

# C6 updates to Level-3 & Joint Level-2 (and netCDF cloud subsets)



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## C6 Updates to Level-3

# Collection 006 Summary Documents

[http://modis-atmos.gsfc.nasa.gov/products\\_c6update.html](http://modis-atmos.gsfc.nasa.gov/products_c6update.html)

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  - Aerosol (04\_L2) (v28, 04/08/2011) [View PDF] [View DOC]
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  - Global (08) - Summary (v28, 01/21/2011) [View PDF] [View DOC]

A left-hand sidebar contains a menu with the following items: PRODUCTS, OVERVIEW, AVAILABILITY CALENDAR, COLLECTION 006 (highlighted), COLLECTION 001, COLLECTION 005, ACQUISITION, KNOWN PROBLEMS, HDF FILENAMES, and FLOW DIAGRAM.

# Two Problems noted in Standard Level-3: Limitations originate in the Daily (D3) then propagate to E3 & M3

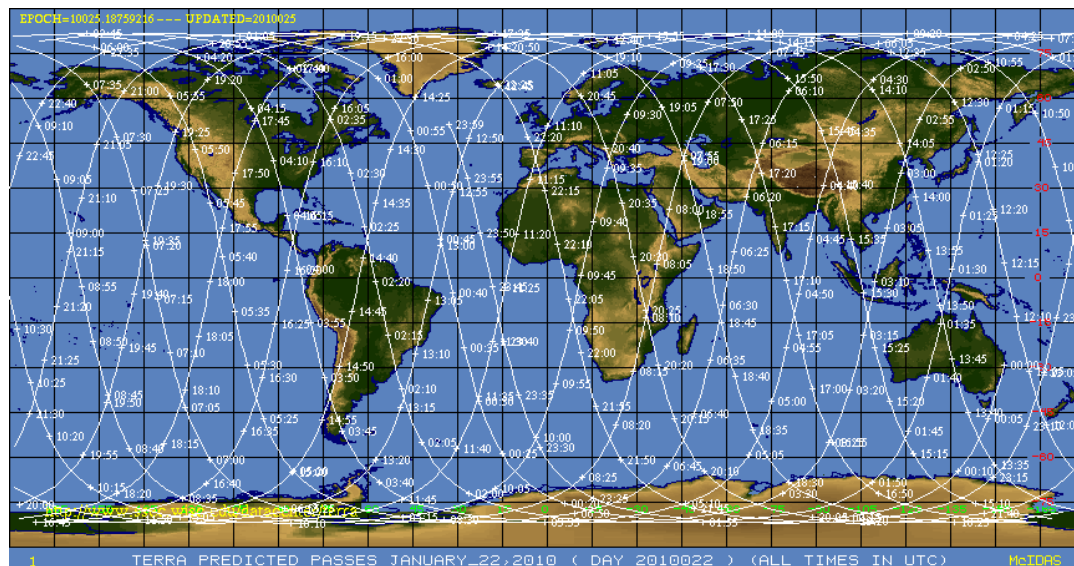
## Problem #1. Data from overlapping orbits are averaged

snapshot vs. multi-hour average (a latitude dependent issue)

issue around the International Date Line (avg. 2 orbits, 24 hrs. apart)

