CLAAS4: Top-Of-Atmosphere (TOA) INPUT DATA: update2

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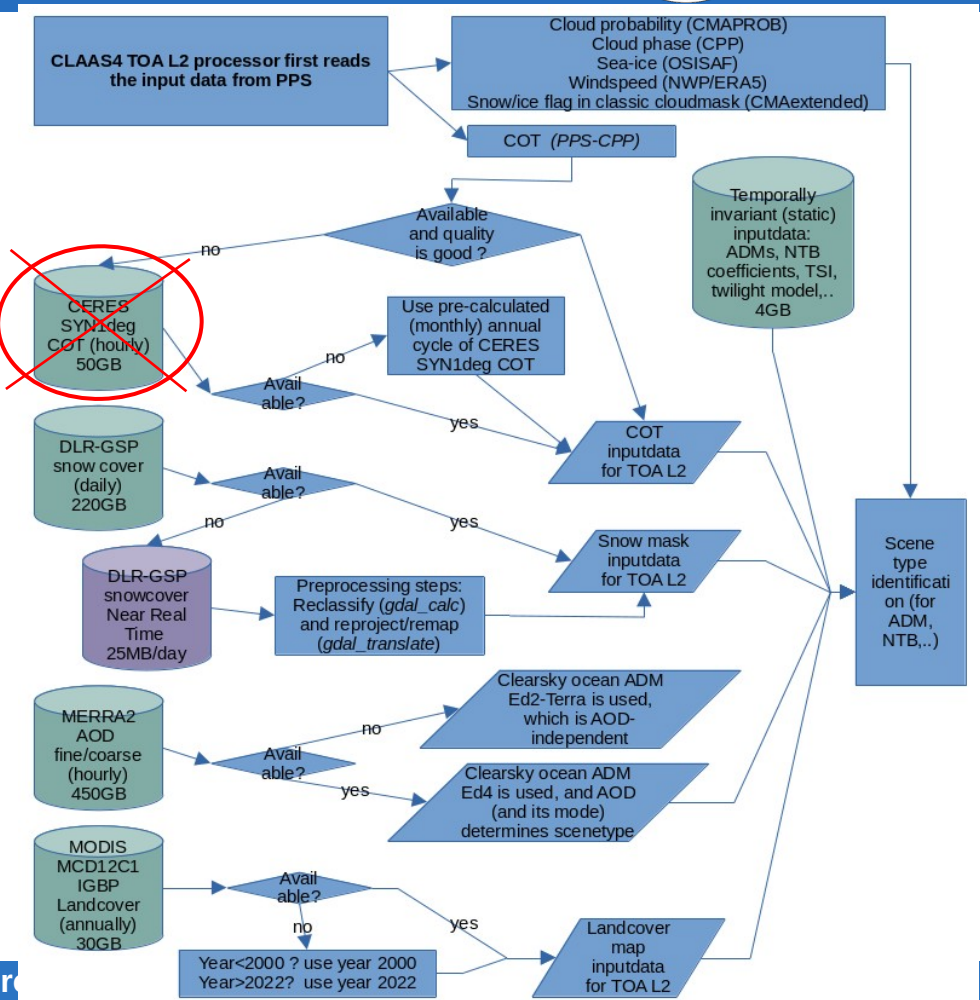
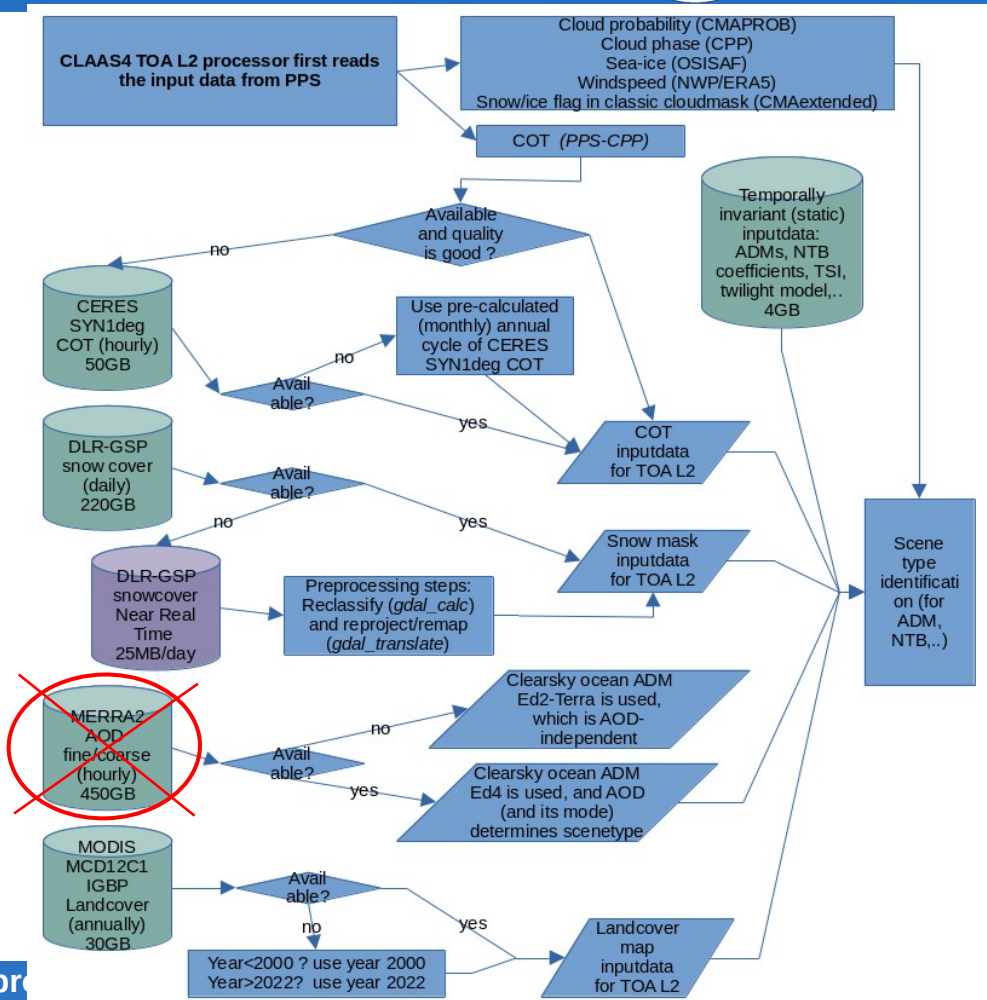
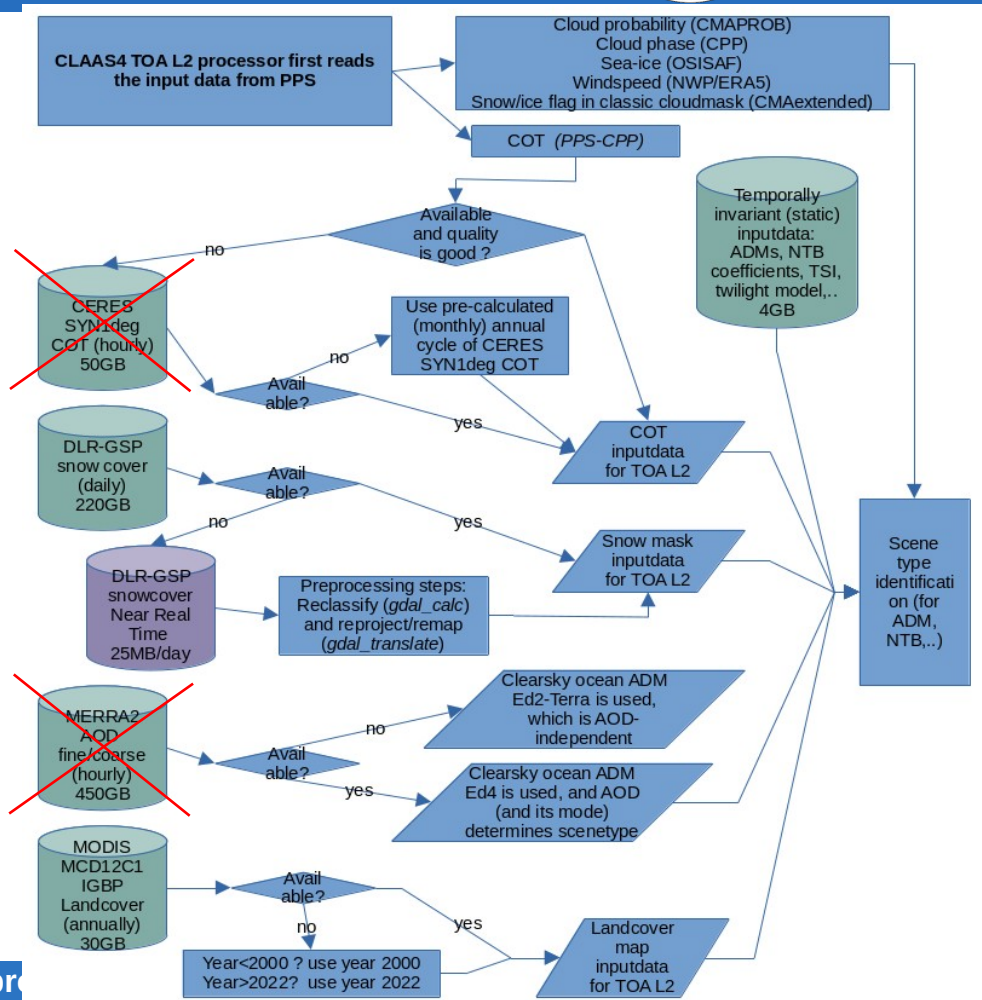
- **Cloud Optical Thickness:**
  - If CLAAS4 COT is not realistic/available
  - Product: Hourly CERES SYN1deg 1°x1°
  - Total file size: 50GB
  - Why using it?
    - *There is no good alternative: we *need* a COT value for clouds, ANY value, really (reason: scene type identification for ADMs). But it should be a realistic value for that time and place, even if it is not the actual or correct value. The climatology does not fullfill that need.*
  - Why not using it?
    - *Not available in Near-Real-Time (NRT), so the ICDR would still use the 12-month climatology*
    - *Extra dependency on external data record is to be avoided if possible*
  - *Alternatives:* ***[this is chosen]***
    - *Climatology of 12 months CERES COT 1°x1° (as used in CLARA-A3)*
    - *Assume constant COT=0.75 in sunglint over ocean*



