NSSDC NEWS

NATIONAL SPACE SCIENCE DATA CENTER

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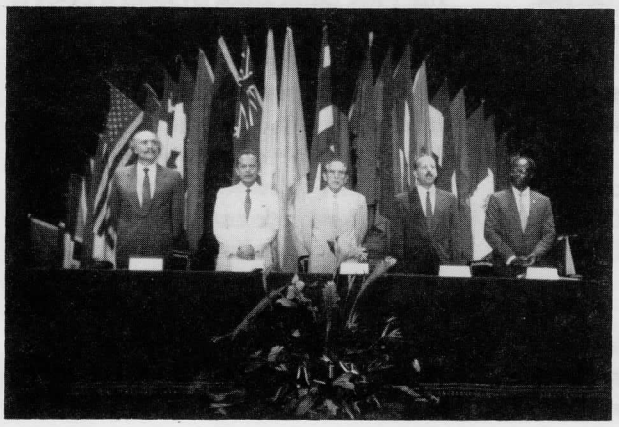
Costa Rica Hosts Conference To Spur Scientific Development



Dignitaries at opening session of Space Conference of the Americas. At center is Jorge M. Dengo, First Vice President of The Republic of Costa Rica.

The "Space Conference of the Americas" identified and delineated viable projects in key areas of space science and technology for Latin American countries. It was held in San Jose, Costa Rica, on March 12 through March 16, 1990.

A NASA delegation of more than a dozen people from many NASA centers participated in the conference, with Dr. James Green (Head of NSSDC) representing NASA's data archiving and networking activities.

This conference was jointly sponsored by the United Nations Development Program (UNDP) and the Republic of Costa Rica's government and private sectors. The organization and hosting of the conference was the responsibility of the Ministry of Science and Technology of Costa Rica, and it was the first step in a larger UNDP-sponsored project of regional space cooperation for development.

From the American continent and the Caribbean, representatives of 23 nations participated in the conference. The meeting also benefited greatly from expert presentations from leading space agencies and centers for space from delegations of ten European and Asian countries and agencies.

The conference had a unique combination of scientific and political representatives from the American nations in official capacities. This framework was additionally enhanced by strong scientific and technical delegations from major space agencies of the world. This combination was felt necessary to ensure the survivability of any new technical project within the political realities of the Latin American region. Total conference attendance exceeded 250 technical and political experts.

Viable space science and technology activities were identified, prior to the

see Americas Conference, *p. 7*

NASA's data census is underway! Turn to page 8 for details.

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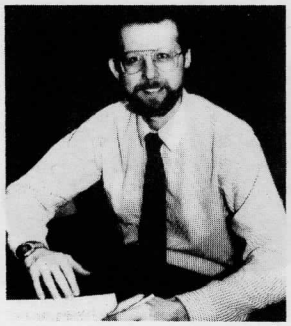


Message from the Director

Preparing NASA for the Future

In the last eight to ten years, the Information Systems Office of NASA Headquarters, working with NASA science discipline offices and the NASA field centers, has initiated new and substantive data management programs. These programs have been recognized by National Academy of Science Committees, such as CODMAC (Committee on Data Management and Computing) and the science community as important steps toward a strong overall data management program. NASA has been acting on many of the recommendations of CODMAC as well as other advisory groups.

NASA scientific data are widely distributed and have been accumulating over a period of 30 years or more. A few data sets are held at each of a great many sites in the NASA data environment. Recently established NASA discipline-specific data systems describe many data sets in their catalogs, but in only a few cases are all such data sets held at any one site.

Not only do these distributed data archives provide rapid distribution of archived data, but they also ensure that the data will never be permanently lost because of a disaster at any one site.

In this column I will briefly review several of the discipline-specific data systems that I feel have provided a great service to the science community over the years and will continue to do so, as NASA evolves toward a structure fully capable of managing widely geographically distributed data holdings.

Earth Science

The NASA Climate Data System (NCDS), managed as part of NSSDC, has developed over the past decade into a mature, operational system. It offers online data and services to NASA-supported researchers in such areas as cloud science, radiation budget, atmospheric chemistry, ocean-atmosphere interactions, etc. NCDS has a high-level catalog that describes data held by NSSDC/NCDS as well as at other sites.

Also, NCDS uses an inventory subsystem whereby needed data granules are located for specific parameters at specific times and places— a "data access" subsystem in which data granules are made accessible for manipulation and display; and data manipulation and display subsystems.