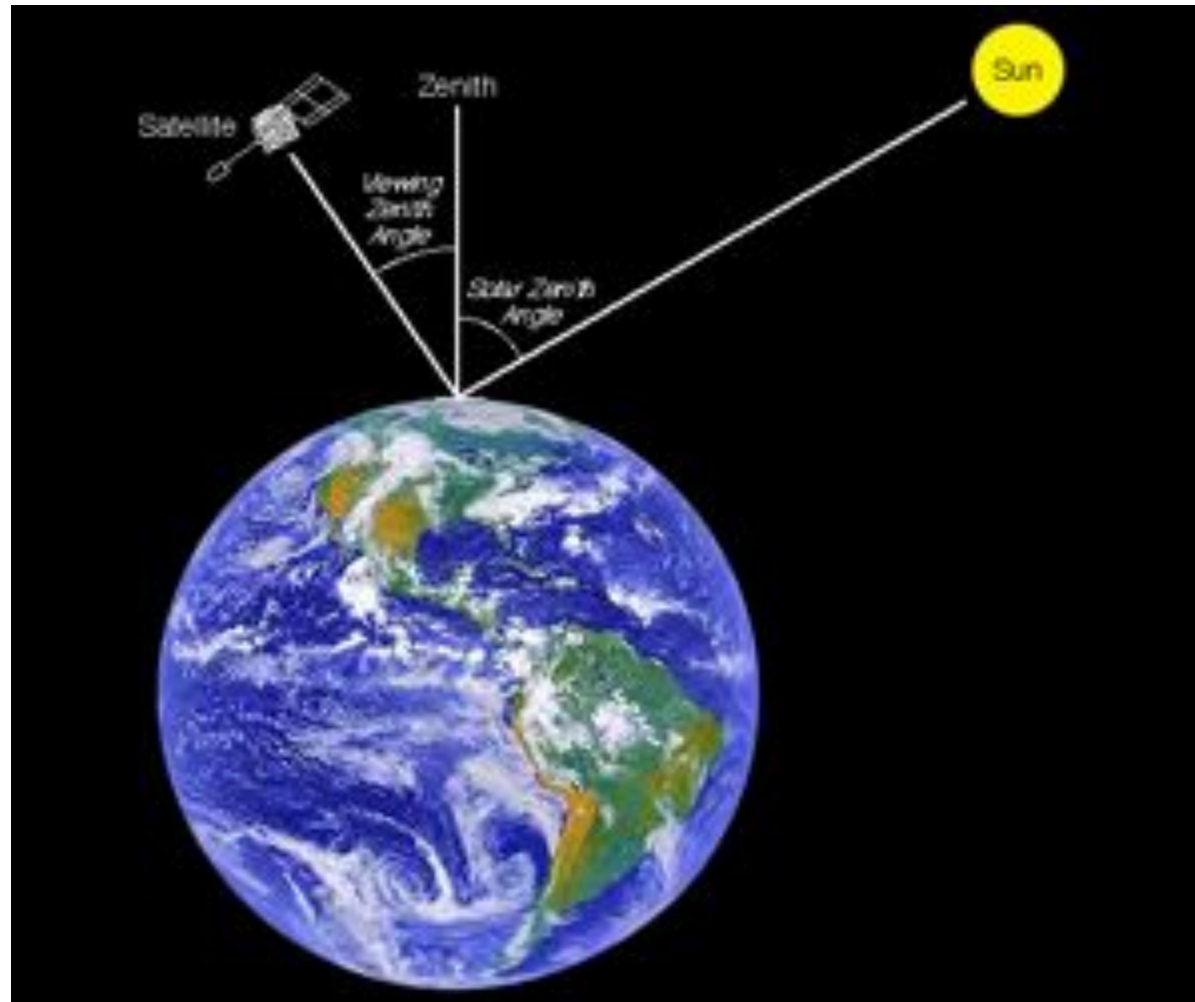
## Problem # 2. Data “Day” was defined as 00:00 to 23:59:59 UTC

