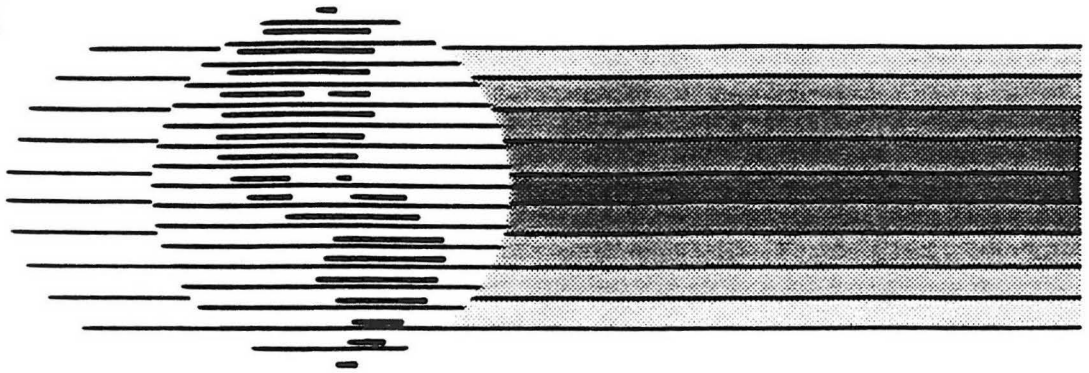


The Earth Observer

An Eos Periodical of Timely News and Events — *November 15, 1989 (Vol. 1, No. 6)*

Message from HQ

Planned Reorganization for ESAD

An October 2 interim organization chart (page 2) for NASA Earth Science and Application Division (ESAD) shows three Associate Directors: Flight Programs, Modeling and Data Analysis, and Process Studies. Under these are five Branches, six Projects, and a set of disciplines (and research facilities). EOS operates at three levels within the organization.

When the EOS Program is approved, a further organizational restructuring will be announced. Two primary results of the restructuring of the ESAD Research and Analysis (R&A) Program are: (1) to emphasize an interdisciplinary approach to the processes, modeling, and data analysis programs; and (2) to emphasize an increased focusing on modeling and data analysis/information systems as a centerpiece of the ESAD Program in the 1990s.

EDITOR'S CORNER

The Earth Observer is intended to be an informal and useful agent of communication across the Project. As the masthead states, we will carry timely news and events. In this sixth edition, you will find an evolving format and a mixture of style and importance. Seldom have periodicals started with what becomes their routine style, and we are no exception. In this case, "getting it into your hands" seems more important than perfecting the journalistic quality. Our standards are much higher than exhibited here. We intend more than a collection of "articles" sent in by willing authors. We will publish a coherent newspaper or newletter from the EOS Project. We ask your forbearance and your ideas, comments, and material. Our goal is for the readership to be able to get the latest and "best" information from *The Earth Observer.*

Science Focus

New IWG Panel Organization

During the second meeting of the Investigators Working Group (IWG) at JPL October 11 to 13, 1989, the IWG took the initiative to implement a "bottoms-up" reorganization to permit a more timely and appropriate means of addressing near-term science issues. There was recognition of an initial need for some disciplinary orientation, but concern was expressed that those disciplinary panels were neither to detract from/hinder the overall interdisciplinary focus of EOS, nor to promote the attitude of disciplinary "business-as-usual." There was also recognition of the desire to limit the size of the Science Executive Committee (SEC) for efficient functioning. Expansion is needed to include the additional panels formed. The SEC now has 15 EOS Investigators, two co-chairmen, and an additional Program and Project representative.

