

MODIS Science Team Semi-Annual Report

July - September 1997
October - December 1997
(Combined Report)

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a) Task Objectives

During these reporting periods emphasis was given to preparation of Code for the V2 Code delivery, developing the land product phase-in plan, refining the land validation plans, planning the sun photometer network for a MODIS validation focus in southern Africa, coordinating the EOS Land Validation Program, reviewing the fire burn scar algorithm, developing the MODLAND production reduction plan and developing the MODLAND QA activity.

We continued to build the collaboration required to conduct the work of developing community consensus algorithms on Fire, Surface Reflectance and Vegetation Indices. The project has developed a number of collaborative activities that are intended to expand the scope of the team members' activities and involve a larger community in MODIS research. Chris Justice also attended the Discipline Leaders meetings and whenever possible the weekly Technical Team (TT) Meetings. Dr. Vermote represents the land group at the TT Meetings in Dr. Justice's absence. Chris Justice presented the MODIS instrument status and data needs and chaired the EDC DAAC SAP at the end of April.

In addition, the goals of the MODIS project, the status of the instrument and preliminary results of the research were presented at scientific meetings. The project was represented at the MODIS Science Team Meeting. Results of the studies undertaken as part of the project are in the process of being written up and submitted for publication.

Considerable time was spent in coordinating and soliciting contributions to the MODLAND IGARS omnibus paper. Publications are listed below.

In agreement with the MODIS Project Scientist, resources from this project continue to support the surface reflectance product. This includes providing shared support for personnel and computer resources with Dr. E. Vermote. A fuller account of this supporting activity performed by P.Fisher is outlined in the companion report of Dr. Vermote.

b) Tasks Accomplished (Data analysis and interpretation)

Version 2 Software (L.Giglio and P. Fisher)

During this reporting period, we focused on the completion and testing of the V2 code and the associated test data sets. A schedule was developed for the Version 2.1 delivery and the development of the MODIS Burn Scar algorithm. A considerable amount of time during this reporting period was spent debugging MODIS surface reflectance and fire product code. We completed the rewrite of MODIS Level 2 fire product code based on algorithm revisions made within the previous year. The rewritten code is much more clearly organized and somewhat faster. Additional modifications were made to account for yet another round of ECS (EOSDIS Core System) mandated metadata changes, as well as changes in input file formats made by the MCST (MODIS Characterization Support Team).

On 15 July and 15 August we completed the deliveries of Version 2, Revision A and B MOD09/14 codes. Giglio and Fisher debugged the MODIS surface reflectance product code. Several memory leaks were found and eliminated.

MODIS Fire Detection (w. L. Giglio, P. Fisher, Y. Kaufman and J. Kendall)

A meeting with Kaufman and Justice was held to discuss possible MOD14 modifications. Several significant changes were made to the algorithm. In particular, the series of tests used to detect fires is now always performed for all potential fire pixels (previously, certain tests, if passed, would short-circuit the evaluation of subsequent tests). Additionally, a much larger amount of quality assurance (QA) information is now produced for each pixel. These and other modifications will allow a much more meaningful confidence flag to be assigned to each detected fire pixel.

These above algorithm modifications were incorporated into MOD14 code. The MOD14 Level 2 Fire Product file specification was updated to include additional QA and other minor changes.

A meeting was held with Sadashiva Devadiga (SSAI/LDOPE) to discuss processing flow and ancillary data requirements for the MODIS Level 2 and 3 fire product codes (MOD14). The MODIS Level 3 Fire Product file specifications were updated to include changes made in Level 2 product. In the second reporting period, a simpler and more useful MODIS fire compositing algorithm was devised. The compositing section of MODIS Level 3 fire code was rewritten to perform this algorithm.

A meeting was held with Andy Wald (GSFC) who is working with Yoram Kaufman (GSFC) to discuss the design of the MODIS climate modelling grid product. Wald agreed to check the method proposed by Kaufman to consolidate adjacent fire pixels which is necessary prior to performing many of the emission calculations.

Several minor modifications to the MODIS Level 2 fire code were made to conform to the sun-glint detection technique being used and several minor changes and corrections were made to the MODIS Level 2 and Level 3 fire product specifications.

The MODIS Fire Algorithm paper based on the ATBD was revised and is and submitted as part of the IEEE special edition.

