MODIS TECHNICAL TEAM MEETING

July 28, 1994

The MODIS Technical Team Meeting was chaired by Vince Salomonson. Present were Locke Stuart, Bill Barnes, Bruce Guenther, Janine Harrison, John Bauernschub, Dorothy Hall, Harry Montgomery, Wayne Esaias, Yoram Kaufman, Chris Justice, Ken Anderson, Al Fleig and Michael King.

1.0 SCHEDULE OF EVENTS

Sept. 13 - 14	MODIS Quarterly Review at SBRC
Sept. 20 - 22	SDST Simulation Data Workshop, Flathead Lake, MT
Oct. 11	Calibration Working Group, GSFC
Oct. 12 - 14	MODIS Science Team Meeting, Holiday Inn, College Park, MD

2.0 MINUTES OF THE MEETING

2.1 ATBD Peer Review Report

Salomonson reported that he has received a copy of the ATBD Peer Review Report issued by the EOS Project Science Office. Michael King assured Salomonson that each MODIS Science Team Member will receive a copy. King wants this peer review process to take place every 2 years.

Included in the report were reviewer comments stating that a complete uncertainty analysis is required for each product. Also, algorithms need to anticipate change in performance after launch and need to be designed to incorporate upgrades. The reviewers said MODIS Team Members generally rely too heavily on models in order to replace missing data.

Salomonson said the reviewers think the structure of the MODIS Science Team is lopsided with large membership in the Land and Oceans disciplines, and almost subcritical presence in the Atmosphere discipline. Salomonson commented that the team membership was decided upon by NASA Headquarters and that an additional Announcement of Opportunity would be needed to add members to the Team.

Quoting from the report, Salomonson read, “There are a number of examples where there is a duplication of effort between CERES and MODIS, MODIS and MISR, and perhaps CERES and MISR. A guiding philosophy, especially within MODIS, is needed to address the issue of product duplication. MODIS proposes 28 products and the explicit connections to related products within MODIS have not been thought through. It is evident that a clear vision for

the format of these products, details of how the data will be presented, has not been considered.”

Salomonson noted that MCST has a big challenge ahead of them. The reviewers said they conducted a review of the radiometric calibration product and not the Level 1 product. The reviewers considered the MODIS Level 1 ATBD to not have been submitted and the review process not accomplished. The MODIS Level 1 algorithm did receive a high ranking of 10 with respect to its importance to EOS. Guenther realizes MCST has a lot of work ahead. MCST's calibration work was also reviewed very thoroughly by a Calibration Panel chaired by Skip Reber two weeks before the ATBD Peer Review. Guenther plans to look at the comments from both groups.

Salomonson noted that the MODIS Oceans Discipline Group seemed to come out on the positive side of the "grading" curve, Atmosphere fell in the middle and Land appears to have the biggest challenge. In closing, Salomonson said the ATBD peer review process produced constructive comments and was a worthwhile endeavor. King plans to meet with Kaufman, Justice, and Esaias to discuss the report. Guenther asked if each time a peer review is conducted the same review panel would be present for the sake of continuity. Salomonson said he didn't know.

Justice said that he had looked at a copy of the ATBD report and was disappointed that some products like FIRE were not commented on. Justice agreed the ATBD review process was worthwhile, but feels it might be conducted differently next time.

2.2 MODIS Characterization Support Team (MCST) Report

Guenther completed his action item to report to Salomonson on the impact of deleting the monochrometer from the SRCA. He handed Salomonson a copy of his assessment (Attachment #1). This assessment emphasizes the importance of the SRCA and was forwarded to Dick Weber. Salomonson said that while it may be permissable to leave the SRCA off the engineering model, he feels strongly that it needs to be on the flight models.

