



# THE PRACTICAL APPLICATION OF REMOTE SENSING TO MINERAL EXPLORATION; EXAMPLES FROM THE SLAVE CRATON, LABRADOR, KALIMANTAN, MEXICO AND BRITISH COLUMBIA

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## ABSTRACT

*Remote sensing has played a significant practical role in the major global mining exploration plays of the past five years; diamonds in northern Canada, nickel in Labrador, gold in Kalimantan and, most recently, gold in Mexico. Beginning with the diamond exploration rush in the Slave Craton in Northern Canada in 1993, RGI has provided extensive remote sensing image sets to a wide cross section of the mining exploration companies involved in these major plays.*

*Our approach, whenever possible, is to make images of remote sensing data sets which can be interpreted by working exploration geologists with a minimum of specialized remote sensing knowledge. Our model for this approach is the processing and imaging of seismic data in the oil industry. Much seismic interpretation is carried out by sedimentologists and structural geologists who have little or no special knowledge of seismic acquisition and processing methods and techniques. They apply their specialized geological knowledge to interpret structure, lithology and sedimentary processes from seismic sections which have been imaged by the seismic processors to approximate geologic sections.*

*In 1993 and 1994, in the early stages of the diamond exploration programs in the Slave Craton of northern Canada, the most useful remote sensing images were derived from winter Landsat TM data. On winter Landsat TM, in the barren lands, features with only a few meters of topographic relief can be clearly mapped. These images enabled the efficient mapping of surficial geology over large areas to derive probable glacial flow directions, till types and meltwater effects, used for the planning and interpretation of diamond indicator glacial till sampling programs. The images also provided significant new bedrock structural information.*

*During the staking rush in Labrador following the discovery of the Voisey's Bay nickel deposit in November 1995, the combination of Landsat TM, aeromagnetism and lake sediment geochemistry images provided the best tools for selection of exploration land.*

*In the huge upsurge in mineral exploration in South East Asia related to the activity at Busang in 1996, satellite radar proved to be one of the most useful exploration tools. ScanSAR Narrow Radarsat mosaics of Borneo and Sumatra, Java and the Philippines provided significant new information on the structural evolution of these islands. JERS-1 SAR and Fine Mode Radarsat images provided property scale information on geologic structure and lithology as well as property access information not available from other sources.*

*The discovery of the El Sauzal gold deposit in NW Mexico in late 1996 coincided with the availability of 5 m resolution coverage over most of Mexico from the Indian IRS-1C satellite. Hydroxyl alteration mapping with Landsat TM shows the probable extent of the large geothermal system which created the deposit and the IRS-1C images clearly show the topographically high weathering silica alteration zones which contain the gold.*