Plans were made for resource allocation through to Version 2.1 Fire Code delivery in January. Kaufman agreed to put emphasis from his group into addressing the triangular response function. During July, Dr. Jose Periera visited the group to evaluate the MODIS fire product suite. Dr. Periera updated the group on fire scar mapping developments at the JRC Ispra. Areas of collaboration were outlined.

EOS Validation (Chris Justice and Bob Swap)

Chris Justice continued to oversee the development of a MODLAND Validation Plan which was submitted with help from Jeff Privette to the EOS Validation Office in August. Justice also continued to manage the MODIS Validation account with help from Privette (GSFC). Justice participated in the Walker Branch Forest PROVE experiment, traveling to the ORNL DAAC. Discussions were also held with ORNL DAAC management on the MODIS Validation Support activity.

Validation activities during July and August 1997 were focused on establishing the link between the Aerosol Robotic Network of Brent Holben (GSFC) and the EOS validation effort of Dr. Jeffrey Privette (Validation P.I. for the Southern African Validation of EOS: Coordinated Augmentation of Existing Monitoring Networks). Much of this effort required communication and consultation with proposed southern African counterparts, primarily the Zambian Meteorological Department, Lusaka, Zambia and the Schonland Research Centre for Nuclear Sciences, University of the Witwatersrand, Johannesburg, South Africa. Discussion about the memorandum of understanding with these two groups also began during this time.

Efforts were also made to help arrange the logistics of both the upcoming SAVE - MODIS validation effort as well as the related pre-MODIS ZIBBEE experiment. The ZIBBEE Experiment is seen as one of the precursors to the MODIS 1999 Validation campaign in Southern Africa and was conducted from mid-August until early October and involved collaboration between Dr. Darold Ward of the U.S. Forest Service, Brent Holben and Tom Eck of NASA Goddard Spaceflight Center, and the Zambian Meteorological Department. The role of the MODIS participation was to aid in the deployment, maintenance and surveillance of the sun photometers of AERONET. This included visiting potential validation sites, logistics planning and assisting in the design of the SAVE MODIS validation effort for the region for MODIS science.

In October efforts were given to preparing for the SAVE-EOS validation of MODIS presentation at the NASA WAVES (Workshop on the Atmospheric Validation of EOS) meeting of October 20-21, 1997 at Hampton University. The MODIS component of SAVE-EOS validation, the research objectives, goals, experiment and data needs were presented to the other NASA EOS validation research groups present at the WAVES meeting. Preparation included several meetings with the SAVE-EOS PI, Dr. Jeff Privette and Brent Holben.

Chris Justice coordinated, prepared and chaired the EOS Land Validation Coordination Meeting at GSFC December 3 - 5th 1997, presenting the objectives of the meeting, the MODIS land validation plan and opportunities for collaboration. Final decisions were made concerning the ASTER and Landsat 7 DAR's and the EOS Land Validation Test Sites. Offline discussions were held with Darold Ward (USFS) concerning fire and burn scar validation.

Reduction Production

Chris Justice developed the MODLAND plan for reduced production resource allocation at the DAAC's for the Reber/Barron Committee and with Mike King and Wayne Esaias (GSFC) developed a coordinated MODIS submission. Justice presented an outline of this proposed response at the Science Team Meeting. Justice also attended the DAAC 1 on 1 meeting (December 16th - 17th) at the Hughes facility in Landover, Md.

The EDC DAAC SAP

Chris Justice chaired the EDC DAAC Science Advisory Panel Meeting (September 7-9th). With respect to MODIS, several critical issues were raised concerning availability of computer resources at the EDC DAAC, at-launch for processing of MODIS products and the adequacy of the network for data transmission to EDC. Justice presented the MODIS land status report and the results of the instrument day discussion.

International Liaison

Justice represented the MODIS Land program at the IGOS planning meeting in Ottawa (July 7-9 1997) and presented the MODLAND activities update at the Remote Sensing Society Conference in the UK (Sept 2-4 1997) and the IGBP LUCC Data Requirements Workshop (November 12-14th 1997).

New Publications

Kaufman, Y.J., C.O. Justice, L.P. Flynn, J. Kendall, E. Prins, D.E. Ward, A. Setzer, Monitoring Global Fires from EOS-MODIS, IEEE EOS AM Special Edition - submitted

Giglio, L., J. Kendall and C.O. Justice, Evaluation of Global Fire Detection Algorithms Using Simulated AVHRR Data, IJRS Submitted.

Justice C.O. et al MODIS land products : at launch status - TGARS AM Special Edition - submitted

New Staff

None