An increasing amount of NCDS data is being stored on line on magnetic and optical disks, in "Common Data Format" (CDF) for immediate use, while tape data held off line are loaded from tape when a user's Data Inventory/Access session calls for specific granules. CDF is a generic, self-documenting data structure being used at NSSDC and outside NASA. NSSDC Graphics System (NGS), which offers a range of advanced data visualization tools, constitutes the display system of NCDS and is also used beyond NCDS.

The NGS is a generic package, in that it can be run against any data organized in CDF. The NGS system is used as a browse facility as well as for data analysis. Use of the mature NCDS system is expected to give major insights into requirements for the future Eos-DIS.

The Pilot Land Data System (PLDS) is being developed to provide a distributed information system to support land science research by helping scientists identify data and acquire those data no matter where they are, as well as by providing a mechanism to access remote computer facilities using electronic communications.

A prototype system has been made available to scientists since August 1987. The PLDS is a multi-center cooperative data system with NSSDC at GSFC as the lead center and ARC and JPL as participating centers. An operational user support office has been established at each of these NASA centers.

The NASA Ocean Data System (NODS) has been operational since 1987. NODS is located at JPL and has the major data archive holdings for the SEASAT satellite. In addition, NODS contains a number of other important ocean data sets such as the West Coast Time Series of CZCS data or SMMI data.

The software system for NODS has been ported to the NOAA Snow and Ice Data Center in Boulder, Colorado. The NOAA installation probably will be operational sometime this year. In addition, the TOPEX spacecraft project has agreed to use the JPL NODS to be the long-term management facility for all its instrument data.

see Director's Message, *page 11*

NSSDC San Marco Staff Members Earn NASA Group Achievement Award

NSSDC staff members Dr. James Vette and Howard Leckner received a NASA Group Achievement Award "in recognition of their dedication, expertise, and outstanding attitude," along San Marco 5 team members.

The 230-kg San Marco 5 spacecraft was launched on March 25, 1988 from the San Marco Equatorial Range (SMER), located off the coast of Kenya near Ungwana Bay. The spacecraft and its payload, a joint American, Italian, and German project, were used to investigate the relationship between solar activity and thermosphere-ionosphere phenomena in the equatorial region. These phenomenological relationships were studied previously by the polar orbiting Dynamics Explorer 2 mission during a period of maximum solar activity. In contrast, San Marco 5 was in orbit during the period when activity was low and rising toward maximum (which is expected this year).

During its operational life, San Marco collected data for about 50 minutes each day and transmitted these to the SMER ground station in real time at 6 kbps or in recorded playback at 72 kbps. First processed at SMER by Machine KENYA using Program PRETRN, the data were then sent by a telecommunications link to Rome for processing on Machine IRMCRA located at the Centro Ricerche Aerospaziali (CRA). Finally, the data went to NSSDC, where Experimenter Tapes were prepared for use by project investigators and other researchers.

San Marco 5 reentered on December 6, 1988. Because the solar activity was greater than anticipated, the eight-month lifetime was somewhat less than expected. Despite this disadvantage, however, the five instruments aboard gathered sufficient data to fulfill their respective objectives. These instruments were: Drag Balance Instrument, Ion Velocity Instrument, Airglow and Solar Spectrometer Instrument, Electric Field Instrument, and Wind and Temperature Instrument.

Carrying on the Data Center's work on the San Marco project are award recipient Howard Leckner and the newest addition to San Marco staff, Ero Poros. Dr. Vette retired from NSSDC last year, but his efforts continue to contribute to the accomplishments of San Marco 5.

For more information about San Marco 5, please refer to *NSSDC News* Volume 4, Number 1, Spring 1988. You may also request reports about the San Marco project by contacting NSSDC at the address specified on the back page of this newsletter.

Ero Poros and James Vette

WDC-D Group from Beijing Visits NSSDC

In early May, a group of scientists representing World Data Center-D (WDC-D) in Beijing, China, arrived at NSSDC, the third stop on their planned tour of several WDC-A facilities. The purpose of the group's visit, to exchange information, evolved out of a recommendation made several years ago by the ICSU panel on WDCs as a practical approach toward improving the effectiveness of the WDC system. Dr. Stan Ruttenberg, chairman of the ICSU Panel on WDCs assisted in establishing communications between WDC-A and WDC-D to arrange the visit.