Guenther also wrote a memo to Weber on the potential implications of choosing a 5 zone dichroic to fix the ghosting problem at the mid and short wave infrared (Attachment #2). Guenther explained that there are different impacts associated with choosing a 7 zone dichroic versus a 5 zone dichroic. A 7 zone dichroic represents putting a 7-layer (filtering) anti-reflective dichroic coating on the fold mirror, versus 5 filters. Scolese thought that a 7 zone dichroic would be a good choice, but SBRC is examining the 5 zone dichroic because of cost concerns. SBRC is concerned that this very expensive procedure might not even work. Guenther showed charts which demonstrate that bands 7 and 21 are out of spec with a 7 zone dichroic due to crosstalk. With the 5 zone dichroic, there is additional ghosting. In particular, band 21 has a large problem and the stray effects for Band 20 are about 1.5%. Barnes commented that the big problem is the scattered light from the mirrors and it is unlikely that a whole lot can be done about that.

Guenther asked if the Technical Team agrees with the 5 zone dichroic approach. Barnes voiced his opinion that the 7 zone dichroic is the better option. He also stated that the effects of ghosting, crosstalk and scattering off the mirror combined amount to the need for a lot of correction in the software. Barnes said the scattering problem is even worse in the shorter wavelengths which include the ocean color bands. Montgomery noted that the scan mirror is of the best quality available. If these problems require extensive software corrections, then ground processing costs will increase dramatically. Salomonson agreed that the data on the charts presented indicate that the 7 zone approach is best.

2.3 Science Data Support Team (SDST) Report

Fleig has put together a document entitled, "MODIS Sensor Patterns and Multiresolution Pixel Registration" (Attachment #3). The document describes geolocation problems. Fleig asked Harrison to fax this document to the MODIS Science Team Members. Fleig will also give a copy of this document to Marvin Maxwell. Kaufman expressed his concern about the effect this registration problem will have on the FIRE product. Justice also feels uneasy about the pixel registration and is specifically concerned about a variation of intensity. It was generally agreed that Fleig's document addresses an important Team issue and should be reviewed and commented on. Anderson indicated that Tom Pagano thinks this issue is no longer of concern to the Team. Fleig told Anderson that is simply not so and that the Team needs to closely examine this issue.

2.4 MODIS Administrative Support Team (MAST) Report

Harrison presented the survey results of alternative dates for the MODIS Science Team Meeting. The majority of responses were positive for October 12 - 14, 1994 versus more negative responses for other proposed dates. Salomonson asked Harrison to plan the meeting for October 12 - 14, 1994.

Harrison told Salomonson that the letter he received from Dr. Oscar Huh of the Coastal Ecology Department at Louisiana State University has been placed into MODARCH by Michael Heney. Dr. Huh has been working jointly with Paul Menzel on a NASA research project to study winter storms and coastal sedimentation using MAMS and MAS. Dr. Huh is interested in MODIS and plans to attend the next Science Team meeting. Salomonson gave Justice a hardcopy of the LSU letter.

Harrison reported that Michael Heney has upgraded the MODARCH EFS client software to the new version 3.5. An e-mail was sent out to the Team regarding this upgrade and all MODIS Team Members are encouraged to upgrade to version 3.5. Questions on upgrading can be addressed by contacting Heney at mheney@ltpsun.gsfc.nasa.gov

2.5 EOS Project Scientist Report

King said that the EOS Project Science Office plans to distribute the ATBD Peer Review Report to the Team within the next 2 weeks. Each Science Team Leader currently has a copy. King hasn't decided yet if the report will be mailed out to Team Members or if it will be available via an anonymous FTP.

King reported that he felt the Payload Panel did a good job of prioritizing missions. King said the meeting helped clear up misconceptions among EOS Project resources personnel who thought that the scientists were not prepared to make hard choices under current budget constraints. King says they now understand that the scientists are putting a lot of thought into prioritizing their science needs. On the other hand, King said the scientists were exposed to what it costs to build the EOS program and now have a better understanding of the trade-offs and difficulties involved.

