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AN OUTLOOK ON LANDSAT DATA MANAGEMENT STRATEGY

Abstract

The Landsat archive managed by the U.S. Geological Survey (USGS) contains nearly 7.5 million scenes available for download. Following the adoption of the free and open Landsat data policy in 2008, data download requests increased dramatically. In 2012, the annual economic value of Landsat data was estimated at 2.19 billion for global users. Landsat 7 and 8 combined currently collect approximately 1,200 scenes per day. As of December 2017, added resellers and partners are increasingly bringing their algorithms to the data (versus data to the algorithms), which reflects a series analysis.

The convergence of free and open Landsat data with advanced computing capacity has made the revolutionary construct of Analysis Ready Data (ARD) a reality. ARD are defined as being consistently processed to the highest scientific standards and level of processing required for direct use in monitoring and assessing landscape change. A fundamental goal for Landsat ARD is to significantly reduce the magnitude of data processing for application scientists, who previously had to download and prepare large amounts of Landsat scene-based data for time-series analysis. Unlike the conventional path/row scene-based format, U.S. Landsat ARD products are processed to a common tiling scheme, in which each tile contains 5k x 5k 30-meter pixels, and includes all data stacked throughout a given time span. In late 2017, USGS EROS released ARD products for the U.S., with a future goal to make global ARD available—which represents an IT modernization challenge.

This paper considers the relevance of new directions in U.S. IT modernization policy in regards to future needs for Landsat data storage, distribution, and processing. Envisioned operational concepts are presented toward modernizing (1) capabilities to download or utilize large volumes of Landsat data quickly; (2) improved “analysis ready” products; (3) timely re-processing of the entire archive; (4) pixel-level access to data; (5) enhanced access and visualization of the data; and (6) strategic partnerships with government and commercial entities.