

REMOTE SENSING APPLIED TO GEOLOGICAL MAPPING OF NEOPALEOZOIC SEQUENCES IN THE CORDON DEL PORTILLO REGION, CORDILLERA DE LOS ANDES, ARGENTINA

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Remote sensing is an essential data source for geological mapping in regions of difficult access, such as the Cordillera de Los Andes. Using digital image processing techniques applied to multispectral imagery, it is possible to identify different lithologies and stratigraphic limits, mainly based on spectral characteristics and textural attributes extracted from the imagery. The study region comprises the Cordon del Portillo, located at the Frontal Cordillera, Mendoza Province, Argentina at 33°40'S-69°30'W. The area comprises rugged mountainous terrain, with elevations ranging between 3,200 and 5,500 meters, with exposed bedrock. The vegetation is scarce and limited to terraces along and within river alluvial plains. The stratigraphy includes a Precambrian basement formed by schists, metadiabases, gneisses, amphibolites, metamorphic mafic rocks, Neo-Paleozoic granites and volcanic rocks. Color composites of TM bands 531 and 457 as RGB depicted most of the lithological units and allowed the definition of their contacts. However, ratio color composites of 5/7, 5/4 and 3/1 enhanced the spectral contrast between some rock types, allowing the separation between the basement and the Neo-Paleozoic lithologies. This contrast was verified through field check and showed to represent to contact between these lithologies. This contact was previously placed to the east of the Cordón del Portillo and the use of spectrally-enhanced Landsat TM allowed a better definition of this contact over the entire image, placing it to the west of the Cordón. Finally, the use of TM data allowed the establishment of important relationships among the other geological units in the study area.