Radarsat: a tool for environmental monitoring and terrain evaluation

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The Radarsat satellite is equipped with steerable, multi-resolution synthetic aperture radar (SAR). The radar is an active system and is therefore independent on the sun illumination and operates in a wavelength that is not significantly effected by cloud, fog, or rain. These qualities make Radarsat a unique tool for monitoring environmental conditions for some regions. The system is sensitive to surface roughness and the dielectric properties of materials and local slope conditions. The ability of the system to highlight topographic variations has made it useful for structural and in some cases geological mapping. Natural oil slicks have been detected with Radarsat indicating natural seepage areas on the ocean floor associated with hydrocarbon deposits. The steerable beam allows a region to be imaged with several repeat passes, more frequently as one moves to high latitudes, allowing frequent monitoring during environmental disasters (e.g. flooding, oil spills, etc.). The steerable beam also allows for stereo coverage of an area, such that it is imaged twice at different incident angles. The stereo pair can be used to construct digital elevation models, which can further be used for environmental applications.

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