King said the Payload Panel accomplished their goal of establishing a mission rebaseline profile. EOSDIS reduced their budget $200 million dollars, but no DAACs were cut. King said there were a lot of DAAC support letters sent to Payload Panel members. King noted that no science was lost even with the $800 million dollar reduction. EOS still has 7 launches **[?]** planned between the years 1998 and 2000. The Payload Panel Report does recommend that EOS COLOR fly on LandSat 7 or not at all.

King visited the BOREAS mission site in Canada and noted that not many MODIS land people participated. The MAS did fly on the C130 and several good flight lines were obtained. Salomonson asked about MODLAND participation and Justice responded that Steve Running and Vern Vanderbilt did attend. Hall noted that she participated in BOREAS in the winter with the MAS on the ER-2. Justice said that MODLAND does plan to use the BOREAS data. King commented that BOREAS was pretty impressive with 12 airplanes and Piers Sellers' coordination efforts. He estimated that about 300 scientists attended. King said that the number of requests for putting the MAS on the C130 is way up for next year and that MAS scheduling will get more complicated. King was disappointed that the C-130 flew at lower altitudes than planned. He is concerned about the calibration of the MAS data at low altitudes. King noted that the EOS Project Science Office World WideWeb (WWW) site contains the EOS Reference Handbook as well as an aircraft section including flight schedules.

King said he has been arguing to establish a separate calibration / validation budget line item. He hopes that this will come out of the rebaselining activity and noted that Dixon Butler thinks all validation should come out of the R&A program budget.

Barnes asked if anyone has looked at the budget beyond FY2000. King responded that he is currently working on an action item to create budgets for FY2000- 2015.

3.0 ACTION ITEMS

1. *Harrison* : Fax out Al Fleig's document entitled, "MODIS Sensor Patterns and Multiresolution Pixel Registration." (Completed 7/29/94)

3.1 Action Items Carried Forward

2. *Science Team:* Provide information to Salomonson regarding the significance of the timing error issue.
3. *Barnes:* At Salomonson's request, explore the possibility of EMI effects on MODIS data as a result of direct continuous broadcast.
4. *Fleig & Herring*: Review the MODIS brochure and recommend changes/alternatives [Ongoing—the first draft is complete and being reviewed].
5. *Barnes*: Investigate the procedure for redesignation of channels for night data return (to Kaufman). [Barnes has determined that MODIS channels can be redesignated for night data return; however, this AI is still open.]
6. *Fleig and Ungar*: Interact with the group leaders prior to developing a MODIS data simulation plan for review at the next Science Team Meeting, due July 4.
7. *Masuoka*: Provide Gordon's Water Leaving Radiance software to ESDIS project as a test case for the utility of massively parallel processing after a beta delivery is received from the Oceans Team.

3.1 Action Items Completed

MCST: Provide information to Salomonson regarding the potential impact of deleting the monochrometer on the SRCA. (Completed 7/28/94)

4.0 MODIS DOCUMENTS

Note: All recent MODIS documents are maintained in MODARCH. If you would like access to or information about MODARCH, please contact the MODARCH System Administrator, Michael Heney, at (301) 286-4044 or via e-mail at mheney@ltpsun.gsfc.nasa.gov.

1. Geolocation ATBD, by SDST. Distribution to the MODIS Science Team by August 5, 1994.

5.0 MODIS DOCUMENTS

NOTE: All attachments referenced below are maintained in MODARCH and are available for distribution upon request. Please contact David Herring, at (301) 286-9515, Code 921, NASA/Goddard Space Flight Center, Greenbelt, MD 20771 if you desire copies of any attachments.

1. Information Regarding the Potential Impact of Deleting the Monochrometer
   on the SRCA, by Bruce Guenther.
2. Ghosting Effects and Impacts for SW / MWIR Focal Planes, by Bruce Guenther.
3. MODIS Sensor Patterns and Multiresolution Pixel Registration, by Al Fleig.