

RADAR REMOTE SENSING FROM THE ARCTIC TO THE TROPICS: LESSONS FROM RADARSAT-1

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Worldwide use of radar remote sensing has grown over the last decade as satellite radar imaging systems from ERS-1, JERS, RADARSAT-1 and ERS-2 provided data for research and commercial users. Terrain images from arctic, temperate and tropical environments will be used to illustrate information content of radar images important for geoscience studies. RADARSAT-1, able to image in several modes of resolution and incidence angle enables comparative analysis between the different beam modes for geological studies. Experience with data collected from different beam modes and dates of acquisition indicates that a judicious selection of beam mode under favourable weather conditions (difficult to predict) are important in determining the effectiveness of radar for geological mapping. Radar image pairs at different incidence angles viewed stereoscopically improve structural interpretations over those made from monoscopic observation. Such data pairs can be radargrammetrically transformed to generate DEMs, which in turn permits orthorectification and data fusion with other geoscience data. Wide area mosaics composed of image strips reveal major tectonic structures and are useful for correlations at intra- to inter-continental scales of investigation. In the near future, radar remote sensing will find more specific areas of application for geology as more advanced Earth observing satellites are deployed. Improved capabilities will invariably include interferometric, multi-polarized, polarimetric and multi-frequency imaging systems.