Landsat Surface Reflectance Climate Data Records

Landsat Surface Reflectance Climate Data Records (CDRs) are high level Landsat data products that support land surface change studies. Climate Data Records, as defined by the National Research Council, are a time series of measurements with sufficient length, consistency, and continuity to identify climate variability and change. The U.S. Geological Survey (USGS) is using the valuable 40-year Landsat archive to create CDRs that can be used to document changes to Earth’s terrestrial environment.

Landsat Surface Reflectance CDRs are generated using Landsat Ecosystem Disturbance Adaptive Processing System (LEDAPS) software, which applies Moderate Resolution Imaging Spectroradiometer (MODIS) atmospheric correction routines to Landsat Level-1 scenes.

Subsets of a Landsat scene, displaying 

A, the natural color of a Level-1 product; B, after applying Top-of-Atmosphere corrections; and 

C, the result of Surface Reflectance processing. [Source: Landsat 5 Thematic Mapper (TM) Path 23 Row 34, acquired May 30, 1995]

The following products are available as options when requests for surface reflectance processing are made through the on-demand USGS Earth Resources Observation and Science (EROS) Center Science Processing Architecture (ESPA) system (https://espa.cr.usgs.gov/):

- Source Products (Landsat Level-1 Product or Metadata, or both)
- Top-of-Atmosphere Reflectance [Hierarchical Data Format for Earth Observing System (HDF-EOS) data format]
- Surface Reflectance (SR) (HDF-EOS data format)
- Band 6 Brightness Temperature (HDF-EOS data format)

Reprojection, user-defined image extents, and pixel resizing also are options for ESPA-submitted data products. Surface reflectance data processing requests for individual Landsat scenes can be placed by accessing EarthExplorer (http://earthexplorer.usgs.gov).


Contact Landsat User Services (http://landsat.usgs.gov/contactus.php) with any questions about Landsat CDRs.