Synthetic aperture radar: a valuable remote sensing tool for the geoscientist in Newfoundland

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Two large areas in Newfoundland centered roughly on the Baie Verte Peninsula and Red Indian Lake were imaged using a C-band synthetic aperture radar (SAR) in September, 1988. These data were collected by the Canada Centre for Remote Sensing under the auspices of the Radar Data Development Program in support of a major effort to develop geoscience applications for SAR in anticipation of the launch of RADARSAT. Analysis of the data has included both analogue (visual) and digital methods. Results to date indicate that a multitude of specific structural, lithologic and glacial elements are represented uniquely by the SAR image data. SAR response is most effected by local terrain shape (specifically slope and aspect) and soil moisture, while changes caused by the relatively small scale roughness variations within the vegetation canopy are minimal. Since terrain shape is a major factor, SAR data must be collected at orthogonal viewing geometries during reconnaissance surveys to ensure that all geologic features of interest will be represented. Digital enhancement techniques, such as directional filtering, may be used to highlight linear elements of various scales and orientations. Integration of SAR with geophysical data, including aeromag and spectrometer, is proving to be a powerful exploration tool since linear elements which are due to some anomaly at depth are often represented at the ground surface on the SAR data.