Here for an information exchange visit, Chinese delegation poses with Dr. Jim Green, NSSDC head, in front of NSSDC building. Left to right are Prof. Luo Baichang, Prof. Jiang Hongyao, Dr. Green, Mr. Hu Zhenou, Dr. Stan Ruttenberg, Prof. Ye Duzheng, and Mr. Zhao Heping.
Photo by Mr. Liu Xinzhu.

Arriving in San Francisco on April 28, the Chinese delegation proceeded to the WDC-A facility in the Boulder/Golden, Colorado area on Sunday, April 29 for a week's visit. Following that, the delegation's itinerary included a one-day visit to the WDC-A Meteorology and associated data activities in Asheville, North Carolina, on Monday, May 7, and a day-long visit to the NSSDC facility at Goddard Space Flight Center in Greenbelt, Maryland on Tuesday, May 8.

After the visit, Dr. Joe King, Head of Central Data Services, indicated in a letter to Professor Jiang Hongyao, Secretary of WDC-D, his desire to continue sharing information within "the context of the World Data Center System, to the mutual benefit of our national scientific research communities and of the worldwide research community." Dr. King also suggested that WDC-D furnish details regarding Chinese scientific satellite launches for publication in the forthcoming Report on Active and Planned Spacecraft to be released by NSSDC later this year.

Len Blasso

Clouds and Radiation Subdiscipline Is Well Represented in NCDS

Many NASA Climate Data System (NCDS) users are interested in gridded satellite-based cloud and radiation data sets. NCDS offers access to a broad range of these. Updates are received on an ongoing basis and incorporated directly into the system. NSSDC (of which NCDS is a part) archives many of the original data products from which these data sets are derived and makes tape copies available to requestors.

NCDS provides catalog, inventory, and data access support for the important long-term International Satellite Cloud Climatology Project (ISCCP) data, just as it does for many other data sets. The visible and infrared radiances for ISCCP are available as the "ISCCP-B3" product-reduced resolution (30 km) images from Meteosat, GOES, and the GMS geostationary satellites, and from NOAA polar orbiting satellites. Through the use of a three-part cloud algorithm combining cloud detection, radiative transfer model analysis, and statistical analysis, the global "ISCCP-C1" data set is produced using the B-3 data.

This data set is a three-hour, 250 km global product with 132 variables. It is divided into two data types within NCDS: one for the pixel-level data and the other for mean radiances, cloud top temperatures and pressure, cloud optical thicknesses, surface reflectances and temperatures.

Dr. Bruce Barkstrom of Langley Research Center works with ERBE data, which are accessible to NCDS users.

Monthly averages of these variables will be available soon as the ISCCP-C2 product. ISCCP began in July of 1983 and will extend through 1995. Users can keep abreast of the latest ISCCP information by reading the online ISCCP catalogs in NCDS, which contain the latest ISCCP status report and inventory.

Correlative data sets used in the production of the cloud product are also available through the NCDS as ISCCP Ice/Snow ("ISCCP_IS") and "ISCCP-TOVS" products. The ISCCP Ice/Snow is from the NAVY/NOAA Joint Ice Center Weekly Sea Ice Analysis and the NOAA/NESDIS Weekly Snow Cover Analysis. ISCCP-TOVS is produced from NOAA's TOVS Sounding Product and several climatologies.

NCDS also provides full support for the Nimbus 7 Temperature Humidity Infrared Radiometer C-Matrix Cloud Product as "C-MATRIX" in the Data Access Subsystem. This is a daily and monthly cloud product that uses a bispectral threshold-type algorithm to yield estimates of total cloudiness.

The NCDS is also serving as the First ISCCP Regional Experiment's (FIRE) Central Archive. FIRE is a cloud climatology research program to validate and improve the International Satellite Cloud Climatology Project (ISCCP) data products and cloud/radiation parameterizations used in general circulation models. A Standard Data Format (SDF) is being used for the exchange of data by FIRE participants.

Dr. David Starr, "hands-on" session leader for clouds and radiation at NDCS' workshop last fall, describes FIRE data centrally archived by NCDS.

