

Comparison of C6 Operational and NRT Land Products

Updated on Dec 22, 2016

This document provides a summary of results from comparison of C6 land products generated by the NRT system with those generated by the operational processing at MODAPS. Metrics presented in this document are from assessment of global data products from processing of instrument data from a typical data day and these metrics are expected to vary slightly from day to day depending on the disparity in the input ancillary and ephemeris data used by the NRT processing.

Confidence in NRT products

- The ongoing C6 reprocessing of land products at MODAPS started in Feb 2015.
- At the current reprocessing rate of 40x the reprocessing is expected to catch up with the C5 forward processing in Feb 2016.
- C6 PGEs used in the C6 operational reprocessing are ported and baselined for use in the NRT processing.
- NRT, in order to meet the latency requirement, may use different ancillaries and ephemeris than MODAPS and may some time use different production rule, resulting in minor difference in products compared to the operational products.
- This document summarizes the ability of the NRT to reproduce the C6 science quality products generated at MODAPS through confidence metric defined as percentage retrieval within given accuracy. Confidence metrics are provided for different data sets stored in products generated at NRT. C6 operational products are used as reference while estimating the confidence.

Accuracy of NRT Retrievals: Terra Day 2015-137

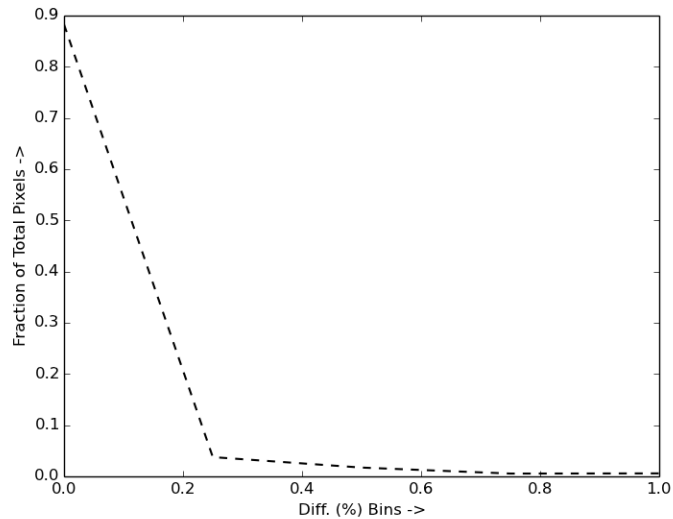
(C6 operational product used as Truth)

ESDT	Science Data	Match (% global)	Omission Error Npix (%)	Commission Error Npix (%)
MOD09	500m Reflectance Band 1	95.7	NA	NA
MOD09	500m Reflectance Band 2	99.6	NA	NA
MOD09	500m Reflectance Band 3	98.2	NA	NA
MOD09	500m Reflectance Band 4	94.18	NA	NA
MOD11	Land Surface Temperature	99.99	NA	NA
MOD10	NDSI Snow	99.99	NA	NA
MOD29	Sea_Ice	99.99	9897 (~0)	13866 (~0)
MOD14	Fire	100	0 (0)	0 (0)
MCD43A	BRDF-Albedo	83	NA	NA

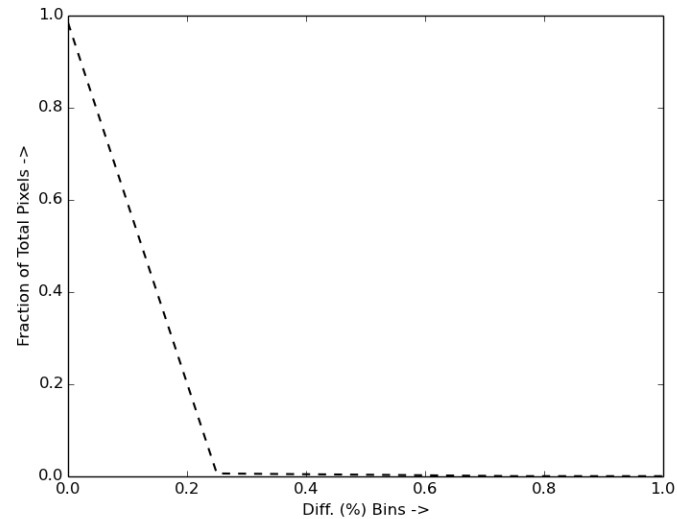
Match – For LSR it is the percentage of retrievals within 1% error margin when compared to operational C6. For other products it is the pixel to pixel exact match between NRT and C6. **Omission and Commission Errors** are computed as percentage of snow/ice/fire in the C6 operational products. All stats are based on DOY 2015137. (for snow 2016032, for BRDF-Albedo day 2016346.)

Plot of Confidence Metric for LSR (MOD09): DOY 2015-137 (C6 operational product used as Truth)

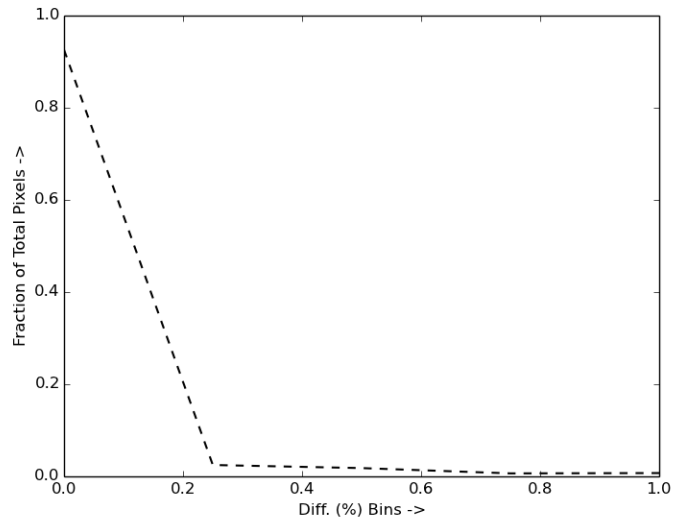
Abs. Fraction Diff: OPS Vs NRT SDS: 1km_Surface_Reflectance_Band_1



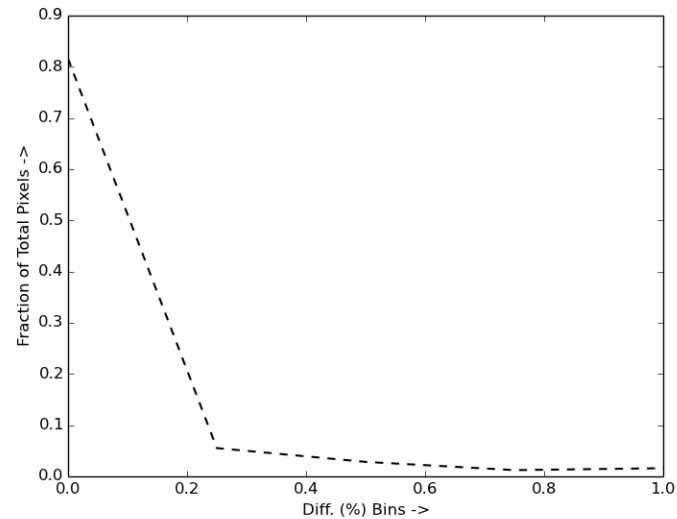
Abs. Fraction Diff: OPS Vs NRT SDS: 1km_Surface_Reflectance_Band_2



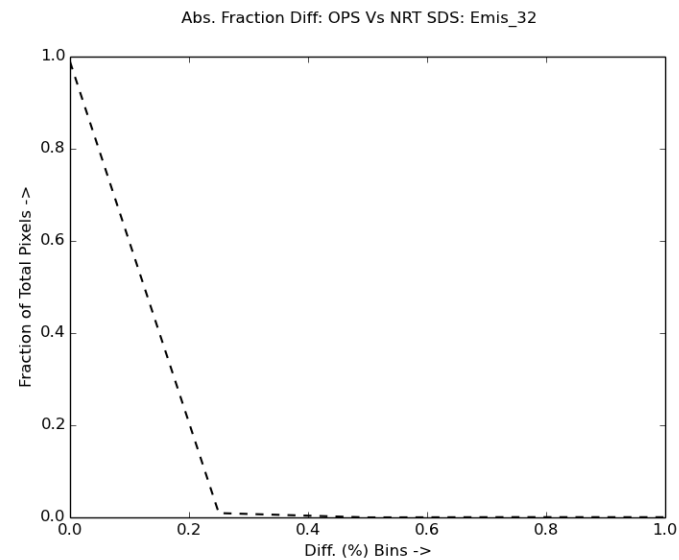
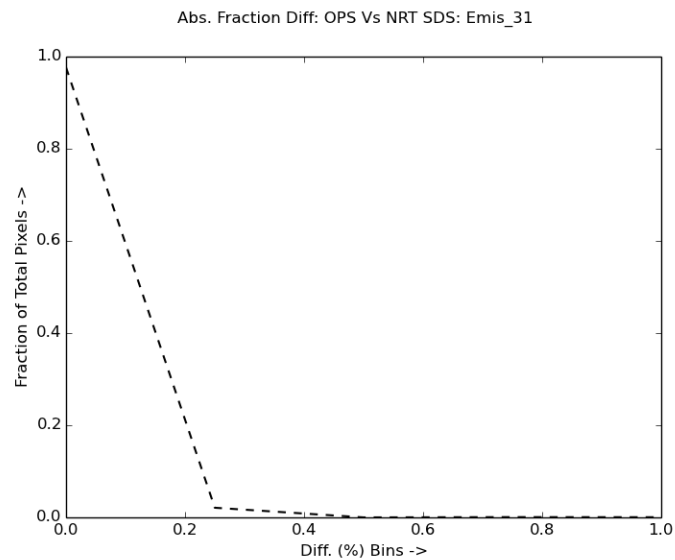
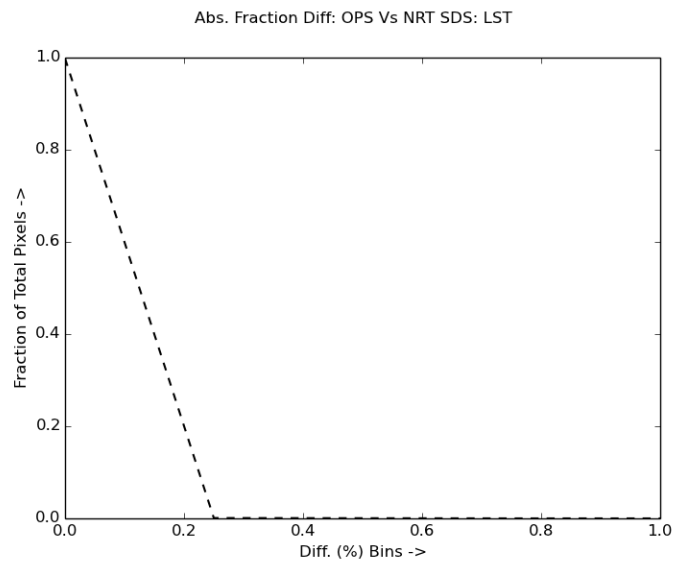
Abs. Fraction Diff: OPS Vs NRT SDS: 1km_Surface_Reflectance_Band_3