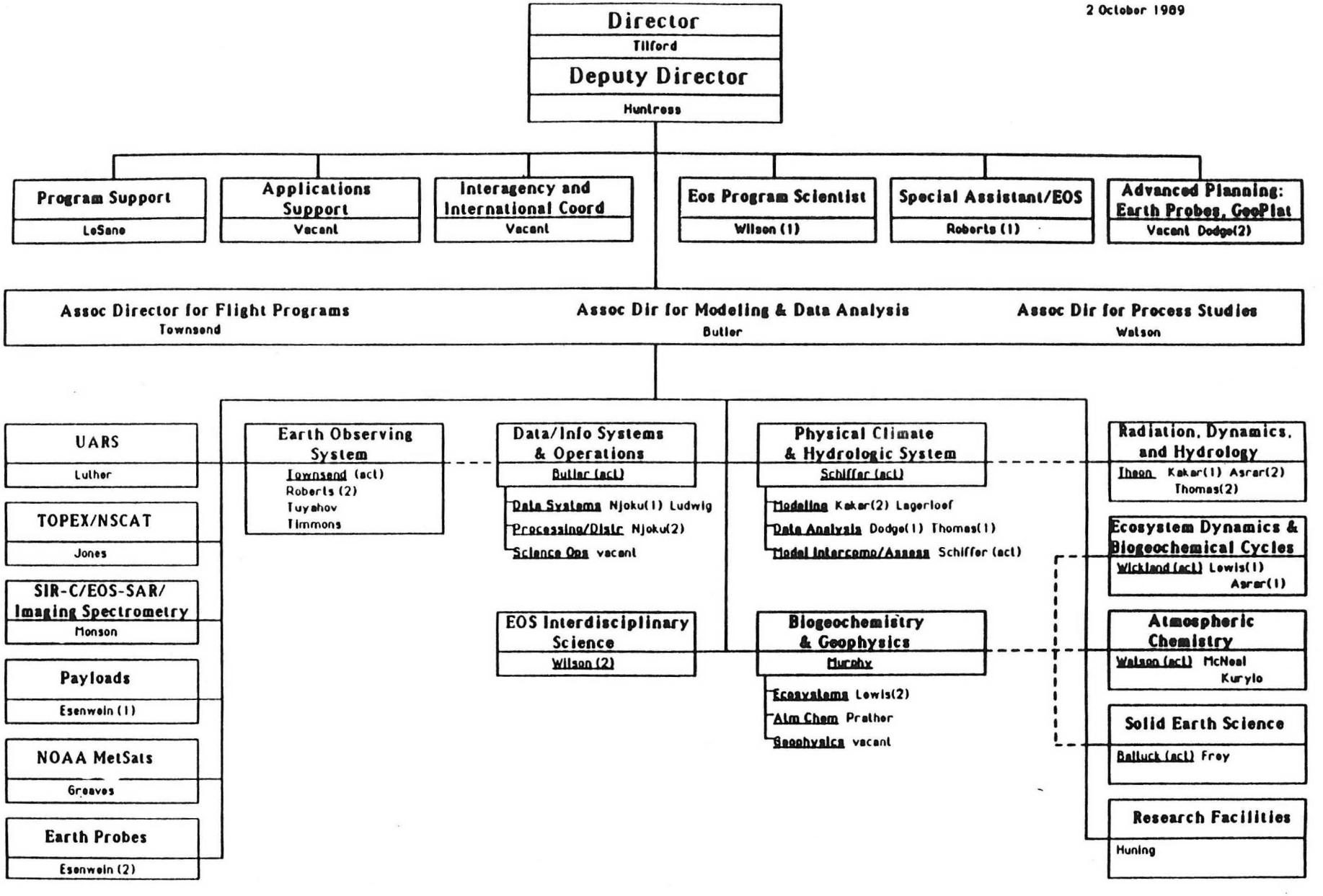
The new panel organization can be viewed as a three-dimensional matrix, with appropriate cross-representation being encouraged amongst the three types of panels. Those which had been active prior to the October IWG meeting are the Facility Instrument, EOSDIS Advisory, Physical/Hydrology, Calibration, and Ocean Panels. Each new panel chairman have been asked to send to the full IWG the proposed "Terms of Reference" for that panel, as well as an invitation for appropriate persons to participate.

The Interdisciplinary and Disciplinary Panels are expected to address those aspects of EOS science related to their area of interest, the associated goals and objectives, and how one might prioritize these. This is important in contributing to the basis for one aspect of investigation selection, as well as providing a basis for descoping due to fund limitations. A current exercise is collecting five science questions addressed by each Instrument Investigation and the associated data products produced plus five science questions addressed by each Interdisciplinary PI and his/her associated data needs. This will provide an input for deliberations by the panels.

(Continued to page 3)

NASA Earth Science and Applications Division

2 October 1989



New IWG...

(Continued from page 1)

At the time of the third IWG meeting, now scheduled for March 20 to 22, 1990, inactive panels will be dissolved. The active panels will each be asked to choose their chairperson by consensus. At that meeting the IWG Charter will be ratified, and the science plan/priorities will be discussed and debated.

Panel chairmen are selected from the IWG (Instrument and Interdisciplinary PIs, Team Leaders, plus the two lead US Co-Is to foreign Interdisciplinary PIs--Richey and Sorooshian). Panel members can be drawn from EOS PIs, Co-Is, Team Leaders/Members; given consensus within a panel. Gaps in expertise can be covered by non-EOS members as consultants.