Two experiments have already taken place: the Cirrus Intensive Field Operation in October 1986 in Wisconsin and the Marine Stratocumulus Intensive Field Operation (IFOs) in the summer of 1987 off the coast of southern California. As principal investigators for both IFOs complete their derived products in SDF, these data sets are cataloged, inventoried, and prepared for the Data Access system of the NCDS as "FIRE-CI" or FIRE-MS" data sets.

Two additional experiments are planned. A second cirrus experiment is scheduled for the November/December 1991 time frame in the Wichita, Kansas, area. A second marine stratocumulus experiment will take place in the vicinity of the Azores in June 1992 as part of the Atlantic Stratocumulus Transition Experiment (ASTEX).

ASTEX is a U.S. research program sponsored by the Office of Naval Research (ONR) and other federal agencies to increase our understanding of the physical processes that govern entrainment at the top of the marine planetary boundary layer.

see Clouds and Radiation, *next page*

Clouds and Radiation, *from p. 4*

Gridded radiation budget data from the Earth Radiation Budget (ERB) experiment on Nimbus 7 are held as the "ERB-MATRIX" data set. It contains regional daily, six-day, and monthly world grids of data at the top of the atmosphere.

Included are albedo, emitted longwave, and net radiation calculations, as well as day, night, and average results. Separate Wide-Field-Of-View (WFOV) and Narrow-Field-Of-View (NFOV) products are available, although the NFOV sensor became inoperable after June 1980, and therefore those data are limited.

The ERB Matrix Summary Tape (EMST) data set contains monthly averaged world grid data. If an NCDS user is only interested in these monthly averages, the appropriate data set to choose in the system is "ERBM-MON". Again, NSSDC holds the original data from which these products were derived.

The Earth Radiation Budget Experiment has been collecting data from scanners and nonscanners on the Earth Radiation Budget Satellite (ERBS), NOAA 9, and NOAA 10 for the past four years. The data are archived as six data sets. NCDS provides access to the Earth Radiation Budget Experiment's (ERBE) S-4 product as "ERBE-S4." This product offers monthly regional (2.5, 5, and 10 degree), zonal, and global averages of longwave and shortwave radiation, and albedo.

Dr. Robert Shiffer, NASA Headquarters Climate Research program, spoke at last fall's NCDS Workshop.

Did You Know...?

Handling 13,000 electronic access and over 3000 letter requests last year for a wide range of space and Earth sciences data and information, the Data Center serves a worldwide scientific community that uses many languages.

Because of this, NSSDC frequently receives requests from a number of non-English speaking countries. Perhaps you may not have been aware that, as a "user-friendly" facility, NSSDC can respond to data requests received in foreign languages.

Since many of its staff scientists and data processing personnel have multi-lingual capabilities, NSSDC can readily interpret and process requests written in Spanish, French, German, Italian, Chinese, Japanese, Russian, and Portuguese. Requests can be taken online (via the SPAN and NSN networks) or through the mail.

Disciplines represented include astronomy, astrophysics, atmospheric sciences, ionospheric physics, land sciences, magnetospheric physics, ocean sciences, planetary sciences, and solar-terrestrial physics.

Data are stored at NSSDC on more than 120,000 magnetic tapes, tens of thousands of film products, and optical, video, and magnetic discs. Data are also disseminated online as well as in published hard copy form, and on VHS, Beta, or PAL (European version of VHS) videotapes.

To facilitate online interactive searches for data, NSSDC maintains a Master Directory that helps users to select and locate data sets by keyword search or by spacecraft, experiment, or investigator specifications.

For further information about NSSDC's data archive, or how to request data from it, please refer to the appropriate addresses and telephone numbers listed on the last page of this newsletter.

Len Blasso

NCDS users can gain access to the daily NOAA Heat Budget Data Set by requesting "NOAA-HB" in the Data Access Subsystem. NOAA's heat budget product provides day and nighttime outgoing longwave radiation, absorbed and available solar energy.

Data are derived from Scanning Radiometers (SRs) and Advanced Very High Resolution Radiometers (AVHRRs) on NOAA polar orbiting satellites. Coverage began in 1974 and continues to the present except for a gap between March 1978 and January 1979 caused by the failure of a scanning radiometer on NOAA 5.

On the following page of this newsletter is a newly updated list of clouds and radiation data sets available through the NCDS. NASA-supported users who wish to access these data sets through NCDS are encouraged to contact the NCDS User Support Office by calling (301) 286-3209, FTS 888-3209, or by sending a SPAN message to NSSDCA::OLSEN.