causes data verification issues near the Date Line

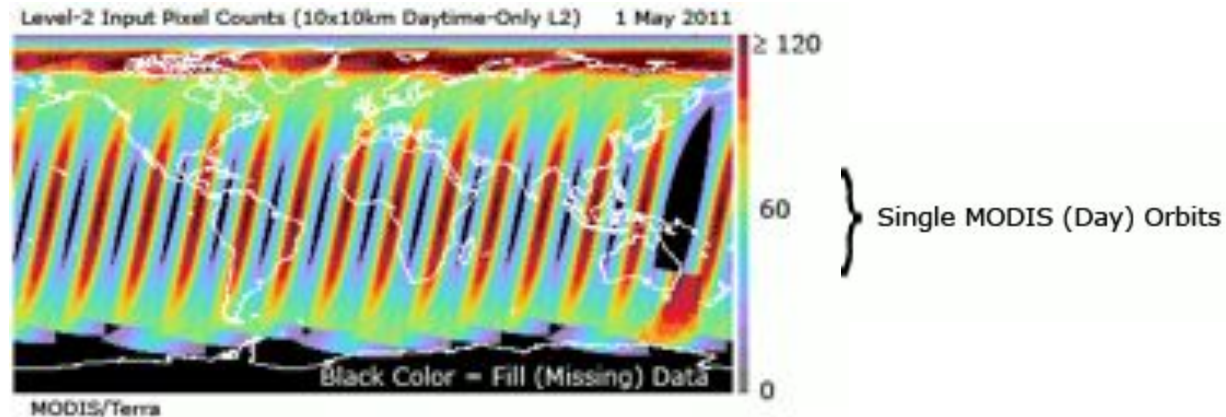


# Solve Prob #1: Make L3 a Snapshot in Time

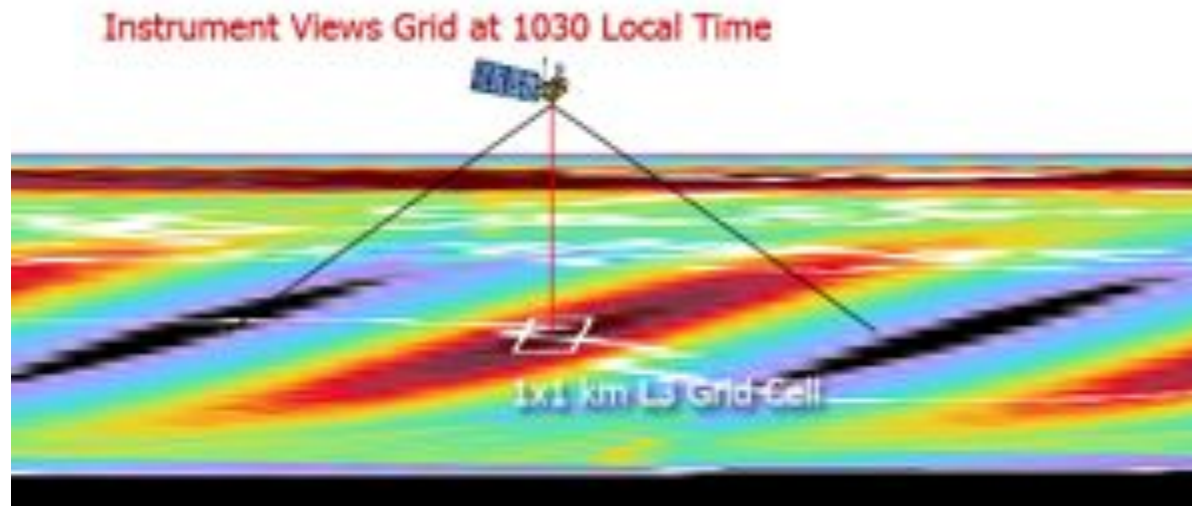
Goal: For each 1x1 deg. L3 Grid Cell, use only the L2 Granule that contains data with the most nadir view



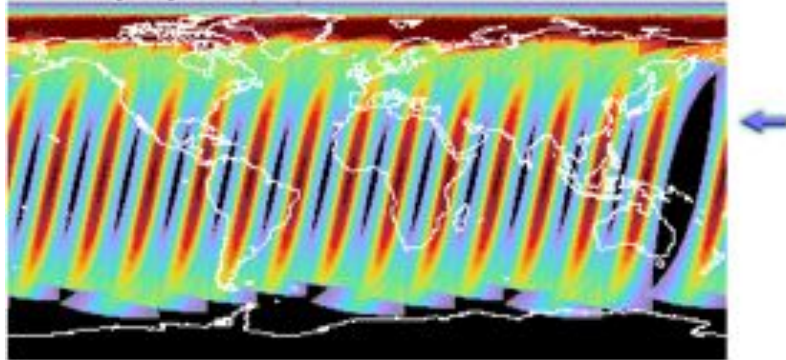
## Pixel Count Image for a Daytime SDS:



