Atmosphere Breakout

Objectives of the Session

Discussions topics focused on how to efficiently and effectively produce useful EOS-SNPP/JPSS continuity data products for science team investigators and the larger community.

Kevin Murphy

- <u>Orphaned but other support</u>: If continuity product can be supported by leveraging funding outside of TASNPP (Senior Review maintenance, MEaSUREs, etc.), and with HQ concurrence, SIPS is still tasked with production as long as PI can support product. Product would then be included in archive (i.e., LAADS for atmosphere products).
- <u>Orphaned and no support</u>: If product has no support, can keep product in production/archive but needs to come with a caveat statement for users that it is no longer supported. This can only continue until algorithm "breaks" (e.g., new production system).
- <u>New products</u>: Intend to support as schedules develops.

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Project summaries: 2-page slides collected from all Atmosphere Science team PIs. PIs with no oral presentation were reviewed in the breakout. Collection of the two slides will be distributed to Atmosphere Team.

Atmosphere SIPS Overview: Liam Gumley

- Delivery Schedule/Plans Update
- Production status of standard (cloud products, aerosol products, fusion) and orphaned products (Dark Target Aerosol, Water Vapor)
- Version Numbering, Example Products
- Software and Product Stewardship
- Reviewed web site and quick looks
- "Yori" Level-3 gridding toolkit developed by SIPS (more on this later)

Atmosphere Level 2/3 Products

Product Description	Product Short Names	Spatial resolution	Product PI	SIPS Production and Delivery to LAADS
Cloud Mask (day/night)	CLDMSK_L2_VIIRS_SNPP CLDMSK_L2_MODIS_AQUA	0.75 km 1.0 km	Ackerman /Holz	Completed May 2017
Deep Blue Aerosol (day)	AERDB_L2_VIIRS_SNPP AERDB_D3_VIIRS_SNPP AERDB_M3_VIIRS_SNPP	6.0 km 1.0 degree 1.0 degree	Hsu	Completed Oct 2018
Cloud Infrared and Optical ProperUes (day/night)	CLDPROP_L2_VIIRS_SNPP CLDPROP_D3_VIIRS_SNPP CLDPROP_M3_VIIRS_SNPP CLDPROP_L2_MODIS_AQUA CLDPROP_D3_MODIS_AQUA CLDPROP_M3_MODIS_AQUA	0.75 km 1.0 degree 1.0 degree 1.0 km 1.0 degree 1.0 degree	Platnick/ Heidinger	Expected Oct 2018

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Level-3 status

- Not explicitly proposed in TASNPP but not orphaned.
- "Yori" toolkit initially pursued for SIPS QA but evolved to support L3 infrastructure for product teams.
- Yori Configuration Files (aggregation rules and QA-filtering) are developed/responsibility of algorithm team.
- Currently being used for for CLDMSK and CLDPROP VIIRS and MODIS streams. Will provide MOD08-equivalent datasets including all scalar, 1D and 2D histograms (daily, monthly).
- AERDB has separate SeaWiFS-like L3 product (daily, monthly); results similar to MOD08.
- Working towards defining how/if users can tailor their own aggregation needs for their studies.
- MODIS-like L3 browse imager and web site not developed. Will investigate leveraging MODIS-Atmospheres browse scripts.
- Products can be displayed in WorldView

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Product Documentation and Publications (ATBD/User Guide discussion)

- Don't want to get hung up on names. Atmosphere team essentially combined ATBD/User Guide wanting to make documentation more comprehensive/useful for science users. Completed and continually updated for MODIS. Continuity product User Guides are written.
- Will work with MODIS /Vince to get links to User Guides and/or add ATBD to title as needed.
- Science team investigators asked to provide input on the documents.

Metrics for Demonstrating Product Continuity

- Discussion with science investigators. Answer depends on product usage. Current foci includes time series across large special regions, pixel-level intercomparisons (to extent possible), and other independent methods (e.g., ground-based networks)

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Relative Calibration between sensors (Discussion)

- Monitoring of adjustment factors. SIPS provides intersensor match files needed for calibration assessments. Algorithm teams analyze for appropriate scenes and retrieval-consistent forward radiative models.
- DB Aerosol (AERDB) and CLDMSK/CLDPROP use different VNIR/SWIR adjustment factors, but very close in most bands. How often do we need to change coefficients? How to keep science quality in forward stream?
  - SIPS reprocessing for assessing time-dependent adjustments
  - AERDB has time-dependent linear adjustment (Sayer et al., 2017)
- Adjustment factors reported in L2 product files? Provided in CLDPROP files. AERDB requested to do so in their next release.
- Need to add NOAA 20 (JPSS-1) to the calibration intercomparison infrastructure. How does SIPS continue to support calibration activities that need new satellites?

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Uncertainties associated with data products (how are we defining uncertainties and how is it tied to continuity)

- No single/simple answer or methodology (depends on part of state space, what datasets or combination of datasets are used). Approaches used by Atmosphere Algorithm developers includes:
  - Pixel-level for quantitative error sources that we understand (AERDB, cloud optical and top for CLDPROP have uncertainty datasets).
  - Statistical approaches based on independent measurement techniques that cover some aspects of a product suite: e.g., AERONET (near global) and other ground-based assets (typically not extensive), field campaigns, independent satellite assessment (CALIOP for cloud mask and cloud-top, etc.).
- L3 time/space aggregation uncertainties more complicated since error source correlation on time/space scales needs to be understood

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Other sensors (discussion requested by B. Baum)

Atmosphere team priority is working with new generation of GEO imagers (ABI, AHI), including Aerosol DT. All algorithms have been ported/tested.

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Thank you

Steve & Steve