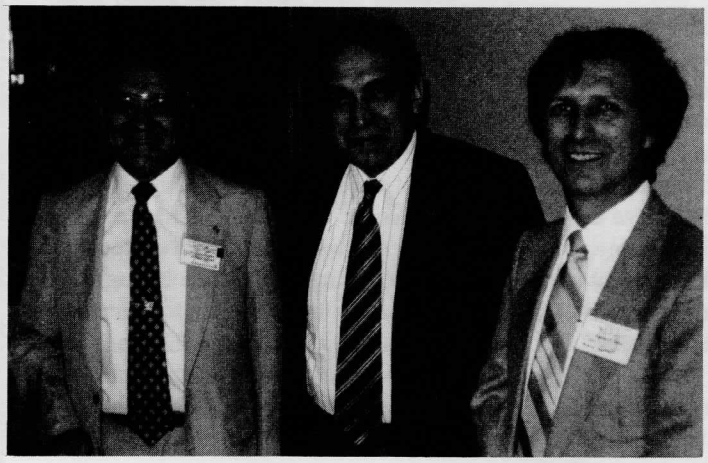
Lola Olsen

Clouds and Radiation Data Sets Are Available at NCDS

Data Set	Parameters Resolution	Temporal Coverage/ Resolution	Spatial Coverage/ Resolution	Archive Media: Volume	Output Options CDF, Tape	NCDS Data Set or CDF* Name
ERBE Regional, Zonal, and Global Averages S-4 (ERBS, NOAA 9, NOAA 10)	Radiation Budget	11/84; 02-07/85; 09-11/85; 01/86; 10/86 hourly, daily, monthly	Global, (ERBS coverage only 57 N to 57 S); 2.5 deg x 2.5 deg 5 deg x 5 deg, 10 deg x 10 deg, zonal, global	Optical disk and Tape (12): 1.1 Gbytes	CDF, Tape	ERBE-S4 ERBES4-G ERBES4-Z
FIRE Cirrus in Standard Data Format	Clouds, Humidity, Radiation Budget, Stability, Temperature, Wind	10/13/86 - 11/02/86; variable with data source	Wisconsin FIRE Network; variable	Tape (16): 1.2 Gbytes 4 Diskettes	CDF, Tape, Diskette	FIRE-CI
FIRE-CX	Radiance	FIRE time periods 10-11/86; 06-07/87	Wisconsin Fire Network and California coastal area/25 km	Tape (15): 1.7 Gbytes	Tape	FIRE-CX
FIRE Marine Strato-cumulus in Standard Data Format	Clouds, Humidity, Temperature, Wind	06/29/87 - 07/19/87; variable with data source	29 - 34 deg N to 119 - 125 deg W; variable	Tape (38): 3.9 Gbytes	CDF, Tape	FIRE-MS
GOES VISSR for FIRE ETO	Radiance	04/05/86 - 07/31/87	Global; 0.9 km for visible, 8 km for IR	Tape (182): approx. 300 Gbytes	Tape only	GOES-VISSR
HSIUNG Mean Surface Energy Fluxes	Energy Flux	01/1946 - 12/1979, Monthly Climatology	Global; 5 deg x 5 deg (70 deg N - 50 deg S)	Online CDF; Diskette: 414 Kbytes	CDF, Diskette	HSIUNG_HEATFLUX*
ISCCP Stage B3	Clouds, Radiance	06/30/83 - 11/08/88, on-going through 1995; twice daily nominal imaging frequency, orbital period for NOAA satellites of 102 min	Global; nominal 24 km sampling resolution	Tape (600): 73 Gbytes	Tape only (coverage not continuous for all satellites)	ISCCP-B3
ISCCP C1	Clouds, Optical Depth, Ozone, Pressure, Reflectance, Temperature	07/01/83 - 07/31/85, on-going through at least 1990; 3 hourly averages	Global; 250 km x 250 km	Tape (64): 9.6 Gbytes	CDF, Tape	ISCCP-C1
ISCCP Ice/Snow	Ice, Snow	07/03/83 - 12/28/88, on-going until at least 1990; daily	Global; 1 deg x 1 deg	Tape (5): 750 Mbytes	CDF, Tape	ISCCP_IS
ISCCP TOVS Atmosphere Data Set	Clouds, Humidity, Ozone, Temperature	07/01/83 - 12/31/88, on-going through June 1990	Global; 2.5 deg x 2.5 deg	Tape (6): 900 Mbytes	CDF, Tape	ISCCP-TOVS
Max Planck Institute Heat Fluxes	Heat Flux	01/01/50 - 12/31/79; monthly climatology	Global; 2 deg x 2 deg	Tape (1): 16 Mbytes	CDF, Tape	MPI-FLUX*
Nimbus-7 ERB-Matrix	Radiation Budget	11/16/78 - 11/01/87; daily, 6-day, and monthly average	Global; 500 x 500 km	Tape (18): 1.6 Gbytes	CDF, Tape	ERB-MATRIX
Nimbus-7 ERB Seasonal Averages	Radiation Budget	12/02/78 - 03/01/86; seasonal	Global; 500km x 500 km	Tape (29): 24 Mbytes	CDF,Tape	ERB-SAVER
Nimbus-7 THIR CMATRIX	Clouds, Radiance, Reflectivity, Snow, Temperature	04/01/79 - 03/31/85; daily and monthly (ascending, descending, and combined)	Global; 500 km x 500 km	Tape (7): 850 Mbytes	CDF, Tape	CMATRIX
NOAA-7, -8, -9, -10 AVHRR GAC, HRPT, LAC for FIRE ETO	Radiances	04/86 - 04/88 (discontinuous coverage)	30 deg N to 50 deg N, 140 deg W to 60 deg E; 1 km for LAC and HRPT, 4 km for GAC	Tape (809): approx. 140 Gbytes	Tape only	AVHRR-1B
NOAA TOVS HIRS/ MSU/SSU for FIRE ETO	Radiance	04/86 - 04/88 (discontinuous coverage)	30 deg N to 50 deg N, 140 deg W to 60 deg E; 109.3 km for MSU, 147.3 km for SSU, 17.4 km for HIRS	Tape (125): 15 Gbytes	Tape only	TOVS-MSU; TOVS-SSU; TOVS-HIRS
NOAA-Heat Budget from SR on NOAA-2,3,4,5 and AVHRR on NOAA-6,7,8,9,10,11	Radiation Budget	06/01/74 - 08/31/89, on-going; daily products	Global; 125 x 125 polar stereographic grids and 2.5 deg x 2.5 deg Mercator grids	Tape (57): 1.1 Gbytes	CDF, Tape	NOAA-HB