Excerpted from material submitted by
--Stan Wilson, Eos Program Scientist

PANELS OF THE INVESTIGATORS WORKING GROUP (IWG)

FIRST IWG MEETING		SECOND IWG MEETING	
FUNCTIONAL PANELS			
Facility Instruments	Salomonson	Facility Instruments	Salomonson
PI Instruments on A	Drummond	PI Instruments	Drummond/Russell
PI Instruments on B	Russell	Cal/Val	Chahine
Cal/Val	Chahine	EOSDIS Advisory	Dozier
EOSDIS Advisory	Dozier	POD/Mission Design	Tapley
		Science Priority	Moore
INTERDISCIPLINARY PANELS			
Hydrology	Barron	Physical Climate/ Hydrology	Barron
Biogeochem	Moore	Biogeochem	Schimel
Geophysics/POD	Tapley		
Physical Climate	Dickinson	Earth Sys. Models	Dickinson
DISCIPLINARY PANELS			
		Ocean	Abbott
		Solid Earth	Cohen
		Atmosphere	Schoeberl
		Land/Biosphere	Sellers
		Solar/P&F	Heelis

SEC Meeting Minutes

In conjunction with the second IWG meeting at JPL, the SEC met on October 12, 1989. Attendees included Stan Wilson and Jerry Soffen (co-chairs), Darrel Williams, JoBea Way, Renny Greenstone, Vince Salomonson, Jim Drummond, Jim Russell, Eric Barron, Bob Dickinson, Berrien Moore, Moustafa Chahine, and Jeff Dozier. (Steve Cohen of GSFC was invited to represent the interest of the Solid Earth PIs.)

The next IWG meeting will be held at Goddard, March 20-22, 1990, and SEC meetings are scheduled for December 13, 14 at Goddard and January 29, 30 at NASA HQ. (All IWG members have been notified directly of the November 15 deadline for submitting lists of measurement objectives and investigation products and the persons to whom these lists should be sent. These lists were referred to as the "silver bullets" at the IWG meeting.

(Continued to page 4)

SEC...

(Continued from page 3)

Considerable discussion led to a restructuring of the SEC so that it now has members representing seven "science" category panels and seven "functional" category panels, where the functional categories basically cover issues cross-cutting the science categories, as summarized below.

Science Panels	Functional Panels
Atmosphere (Schoeberl)*	Facility Instruments (Salomonson)
Land/Biosphere (Sellers)*	PI Instruments (Russell/Drummond)
Oceans (Abbott)*	EOSDIS Advisory (Dozier)
Solid Earth (Cohen)*	Earth System Models (Dickinson)
Solar/Particles & Fields (Heelis)*	Calibration/Validation (Chahine)
Physical Climate & Hydrology (Barron)	Precision Orbit Determination/Mission Design (Tapley)
Biogeochemical (Schimel)*	Science Priority and Payload Scenarios (Moore)

For purposes of continuity, the nine original SEC members were retained and six new members (* above) were appointed. This SEC membership is to remain in effect until the March 1990 IWG meeting, at which time all of the panel "chairs" will be selected by consensus of the IWG members on their respective panels.

Also, henceforth, the SEC will consist of the panel "chairs" of the various active IWG panels. Inactive panels will be dissolved. Chairpersons of active panels (therefore SEC members) may be rotated at specific intervals based on nominations and voting within each panel. Details of this process should be spelled out in the IWG Charter, but the nomination/selection process should be scheduled such that no more than one third of the SEC membership will be eligible for replacement at any one time.

Other business:

(1) It was decided that current Co-Is Soroosh Sorooshian and Jeff Richey will have full status as IWG members.

(2) It was decided that informal minutes of the SEC meetings (such as this) would be distributed to all IWG members via electronic mail; these minutes would also be published in the subsequent issue of *The Earth Observer.*

(3) With the elimination of SAR on the EOS-B platform, the phasing of Platform A and B orbits is no longer closely coupled, and, therefore, the phasing of the orbits is open for discussion. [During the IWG, Piers Sellers had suggested a mid-morning/mid-afternoon phasing to maximize observations of diurnal change.] It was felt that data collected using such an approach would greatly improve the accuracy of 4-D models. Consideration of various orbit-phasing scenarios will fall under the purview of the "Precision Orbit Determination/Mission Design" Panel headed by Byron Tapley.

(4) Key topics of discussion at the next SEC meeting (December 13-14) will be a report on payload scenarios (Moore) and a discussion of EOS science priorities (Wilson/Soffen) based on a synthesis of the "silver bullet" items submitted by the various IWG members and due consideration of the Committee on Earth Sciences (CES) global change priorities.

-- Darrel Williams and Renny Greenstone

Science Panel on Physical Climatology and the Hydrologic Cycle

One of the most important decisions of the EOS Panel on Physical Climatology and the Hydrologic Cycle at the recent IWG Meeting was (1) to take an active role in describing our observational needs, capability, and areas of current debate, and using their response to define our observation priorities in detail; and (2) to gather science objectives as a group so that we can be diligent and representative in fostering our objectives in EOS. In order to communicate our needs to the Instrument PIs, the following tasks were completed:

(1) The panel reviewed the "EOS Observational Needs" document dated June 12, 1989, and designated those measurements of critical interest to individual projects.