Abs. Fraction Diff: OPS Vs NRT SDS: 1km_Surface_Reflectance_Band_4



Plot of Confidence Metric for LST (MOD11): DOY 2015-137 (C6 operational product used as Truth)



Accuracy of NRT Retrievals: Aqua Day 2015-152

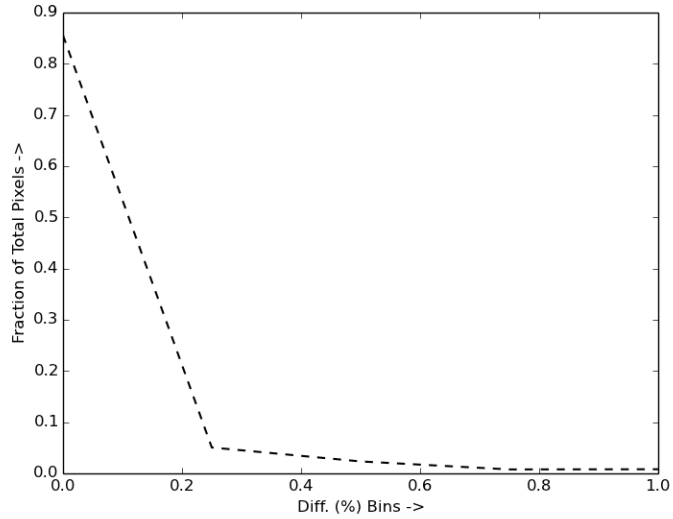
(C6 operational product used as Truth)

ESDT	Science Data	Match (% global)	Omission Error Npix (%)	Commission Error Npix (%)
MYD09	500m Reflectance Band 1	94.5	NA	NA
MYD09	500m Reflectance Band 2	99.46	NA	NA
MYD09	500m Reflectance Band 3	98.239	NA	NA
MYD09	500m Reflectance Band 4	93	NA	NA
MYD11	Land Surface Temperature	99.99	NA	NA
MYD10	NDSI Snow	99.98	NA	NA
MYD29	Sea_Ice	99.99	9897 (~0)	13866 (~0)
MYD14	Fire	100	0 (0)	0 (0)

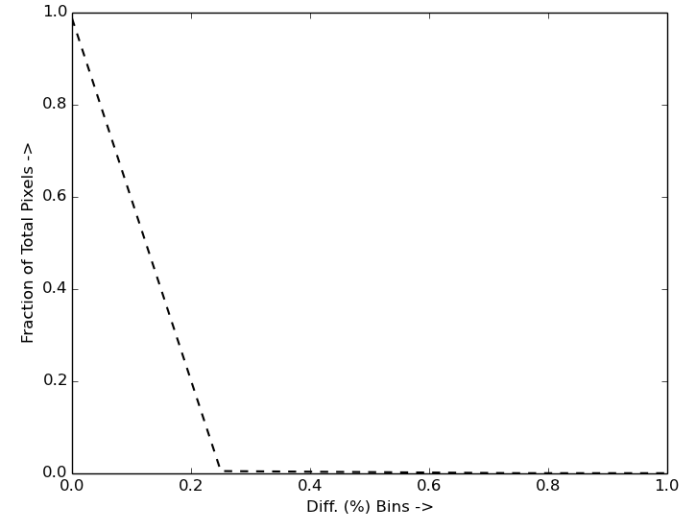
Match – For LSR it is the percentage of retrievals within 1% error margin when compared to operational C6. For other products it is the pixel to pixel exact match between NRT and C6. Omission and Commission Errors are computed as percentage of snow/ice/fire in the C6 operational products. All stats are based on DOY 2015152. (for snow 2016032)

Plot of Confidence Metric for LSR (MOD09): DOY 2015-137 (C6 operational product used as Truth)

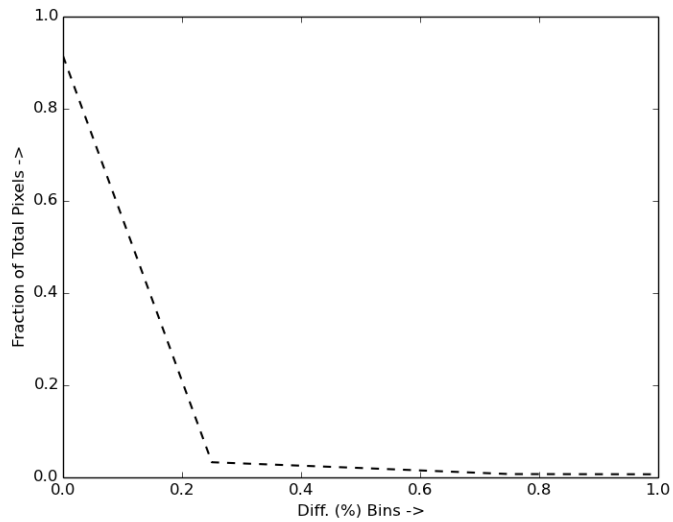
Abs. Fraction Diff: OPS Vs NRT SDS: 1km_Surface_Reflectance_Band_1



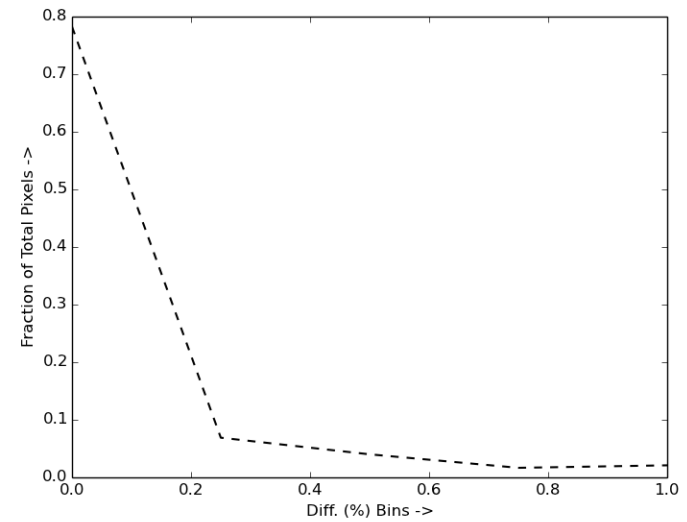
Abs. Fraction Diff: OPS Vs NRT SDS: 1km_Surface_Reflectance_Band_2