Americas Conference, *from p. 1*

meeting, through consultations with experts from both North and South America and over a period of several years. The technical areas considered were basic space science, applied space science, space technology, education, and space law.



Attending one of the conference sessions were (left to right) Juan Roederer of the University of Alaska and Mario Acuna and Adolfo Figueroa, both of NASA, Goddard Space Flight Center.

The conference was organized so that the first several days involved presentations providing both background material and proposed projects. Documentation on the proposed projects was collected and fine tuned. Over 150 multi-national projects were then presented to the full delegation in the final stages of the conference; from these, 66 were selected and then presented to the Costa Rican Ministry of Science and Technology, which has the task of coordinating the follow-up activities.

In the short space of this newsletter article, only a few of the chosen projects will be discussed. Clearly, there was a great need to implement a data network within Latin America: the data network was discussed in all of the five technical panels.

It was determined that this network must be capable of accessing scientific data banks of the developed nations (such as NSSDC's data). Such a network became the single most important project identified at the conference. Franklin Chang Diaz, a NASA astronaut from Costa Rica said that "once in place, this (network) system will put to work the large intellectual resources of Latin America, while contributing to ease the immense data reduction task facing scientists in the developed world."

Implementation of such a Latin American network may be relatively simple if it takes advantage of the computer systems that are already in place in universities and space related industries of the area.

Another of the major projects that needed to be undertaken was the training of technical experts at the college and university levels. This was identified as a fundamental necessity if the Latin American countries are to be involved in the regional management of emerging space technologies. The elements of this activity included strengthening the programs at existing regional training centers (such as using remote satellite links for education-at-a-distance) in Latin America and exchange of students and teachers.

The entire set of approved projects is to be coordinated, at the international level, by a follow-up commission defined at the conference. Such a commission would work closely with the official representatives of the governments of the countries interested in any given project and to secure the funding needed to carry out the project. The Ministry of Science and Technology of Costa Rica has been assigned, and has agreed to take on, the task of coordinating the follow-up activities.