(2) The panel reviewed the EOS instrument list and designated the following as instruments of high interest:

MODIS-N	MIMR
MODIS-T	ALT
MISR	SCANSCAT
HIRIS	STIKSCAT
ITIR	MOPITT/TRACER
CERES	TES
EOSP	HIRRLS/DLS
AIRS	LIS
AMSU	GLRS
HIMSS	SAR
AMSR	LAWS

Excerpted from material submitted by
-- Eric Barron, Panel Chair

Science Advisory Panel for the EOS Data and Information System

Presentations and interactions with the EOS IWG consisted of two sessions. October 11, Jeff Dozier, panel chair, reported to the plenary session and Eni Njoku reported on the Headquarters perspective. October 12, Hughes and TRW each gave a 25-minute overview, and the EOSDIS Panel spent about an hour in a widely ranging discussion. About 60 people attended this session. In general the presentation was well-received. There were some protests about the panel's identification of the most important success criterion:

> "EOSDIS will be judged by the quality, compelling results, and creative ideas in EOS scientists' publications."

Thus, the panel has some more work to do, to make the Mission really sign up to the idea that the final judgement of EOS depends on Investigator productivity. More specific criteria for EOSDIS will need to be directed to this general one, but there is a need to recognize that the success of EOS depends on the Investigators' performance, hence EOSDIS needs to enhance their performance. If the instruments deliver their bits to the ground and illuminating science does not follow, the reaction of the scientific community will be that NASA has again built an inadequate data and information system. In the EOS mission, however, it will not be because of lack of forethought, planning, or budget.

In the panel's view, the contractors' presentations were not very successful. They did cooperate in preparing a common outline, but because they were both in the room, we still heard the sanitized overviews. The audience asked some specific questions, but the generic answer was "We've thought about it and we have some good ideas but don't want to reveal them here." The participation of the contractors must be thought about prior to the next IWG. Because of the optimism of the EOSDIS Advisory Panel, most EOS IWG members are less nervous about the contractors' approach and competence, but it is important to avoid this "Trust me -- they're doing OK" evaluation.

Subsequently 13 Advisory Panel Members attended the contractors' Preliminary System Design Review, held at NASA Goddard October 30 to November 3. The panel is preparing its response to this review, and some of the details will be available in the next EOS Newsletter.

The **Initial Scientific Assessment of the EOS Data and Information System (EOSDIS), Report EOS-89-1,** will be mailed in November. Please send any comments to Jeff Dozier.

At the Advisory Panel Meeting at NASA Goddard on November 3, Jeff Dozier was elected to continue as chairperson. Some members have resigned from the panel, and some added after the October IWG meeting. Representatives are also appointed from some sites proposed as nodes for EOSDIS. The current list of members and ex-officio representatives is:

Members	Ex-Officio
Jeff Dozier (Chair)	Arthur (Bud) Booth
John Barker	JoBea Way
Bruce R. Barkstrom	Al Fleig
Roger G. Barry	Tom George
Francis P. Bretherton	Strat Laios
John Curlander	Gary Metz
Lee Elson	David Nichols
William Emery	Eni Njoku
G. David Emmitt	Paul Rotar
Robert H. Evans	Jerry Soffen
Terry Fisher	Tom Taylor
David Glover	Vince Troisi
David Halpern	Darrel L. Williams
James F. Kibler	W. Stanley Wilson
David A. Landgrebe	
Paul A. Newman	
Bob Schutz	
Ronald Welch	
Al Zobrist	

The panel is currently examining the following issues, and information should be available in the next edition of *The Earth Observer*:

- Browse requirements need to be tightened. Several levels of browse, including searches on meta-data, special browse products, and full-resolution data must be examined.
- Specific success criteria that enhance Investigator productivity must be presented.
- The rationale and criteria by which EOSDIS activities are distributed around some number of nodes need to be specified.
- The Investigators must know what EOSDIS will provide and what they must plan and budget for to write their proposals for the Execution Phase. The EOSDIS Panel will draft a version of these expectations that the Program and Project can distribute to the Investigators to use in preparing their proposals.
- Al Fleig has put together a data base from proposals and interviews that contains information about data requirements, proposed products, and browse requirements. This must be evaluated and coordinated with other efforts in the IWG to identify the mix and match between products to be created and those that are needed.
- Al Fleig gave a presentation on algorithm development, coding standards, etc. at the IWG meeting. A plan for these activities is required.

