



MODAPS: Forward Processing, Reprocessing and Data Distribution

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Forward Processing Status



- **Forward processing is typically 1-2 days behind real time**
 - **C5 L1B, C5 Land, and C51 Atmosphere**
 - **C4.1 LST (C4 LST algorithm with C5 L1 input) is being processed for the duration of the C5**
 - **C6 Cloud Mask and Atmospheric Profile**
 - **Maneuver days could be delayed because of the need for an offline processing to facilitate review of data by LDOPE for geolocation error from loss of pointing accuracy.**
- **C5x Land Reprocessing**
 - **Completed C51 processing of Land Cover (MCD12Q1) and Burned Area (MCD45A1) for the mission period through 2012. Products released to public.**
 - **Reprocessing of C51 VCF (MOD44B) in progress – product under review by the Science Team.**
 - **C55 version of GPP/PSNnet (MOD17A2) generated from improved version of the product generated at the SCF.**
- **Land (except for snow and sea-ice) and Atmosphere products available from LAADS archive.**



C6 L1B Reprocessing Status



- **L1 (MxD02), Geolocation (MxD03) and L1B (MxD02QKM, MxD02HKM, MxD1KM)**
 - **Reprocessing of Terra and Aqua completed in 2012, and forward processing in progress.**
 - **Products from both collections available to public from LAADS archive.**
 - **C5 forward processing of Terra and Aqua is expected to continue for an year after completion of C6 land and atmosphere reprocessing.**
- **C6 L1B with polarization correction (MxD02PCQKM, MxD02PCHKM, MxD021KM)**
 - **Terra MODIS products impacted by increasing polarization sensitivity since launch – visible artifact in product since 2007.**
 - **Correction applied to TOA radiances and is not part of L1B calibration. Corrected products generated from post processing of operational C6 L1B products.**
 - **To be generated as an intermediate product for use in C6 Land reprocessing.**



Collection 6 Atmosphere Reprocessing Status



- **L2 Cloud Mask and Atmospheric profile**
 - **Reprocessing of Terra and Aqua started with the reprocessing of C6 L1B and is currently at the leading edge of forward processing**
 - **Products for the entire mission period available to public since early 2013.**
- **L2 Cloud and Aerosol products**
 - **Reprocessing of products from Aqua started on 12-06-2013 and products released to public on 01-10-2014.**
 - **Processing completed for the mission period 2002185 – 2013177.**
 - **Reprocessing of Terra is expected to start after completion of the Aqua.**
- **L3 products**
 - **Current reprocessed products are released as beta version**
 - **Final C6 version are currently under development and testing.**



C6 Land Reprocessing Plan



- **Land Reprocessing will include two tiers of processing with first tier of processing currently projected to start in June/July 2014.**
 - **First tier of reprocessing will generate most of L2/L2G and L3 products – suite of LSR (MxD09), Fire(MxD14), Snow(MxD10), sea-ice(MxD29), LST(MxD11), VI(MxD13), LAI/FPAR (MxD15), GPP/PSNnet (MxD17) and BRDF/Albedo (MCD43)**
 - **Second tier of reprocessing will generate new land products – MAIAC (MOD19), Simon’s LST (MOD21), Evapotranspiration (MOD16) and other L3/L4 products like Burned Area (MCD45A1), VCF (MOD44B), LC (MCD12Q1 and MCD12Q2).**
- **Reprocessing will start from the beginning of Terra mission, and will include Aqua and Combined processing when the processing reaches beginning of Aqua mission in 2002.**
- **At 30x processing rate the first tier of reprocessing could take 8-12 months to complete reprocessing of entire mission.**
- **Initial 2-3 months of first tier of reprocessing will generate the needed C6 input data for the final development and testing of the PGEs in the second tier.**
- **MODAPS is ready to process the second tier products as C6 algorithms become available.**
- **C6 products will be released to public after review of data from the initial period of reprocessing by the science team (~ 3 months after start of reprocessing).**
- **C5 land reprocessing is will continue for a year after completion of the C6 reprocessing and data products from both version will be available to public during this period.**