Abs. Fraction Diff: OPS Vs NRT SDS: 1km_Surface_Reflectance_Band_3



Abs. Fraction Diff: OPS Vs NRT SDS: 1km_Surface_Reflectance_Band_4

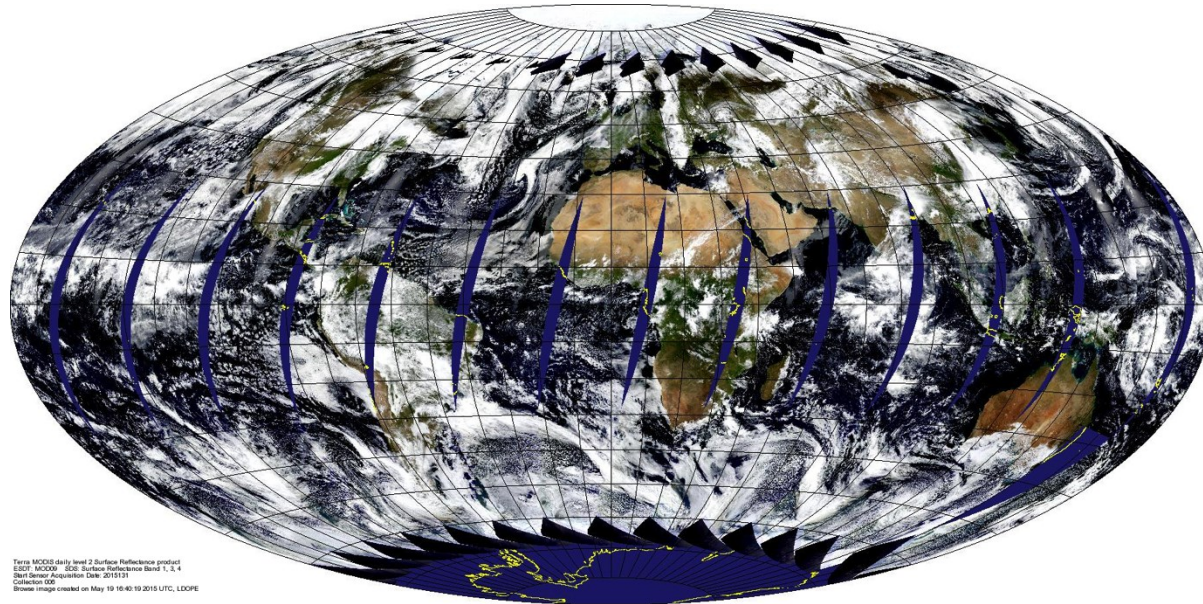


Summary

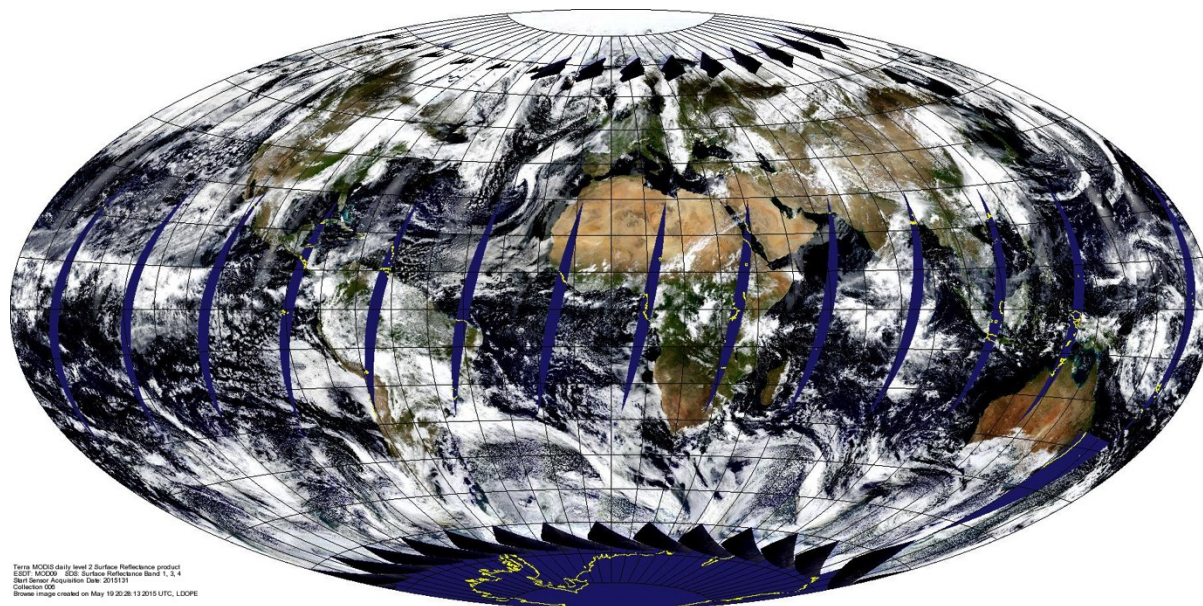
- Overall the C6 land products from NRT processing match to the operational C6 products with some expected minor differences from use of different ancillaries and ephemeris – this information is posted on the NRT web page at http://lance.modaps.eosdis.nasa.gov/data_products/comparison.html.
- There aren't any data gaps or data artifacts.
- C6 NRT on nrt3 will run in parallel with C5 NRT on nrt1/nrt2 – expected to continue for a year giving user enough time to get familiar with the C6 NRT products.

C6 Land Surface Reflectance: MOD09, RGB Composite of Bands 1, 3, and 4

NRT

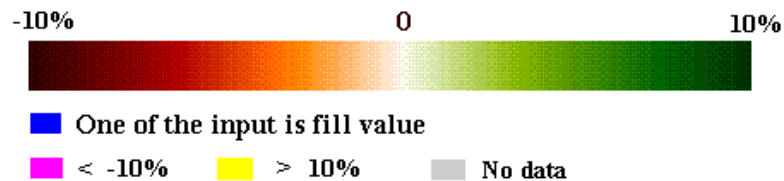
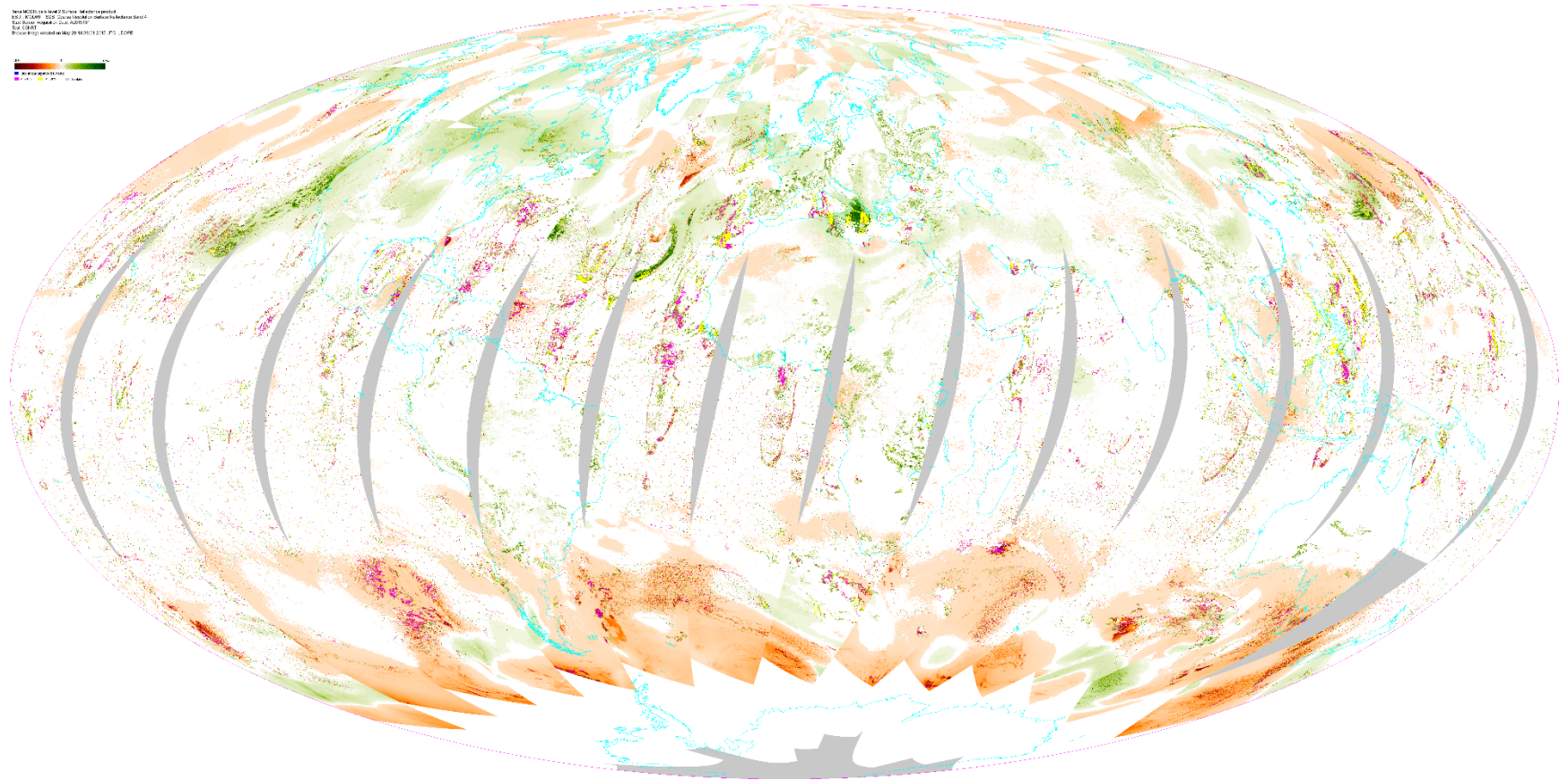


