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ABSTRACT -- KEY POINTS

Work focused on V2 coding and algorithm development. In BRDF/Albedo, science issues included the continued development of AVHRR databases for New England and the southern Amazon region. In land cover/land-cover change, test site development, land surface parameter extraction from test sites were primary foci. We participated in the MODIS Science Data Support Team (SDST) meeting on 17-20 February 1997 at GSFC.

TASK PROGRESS

BRDF/Albedo Product

Algorithm development
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* MOD43 BRDF/albedo product-specific metadata was defined

* The MOD43 product was divided into 4 separate products to allow smaller user file sizes. It now consists of (1) semiempirical BRDF/albedo parameters, (2) empirical BRDF/albedo product, (3) minimal albedo product ("ready to use reduced albedo"), and (4) BRDF-corrected nadir reflectance.

* For all 4 MOD43 products version 2 file specs and quality flag fields were defined

* MODLAND-SDST meeting in February set timetable for version 2 algorithm deliveries, resolved gridding and format issues and defined common approaches to metadata and quality control

* The multiangular database building code was transitioned into Robert Wolfe's MODLAND responsibility, but BU remains involved

* New ECS toolkits were installed (with problems due to ECS errors)

* A format for the required ancillary BRDF database was developed

* New SGI-O2 workstations (joint with MOD12 landcover) moved the SCF closer to be able to handle at-launch data volumes

* The MODIS BRDF/albedo algorithm continues to be used by other investigators. In this reporting period requests for the code were received from the University of Nottingham, UK, the ETH in Zurich, Switzerland, and the University of Hamburg, Germany.

Scientific advances
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* Nearing completion: BRDF inversions of 160,800 pixels of combined NOAA-AVHRR and GOES-8 Imager data over New England from September 1995. First-ever derivation of albedo on 1 km scale from the BRDF. This prototyping of the MOD43 algorithm has provided valuable insights into strengths and weaknesses of the MOD43 approach. Overall, the results are very satisfying. Surface reflectances, albedos and BRDF model parameters clearly correspond to surface features.

* Completed: A study of AVHRR/GOES-8 inversions for selected snow-covered regions in New England, demonstrating the capability of our models to handle trees on snow with consistency.

* Started: preparation of 4km AVHRR data taken over South America for BRDF inversions of tropical surfaces.

* Continued: investigation of the relationship between biophysical parameters and Ambrals BRDF model parameters through numerical simulation. A clear dependence of model parameters with simulated scene parameters was found.

* Completed: in a 3-month effort, BRDFs were assigned to the land classes used in the MODIS synthetic data set using field-observed BRDFs. These data will be used to enhance the synthetic data set for code testing.

* Marc Leroy (France), David Jupp (Australia) and Jan-Peter Muller (UK) visited Boston University, gave talks and discussed the progress of the algorithm with us.

Validation activities
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* In January, a MODLAND field campaign at Jornada, NM, was agreed upon.

* Field work was planned for this campaign in May, focusing on studying the spatial variation of albedo at the site and issues of scaling to MODIS 1 km footprints.

* The market was investigating for buying pyranometers/albedometers, a data logger and a GPS. We decided to buy CM-21 albedometers from Kipp and Zonen, one for total SW broadband, one for the NIR broadband.

Publication/talks activity
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* A paper on retrieval accuracies of BRDF and albedo from MODIS, was submitted to JGR.

* A paper on the validation of the MODIS BRDF model came back with favorable reviewer's comments and is likely to get accepted soon.

* Two conference talks concerning MODIS BRDF/albedo were accepted, one at IGARSS'97 and one at the IAMAS conference in Australia in July. The first talk will address the scientific community, the second the user community.

* In January, a workshop was held by NASA at the University of Maryland

to investigate the current status of BRDF research and to plot a way into the future for this field. Alan Strahler gave a report on the status of geometric-optical modeling, and Wolfgang Wanner gave a talk on retrieval accuracies as studied for the cases of MODIS and MISR.

Land Cover/Land Cover Change

Test Sites
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* In this quarter, we continued the development and testing of a land surface parameter database derived from Landsat TM and ancillary sources, especially for one of our regional test sites, Central America. We also looked at the distribution of test sites globally using bioclimatic and physical data to assess the overall representativeness of the test site network.

* Test site activity continued in the Southwest US, in a regional site that includes Walnut Gulch Arizina, and Jornada and Sevilleta, New Mexico. We continued the extraction of land surface parameters for the Central America Regional Site.

* Central America and the Caribbean: We continued processing of AVHRR, TM and ancillary data for this regional test site, and development of a land surface parameter database.

* Glacier National Park: We continued algorithm testing for TM data for Glacier National Park with the Snow/Ice Team (Dorothy Hall).

* Global 1-degree data: We compiled and analyzed numerous bioclimatic and physical datasets as part of an assessment of test site distribution globally.

Neural Nets
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* We continued research on neural net classifiers focusing on operational processing scenarios.

Algorithm Coding
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* V2 product specs were delivered at the end of March.

Participation in MODIS Activities
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* IGBP-DIS Landcover Working Group Workshop at UC Santa Barbara (Muchoney); 21-23 January 1997; UC Santa Barbara

* MODIS Science Data Support Team (SDST) meeting; 17-20 February 1997; GSFC

ANTICIPATED ACTIVITIES DURING THE NEXT QUARTER

* Start of version 2 algorithm coding

* Field campaign at Jornada

* Completion of algorithm prototyping with AVHRR/GOES data

* Continued building of Central America land cover test site prototype

PROBLEMS/CORRECTIVE ACTIONS

* None required