C6 Land Algorithm Change Testing Status



- **Evaluation of C6 algorithm changes to the first tier of products is nearly complete**
 - Algorithm changes delivered by the science teams and some developed in-house at LDOPE
 - Science tests planned by LDOPE working with the science teams.
 - Product specific science tests and Chain tests of downstream run at MODAPS.
 - Test products evaluated by LDOPE and science team.
 - More details available on poster “C6 Land Algorithm Change Testing and Reprocessing Status” and at url http://landweb.nascom.nasa.gov/cgi-bin/QA_WWW/newPage.cgi?fileName=sciTestMenu_C6
- **Development and testing of some of the tier 2 products is in progress (MxD19, MxD21, MxD16) and other products is being planned working with science teams.**
- **Land Reprocessing will use the L1B product with polarization correction applied to Terra and Aqua bands (in testing at MODAPS)**
 - Anomaly in the form of striping noticed in global browse images of C5 MODIS Terra Daily L2 Land Surface Reflectance on the right edge of swath – from error in RVS correction and mirror side polarization difference.
 - After the change the RVS correction approach for Terra in C6 L1B residuals present in C6 L1B from polarization sensitivity.
 - Land Science Team recommended using polarization correction for both Terra (time dependent) and Aqua (pre-launch) in C6 reprocessing.
 - Polarization Correction approach implemented as a post processing PGE generating the new L1B product with polarization correction applied to the input operational C6 L1B.
 - Polarization corrected L1B will be identical in format to the operational C6 L1B with selected bands (1, 2, 3, 4, 8, 9 and 10) updated with correction or gain change.

