SUBJECT: MODIS Data Study Team Minutes for January 26, 1990

ATTENDEES:			
	Mike Andrews	GSC	953-2700
	Phil Ardanuy	RDC	982-3714
	P.K. Bhartia	TRW	794-9016
	Dave Case	ARC	805-0305
	Hyo-Duck Chang	STX	794-5000
	Al Fleig	630	286-7747
	Watson Gregg	RDC	982-3734
	Daesoo Han	636	286-9414
	Doug Hoyt	RDC	982-3732
	Temp Johnson	STX	286-9430
	Lee Kyle	636	286-9415
	Al McKay	RDC	982-3720
	Jim Ormsby	624	286-6811
	George Riggs	RDC	982-3740
	Vince Salomonson	620	286-6481
	Jack Schols	GSC	953-2700
	Tom Wolford	GSC	953-2700

NEXT MEETING: Because of the MODIS Science Team Meeting, to be held from January 31 through February 2, the regularly scheduled Friday meeting of the MODIS Data Team will not be held next Friday, February 2. The next meeting of the MODIS Data Study Team will be held at 9:30 AM, Friday, February 9, in Building 28, Room W125.

TOPICS:

1. A list of the major ancillary and correlative data sets that are required to generate MODIS Core Data Products was presented.

AMSU and AIRS Level-2 products potentially needed as ancillary data include Total Column Ozone (for atmospheric correction, especially over oceans), temperature and moisture profiles (potentially useful for synergistic processing of MODIS Level-2 products), and surface pressure (for regions where the accuracy of the AMSU or AIRS atmospheric pressure data exceeds that of NMC models). Surface and cloud-top temperature from AMSU or AIRS may also be useful as correlative data for validating and improving MODIS data products.

Needed ancillary data from the NMC and ECMWF include surface pressure (accurate to 1 mb wherever possible) and surface wind speeds (accurate to 1 m/s if possible). Useful correlative data may include upper-air and surface analyses (to validate and develop atmospheric products) and radiosonde profiles (also for MODIS atmospheric product validation).

Potentially useful data from other instruments includes CERES surface incident fluxes (used to compute biological productivity), SCANSCAT near-surface winds (potentially useful for sun glint corrections over oceans), LAWS-derived winds (SCANSCAT and LAWS winds may be incorporated into NMC analyses), and LAWS-derived

aerosols. Passive microwave measurements (perhaps from AMSR or HIMSS) may be useful as ancillary data and for MODIS sea-ice validation. Ship and buoy observation data will also be needed as correlative information for validating and developing MODIS ocean products.

A Digital Elevation Model or appropriate Digital Terrain Model (incorporates terrain elevation and slope information) will be required. Land/ocean masks and land cover type are required ancillary data. Terrestrial aerosol climatologies may be useful as ancillary data for atmospheric correction over land. Extraterrestrial solar spectral irradiance will be required as a function of time.

Potentially useful correlative data sets include ISSCP or equivalent cloud data, NOAA free-flyer and geostationary satellite data sets, and other Eos or non-Eos satellite instrument data sets as well as conventional and in-situ data sets.

Efficient MODIS data product generation will require the use of lookup tables to access precomputed parameters. Examples include Rayleigh scattering and the reflection function for an infinite cloud. MODIS data processing will also include the comparison of new products with existing products from preceding time periods, so that previously-processed MODIS data products must be accessible to support current MODIS processing.