Excerpted from material submitted by
--Jeff Dozier, Chairman

EOS Oceans Panel

The purpose of the Oceans Panel meeting was to begin discussions concerning the development of an oceans science plan within the larger framework of Earth system science and to describe the relationship of the ocean-related science goals to the various EOS instruments. The panel also developed an organizational plan to coordinate our response to various EOS mission plans.

Bill Patzert presented an overview of planned ocean-related missions in the pre-EOS era. This includes ERS-1 which will carry a SAR/scatterometer and an altimeter, Geosat II which have an altimeter, the joint NASA/Hughes SeaWiFS mission which will have an ocean color sensor, JERS-1 which will have a SAR, TOPEX/Poseidon which will have an altimeter, ADEOS which will have a scatterometer and a color/temperature sensor, and RADARSAT which will carry a SAR. Operational satellites from NOAA will continue carrying temperature sensors and the DoD DMSP satellites will carry passive microwave radiometers. Although these sensors will provide an invaluable suite of ocean-related measurements, they will not replace the EOS observations. Many of the essential observations may not overlap in time for a sufficient period of time in which to study processes on time scales greater than one year.

Continuation of these observations in the EOS era as well as simultaneous observations of several key geophysical variables are essential for both ocean-related and Earth system studies. The CES report on global change was also reviewed. It was noted that many of the key EOS sensors "map" into several of the primary global change study areas, particularly in the physical climate and biogeochemical areas which involve ocean studies.

The panel reviewed the EOS sensors of relevance to ocean sciences. These include the scatterometer, altimeter, AMSR (HIMSS), MODIS, HIRIS, SAR, and MISR. Although the panel was not able to cover each sensor in equal detail, several areas of concern were noted. First, the postponement of the SAR was viewed as a serious setback for polar ocean studies. However, the availability of pre-EOS SARs should mitigate (though not eliminate) this impact. Again, the need for coincident observations using several observation techniques is one of the prime capabilities of EOS and may not be met by reliance on pre-EOS SARs. Second, correction of the active radars (scatterometer and altimeter) by passive microwave observations is essential. This is directly comparable to the correction of the visible imagers by atmospheric sounders. Third, the panel briefly reviewed the capabilities of SCANSCAT and STIKSCAT. The panel reiterates our strong support for scatterometer measurements to be made simultaneously with other ocean measurements. Fourth, the panel noted that scheduling of the full complement of ocean-related sensors would affect the continuity of pre-EOS time series. Gaps of a year of more will seriously compromise our ability to study low-frequency phenomena, such as ENSO events. For example, the 1982-83 El Nino event would have been missed if there had been a one-year gap in the time series. As long time series are essential if the panel is to study such processes in a statistically rigorous manner, the possibility of uninterrupted time series of winds, sea level, sea surface temperature, and ocean color from the early-1990s through the EOS era must be viewed as a unique opportunity in the study of global change.

To address these issues and to organize the EOS Oceans Panel, two activities are planned. First, we will develop a white paper describing the goals of ocean sciences in the context of global change. That is, this will not be a discipline-focused report but rather will put discipline-related goals into the larger focus of global change and Earth system science. Much of this work has been done previously; the intent is to collate and synthesize. The second part of the report will assess the planned EOS studies in the context of the science plan. The third part of this report will focus on the relationship of these science goals and objectives to the pre-EOS missions. The fourth part will focus on the EOS instruments and their relationship to this science plan.

The panel plans to distribute this report widely to the IWG and various Project and Program personnel. This report should form the scientific rationale for future studies and reports. For example, the IWG may be asked to justify certain instrument capabilities or phasing of particular instruments. This report should help in the development of the consensus IWG position on such matters. Eventually, the IWG will need to develop a long-term science plan for the entire EOS mission. The panel expects that this report should form the basis of the ocean-related portion of this mission plan. In essence, this white paper should allow the formulation of science positions on various mission decisions in a rapid and consistent manner.

The second part of the plan is to assign various EOS Oceans Panel members to the various ocean-related ocean sensors. These members will act as liaisons between the Oceans Panel and the various instruments. This should encourage the free flow of information between the instrument builders and the science users and should strengthen both groups. Specific assignments are:

Altimeter - Lee Fu
Scatterometer - Mike Freilich
MODIS - Mark Abbott
HIRIS - Curt Davis
AMSR - Tim Liu and Frank Wentz
MISR - Curt Davis
SAR - Drew Rothrock

The first assignment for the liaisons is to present a short report on the present status of the instrument and on foreseeable areas of modifications of instrument capabilities. For example, bandwidth on the imaging sensor may change; in conjunction with the science plan the panel should be able to develop a position paper on the potential impact on science studies and their treatment within the larger science plan.

(Continued to page 7)

Oceans...