It was recognized that a key element of success will be the active participation of the major space agencies and science centers of the developed world. In order to evaluate the progress, a second conference will be held in 1992.

For many participants, the conference was truly exciting, and they were glad to have been a part of the stimulating discussions and presentations. But before Latin America can fulfill its plans, much work needs to be done.

Since NSSDC is also a World Data Center, it avidly promotes space and Earth science throughout the world and will continue to do so by increasing its effort, over the next several years, to provide better access to data within NASA's archives. In this way, NSSDC can aid Latin American science development in its transformation of good plans into solid reality.

James L. Green

Participants and guests assemble for opening session of Space Conference in the National Theater, a historic landmark in the Republic of Costa Rica.

NSSDC and JPL Cooperate in Conducting NASA Data Census

A census of NASA's distributed data holdings is underway. The census is intended to identify all NASA/OSSA data sets and to capture information about the contents, location, media status, documentation adequacy, etc., for each.

Data set entries will have associated discipline keywords that will be used to extract parts of the census data base to share with discipline-specific groups of scientists who will make prioritization recommendations for a follow-on data restoration program.

The census involves a close cooperation of NSSDC and JPL staff and is being pursued as a two-phase effort. In the now-completed first phase, most data sets held at GSFC (including those held at NSSDC from about 20 "currently important" missions) and at JPL were described in the data base. These numbered close to 300.

The second phase of the census effort involves the mailing of survey forms to about 200 scientists who have been principal investigators on various past NASA spaceflight missions.

The results of this community survey will be combined with the results of the GSFC and JPL surveys of phase one, and with information about the large number of NSSDC-held data sets from earlier missions, to create a definitive data base—one that will be managed into the future and probably used as a data management tool by both NSSDC and JPL personnel.

Other relevant information systems at NSSDC include the Master Directory, which describes presently accessible and usable data held at NSSDC and other sites; the SIRS system, which describes NSSDC's 1500 magnetic tape data sets and 2500 other data sets; and the NASA Climate Data System Catalog and inventory, which afford a higher level of functionality for a subset of NSSDC-held climate data sets.

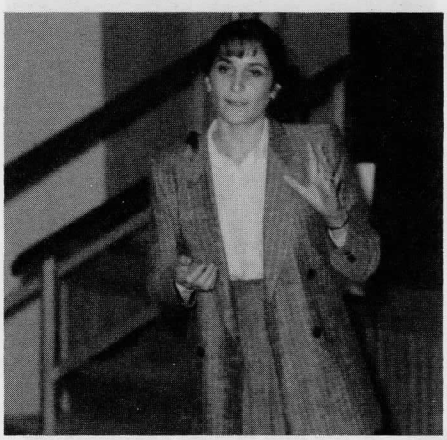
NSSDC management soon expects to define and implement an optimal level of integration across its various data bases, including the new census data base, that partly overlap in content and customer communities.

The purpose of the census data base is to identify data sets irrespective of their state of readiness for access by other scientists. As such data sets are determined to be ready for access, or are brought to such a state (by migrating to new media, improving the documentation, etc.), their accessibility will be made known by their inclusion in the Master Directory.

The creation of the full census data base will occur in 1990, with discipline-specific peer reviews held to prioritize extant data in late 1990 and 1991. The scope and nature of the actual community-wide data restoration program is still evolving.

Joseph King

NSSDC Hosts First NSI Users Working Group Meeting



NSI Customer Service Manager Christine M. Falsetti describes new Network Service Request (NSR) process that replaces old Request for Service (RFS) process.

The first meeting of the newly formed NASA Science Internet (NSI) Users Working Group (NSIUWG) was held at the Goddard Space Flight Center November 13-15, 1989. To paraphrase Dan Baker, the former Data Systems Users Working Group (DSUWG) Chairman who chaired some of the sessions at this meeting, it was truly a historical occasion. This meeting marked the ending of an era for the DSUWG, which spanned from 1980-1989, and the merging of two Networking Users Working Groups (for SPAN and NSN).

Organizing and successfully conducting this meeting were unique challenges because the Working Group's structure and charter had to be agreed upon and ratified at this meeting. The content of the technical presentations and issues addressed in the working sessions had to be sensitive to the diverse audience, which included both networking managers and scientists. In addition, the networking-specific sessions and subgroups had to address topics of concern to both the DECnet and TCP/IP communities.

