

REMOTE SENSING AND GIS TECHNOLOGIES APPLIED IN A  
SOIL EROSION STUDY

## ABSTRACT

This work was carried out in the Casa Branca region (eastern São Paulo State - Brazil) and its objective was to develop a methodology on the use of remote sensing techniques and data integration to study soil erosion. Digital TM/Landsat (bands 3, 5 and 7) and HRV/SPOT panchromatic data were merged. The TM data selected were collected on 17 July 1988 and the SPOT data were collected on 3 July 1988. TM bands were transformed by IHS enhancement and the combined images (bands R, G and B) were obtained after the displacement of the I component by a panchromatic SPOT image. The good performance of R, G and B bands for the detection of erosion scars was evaluated by comparative analysis with aerial photographs (acquired on July 1988). A schematic map of the distribution soil erosion features was obtained from the R, G and B images. The TM images (multispectral color compositions - TM 3 (blue), TM 5 (green), TM 7 (red); and TM 3 (blue), TM 4 (green), TM 5 (red) were used to make a land-use map. Erosivity, erodibility, slope and length of slopes data were obtained from topographic charts, thematic maps (at a scale 1:50,000) and ancillary data. The data were integrated by the Universal Soil Loss Equation (USLE) model with the support of a Geographical Information System (SGI/INPE). These data (in raster format) were georeferenced by the UTM grid. The Natural Potential of Erosion (NPE) was calculated from these data. Vegetation cover and land use data (factor C of USLE) were integrated with NPE data and values of Relative Soil Loss (RSL) were obtained. Finally an Index of Relative Soil Loss (IRSL) was calculated by the ratio between RSL and Tolerance (T) values. The coherence between the IRSL data and soil erosion features map was demonstrated by a comparative analysis.