(Continued from page 6)

Finally, the recent IWG meeting established a number of other discipline-oriented panels, cross-discipline panels, and technical panels. We expect that at least one EOS Oceans Panel member will be on each relevant panel. For the cross-discipline panels, it is essential that the oceans program blend in with the cross-cutting programs, such as biogeochemical cycles, that are at the EOS mission.

Similarly, the technical panels should also have representation to ensure that a consistent Earth science observing mission is developed. Presently, David Glover has volunteered for the Biogeochemical Panel, Tim Liu for the Physical Climate/Hydrologic Cycle Panel, Mike Freilich for the Payload Panel. Bob Evans and David Halpern are presently on the Data Panel. Subsequent to the meeting, Bill Patzert has volunteered for the Payload Panel, Bill Holland and Frank Carsey have volunteered for the Earth System Modeling Panel. Any other co-investigators or team members who wish to serve on any EOS panel should contact the panel chairperson as well as the Oceans Panel chairperson.

Lastly, the panel plans to hold only a minimum of meetings, given the restricted budgets available for travel. A mailing list will be developed on OMNET for those investigators wishing to participate in the EOS Oceans Panel. A short meeting during the AGU/ASLO Ocean Sciences meeting in February 1990 would be useful to review the present status of the reports and the EOS mission in general. This would minimize travel as well as giving the panel an opportunity to meet in advance of the next EOS IWG meeting in March 1990.

Excerpted from material submitted by
--Mark Abbott

NEWS FROM THE PROJECT

The "delta NAR" was held October 24-26, 1989. This meeting was the follow-up to the Non-Advocate Review held in June. The Project demonstrated responsiveness to all the NAR recommendations. The Committee expressed its satisfaction with the quality and amount of relevant data presented and the progress made in a very short time by the Program/Project personnel.

The delta NAR members agreed that EOS is ready to proceed as a major, long-term initiative. The updated observatory description document that was distributed at the NAR is based on the unique platform design and the delta-NAR payloads for EOS-A and EOS-B.

Following the completion of the delta NAR, the project announced an interim organization and personnel structure to help implement the NAR recommendations. In the interim, and to facilitate a smooth transition, the following changes in Project assignments are effective Monday, November 13, 1989:

- **Jeremiah J. Madden, Acting, Earth Observing System Study Project Manager**
- Richard A. Austin, Acting, Earth Observing System Study Project Deputy Manager/Resources
- Thomas D. Taylor, Acting, Ground Data Processing Systems Manager, Earth Observing System Study Project
- Arthur F. Obenschain, Acting, Work Package 3 Project Manager

The general instrument Performance Assurance Requirements (PAR) document has been distributed to the instrument developers for use in developing their Conceptual Design and Cost Review presentations that are to be given next spring.

UPCOMING MEETINGS

AGU Fall Meeting
December 4-8, 1989
San Francisco, CA

EOS Earth System Modeling Panel
December 4, 1989
During AGU Meeting, San Francisco, CA (R. Dickinson)

EOS Physical Climatology/Hydrologic Cycle Meeting
December 5, 1989
During AGU Meeting, San Francisco, CA (E. Barron)

Ninth Miami Intern. Congress on Energy and Environment
December 11-13, 1989
Miami Beach, FL (L. Walter)

HIRIS Team Meeting
January 23-25, 1989
Monrovia, CA (A. Goetz)

MODIS Team Meeting
January 31- February 2, 1990 (tentative)
Greenbelt, MD, Bldg. 28 (L. Stuart and R. Kumar)

ICWG Meeting
January/February, 1990
Europe

SPIE's 1990 Symp. on Rem. Sens. & Signal & Image Processing
April 16-20, 1990
Peabody Orlando Hotel and the Orange County Convention Center, Orlando, FL (D. Butler and P. Slater)

CEOS Working Group on Data
April 1990
Tokyo, Japan

IGARSS '90
May 20-24, 1990
College Park, MD (V. Salomonson)

SAFISY
May 17-18, 1990
Kyoto, Japan

GUEST COLUMN

Status of the EOS SAR

As many of you know, the EOS SAR was removed from the EOS-B platform this past summer. The purpose of this article is to bring you up to date on the status of the EOS SAR mission, to emphasize the SAR's role in the overall EOS mission, and to compare the EOS SAR under study to the earlier SAR on EOS-B.

Status

The EOS SAR had been carried as a facility instrument on EOS-B through the June, 1989, Non-Advocate Review (NAR). Shortly after the NAR was held, NASA elected to take the SAR off the EOS-B platform. This was done to make the designs of the EOS-A and the EOS-B platforms the same in order to reduce the cost of the EOS mission. Because the SAR drove most of the mass, data rate, and power requirements on EOS-B, the instrument was removed. NASA then requested JPL to study a dedicated SAR mission tailored to the SAR requirements. Meanwhile, NASA has proceeded with an FY 91 new start request for EOS without the SAR.

