MODIS Science Team Quarterly Report

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a) Task Objectives

During this reporting period emphasis was on the preparation for the V2 Code delivery, developing the land validation plans and hiring a science support person.

We continued to build the infrastructure and 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 in Dr. Justices absence.

In addition, the goals of the MODIS project, the status of the instrument and preliminary results of the research were presented at a number of scientific meetings. The project was also represented at the MODLAND SDST Meeting. Considerable time was spent in the planning and review of the MODIS Emergency Back Up Plan. Results of the studies undertaken as part of the project are in the process of being written up and submitted for publication. Publications are listed below.

In agreement with the MODIS Project Scientist, resources from this project continue to support the surface reflectance product. This will include providing shared support for personnel and computer resources with Dr. E. Vermote. A fuller account of this supporting activity are outlined in the quarterly 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. This consisted of 1) rewriting portions of the code that needed corrections and/or reorganization to improve clarity and simplify processing, 2) identifying and optimizing computationally intensive tasks, and 3) incorporating new and/or replacement modules and functions into the Beta 3 code. Detailed activities included:

--obtaining increased code performance of the atmospheric correction subroutines of the V2 L2g MODIS Surface Reflectance (MOD09 L2) algorithm. Without the BRDF correction the code runs within the allotted allocation from the February 1996 baseline.

-- made revisions to the adjacency correction subroutine of MOD09 L2. A further revision to increase code performance is planned for V2.1
-- developed coarse resolution QA product.
-- generated V2 HDF file specs. for both the MOD09 L2 product and the MOD09 L2 coarse resolution product.
-- Developed and delivered V2 HDF file specs for MOD14 L2, MOD14 L3 and MOD14 L3 8 day.
-- The SeaWifs Scheduler was reviewed.

CIMEL Surface BRDF Measurements (w. J.Privette, E.Vermote)

The CIMEL BRDF operation mode was tested. Plans were developed to collocate the CIMEL next to the PARABOLA instrument as part of the MODIS PROVE campaign in Jornada in May 1997.

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

Emphasis during this period was given to completion of the AVHRR active fire prototyping. A modeling paper was generated describing the AVHRR active fire methodology and providing a comparison of alternative algorithms. The fire code has been submitted to the AVHRR Pathfinder 2 Project to run on 1km data.

Improvements to the V1 code were identified and preliminary discussions were held amongst the fire team concerning scheduling of the V2 delivery. The ECS common quality assessment (QA) flags were adopted for the fire product.

The application of AVHRR fire simulation code to MODIS was completed. This code models 25 km x 25 km scenes containing burning areas under various atmospheric, surface, and fire conditions. Application to MODIS basically involved insertion of suitable spectral response and point spread functions into simulation code, and using MODTRAN to generate tables of atmospheric radiometric quantities for the 1 km thermal channels. Application of the MODIS fire algorithm to these simulated scenes allowed algorithm performance to be quantified in terms of probabilities of fire detection and false alarms. This work has suggested possible algorithm modifications which are currently being tested with MAS (MODIS Airborne Simulator), AVHRR (Advanced Very High Resolution Radiometer), degraded Landsat data, and additional simulation runs.

The Level 2 and Level 3 fire product file specifications (Version 2) were drafted with help from Paul Fisher (SSAI). Subsequently revised file specifications included 8 additional fields that will be useful for end users.

The MODIS Fire Algorithm paper based on the ATBD has been revised and is close to submission.

EOS Validation (w. J. Privette)

Plans were further developed for a Validation Prototyping Campaign in 1997, the objective being to develop the protocols for data collection commensurate with the MODIS spatial resolution. Discussions were held with MISR and ASTER scientists to participate in this prototyping activity. A site visit was made to Jornada in preparation for the May field campaign.

The Modland SDST Meeting (w. Robert Wolfe SDST and MODLAND)

Chris Justice chaired the MODLAND SDST meeting February 18-20th . A realistic schedule was developed for the V2 Code delivery. The land validation package of overheads was revised. The QA plan for MODLAND was discussed and a product Phase-in plan was developed.

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, in preparation.

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

New Staff

We are in the process of hiring Dr.Robert Swap to join the Science Side of the activity. His first task will be to assist in the aerosol transport modeling for the surface reflectance product and to set up the MODIS sunphotometer validation network in Southern Africa.