LaSRC Cloud Detection Algorithm for Landsat 8 and Sentinel-2 Data

*Sergii Skakun\textsuperscript{1}, Eric Vermote\textsuperscript{2}, Jean-Claude Roger\textsuperscript{1}\n
\textsuperscript{1}. University of Maryland College Park, \textsuperscript{2}. NASA Goddard Space Flight Center

This study aims at introducing and validating the cloud mask produced by the Land Surface Reflectance Code (LaSRC) for Landsat 8 and Sentinel-2 data. To detect clouds in optical satellite imagery, LaSRC uses quality assurance (QA) layers, which are produced during the atmospheric correction process. Validation is performed using two reference datasets. The former is the “L8 Biome” cloud validation dataset, which is produced by the US Geological Survey (USGS), and consists of 96 Landsat 8 scenes distributed globally over 12 different biomes. The latter is the dataset, which is produced over NASA GSFC assisted by ground photos of the sky and available for Landsat 8 and Sentinel-2A/B. We show that the LaSRC cloud detection algorithm reliably identifies thick clouds with commission and omission errors less than 4%. Large overdetection occurs for thin clouds. We conclude the study with recommendations on using the LaSRC QA layers, and provide an outlook on the need of acquiring objective reference cloud datasets.

Keywords: cloud, Landsat 8, Sentinel-2, LaSRC