JPL recently conducted a study and defined an EOS SAR mission on a dedicated Delta II launch. The revised SAR has almost the full capability of the original EOS SAR (see below). Data will be input to EOSDIS and be available to the science community. NASA is looking at options for obtaining a new start for the EOS SAR as soon after the EOS new start as feasible, aiming for a launch in the late 1990s.

The Role of SAR in EOS

Global Warming and the Carbon Cycle -- Atmospheric CO_2 flux from deforestation is a key unknown parameter in determining the contribution of the carbon cycle to global warming. Unknown parameters include the areal extent of deforestation (measurable with a single channel radar) and the biomass of existing forests (only measurable with multichannel radar). Biomass is essential to determine carbon input from cleared forests. In their first 10 to 20 years, forests reach maximum leaf area index in order to intercept maximum sun for growth. This shields the lower canopy to optical sensors. Beyond about 20 years, forest growth occurs in the trunks and branches. Only the long wavelengths of SAR can penetrate the upper canopy and sense forest biomass. The other major unknown in carbon cycle is the amount of carbon taken up in the ocean by phytoplankton: MODIS on EOS-A will measure this. Thus both SAR and MODIS are essential to determine the role of the carbon cycle in global warming.

Hydrologic Cycle -- Understanding the global hydrologic cycle is essential as it plays a role in nearly every process on Earth. A key component is soil moisture. Historically it has been difficult to measure soil moisture with any remote sensing instruments as surface roughness and vegetation confuse the measurements. New advances which utilize multipolarization radar techniques allow the separation and measurement of the soil and vegetation moisture independently. The SAR is the only EOS instrument with the potential capability of global soil moisture measurement.

Polar Ice Mapping -- Through its fine-scale measurement of sea ice motion, ice type and concentration, and ice edge configuration, the EOS SAR (in conjunction with MODIS surface temperature and ocean color data) is a key instrument for determining ice dynamics, heat flux bottom water formation and ice margin biological products. All of these measurements are important for modeling of the global climate, energy balance, and ocean circulation, and for monitoring ocean/atmosphere/cryosphere/biosphere interactions. In addition, knowledge of the nature of thin sea ice as measured by the EOS SAR along with HIMSS will help assess the magnitude of global warming. Because of the lighting conditions and cloud cover in the polar regions, the radar, with its global coverage capability, is essential to achieve this monitoring capability. Several key algorithms, including ice motion and ice classification, have already been implemented and are operational at the Alaska SAR Facility (ASF) in preparation for ERS-1.

The New EOS SAR

The scientific measurements stated above require a multiple frequency (at least three), full polarization imaging radar with the capability for global mapping every four to five days at moderate resolution (250 m) with nested local high resolution (30 m) capability. This cannot be met by any U.S. or international SAR presently under development or planned (SIR-C/X-SAR, ERS-1, JERS-1, or Radarsat). A number of science advisory groups appointed by NASA recommended a multiparameter SAR to be a key facility on EOS.

The capabilities of the new EOS SAR under study and the previous EOS SAR are compared in Table 1. The new EOS SAR, like its predecessor, will have three frequencies: L-, C-, and X-bands. However, as a result of the new mass, power, and launch envelope constraints, quad polarization will be available only at L-band, and dual-polarization available at C- and X-bands. The swath width for the global mapping mode will be reduced from 600 km to approximately 350 to 450 km. The other modes will not be affected. A global coverage capability may still be achieved over five days at an altitude of 620 km with the reduced swath and maximum incidence angle (40 degrees). The new altitude will reduce the amount of simultaneous data collected with MODIS; however, well over half of the MODIS data will be collected within 30 minutes of the SAR passing over the same target.

(Continued to page 9)

SAR...

(Continued from page 8)

Table 1.

	EOS-B's EOS SAR	New EOS SAR (on SAR platform)
Frequencies:	L-band (1.2 GHz, 25 cm) C-band (5 GHz, 6 cm) X-band (9 GHz, 3 cm)	L-band (1.2 GHz, 25 cm) C-band (5 GHz, 6 cm) X-band (9 GHz, 3 cm)
Polarization:	Quad-polarization L-band Quad-polarization C-band Dual-polarization X-band	Quad-polarization L-band Dual-polarization C-band Dual-polarization X-band
Imaging modes:		
Global mapping	250 m resolution, 600 km swath	250 m resolution, 350-450 km swath
Regional mapping	50-100 m resolution, 100-200 km swath	50-100 m resolution, 100-200 km swath
Local high resolution	20-30 m resolution, 30-50 km swath	20-30 m resolution, 30-50 km swath

In the coming year, the EOS SAR Facility Instrument Team will be reviewing the SAR science requirements and will then make recommendations with regard to the SAR capabilities. All Interdisciplinary Science teams interested in SAR data are invited to make their requirements known to the SAR Team.