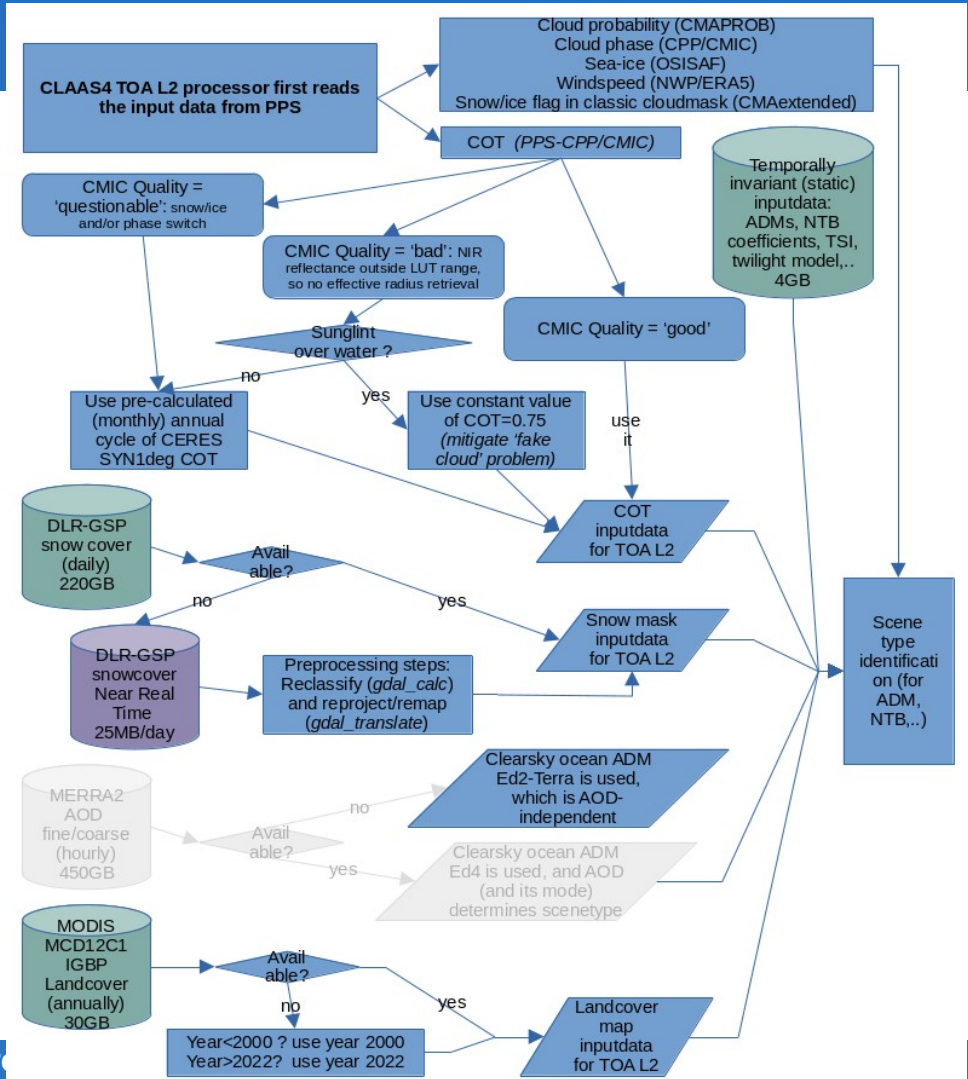
- **Aerosol Optical Depth + AOD mode:**
  - Product: MERRA2 hourly reanalysis 0.5°x0.625°
  - Total file size: 450GB
  - Why using it?
    - *Reliable scene type identification of AOD and its mode (coarse vs fine), needed for clearsky ocean Ed4 ADMs*
    - *These are the newest available, state-of-the-art ADMs, this is an argument which will help to "sell" the product (PR) and keep it competitive and future-proof (at least, on paper).*
    - *Not using it would raise questions with reviewers and users*
  - Why not using it?
    - *Large effort and external dependency for relatively small gain in performance with respect to the AOD-independent Ed2/Terra ADMs (see next slide)*
    - *Not available in Near-Real-Time (NRT), so the ICDR would not make use of it and fall back to the AOD-independent Ed2/Terra clearsky ocean ADMs (but then again, this would not come with a big decreasing jump in quality/performance)*
    - *Extra dependency on external data record is to be avoided if possible*
  - *Alternatives?*
    - *Yes, it would be possible to altogether eliminate the use of MERRA2 AOD by entirely replacing the Ed4 ADMs for clearsky ocean by the AOD-independent Ed2/Terra ADMs **[this is chosen]***