2. The UARS data team has found that specialized working groups selected from the science team and involved data system contractors can usually address data system concerns efficiently and effectively. A strawman list of working groups potentially applicable to MODIS data efforts was presented. Besides the science discipline groups (land, ocean, and atmospheres) and the Instrument Characterization Team, the needed groups may include an Ancillary Data Working Group (responsible for identifying ancillary and correlative data requirements and ensuring that the required data sets are developed and made available), a Scene Identification Working Group (responsible for cloud identification, snow/ice discrimination, Case-1/Case-2 water indentification, land/ocean identification, and land cover type identification), a Peer Review Working Group for standard algorithms and data products, an Atmospheric Correction Working Group (to facilitate commonality between atmospheric corrections over land and oceans), an Averaging and Rectification Working Group (concerned with common grids and implementation techniques for Level-3 processing), a Simulation Data Working Group (concerned with developing a common set of simulated MODIS data for algorithm development and check-out), and a Communication Working Group (responsible for identifying the data needs of MODIS Science Team Members, other Eos Team Members, and the interdisciplinary investigators.

3. Last week, several members of the MODIS Data Team met with Dr. Skip Reber to discuss the Upper Atmosphere Research Satellite (UARS) data system experience. The UARS data team developed a hardware size estimate based on a poll of UARS science team

members. Since 1983, the estimated UARS data processing requirement has grown by a factor of ten. The primary source of the increase seems to have been simple underestimation of the size of the required processing task when routines had not yet actually been implemented. Some of the most experienced groups have had the largest increases.

At least partially as an aid to algorithm definition and development, the individual UARS instrument teams were assigned the task of generating simulated data for their respective instruments. Beginning with assumed physical parameters and deriving instrument outputs is a natural inverse to the actual data processing problem, whice is to begin with instrument output and derive physical parameters. A future version of the simulated data will introduce actual data transmission formats and representative data transmission anomalies and glitches.

4. A report on two recent developments in Digital Elevation Models (DEMs) was given. A CD-ROM entitled "Geophysics of North America" has been developed from Defense Mapping Agency data. The CD-ROM contains elevation data for all of North America at a 30 second horizontal resolution and an elevation accuracy of 10 meters. Altogether, the disk contains about 45 megabytes of data.

The second development is a planned Digital Chart of the World to be available around December 1991. This effort is to be completed by ERSI with Defense Mapping Agency funding. The effort will start with 270 Operational Navigation Charts as source material; a CD-ROM will be the final distribution medium. The December 1989 issue of Photogrammetric Engineering and Remote Sensing reports on this effort.

5. An updated table showing ancillary data required to correct for atmospheric effects over land was presented. The table includes estimated surface atmospheric pressure and ozone accuracy requirements provided by Dr. Yoram Kaufman. Accuracy requirements for aerosol data cannot be specified at this time; data that is available will be used. Dr. Kaufman is expecting to play an active role in developing MODIS atmospheric corrections for use over land.

6. An updated chart of MODIS-N and MODIS-T spectral and IFOV parameters was presented. The table included in the "handout" distributed at the weekly meeting of the MODIS Data Team was current information as of January 26, but it does not include changes announced at the Science Team meeting held from January 31 through Februray 2.

7. An updated estimate of MODIS-N and -T data rates and daily volumes was presented, based on the information in the chart referenced above. Although instrument changes were announced at the Science Team meeting, it appears that this data rate estimate is still current (i.e. changes do not affect data volume). The current estimated total data volume from the MODIS instruments (allowing 10 percent for overhead) is 832 Gigabits/day.

not addressed in the estimates, including interpolation across datelines, latitude and longitude determination near the poles, tests for other special conditions/problems, and possibly refined techniques for large MODIS-T tilt angles.

10. Two independent analyses of the processor capability needed to produce estimates of aerosol size distribution were presented at the January 12th meeting of the MODIS Data Team. The two estimates differed by an approximate factor of two, and a short discussion of the differing assumptions and approaches of the two analyses was presented. The difference in results appears to arise primarily as a result of a difference in assumed number of iterations for each pixel and in the number of pixels assumed to require processing. Similar differences may affect other sizing estimates. In general, inconsistencies may arise due to 1) uncertainties in how the algorithm will actually work with MODIS data (e.g., how many iterations per pixel will be made) and 2) uncertainties in how the algorithm will be applied (e.g. what spatial resolution or subsampling strategies will be applied).

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