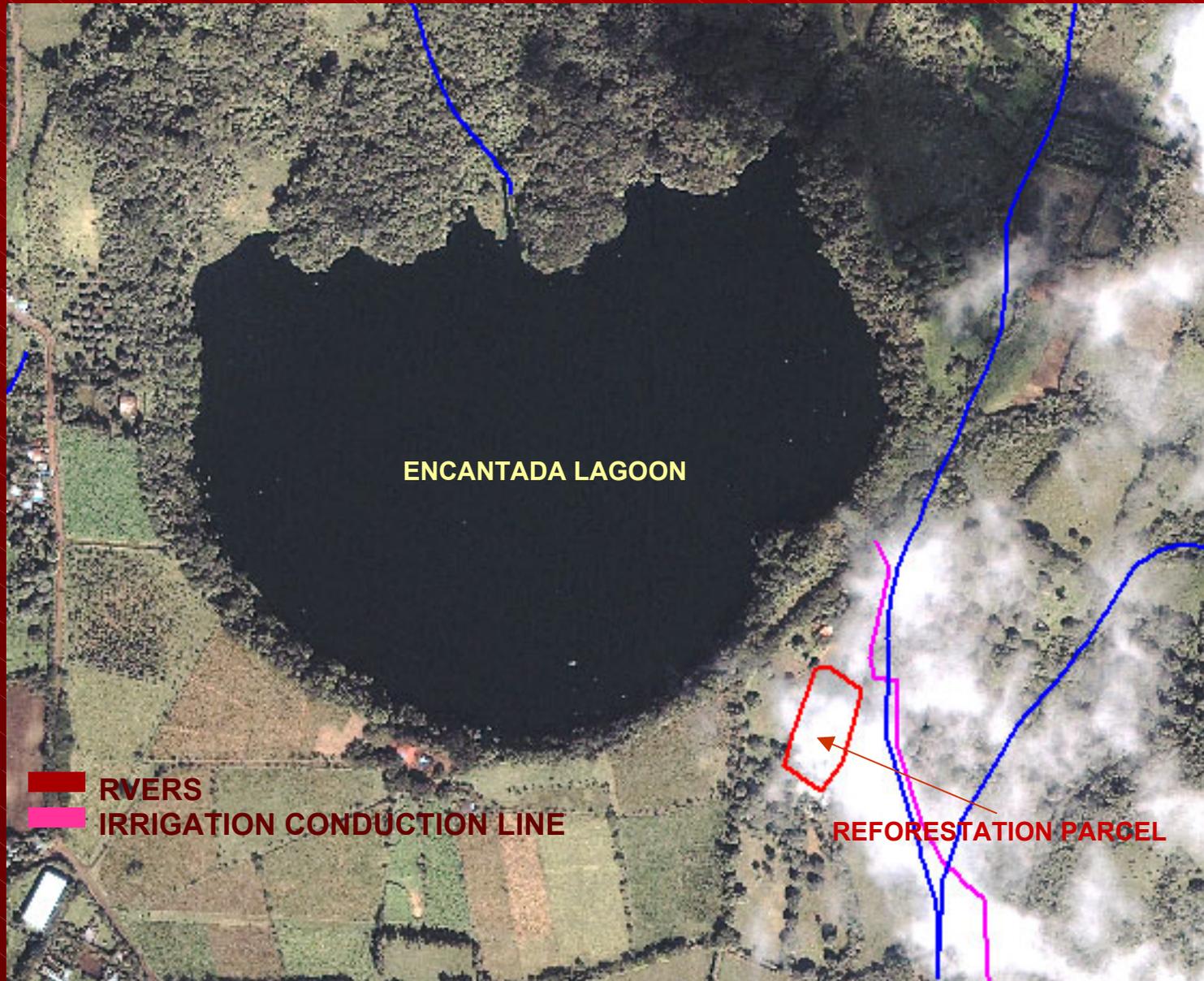
 **Watershed boundary**

 **River**

 **Irrigation System  
Main Line**



**IKONOS IMAGE VISIBLE-COLOR COMPOSITE SHOWING DEFORESTED AREAS AROUND ENCANTADA LAGOON AND THE NATIVE FOREST SPECIES EXPERIMENTAL PLOT LOCATION.**