CLAAS4 TOA L2 processor first reads the input data from PPS
Cloud probability (CMAPROB)
Cloud phase (CPP)
Sea-ice (OSISAF)
Windspeed (NWP/ERA5)
Snow/ice flag in classic cloudmask (CMAextended)
COT (PPS-CPP)
Temporally invariant (static) inputdata: ADMs, NTB coefficients, TSI, twilight model,.. 4GB
Available and quality is good ?
no
CERES SYN1deg COT (hourly) 50GB
Use pre-calculated (monthly) annual cycle of CERES SYN1deg COT
no
Avail able?
yes
COT inputdata for TOA L2
DLR-GSP snow cover (daily) 220GB
Avail able?
no
yes
DLR-GSP snowcover Near Real Time 25MB/day
Preprocessing steps: Reclassify (gdal_calc) and reproject/remap (gdal_translate)
Snow mask inputdata for TOA L2
Scene type identificati on (for ADM, NTB,..)
MERRA2 AOD fine/coarse (hourly) 450GB
Avail able?
no
Clearsky ocean ADM Ed2-Terra is used, which is AOD-independent
yes
Clearsky ocean ADM Ed4 is used, and AOD (and its mode) determines scenetype
MODIS MCD12C1 IGBP Landcover (annually) 30GB
Avail able?
no
yes
Year<2000 ? use year 2000
Year>2022? use year 2022
Landcover map inputdata for TOA L2

- Eliminated use of MERRA2 reanalysis
  - No large impact on perfomance

- Eliminated use of CERES Hourly COT
  - But still mitigated the ‘fake cloud’ problem by imposing COT=0.75 in sun glint conditions (over ocean) when CMIC COT quality = bad



EUMETSAT CM SAF

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Thanks for your attention!

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RSS Remote Sensing from Space group