

INTEGRATED IMAGING OF JERS-1 AND ERS-1 SAR DATA FOR EARTHQUAKE
TECTONIC INVESTIGATION OF THE NAHANNI EARTHQUAKE AREA IN
NORTHWEST TERRITORIES, CANADA

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ABSTRACT

The Nahanni region, Northwest Territories, Canada is a remote area and has been seismically very active. As a collaborative research project, the investigation team acquired JERS-1 SAR, ERS-1 SAR, SPOT and Landsat data in addition other geophysical data such as earthquake epicenter data for main shocks and after-shocks. Recently there have been several large earthquakes near the North Nahanni River including the ones on 5 October 1985 (Ms 6.6), 23 December 1985 (Ms 6.9) and 25 March 1988 (Ms 6.2). The earthquakes occurred within a small relatively undeformed plateau, the Mackenzie Plain, in the Foreland Fold Belt created along the northeastern Cordillera during the Columbia or Laramide Orogeny. One of the problems in studying the geological and tectonic setting of the Nahanni epicentral region has been lack of comprehensive geological and geophysical data, perhaps due to remote isolation and logistic difficulties in accessing the study area. In this study an attempt was made to use space-borne L- and C-band SAR digital image and optical (Landsat and SPOT) image data to compliment other available information. Detailed investigation of the surface structural features of individual as well as the final integrated composite images over the epicentral area indicates that there are several new structural features intersecting the major northwest trending Iverson thrust fault and accompanying structures at the earthquake epicentral region.

KEY WORDS : SAR, Geological Remote Sensing, Earthquake, Integration