OPS

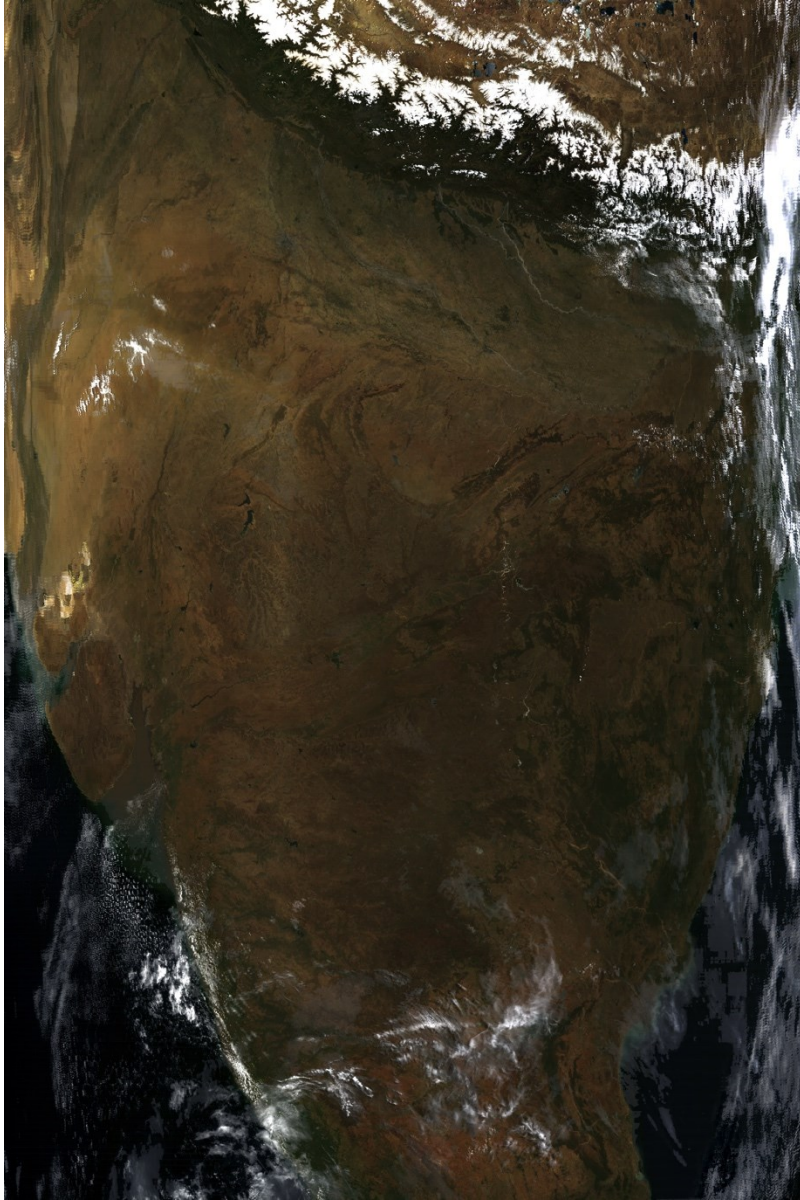


Difference in Surface Reflectance Band 4

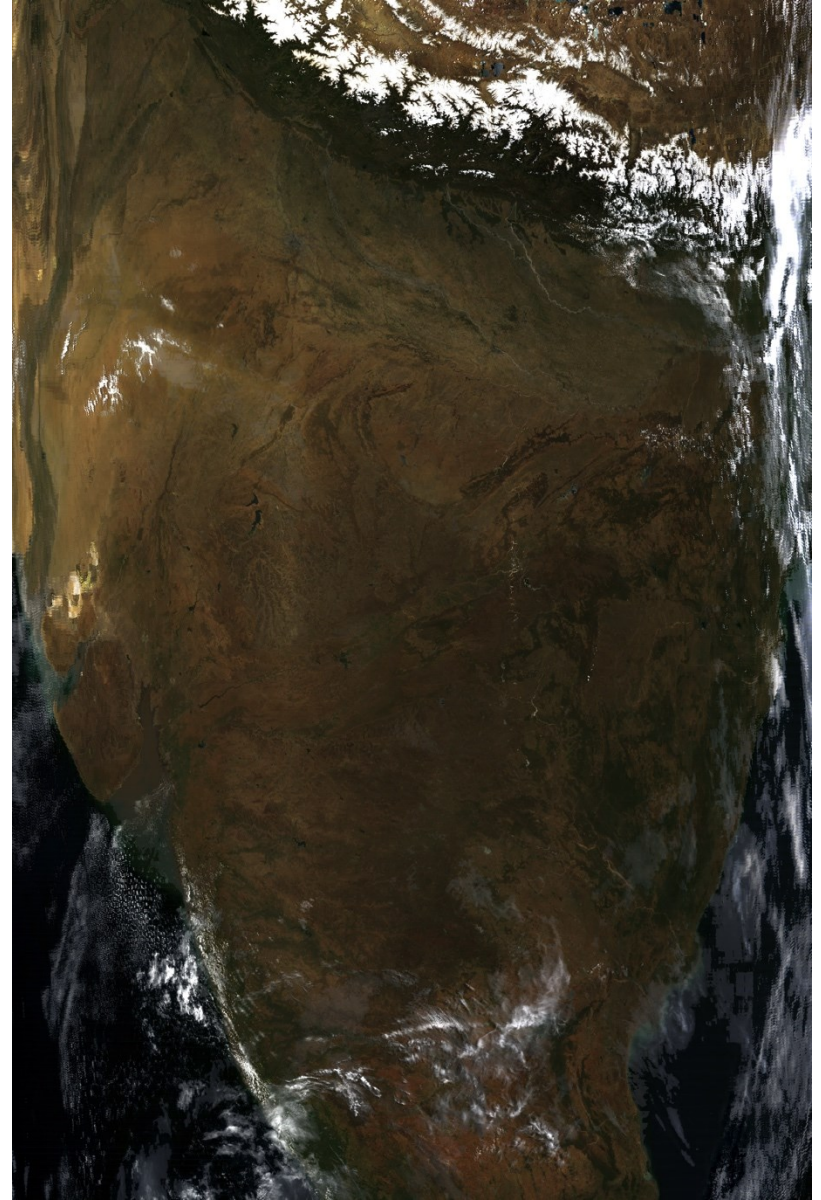
Map of the difference in surface reflectance in Band 4. The map shows a global distribution of reflectance differences, with a color scale ranging from -10% (dark red) to 10% (dark green). The map is overlaid with a grid of latitude and longitude lines. The legend indicates that blue areas represent one of the input values being a fill value, magenta areas represent differences less than -10%, yellow areas represent differences greater than 10%, and grey areas represent no data.



C6 Land Surface Reflectance: India

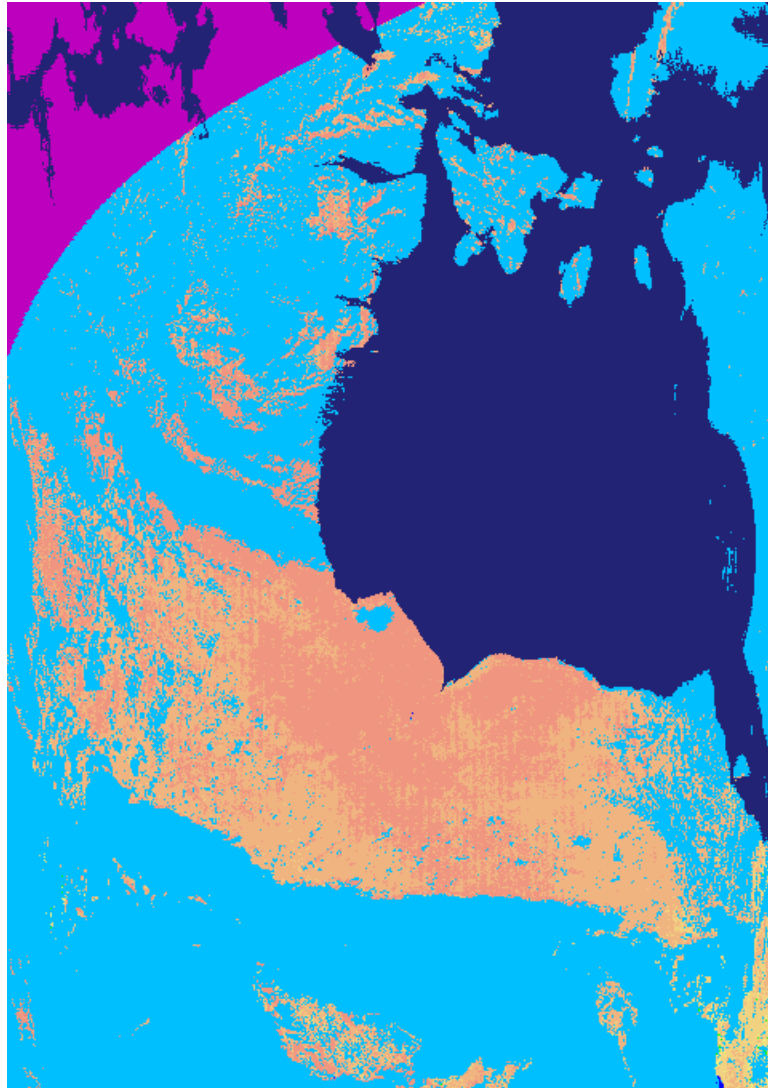


NRT

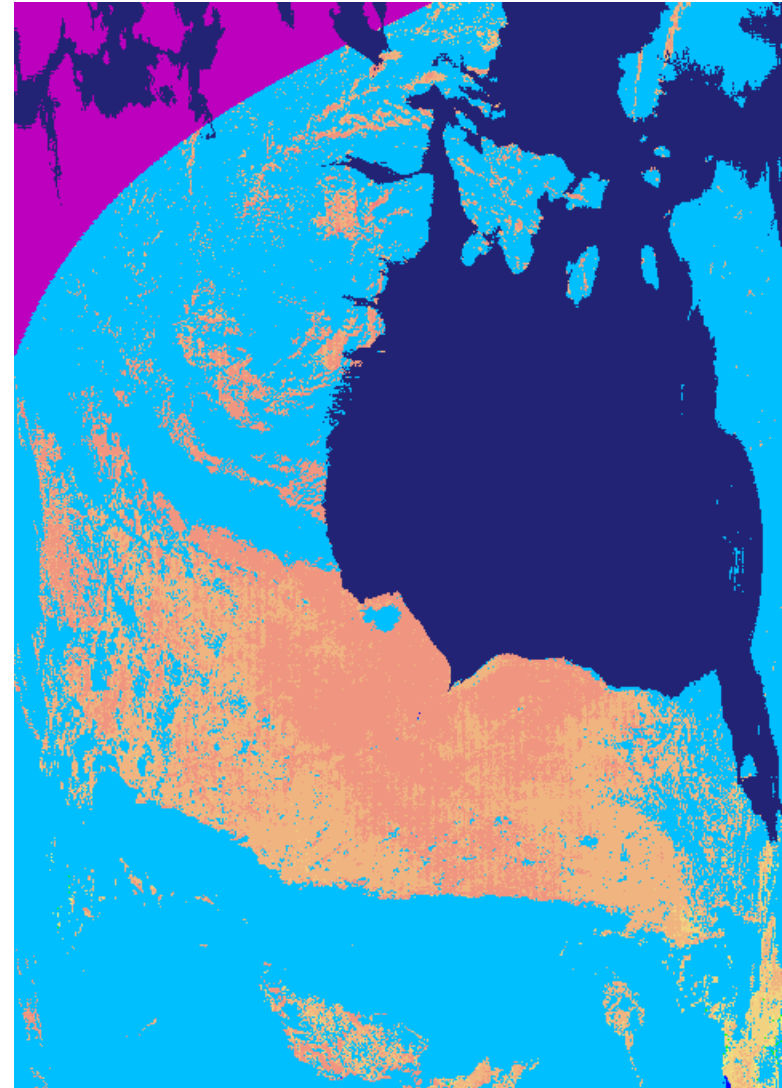


OPS

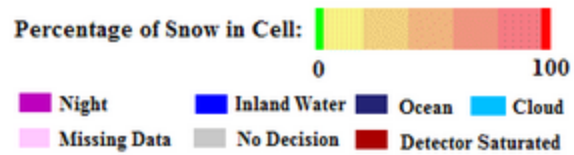
Snow Cover: North America (Day 2016032)