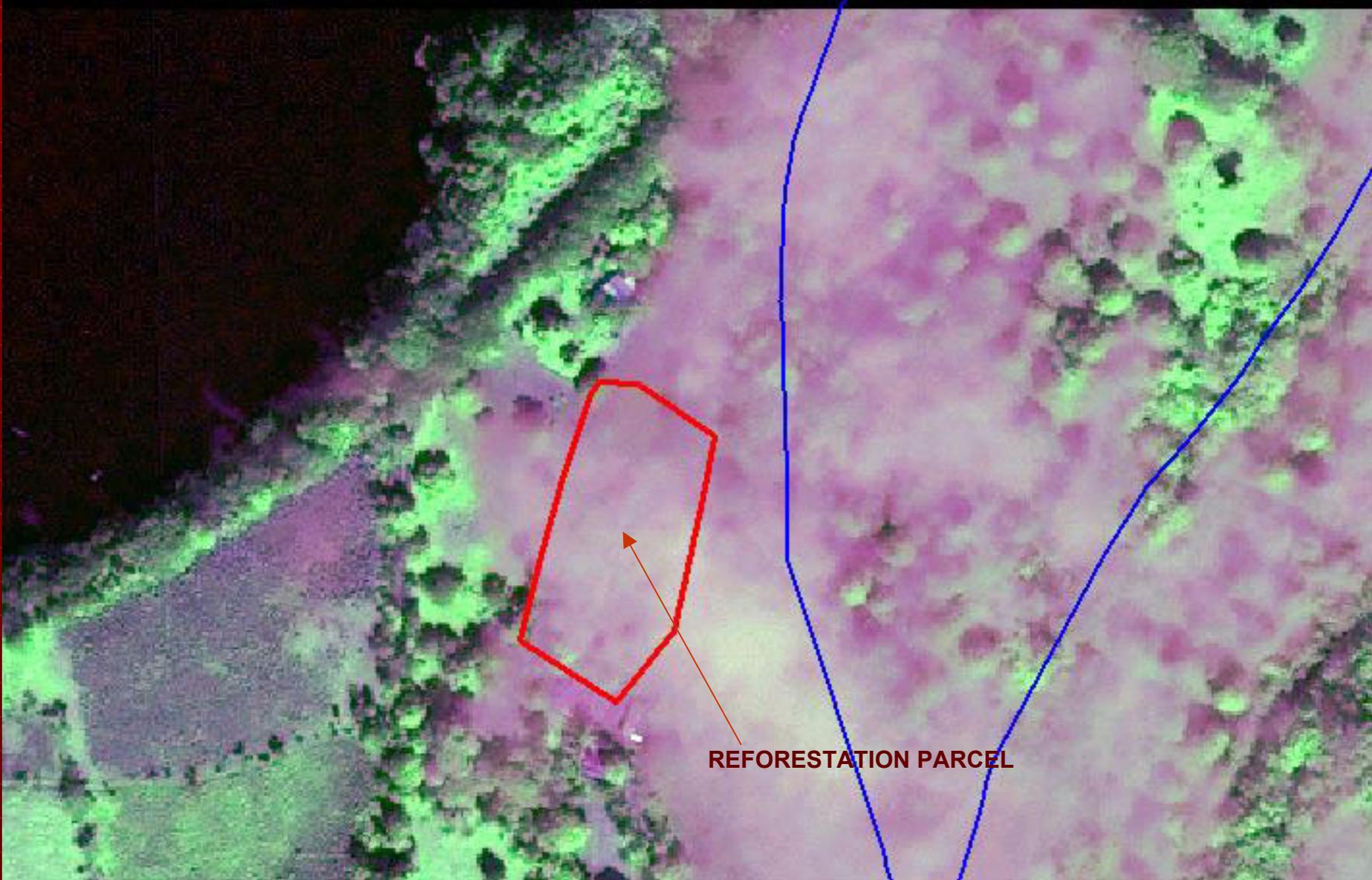
**IKONOS IMAGE INFRARED-VISIBLE COMPOSITE SHOWING DEFORESTED AREAS AROUND ENCANTADA LAGOON AND NUBOSITY OVER THE EXPERIMENTAL PLOT. IT IS POSSIBLE TO DETECT BIOMASS VOLUME.**



**IKONOS IMAGE FALSE-COLOR COMPOSITE SHOWING DEFORESTED AREAS AROUND ENCANTADA LAGOON. BAND COMBINATION ALLOWS A BETTER VIEW THROUGH THE CLOUDS.**



**IKONOS IMAGE FALSE-COLOR COMPOSITE CLOSE UP. LIGHT COLORS ZONES INDICATE LOW VEGETATION COVER. GPS GEOREFERENCED POLIGON, HALF A HECTARE (0.49 HAS.). PARTIAL FILTERING OF NUBOSITY.**



**DEMONSTRATIVE REFORESTING PLOT WITH NATIVE SPECIES  
WITH HIGH POTENTIAL FOR WOOD AND FRUIT PRODUCTION  
IN LOS TUXTLAS. FIELD VISIT: REMOTE SENSING DATA  
WAS CONFIRMED.**

