

Collection 005 Change Summary

for MODIS BRDF/Albedo (MCD43) Algorithms

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Summary:

- 1) Input: Changed from 1km MODAGAGG files to L2G 500m files
- 2) Output: Changed primary output spatial resolution from 1km to 500m
- 3) Output: 3D/4D SDS output layers have been simplified to 3D/2D structure.
- 4) Output: Second BRDF model was removed
- 5) Output: A simplified QA scheme is used
- 6) Output: All output SDSs are internally compressed
- 7) Algorithm: Obscov weighted mean of observations is used in retrieval
- 8) Algorithm: Local solar noon was changed to the actual number in degrees
- 9) Algorithm: Solar zenith angle for NBAR was changed from mean solar zenith angle to the solar angle at local solar noon time

1) Input: Changed from 1km MODAGAGG files to L2G 500m files

The major difference between collection 5 and collection 4 of MODIS BRDF/Albedo products is that collection 5 produces not only 1km product, which collection 4 produces, but also 500m product. Therefore, the required inputs are changed from 1km MODAGAGG to L2G 500m surface reflectance (MOD09GHK), 1km angles file (MODMGGAD), 1km state file (MOD09GST) and 500m pointer file (MODPTHKM).

2) Output: Changed primary output spatial resolution from 1km to 500m

The primary output spatial resolution is changed from 1km to 500m in collection 5. The following name conventions are used to reflect changes:

MCD43Ax: 500m products

MCD43Bx: 1km products

where x: 1=BRDF/Albedo model parameters, 2=BRDF/Albedo quality, 3=Albedo (both black-sky albedo and white-sky albedo), and 4=NBAR (Nadir BRDF Adjusted Reflectance). Product using observations from Terra alone is no longer produced.

3) Output: 3D/4D SDS output layers have been simplified to 3D/2D structure.

All 3D/4D output layers have been simplified to 3D/2D structure to make the reading easier. BIP format is used for 3D structure data.

4) Output: Second BRDF model was removed

The second BRDF model parameters, which are originally stored in MOD43B2, are no longer produced. Instead, the BRDF inversion qualities are stored in this file (MCD43A2 for 500m quality and MCD43B2 for 1km quality). All other output files (BRDF parameters, albedo and NBAR) do not include BRDF/Albedo inversion quality as separate QA layers any more.

5) Output: A simplified QA scheme is used

In collection 4, 13 QA values (0-11 and 15) is used to specify the band retrieval quality while, in collection 5, only 5 band QA values are used:

- 0 = best quality, full inversion
- 1 = good quality, full inversion
- 2 = magnitude inversion (number of observations > 7)
- 3 = magnitude inversion (number of observations ≥ 3 & < 7)
- 4 = fill value

6) Output: All the output SDSs are internally compressed

All the output SDSs are internally chunked and compressed using gzip deflate.

7) Algorithm: Obscov weighted mean of observations are used for inversion

The observation coverage (Obscov) weighted mean of observations from the same orbit is used in the retrieval. For each day, observations from up to 4 orbits from one satellite (either Terra or Aqua) can be used in the retrieval.

8) Algorithm: Local solar noon was changed to the actual number in degrees

Local solar noon in QA was changed from 5-degree steps to actual numbers in degree.

9) Algorithm: Solar zenith angle for NBAR was changed from mean solar zenith angle to the solar angle at local solar noon time

Solar zenith angle for NBAR is changed from mean solar zenith angle to the solar angle at local solar noon time.