MODIS Technical Team Meeting
Thursday, March 20, 2003
Building 33, Room E125

Vince Salomonson chaired the meeting. In attendance were Gary Alcott, Bob Barnes, Bill Barnes, Mike Teague, Jack Xiong, Steve Kempler, Michael King, Ed Masuoka, and Barbara Conboy, with Yolanda Harvey taking the minutes.

1.0 Upcoming events

- Ocean Color Meeting, April 15-17, 2003, Miami, Florida, USA.
- IGARSS 2003, July 21-25, 2003, Toulouse, France (abstracts deadline past). http://www.igarss03.com/
- 10th International Symposium on Remote Sensing by The International Society for Optical Engineering (SPIE). September 8-12, 2003, Barcelona, Spain (abstracts deadline past). http://www.spie.org/info/rs

2.0 Meeting Minutes

2.1 General Discussion

Salomonson discussed the themes for the next MODIS Science Team Meeting. The first theme will be the team's accomplishments as they relate to Climate Data Records (CDRs). He said that we have data that are CDR quality, and this would be a chance to display them. The other theme would be finding ways to get more people in the user community to use MODIS data products. He asked Conboy to poll the Science Team Members to find an appropriate date range. Salomonson asked Xiong to present comparisons of MISR vs. MODIS calibration for the meeting.

Salomonson reported that he attended a meeting on March 20, 2003, concerning ocean color. The current requirement for Ocean Color Level 1 data is 35 % difference rms between satellite measurements and in-situ measurements. He noted that in an analysis prepared by Watson Gregg that all three MODIS products and the SeaWiFS product meet that requirement and then some. This indicates that SeaWiFS has CDR-quality data for 1997 forward, and MODIS appears to have CDR-quality data for much of the Collection 4 November 2000 to March 2002 period. There is the potential that MODIS could improve compared to SeaWiFS because of its larger sensitivity. Salomonson said that this is a positive message, but he also noted that there is still a lot of work to be done.

Salomonson briefly mentioned a two-part study on satellite systems climate research by the National Research Council in which MODIS was discussed; he said that he thought it was very well written. The citations are:

1. National Research Council (NRC), 2000: Issues in the Integration of Research and Operational Satellite Systems for Climate Research. I. Science and Design, Washington, DC, National Academy Press.

2. National Research Council (NRC), 2000: Issues in the Integration of Research and Operational Satellite Systems for Climate Research. II. Implementation, Washington, DC, National Academy Press.

King noted that he had a discussion with Liam Gumley on the IMAP issue. Xiong said that MCST is delivering different formats of the LUTs to the DAAC and Goddard Rapid Fire Response Team (Jacques Descloitres), and could also make them available via ftp for Miami, Wisconsin, and other DB stations to download. Salomonson suggested having the DAAC handle LUTs delivery for all the DB users, and Xiong agreed. Coronado could then get those files off the ftp site and make them available on his own. Salomonson said that he would like the data to go up on the ftp site before Coronado announces the data's availability. Xiong suggested discussing the issue at the next PIP meeting.

2.2 Instrument Status

2.2.1 Aqua MODIS

Xiong reported that the SRCA test to determine which lamp is faulty has been completed, and he's now waiting to get the data for analysis. Xiong also reported that the L1B data should be declared valid by May 4, 2003 (one year from the launch of Aqua). The issues they have to resolve before then are SWIR crosstalk and Band 26 striping. There has been some discussion of using Bands 28 or 25 to correct the SWIR crosstalk problem among MCST, Chris Justice, and Eric Vermote; the code to do so could be put in by mid-April. As for the striping, Xiong said that they are planning on using Band 5 to de-stripe Band 26, similar to the method used for Terra MODIS; MCST has also performed some tests trying to remove some striping in the mid-wave detectors. Xiong said that they haven't performed this fix yet in the L1B code.

2.2.2 Terra MODIS

Xiong reported that there will be a lunar roll maneuver on March 22, 2003, to measure radiometric trending. Also, the Deep Space Maneuver will take place on March 26, 2003. Salomonson asked if there was a problem with the Deep Space Maneuver (DSM) rehearsal, and Xiong replied that there were some problems, so the rehearsal at the flight operation team will be repeated to make sure that everything goes as planned. Xiong asked if there will be any planned downtime at the Goddard DAAC during the week of the DSM (especially Wednesday and Thursday), and Alcott said no. The DAAC has been working with EDOS on reducing timers to get two to four hours improvement for getting data ready for the DSM. [Note: On March 26 the DSM was completed successfully and as of early March 27 all bands of MODIS—including the cooled focal plane bands—are working fine.]

