

IAF EARTH OBSERVATION SYMPOSIUM (B1)
Earth Observation Systems (2)

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RADARSAT CONSTELLATION MISSION OVERVIEW AND STATUS

Abstract

Earth Observation (EO) has been a major thrust of the Canadian Space Program since its inception. In the 1980's, Canada pioneered Synthetic Aperture Radar (SAR) technology through the development, and extensive use in field tests around the world of a sophisticated radar imaging system deployed in aircraft as a simulator to Canada's future satellite system. Canadian technological advances were integrated in-to spaceflight hardware flown on the European Space Agency ERS-1 and ERS-2 radar demonstrator satellites launched respectively in 1991 and 1995. Having attained space flight heritage, Canada launched its own radar Earth observation satellite, RADARSAT, in 1995. RADARSAT was primarily driven by a requirement to better manage navigation through Canada's ice-infested waters. Operating independent of daylight or weather conditions, Synthetic Aperture Radar (SAR) sensors provide global coverage of the Earth's surface. Since 1995, RADARSAT, later re-named RADARSAT-1, provided until March 2013 operational service to both government and commercial users worldwide. It has given Canada a world leadership position in space-borne SAR systems for data use and value-added products and services.

Building upon RADARSAT-1 heritage, RADARSAT-2 was launched in 2007 with added beam modes and polarizations that helped develop new operational applications and increased SAR data consumption within the Government of Canada by a factor of five (5).

Launched in June 2019, the RADARSAT Constellation Mission (RCM) aims to ensure continuity of operational SAR imagery for RADARSAT-2 users, as well drawing from the constellation approach to enable new applications. Now more than three years after commissioning, the RCM is becoming the Canadian Government's premier mission to provide all-weather day and night data in support of Canadian sovereignty and security, environmental monitoring, natural resources management and other government priorities such as Northern development. As a three-satellite constellation coverage of most of Canada and its surrounding waters are covered daily. Compared to previous RADARSAT missions, coverage increases significantly in Canada's North, for example providing coverage of the Northwest Passage three to four times daily. With the increased frequency of revisit, emerging applications such as land de-formation and operational disaster management can be further exploited.