Summary

The JPL study has shown that a dedicated EOS SAR mission is a technically and fiscally sensible approach. The SAR is a key element of the EOS program and is essential to make the measurements needed for global change studies. It is critical, especially for carbon cycle study, that the SAR data are acquired in conjunction with the MODIS and HIRIS data on EOS-A (launch in 1997). Therefore, it is essential that the EOS SAR be launched in parallel with EOS-A within the budgetary constraints of the EOS mission.

-- *Charles Elachi*
Jet Propulsion Laboratory

Status of the First European Polar Platform Mission

The European Space Agency (ESA) is planning to launch an Earth Observation Polar Platform in early 1997. The platform is being developed in the Columbus Space Station programme, while the payload is under study in ESA's Earth Observation programme. The primary objectives of this mission have been established at the 1988 ESA workshop on the future Earth observation strategy and will be in the wider frame of environmental monitoring of: (1) atmospheric observations, (2) operational meteorology, and (3) observations of oceans and ice.

Being of an interdisciplinary character, the mission shall also have some capability for land applications.

Data continuity, operational prospects, and the advancement of understanding and knowledge of the Earth's environment as a matter of priority are some of the most important aspects of this mission. A model payload complement, consisting of core facility instrument, operational meteorology payload, and Announcement of Opportunity instruments (including space science instrumentation) arriving at a total net payload mass of 1,700 kg has been established and will be subject to confirmation by the Earth Observation Programme Board.

The development and exploitation costs for the first mission, the payload, and the associated ground segment data handling are roughly projected at around million (US).

The launch vehicle will be an Ariane 5 rocket. The of the platform will be sunsynchronous polar with inclination of 98 degrees and a nodal crossing (descending) between 9:30 and 10:30 am. The altitude range reaches from 700 to 850 km.

The first mission is not to be seen in isolation but with view to compatibility with the US-EOS facility and Japanese NASDA platform, and also with regard to ESA's second polar platform which will in its objectives directed more towards land applications, i.e., the monitoring of renewable and non-renewable resources investigations associated with the solid Earth.

One of the major goals shall be the exchange of data these different polar platforms between Space partners and their associated countries.

-- *Michael Rast, ESA*

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20771

********** HIGHLIGHTS AND SPOTLIGHTS **********

- GSFC plans to change the EOS Project to the level of Deputy Director of Flight Projects with three subordinate Projects: Spacecraft, Instruments, and Ground Systems. The EOS Project Science office within the Science Directorate has been expanded to include groups dealing with interdisciplinary and disciplinary science, data, sensor science, calibration and validation, and the science part of Mission operations.

- The October 11-13 IWG dealt with panel reports, IWG charter, Program and Project reports, and many topical issues such as international spacecraft, upcoming proposals for Phase C/D, reports of NAR activity, and payload accommodation studies. A major theme was concern over science priority. The SEC recommended the formation of five additional panels dealing with various disciplinary sciences and science priority, and IWG members have agreed to organize these new panels.

- The "delta NAR" (update to the Non-Advocate Review Panel) was presented by the Project Office on October 24-25. This update was in response was to the NAR recommendations to NASA management. Major changes which affect science include: move SAR to separate spacecraft, prioritize science of EOS mission, consolidate management at one NASA center, and develop common spacecraft for A and B missions. Concern was raised within NASA about the "risk" factor incurred by the shortage of early funding. Fiscal reality is the major reason for this, other pending flight projects must be supported.

- A Major System Architecture Review of EOSDIS was held at GSFC October 30 to November 3. The two study contractors, Hughes and TRW, made presentations to the EOS Project, separately. The science data panel was present and participated in the review and assessed results.

- EOS Interdisciplinary Science PIs are preparing for a meeting at the end of November to deal with the issues of science priority.

- The Committee on Earth Science of OSTP has issued a Report (July 1989), **Our Changing Planet: The FY 1990 Research Plan.** This report presents a comprehensive plan for the U.S. to provide a "sound scientific basis for national and international decision making on global change issues." The objectives are to monitor, understand, and predict the changes. Research activities are divided into seven interdisciplinary areas and each is presented in terms of the various agencies funding. The areas are: climate and hydrologic systems, biogeochemical dynamics, ecological systems and dynamics, Earth system history, human interactions, solid Earth processes, and solar influences. The strategy was developed by the Federal Coordinating Council on Science, Engineering, and Technology (FCCSET