The area selected for study is situated in the southern margin of the Amazonas Synclise, enclosed approximately by 4°00' - 5°50' south latitudes and 55°40' - 57°20' west longitudes and covers approximately 11,200 km². In this tropical terrain with dense virgin jungle coverage, conventional field mapping is almost inaccessible for the most part, and mapping a broad region is also questionable. The temporal and spectral attributes of the Landsat images are barely available in this region. Therefore, enhancement computer techniques including contrast stretch and digital filtering were applied to the digital MSS Landsat data in order to facilitate the visual analysis and increase the quantity of information to be extracted. These techniques tend to emphasize subtle scene features such as surface texture, topographic elements, etc., that are not perceived in original raw data. The synoptic view provided by Landsat MSS imagery produced different photographic mapping units and structural lineaments. Drainage patterns, landforms, surface textures and their continuities were mapped and a division of mapping units along the Tapajós River, which runs along the southern and southeastern margin of the study area, was performed. The assumption that image signatures and topographic lineaments represent directly or indirectly bedrock conditions led to the designation of: (1) three units of Precambrian rock, (2) three Mesozoic sedimentary rock units and (3) two units of Tertiary sedimentary cover. Topographic lineaments were inferred to be bedrock fractures which may be significant in terms of regional tectonic studies. Field checking along the Trans-Amazon highway, which passes through all of the mapped units, was performed. The study revealed that computer-enhanced techniques can increase the quality of an image and is helpful for visual examination, and that geological mapping of hardly accessible terrain through the analysis and interpretation of Landsat imagery is practicable and may be the best way to establish preliminary geological information in a remote territory.
The area selected for study is situated in the southern margin of the Amazonas Syneclise, enclosed approximately by 4°00' - 5°50' south latitudes and 55°40' - 57°20' west longitudes and covers approximately 11,200 km². In this tropical terrain with dense virgin jungle coverage, conventional field mapping is almost inaccessible for the most part, and mapping a broad region is also questionable. The temporal and spectral attributes of the LANDSAT images are little available in this region. Therefore, enhancement computer techniques including contrast stretch and digital filtering were applied to the digital MSS LANDSAT data in order to facilitate the visual analysis and increase the quantity of information to be extracted. These techniques tend to emphasize subtle scene features such as surface texture, topographic elements, etc., that are not perceived in original raw data. The synoptic view provided by LANDSAT MSS imagery produced different photographic mapping units and structural lineaments. Drainage patterns, landforms, surface textures and their continuities were mapped and a division of mapping units along the Tapajós River, which runs along the southern and southeastern margin of the study area, was performed. The assumption that image signatures and topographic lineaments represent directly or indirectly bedrock conditions led to the designation of: (1) three units of Precambrian rock, (2) three Mesozoic sedimentary rock units and (3) two units of Tertiary sedimentary cover. Topographic lineaments were inferred to be bedrock fractures which may be significant in terms of regional tectonic studies. Field checking along the Trans-Amazon highway, which passes through all of the mapped units, was performed. The study
revealed that computer-enhanced techniques can increase the quality of image and is helpful for visual examination, and that geological mapping of hardly accessible terrain through the analysis and interpretation of LANDSAT imagery is practicable and may be the best way to establish preliminary geological information in a remote territory.