NRT



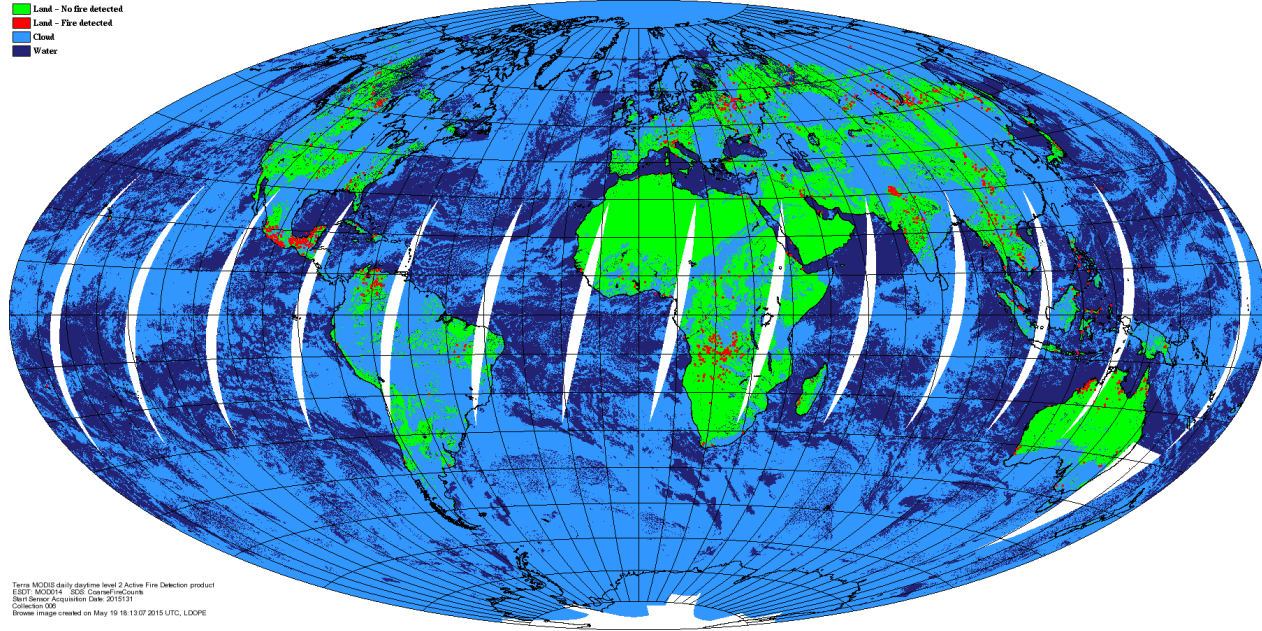
OPS



C6 Active Fire: MOD14

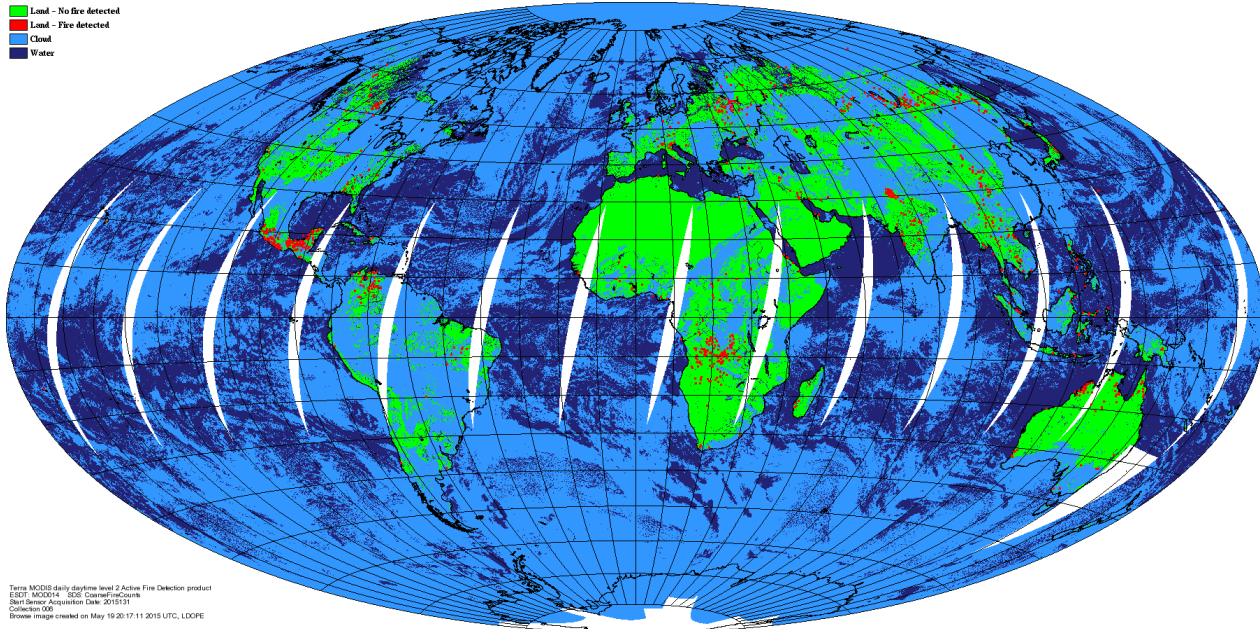
■ Land - No fire detected
■ Land - Fire detected
■ Cloud
■ Water