Xiong reported that he received the solid diffuser test data; he expects to see vibrations for Band A with other bands getting smaller variations. The results are within acceptable uncertainty levels: 0.5-0.8% for B8, and smaller for other bands. Salomonson asked if these were vignetting corrections for the screen, and Xiong said yes. He noted that charts from this test were included in the MsWG minutes (attached) from March 19, 2003. Vermote said that this test (SWIR correction) provided good evidence why B25 is better than B28 for Aqua.

Xiong reported that the Terra out-of-band response errors have been lowered using B28; currently Aqua's have stayed with the same approach. It will be changed to B25 in the next Aqua code delivery.

2.3 DAAC

Kempler reported that they are resolving problems with the gigabit Ethernet. Alcott reported that throughput is up to 75% capacity. Additional patches should be received by Friday March 21, 2003, and the code should be fixed by the middle of the next week (around March 26, 2003). Kempler said that this would not affect the Deep Space Maneuver. Salomonson asked if it would affect Collection 4 reprocessing, and Kempler said no; they are ahead of schedule. Aqua processed at .9x in March, while Terra reprocessed at 4x in March with zero gaps. Overall, reprocessing is 54% complete.

Kempler reported on his experiences at the Strategic Evolution of ESE Data Systems (SEEDS) workshop on developing a framework for evolving data systems. They worked on the framework and roles of SEEDS, as well as on processes, metrics-gathering methods, service levels, and life cycles. The aim is to ensure that specific levels/gradations of service were defined for individual data centers. This effort is aimed at ensuring that the data are available and useful throughout their lifetime. Salomonson said that he heard that NOAA is storing Level 0 and Level 1 products, but will consider storing higher-level products on a case-by-base basis or processing them on demand. Kempler said that the DAAC is working closely with those parties, starting with Level 1 data then moving to archiving higher-level products as well. CDRs were also discussed at the SEEDS meeting, though nothing new was said besides making the audience aware of the issue. The first couple of workshops were attended by systems, data, and engineering people, with few users present. Out of 70 attendees, maybe 12 were users. It is a good sign that some attended, but not as many as they would like. He suggested targeting specific user groups in the future as a method of attracting their presence.

2.4 MODAPS

Masuoka reported that everything is going well and according to plan in the Collection 4 reprocessing, and that mtvs3, a SGI Origin 300 similar in configuration to mo2 (the Science Test system in the MODIS TL-SCF) is being readied for use in the Oceans reprocessing.

Teague reported on the Oceans reprocessing timeline (provided handouts). He said that the plan is to reprocess 19 months of Oceans data as fast as possible while maintaining data integrity. The plan should not affect Atmospheres or Land reprocessing schedules. For Oceans, a complete reprocessing of data days 2001-240 to 2002-365 will be completed by September 8, 2003, and data days 2003-001 to 2003-090 will be completed by September 25, 2003. Land and Atmospheres reprocessing will continue on the present mtvs2 machine, while Oceans reprocessing will occur on the new mtvs3 machine (not yet commissioned). The two machines (mtvs2 and 3) will both ingest the same L1b data from the PDR server, starting on or around May 12, 2003. Oceans reprocessing will start on May 26 and will proceed at 4x until June 29, then will increase to 5x until data day 2002-365 is completed. 2003 data will be completed at 6x. A suite of Oceans PGEs with reduced-volume export may be required to ensure that the GDAAC can ingest data products at the 4/5/6x MODAPS production rates; these PGEs are already in testing. MODAPS/GDAAC tests will be conducted in April to ensure that MODAPS ingest and production rates are compatible with GDAAC ingest rates. Also, Miami will provide the new PGE code and RADCOR files (to ensure quality science products).

This model works on the assumption that MODAPS will receive data from the GDAAC at 4x (the strict requirement is 3x), which Teague felt is reasonable based on past

performance. Should data be received at 3x, the dates for completing the reprocessing will change: 2002 data would be completed by November 5, 2003, instead of September 8, and 2003 data would be completed by December 5 instead of September 25, 2003.