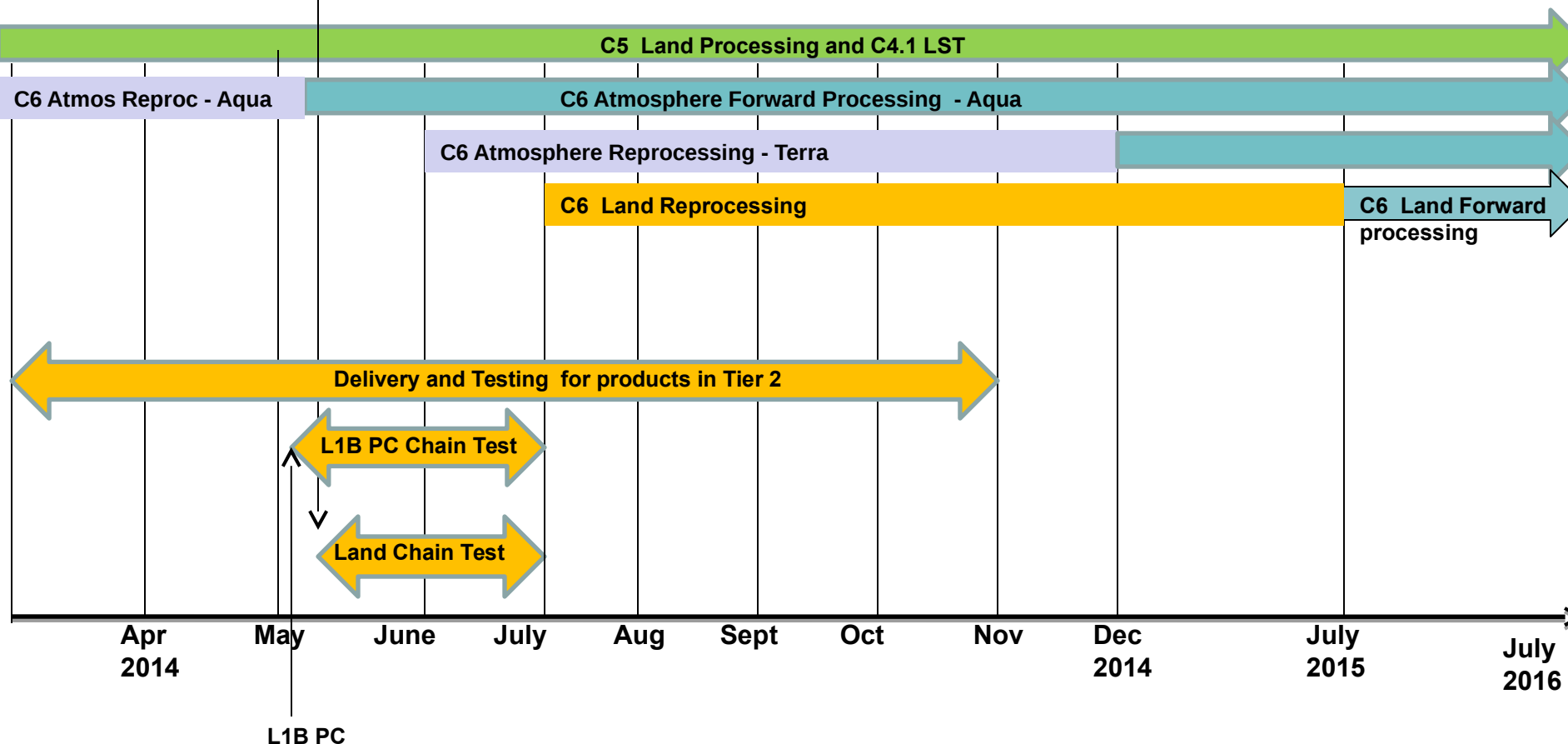


C6 Land and Atmosphere Testing and Reprocessing TimeLine



C6 Atmosphere Forward Processing – Terra

LSR LUT,
Snow PGE



L1B PC



Near Real Time Processing for LANCE MODIS – C5/C6



- **Products are being generated within 2 hours of data acquisition for most L2 products. Latency varies for L3 products.**
- **Current production uses NRT variation of operational C5 PGEs in production at MODAPS.**
- **C6 PGEs are currently being prepared for NRT and expected to be operational within 6 months after start of C6 reprocessing at MODAPS.**
- **C6 PGEs could be run in parallel with C5 version for 1 year to allow applications users time to transition – additional resources may be needed to meet the latency requirement and the needed redundancy (nrt1 and nrt2)**
- **Note on induction of new products in NRT**
 - **LANCE gets recommendations from the UWG to implement new LANCE products – could be a standard product running at MODAPS or sometimes a new product.**
 - **The LANCE team works with the MODAPS to implement the product in the LANCE framework.**
 - **For an existing product, the ST member is contacted by LANCE and/or the MODAPS and they work together on any needed modifications needed to make them LANCE/NRT compatible.**
 - **ST member participation (algorithm update and QA) appears to be voluntary.**
 - **Products are QA'd after the product id running at NRT (e.g. comparing against the standard product).**



Land PEATE



- **Operational Processing of VIIRS data**
 - **Products from processing of RDR using IDPS ops PGEs available in AS 3001.**
 - **Products from new science algorithm and science team improvement to IDPS algorithm available from AS 3002**
 - **Aggregation of IDPS data in AS 3000 downsized to 1-day in a week for regression testing of IDPS process in operation at Land PEATE (3001)**
- **C1.1 reprocessing of VIIRS started on 2/26/2014 beginning with data day 1/19/2012 in AS 3110**
 - **Reprocessing uses the calibration LUTs provided by the NASA VCST for the L1B SDR and uses the best of land algorithms available (LPEATE Adjusted variations of OPS PGEs and new science algorithms).**
 - **DNBs are processed using the LUT for calibration and stray light correction provided by the NASA VCST.**
 - **Cloud Mask uses the Climatology 16-day composite NDVI from the 4-years of Aqua MODIS observations and daily snow-ice from NISE data replacing the 17-day rolling tiles of NBAR-NDVI and the monthly snow-ice rolling tiles used in the operational process at IDPS.**
 - **LPEATE Science DDRs use the C5 version of the MODIS algorithms.**
 - **This reprocessing generates CERES subsetter and subsets of products requested by the science teams.**
 - **OPS L2 Land Albedo, Surface Albedo or GIPs are not generated in this reprocessing.**
 - **At the current production rate of 7x, reprocessing will be completed in June 2014.**



Global Image Browse System



- **GIBS project generates, archives and distributes browse images of products from many different instruments to meet the requirements of its clients**
 - **Not supposed to be used in scientific research.**
 - **An example client World View <https://earthdata.nasa.gov/labs/worldview/> needs high quality multi-resolution browse images to improve the browsing capability in data ordering.**
 - **GIBS is currently collecting requirements from clients with examples of specific use cases.**
- **MODAPS will generate the global and granule browse images for GIBS**
 - **Metadata to be included to facilitate archive and search**
 - **Final product list, map projection type, color LUT is currently being finalized.**
 - **Not tied to C6 reprocessing schedule**