NRT

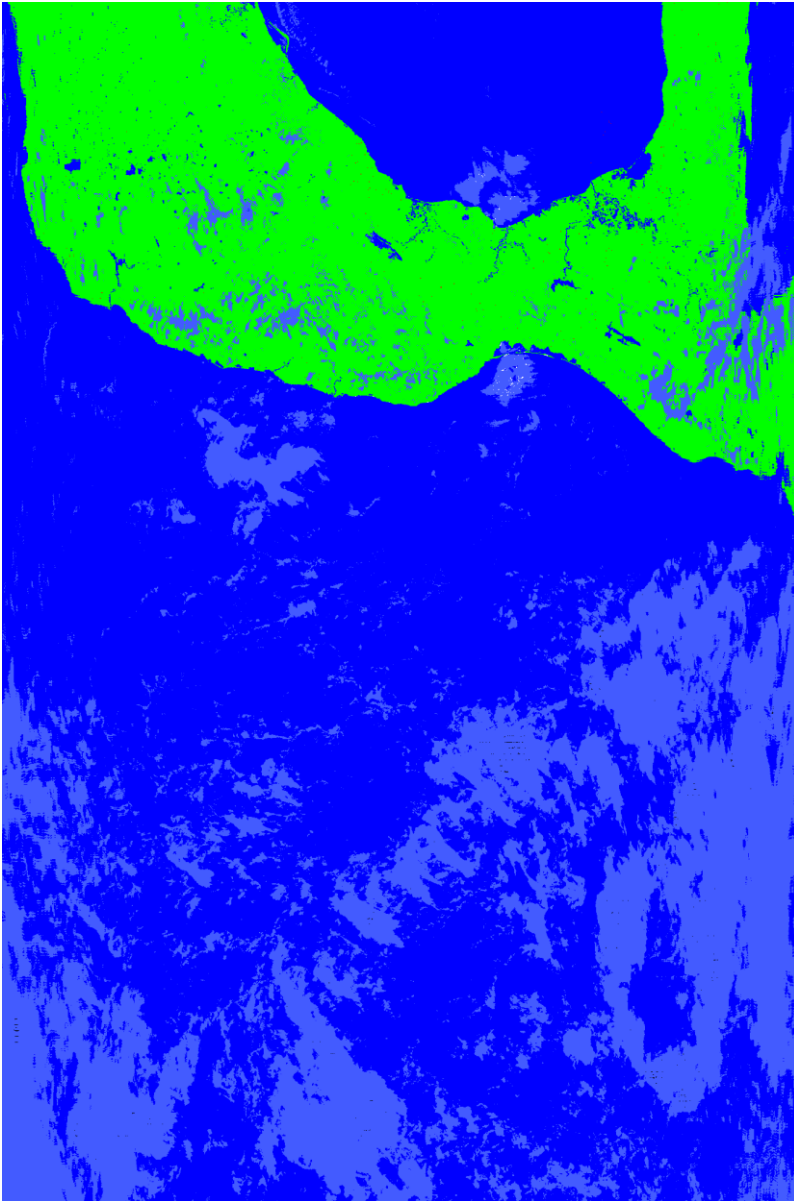


■ Land - No fire detected
■ Land - Fire detected
■ Cloud
■ Water

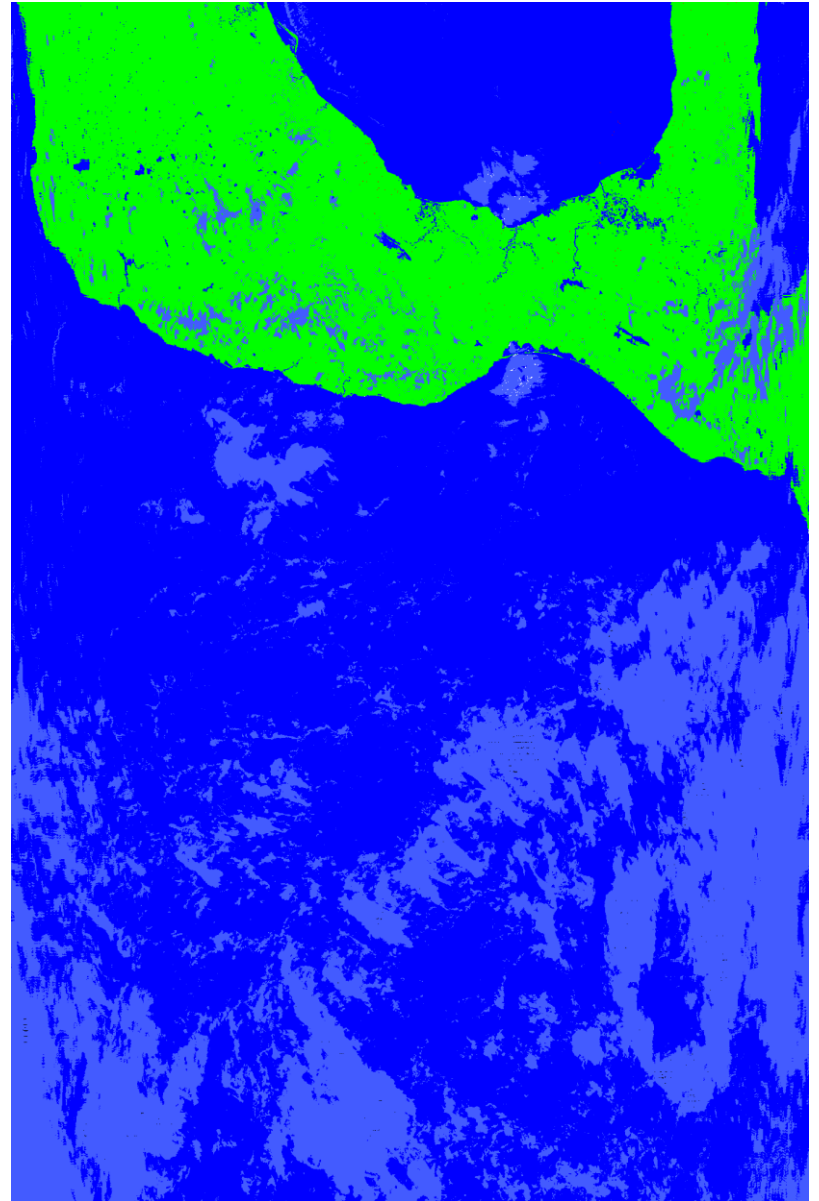
C6



Active Fire: Panama Region

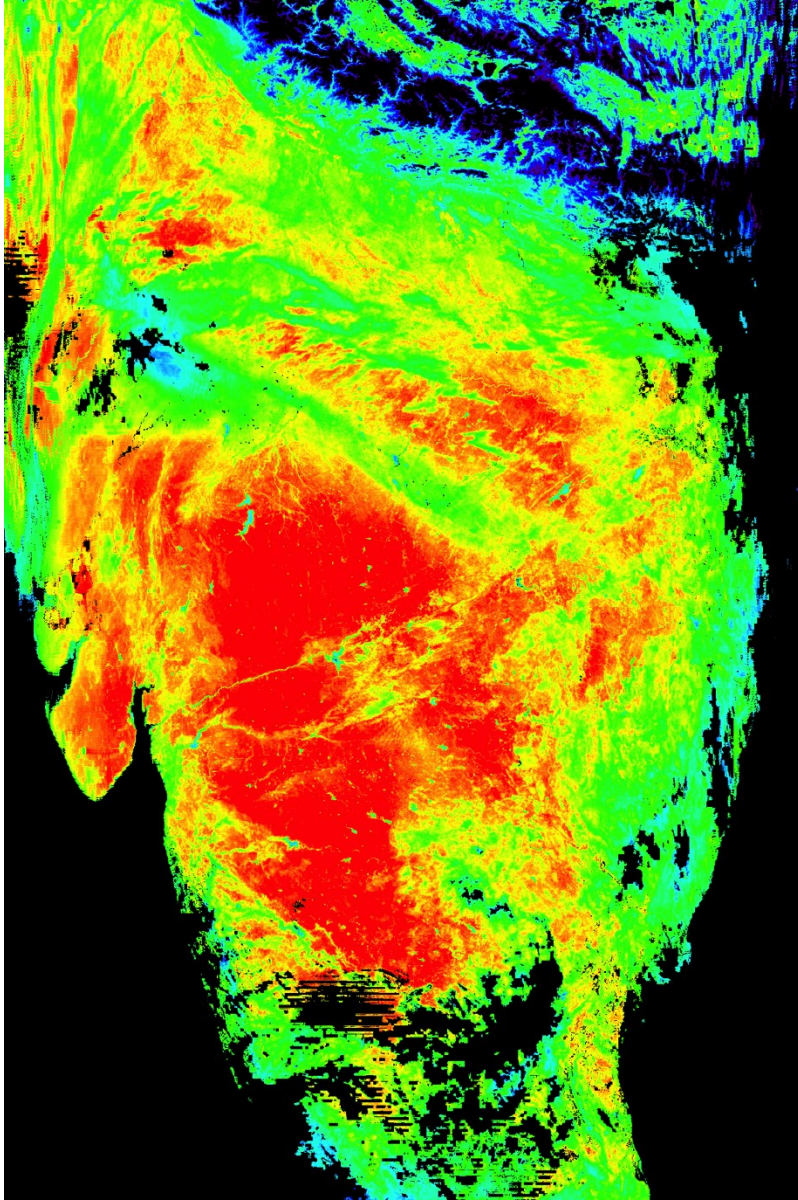


NRT

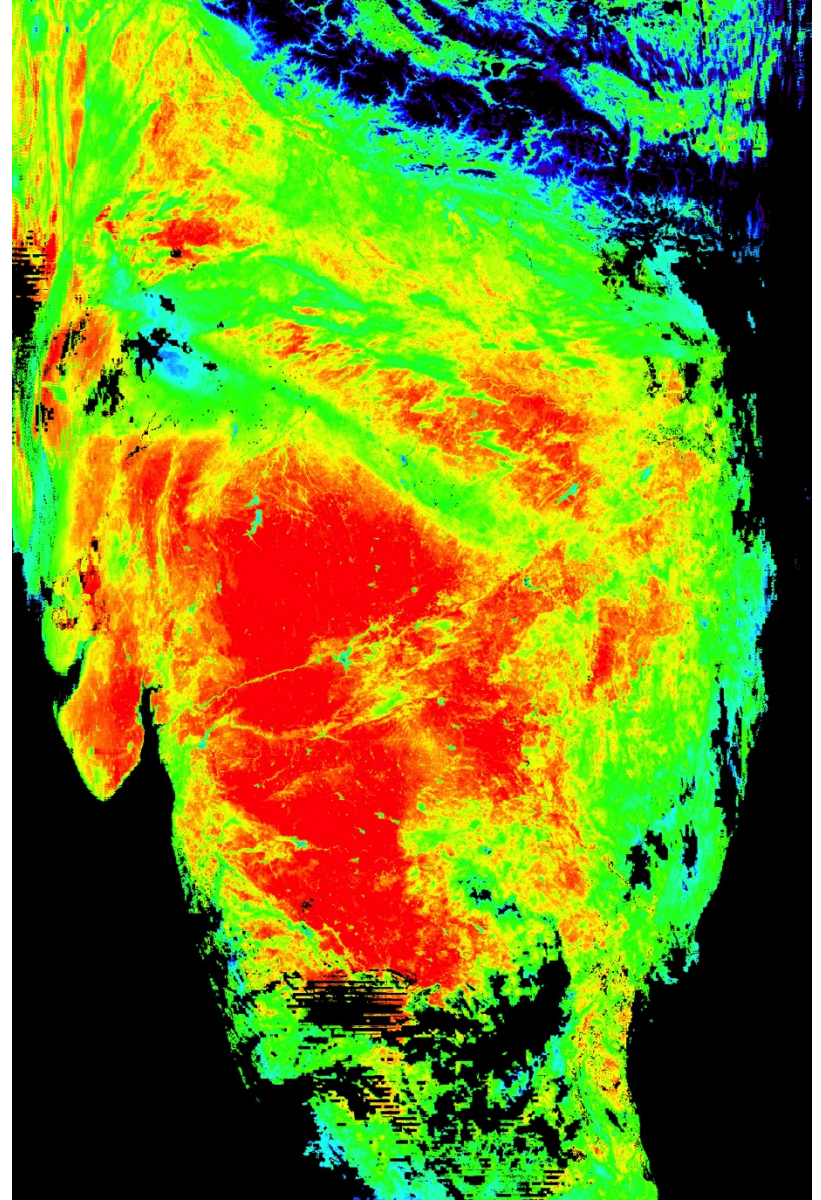


OPS

Land Surface Temperature: India



