

HISTORY OF GLOBAL LAND COVER MAPPING AND MONITORING USING EARTH OBSERVATION DATA

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ABSTRACT:

From the 1990's to present, the quantification of global land cover from space has advanced from coarse to medium spatial resolution, classification to change detection, and research to operational in implementation. Initial products were experimental and focused on land cover as a static set of themes, initially depicted at one degree spatial resolution using meteorological AVHRR imagery. With the launch of MODIS, spectral bands specifically designed for land monitoring led to operational categorical cover classifications and percent cover characterizations. Similar capabilities were developed using Vegetation and MERIS data for global land classification. Follow-on missions such as the VIIRS and PROBA-V sensors will continue the global scale coarse resolution mapping and monitoring of the land surface. With the opening of the Landsat archive, a medium spatial resolution global mapping capability was realized. Similar to the antecedent efforts, first products were classifications and percent cover maps. Concerning change detection, forests have been the primary thematic target, due to the impacts of disturbance to key ecological services, but also due to the relative ease in which they are mapped using satellite data. Initial global change forest products employed AVHRR and MODIS, and more recently Landsat data. Next steps using Landsat data include moving into additional themes at the global scale, with examples for water, agriculture, and urbanization illustrated. Future capabilities using Sentinel data and very high spatial resolution imagery such as RapidEye and PlanetLabs, will be discussed.