

Toward a Consistent Climate Data Record Surface Reflectance Product

Eric Vermote¹

1) eric.f.vermote@nasa.gov, NASA/GSFC

Abstract

Surface reflectance is one of the key products used in developing several higher-order land products, such as Vegetation Indices, Albedo and LAI/FPAR, it is therefore seminal to detecting trends in the biosphere and land surface and has been classed by NOAA as a “Fundamental Climate Data Record (FDCR) for Land”. Building a long-term surface reflectance data record of climate quality implies combining different instruments, sensors and satellites, accounting for different spatial resolutions and spectral characteristics, assuring consistent calibration, and correcting for atmospheric and directional effects.

In this work, we are using robust reflectance data records and inter-comparison methods that we have developed over the past several years (consisting of atmospheric correction, directional effect correction and spectral normalization) to evaluate the performance of the different sensors surface reflectance product.

First, we briefly describe the LaSRC (Land Surface Reflectance Code) algorithm used to generate surface reflectance from a variety of sensors and the validation of the LaSRC surface reflectance products. Then we use Aqua and Terra surface reflectance products corrected for directional effects to demonstrate our inter-comparison approach. Finally, we evaluate several surface reflectance products (including AVHRR, VIIRS and Sentinel 3) globally against Terra/Aqua focusing on Red, Near Infrared bands and NDVI.

Keywords - Cross Calibration / Validation