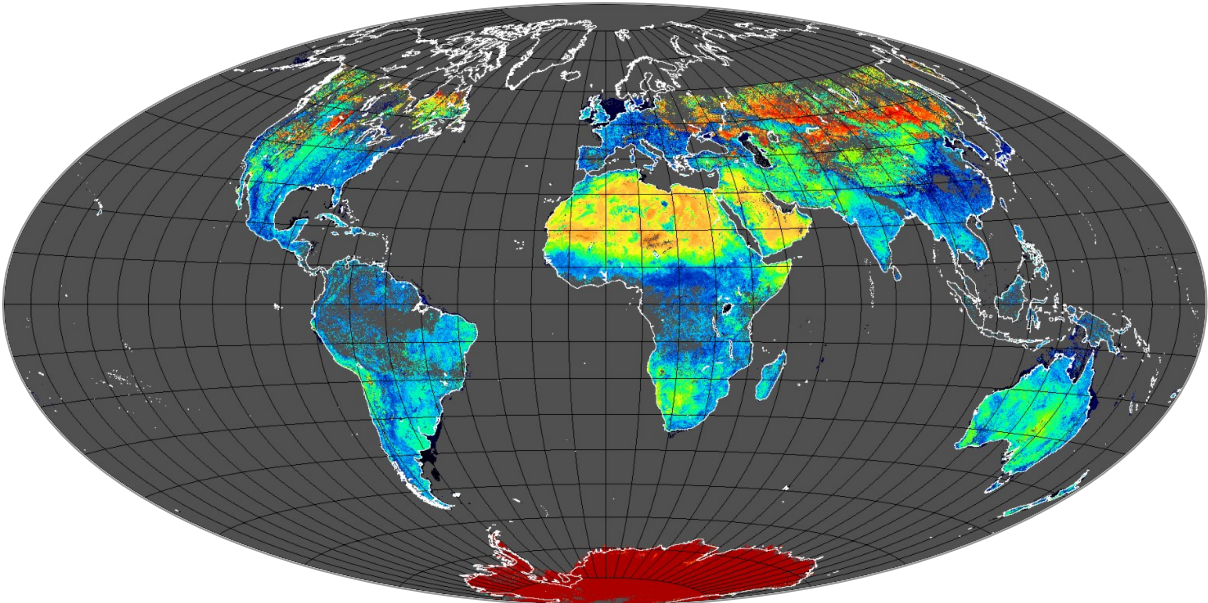
NRT



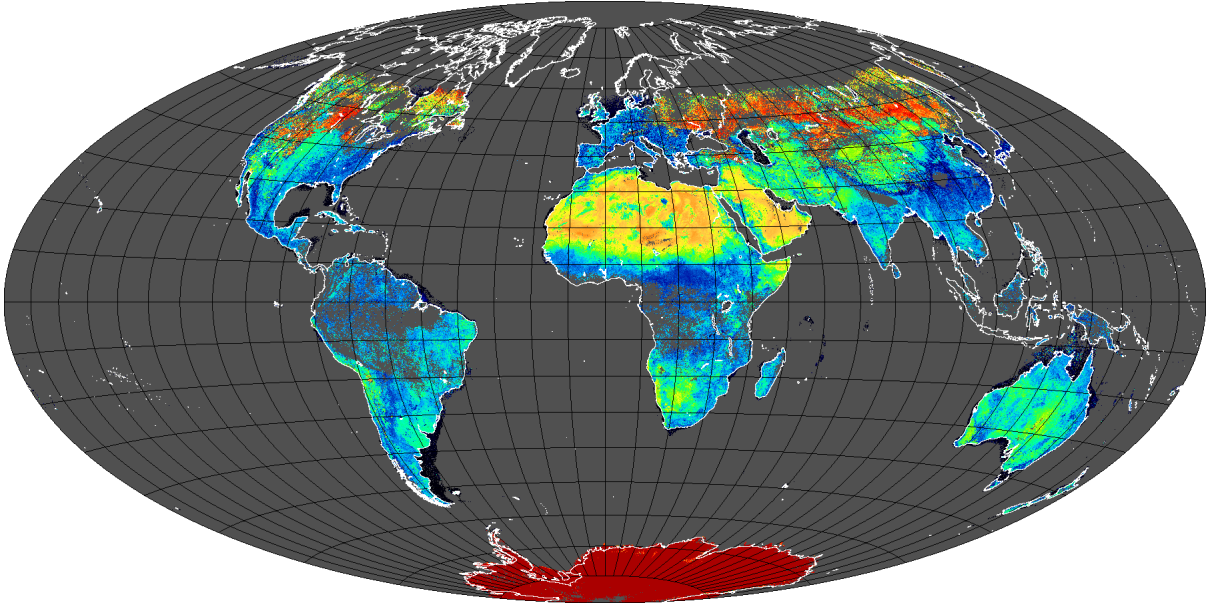
OPS

Global browse of Albedo_WSA_shortwave (MCD43A3)

NRT

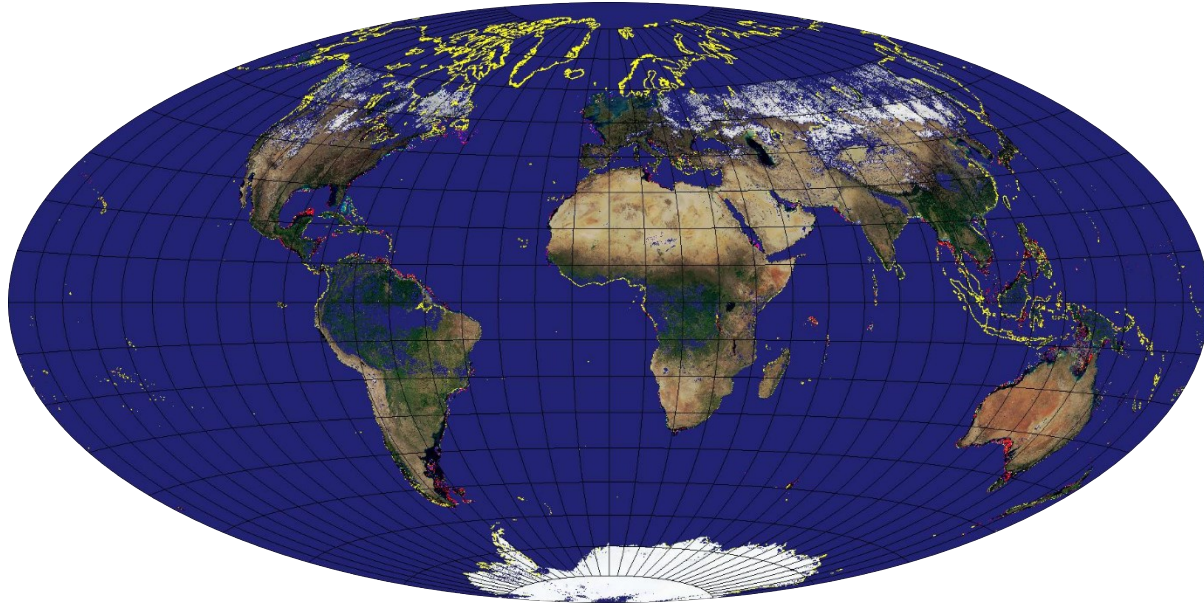


C6

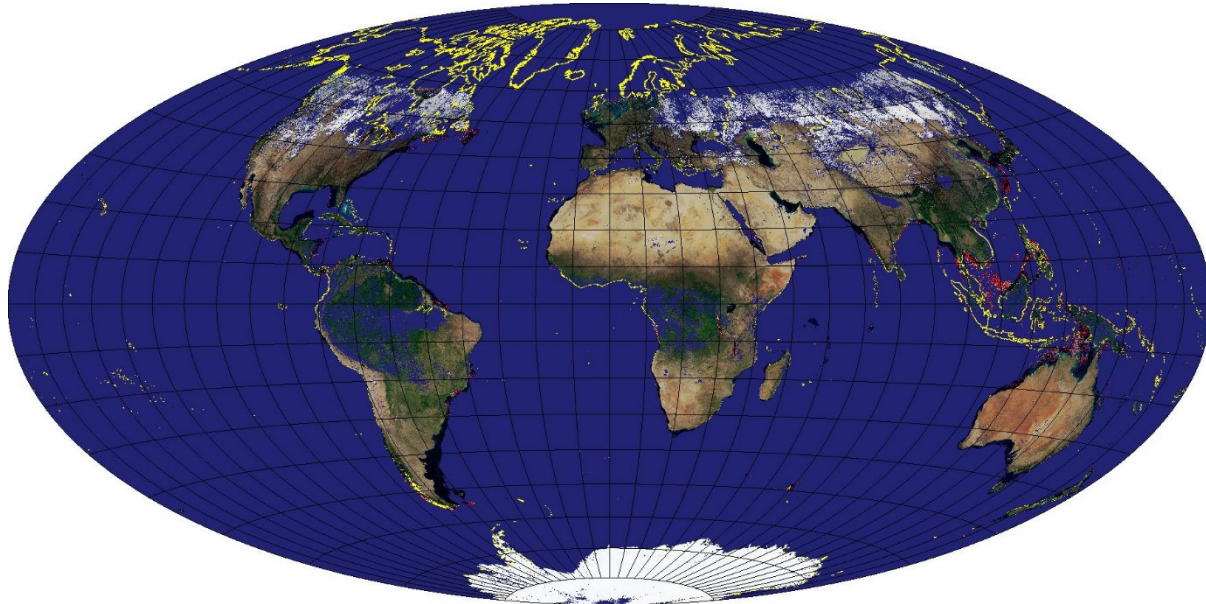


Global browse of NBAR: RGB Composite of bands 1,3, and 4 (MCD43A3)