Teague noted that mtvs3 needs to be commissioned and operational by May 12 to keep to the projected schedule. It should be available for operations performance and GDAAC ingest testing by early April. Masuoka noted that there shouldn't be any problems with this, since mtvs3 is the same type of machine as mo2, so they've done this before. Vermote asked if this would affect the time that products will stay on disk, since he's concerned about QA pushes to LDOPE. Masuoka said that there will be less disk on mtvs2 to hold data for the pushes so there may be an impact if the LDOPE machines go down for extended periods of time. Teague continued that the new science code and RADCOR files must also be delivered on time, and Oceans will need to establish scenarios for the reduced-volume PGEs by mid-April. Masuoka said that if Miami delivered the RADCOR files in late April, and we want to start mtvs3 on May 26, then some science testing that was done without those files would have to be re-done. Esaias noted that those RADCOR files are only updates of existing RADCOR files, so there isn't too much difference. The point is that they want as long of a period of data in the RADCOR file as possible, but, if needed, an earlier file can be used.

Teague addressed some risks and what they would do to mitigate them. One risk is that the GDAAC could go down, but MODAPS could continue processing and retaining products on disk for approximately ten days before production would have to stop. The risk level on this is low. Second, MODAPS/mtvs3 could be non-operational. Data ingest could continue from GDAAC to the mtvs2 machine; although MODAPS would have significant "catch-up" capacity, the GDAAC ingest would not, so schedule delays would result after five days of downtime. The risk level on this is medium. Third, MODAPS/mtvs2 could be non-operational. This would be very difficult, and would delay Land and Atmospheres reprocessing. Mtvs3 processing could continue for approximately ten days before the backlog is used up; thereafter, L1B ingest would be moved from mtvs2 to mtvs3 for a further ten days, after which production would halt and schedule delays would begin. The risk level on this is low. Masuoka suggested that they could also make use of mo2 to add catch-up capabilities or to stand-in for mtvs2 if it were down for significant amounts of time. Fourth, there could be delays in the Miami deliverables. The schedule includes approximately seven days of slack for each RADCOR delivery, after which the schedule would be delayed one day for every day Miami delayed. The risk level on this is medium. Finally, mtvs3 performance tests or joint GDAAC-MODAPS ingest testing could fail to meet the 4/5/6x criteria. To mitigate this very low-level risk, MODAPS could add more Linux processing resources to mtvs3 and/or make further reductions in product volumes exported to the GDAAC.

Salomonson concluded that they could be done as early as September or as late as December, and Masuoka noted that there would be a small amount of give in the schedule if MODAPS could start earlier than the May so that it may be possible to finish in late August. Salomonson said that this sounds like a good plan, and that they should proceed.

2.5 Oceans Discipline

Esaias reported that the first set of new RADCOR files are at Miami, are in operations, and thanks to MODAPS are improving de-striping. Updates will occur every two weeks. Xiong noted that when they declare L1B valid for Aqua, they would do the same thing for updating RADCOR files and M1 processing.

2.7 Atmospheres Discipline

King reported that Atmospheres just completed a 3-day workshop in St. Michaels, Maryland, which thirty people attended. King observed that data products' progress and quality are very good with few exceptions; the products in Collection 4 look very good; and Aqua and Terra data are comparing very favorably. King said that there was some discussion at the end of the workshop about holding a MODIS atmospheric workshop along the lines of what the Land and Oceans disciplines have been holding, and that he would like to see more presentations on data quality and on engaging the larger community on MODIS data use. He said that he is considering holding such a workshop in October at the University of New Hampshire, and though there are not yet any set dates, it is a good time for published papers and data collections.

King noted that cloud top pressure on Terra isn't working as well as on Aqua because of noise in the CO_2 slicing bands in the 13 to 14-µm region. A programmer is working on these issues, and they will be able to get some algorithm improvements done for Collection 5. Near-IR water vapor compares very well to thermal-IR water vapor as well, and the near-infrared algorithm has been blended with SSMI water vapor for missing data over oceans. The near-infrared algorithm works only over land and bright (sunglint) portions of the oceans, so missing observations over the daytime ocean can be supplemented by SSM/I data (and eventually AMSR-E data on Aqua). King noted that product quality is generally very good, and he indicated being generally pleased with the performance of the algorithms.

3.0 Action Items

3.1 New Action Items

3.1.1 Conboy to poll Science Team for MODIS Science Team Meeting dates in August 2003.

3.2 Old Action Items

3.2.1 King and Kempler to work together on getting ESDTs for the new Atmospheres L2 data product.
Status: Closed.

3.2.2 Kempler to coordinate with Oceans group on creating documentation for the DAAC on the new Oceans L1A data subsets.
Status: Open.

3.2.3 Wolfe to contact Herring about the shopping cart feature for the Earth Observatory website.
Status: Open.

3.2.4 Tech Team to further discuss TRW using MODIS data for validation of the NPP/NPOESS production process.

Status: Open.

3.2.5 Johnston to create possible scenarios of when to reprocess Aqua and start Terra Collection 5.