

Seasat and the Early Days of Radar Geology

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Even though it was designed as an ocean sensor, Seasat produced excellent images of the land, opening the eyes of many geologists to its potential for mapping landforms, geologic structures, rock weathering patterns, and volcanic deposits, among others. Aircraft testbeds had shown the utility of imaging radar for land studies, but it had been assumed that look angles needed to be large to allow discrimination between surfaces of differing roughness. The small look angle of Seasat, though it caused significant geometric distortion in areas of high topographic relief, was found to enhance low-relief landforms much more than optical sensors, giving geologists new "eyes", especially in cloud-covered tropical areas. At the same time, the uniform illumination over a wide swath allowed regional studies to be conducted much more easily. Even the new field of imaging radar interferometry owes its beginnings to Seasat as several years after the mission ended, repeat-pass Seasat images were successfully interfered, yielding some of the first topographic maps and topographic-change images generated with that technique. It is interesting to note that, although the oceanographic applications of Seasat were cut short by its untimely demise, that very failure caused more attention to be focused on processing of the land data that had been acquired, providing geologists with a new tool for mapping the Earth.

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