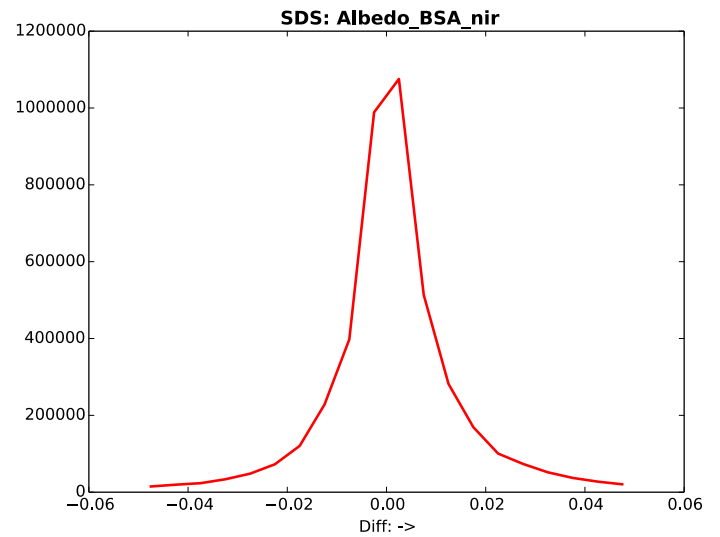
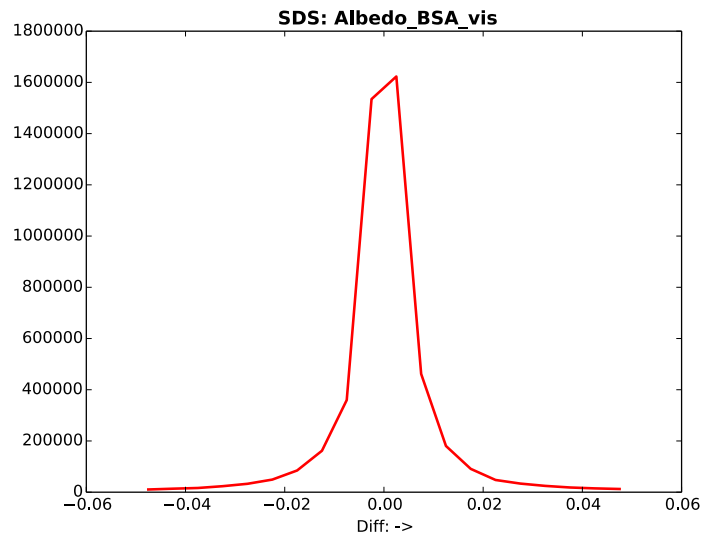
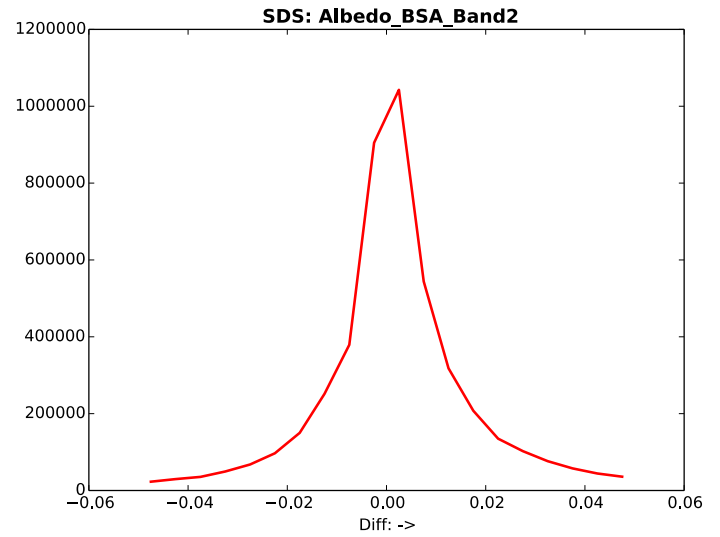
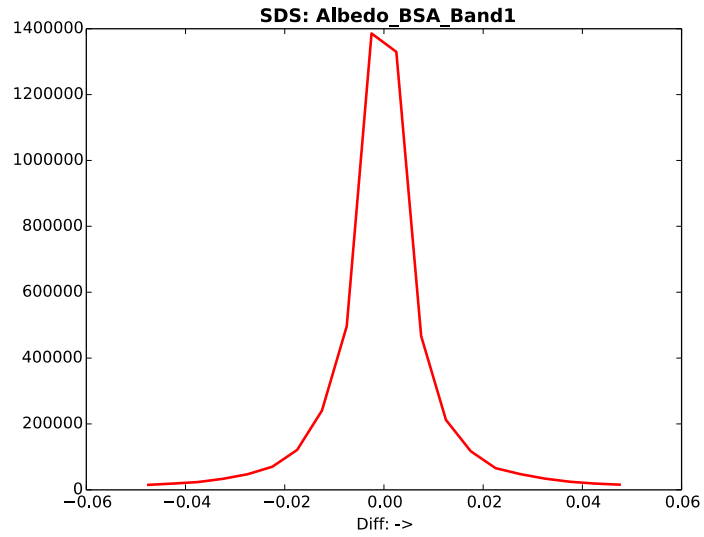
NRT



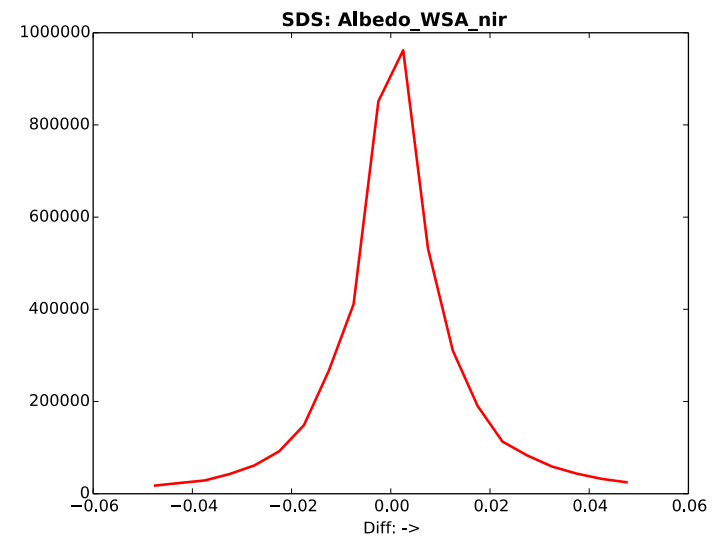
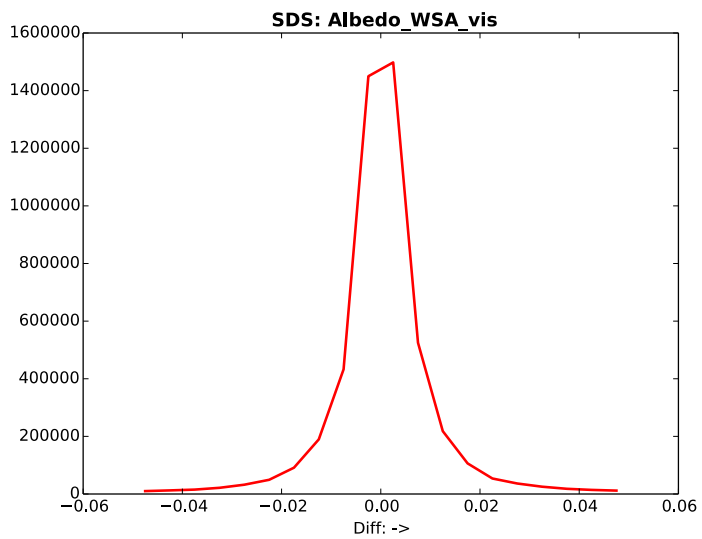
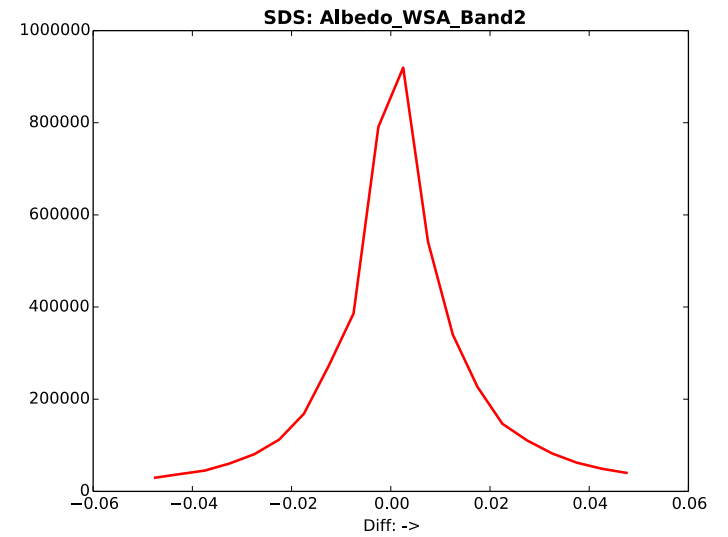
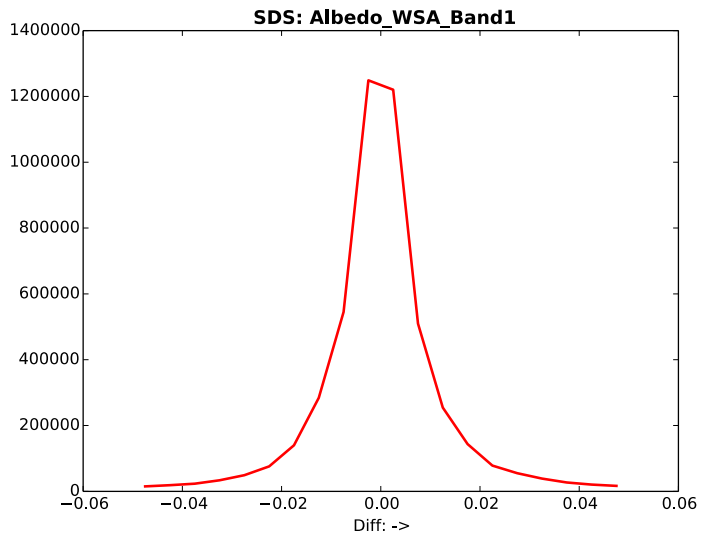
C6



MCD43A3 NRT-C6 Diff.



MCD43A3 NRT-C6 Diff.



MCD43A4 NRT-C6 Diff.

