

Remote Sensing Research Over Plutonic Bodies of Nova Scotia

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Transfer of geologic data and superimpositioning of Landsat imagery and digital airborne gamma-ray spectrometric data was conducted to extract useful geological information related to exploration targets and to detect geologic associations suitable for mineral emplacement. A multilayer database was created. Three radioelements: equivalent Uranium (eU), equivalent Thorium (eTh) and percent Potassium (%K) as well as U/Th and Th/K ratios constituted the digital airborne geophysical data. MSS and TM Landsat coverage comprised the spaceborne imagery utilized in this database. Conventional geologic data were digitized, transferred and registered to the database for reference purposes.

Four major plutonic bodies located in southeastern Nova Scotia were selected as test sites to examine the utility of such a database in humid, heavily vegetated regions. These include the

Guysborough Plutons, the Liscomb Pluton, Musquodoboit and South Mountain Batholith. The integration technique permitted the extraction of spectral relationships controlled by the existing geology of the region, detection of plutonic phases, and the delineation of lineament distribution. Exploration target areas were selected on the basis of the detection of above threshold values for radioelements and ratios, as well as the intersection of lineaments and other geologic characteristics.

A limited field investigation was conducted over these test sites. The primary purpose of this field work was to study the lithology and structural framework of this area and to compare the remote sensing observations with the in situ geologic conditions. It is admitted that our field work is of reconnaissance nature and there is a need for systematic field investigation including geologic, geophysical and geochemical sampling.