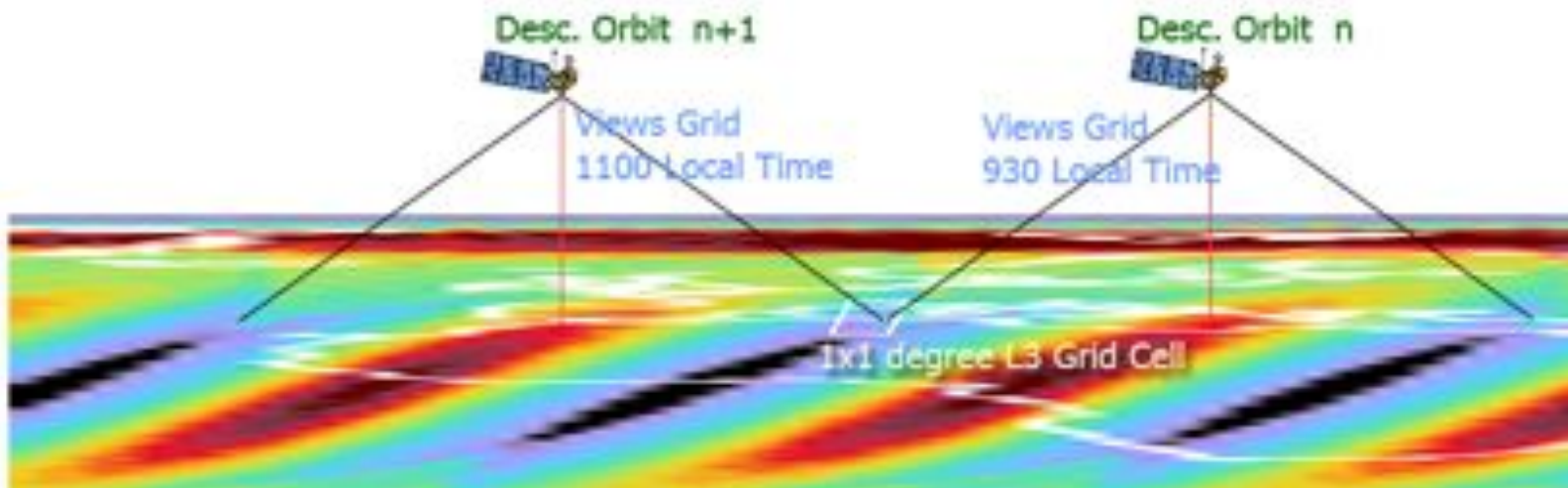
For a L3 Daily 1x1° grid cell between 30N – 30S there is only 1 view of grid per node (asc/dsc) in D3



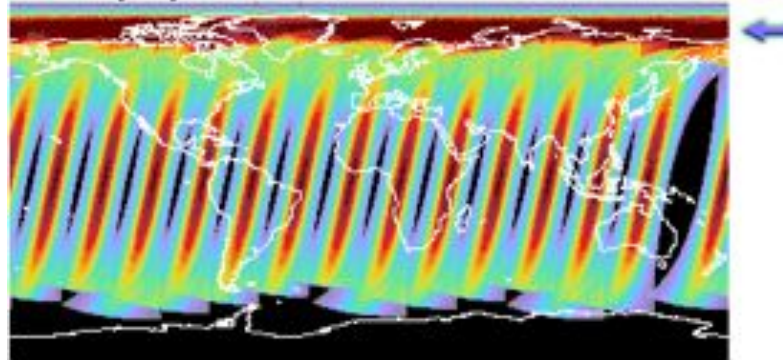
Consider a  $1 \times 1^\circ$  L3 grid cell around 45N



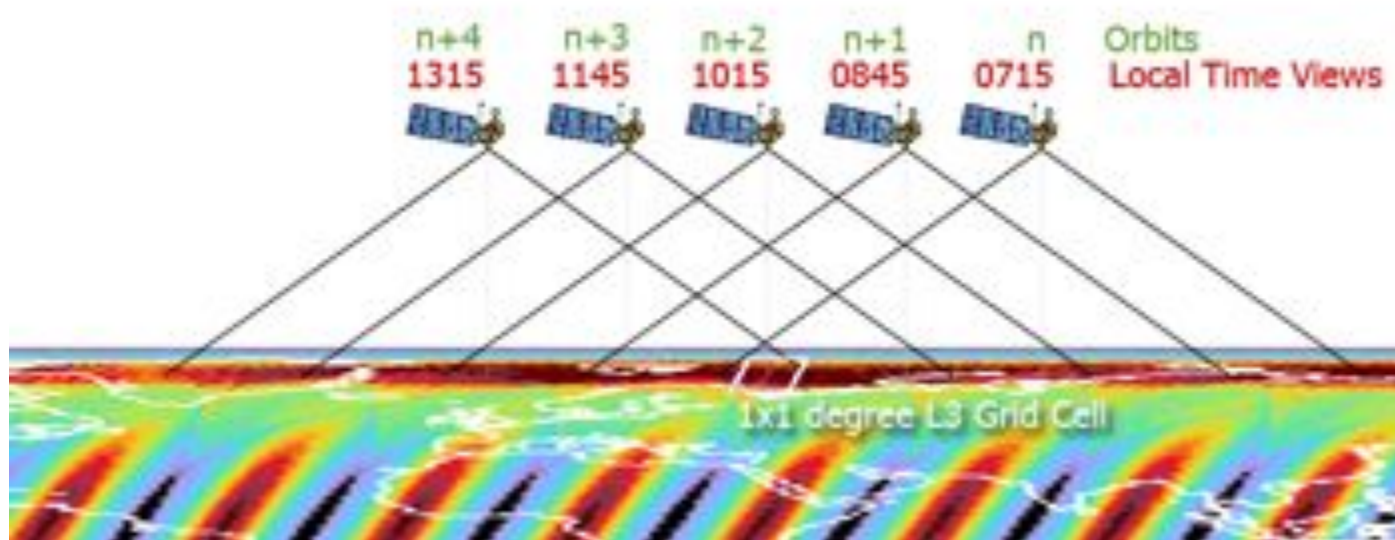
Now there are 2 views of grid per node (asc/dsc)



Consider a  $1 \times 1^\circ$  L3 grid cell around 80N



Now there are many views of grid per node





## Most Nadir View Modification

### Pros:

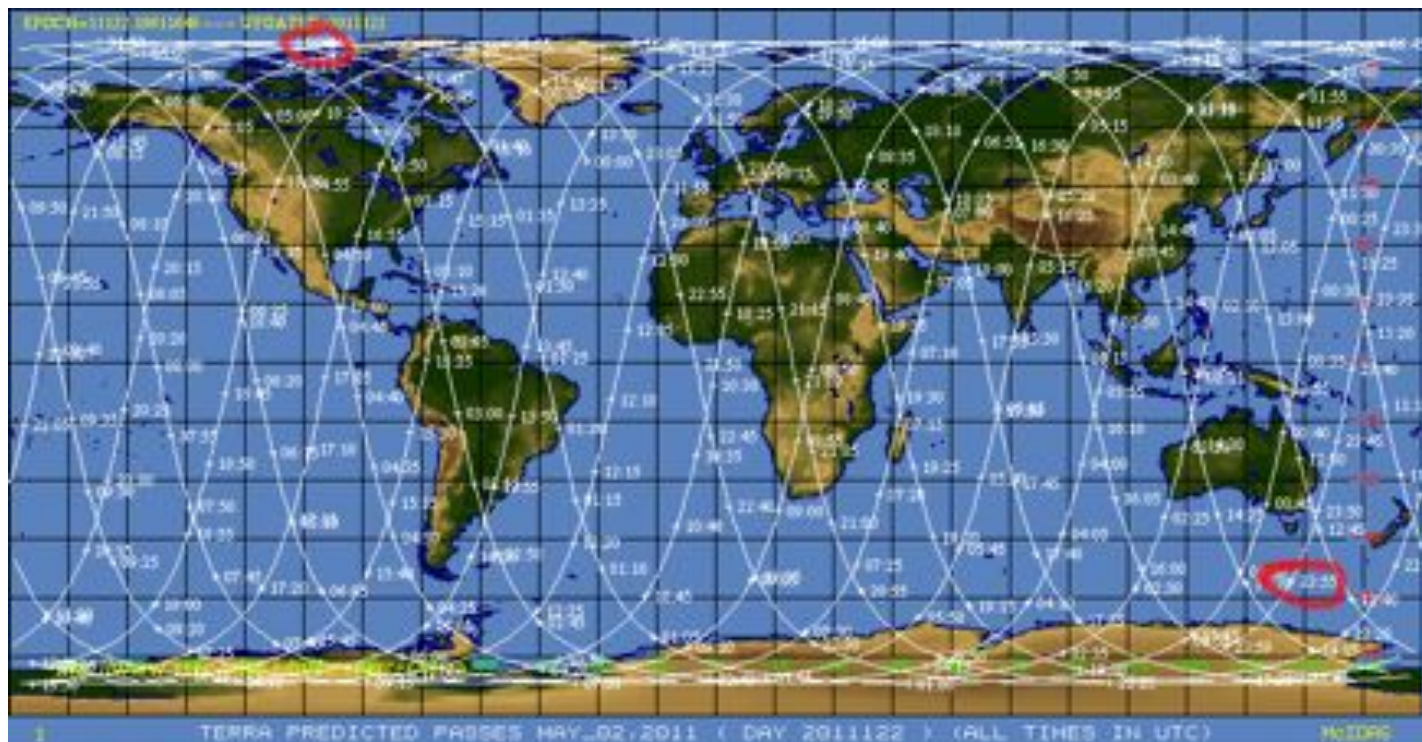
- **More Straight-Forward Validation:** L3 Daily Products are converted from a multi-hour average ... to a snapshot of data closer to a nominal local solar overpass time (1030 Terra, 1330 Aqua for day)
- **More Reliable Data:** Oblique View Angle data is thrown out when a more Nadir view is available. Nadir view data is generally believed to be more reliable.

### Cons:

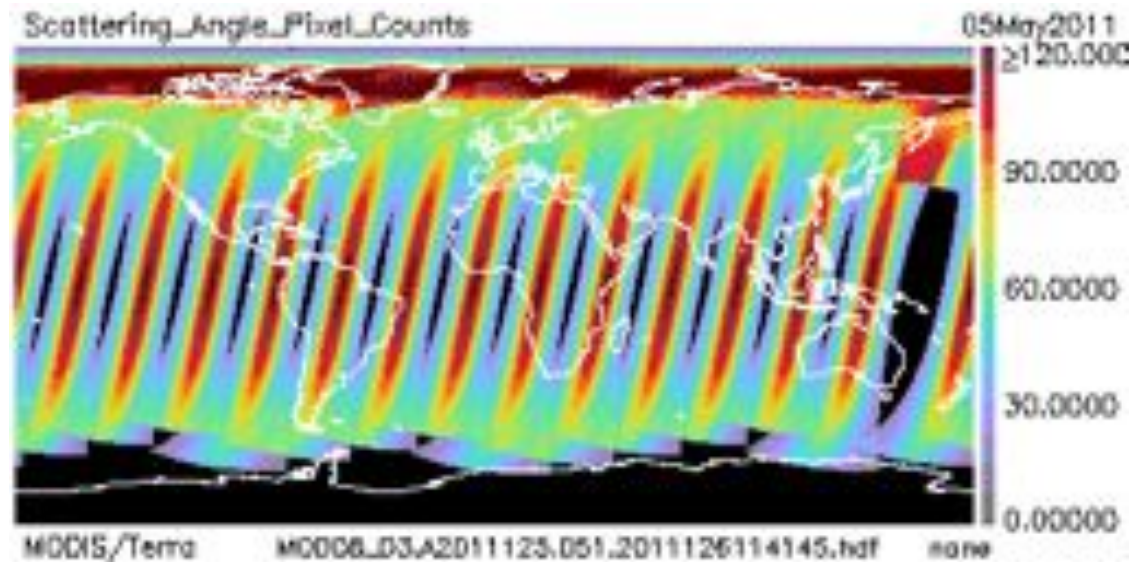
- **More Missing Data Cells:** In data sparse regions, L3 Daily may show more missing data grid cells with new logic. Fewer chances to get a valid data point to populate (“turn on”) a L3 grid cell
- **Less L2 Data Used:** Reduced L2 pixel counts will be noticeable in L3 (subsampling already throws out some L2 data).

## Solve Prob #2: Change “Day” definition from UTC to Local Solar Day

**Goal:** For each input L2 pixel, compute the local solar day/time and use the local solar day boundary for defining a “day”



## Solve Prob #2: Change “Day” definition from UTC to Local Solar Day



UTC “Day” problem is clearly visible in browse.  
Note these 5 consecutive D3 browse images.

## Local Solar Day Modification

### Pros:

- **Fixes verification issue near Date Line (removes averaged data nearly 24 hours apart)**
- **Eliminates missing data gaps near Date Line on alternate days**

### Cons:

- **Need to attach and read more granules in the L3 Tile runs**  
(computation of local solar day & time for every L2 pixel)  
leading to **slower run times**
- **Need to be alert when making comparisons of C051 (or earlier) with C006. Some of the before/after change would be due to these L3 code changes – so mindful implementation must be made in the MODAPS testing environment.**



# C6 Updates to Joint Level-2 (MODATML2)

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# Action Item for L2 Development Teams

## Review content of ATML2 for SDS and QA Flag updates

C051 ATML2 Content: [modis-atmos.gsfc.nasa.gov/JOINT/format.html](http://modis-atmos.gsfc.nasa.gov/JOINT/format.html)

C051 QA Plan: [modis-atmos.gsfc.nasa.gov/reference\\_atbd.html](http://modis-atmos.gsfc.nasa.gov/reference_atbd.html)

Current C006 Plan: [modis-atmos.gsfc.nasa.gov/products\\_c6update.html](http://modis-atmos.gsfc.nasa.gov/products_c6update.html)



The screenshot displays the MODIS Atmosphere website interface. The main content area is titled 'Format & Content' and 'SDS Parameter List'. It features a section for '5-km Resolution Parameters' with a sub-section for '5-km Geolocation'. This section lists three parameters: Latitude, Longitude, and Precipitable\_Water\_Near\_Infrared\_Clear. Each parameter entry includes a description, source product, array type, dimensions, resolution, and notes. The Latitude and Longitude entries specify that source data are repacked as Integer\*2 with a precision of 1/1000th of a degree. The Precipitable\_Water\_Near\_Infrared\_Clear entry notes that source data at 1-km is subsampled at 5-km and that QA flag values of 0 and 3 are used to pass data through to the array. The website also includes a navigation menu at the top and a sidebar on the left with various links like 'Introduction', 'Format & Content', 'Grids & Mapping', etc.



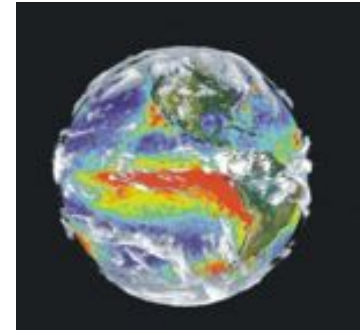
# NetCDF Cloud Subsets



## netCDF Cloud Subsets for Climate Modelers

Q: What are these files?

A: A subset of MODIS Monthly L3 (08\_M3) files geared for climate modelers



Q: Why netCDF?

A: A particular form of netCDF with so called “CF” or “climate & forecast” metadata is the defacto standard for distributing model output.

Q: Where can I get these files?

A: [ftp://ladsweb.nascom.nasa.gov/NetCDF/L3\\_Monthly/](ftp://ladsweb.nascom.nasa.gov/NetCDF/L3_Monthly/)

Q: What are the different file versions?

A: V01 = Mixed C005 and C051

V02 = Rerun using all C051

Q: Filename naming convention?

A: M[OYCY]D08\_M3\_NC.2000.03.C051.V02.nc

for V02 files we added a collection field

Q: What's different between these files and MOD08\_M3 files?

A: Combined instrument files are available (combined instrument SDS's were PC weighted). Also some additional post-processed SDS's were added (high, middle, low cloud fractions from 06 & 35)

Questions on these netCDF files?

Contact Robert Pincus [robert.pincus@noaa.gov](mailto:robert.pincus@noaa.gov)



Questions/Comments on L3 or Joint L2?  
[Paul.A.Hubanks@nasa.gov](mailto:Paul.A.Hubanks@nasa.gov)