To help the group better understand the operating and reporting environment of the NSIUWG, presentations

see NSI Users Working Group, *next page*

NSI Users Working Group, *from p. 8*

were given by representatives from the NSI Program Office at NASA Headquarters and the Chairman of the Science Steering Committee (SSC) on "NASA's Vision of Networking" and the "Relationship Between the SSC and the NSI," respectively. The NSI Program Office has overall programmatic and funding responsibility for the NSI Project; the SSC is an advisory group that represents the discipline scientists and provids input to the Program Office. The NSIUWG will be represented on the SSC.

NSIUWG Chairman Appointed

The DSUWG organizational and meeting structures were used as models for the NSIUWG. However, the NSIUWG Chairman will have a 3-year term with multiple terms optional. Ron Zwickl, NOAA/SEL, has been appointed Chairman of this new Users Working Group. Because of the amount of work that now needs to be done in the subgroup meetings to accommodate the DECnet and TCP/IP communities, it was suggested that less time be spent in the plenary and parallel sessions and more time be made available for the subgroup meetings. There was also a recommendation for more substance in the discipline science oriented sessions.

User support was a prominent topic at the NSIUWG meeting. Christine M. Falsetti, the NSI Customer Service Manager, described the new Network Service Request (NSR) process that replaces the old Request For Service (RFS) process. She and SPAN Management will have to work closely together to ensure that the new process is as effective, in getting the new SPAN nodes installed, as the RFS process had been.

Dave Peters, in his NSI Interoperability Gateway presentation, described the gateway configuration. It is A full function gateway between SPAN and NSN, resides on a micro VAX at GSFC, and has the GSFCMAIL gateway installed on it. There were also discussions about the SPAN Network Information Center (SPAN_ NIC) and the need for a similar facility for NSN. Because of strong user interest, a User Services Subgroup was formed and chaired by Neal Cline.

During the science discipline parallel sessions and the Standards Subgroup meeting. presentations were given on topics previously requested by users. Presentations included one on the Advanced Communications Technology Satellite (ACTS) Program, which supports a May 1992 launch. This program will test the most advanced communications technology and stimulate the commercial use of such technology through applications experiments from the private industries, government, DOD, and academia. According to Jim Green, Director of NSSDC, ACTS can support activities such as NASA science missions, planetary and cometary encounters, land science field campaigns, microgravity and life science missions, astrophysics, ultra high speed connections to supercomputers from remote users, and delivery of large data sets.

User Recommendations Heeded

In direct response to recommendations made by users who attended the October 1988 DSUWG meeting, presentations were given on the use of the NSSDC developed Common Data Format (CDF), NSSDC CD-ROM activity, data compression techniques, and use and impact of the International Solar Terrestrial Physics (ISTP) Program on SPAN.

The results of the AFGL CDF field test presentation and standards subgroup discussions indicated that the CDF and Standard Format Data Unit (SFDU) are more appropriate for archiving and other large programmatic applications; and a simpler well defined format, that conforms with the SFDU, is needed for interchanging data between collaborating researchers.

Ed Grayzeck gave an overview of NSSDC's CD-ROM activities and informed the group that anyone supported by NASA/OSSA can arrange to utilize the NSSDC's premastering system, on a capacity-available basis, for data sets that are not too large or too small and are needed by at least 20 to 100 researchers. Requesters for this service are required to provide a detailed description of the data and how it will be accessed.

An in-depth presentation on lossless and lossy compression techniques was given by M. Manohar.

Standards Subgroup meeting participants supported the idea of developing a data compression application to support several complimentary techniques that can be tried on portions of data to compare relative degrees of compression. Several people volunteered to provide example data and test the prototype software.

Bob McGuire gave a very comprehensive review of the ISTP Program. The first ISTP mission is scheduled for launch in July 1992 and the expected data volume is generally low; however, ISTP requires very reliable and secure connections.

Because of the depth of user interest and amount of information that needed to be exchanged in forums that represented both the DECnet and TCP/IP communities, the networking component was the most unwieldly to handle in this meeting. The DECnet users were extremely concerned about security and the SPAN/HEPnet transition from DECnet Phase IV to Phase V. The newly revised *SPAN Security Policies and Guidelines* document was distributed, Phase 2 of the SPAN Security Toolkit was discussed, and the characteristics and symptoms of the DECnet WANK worm were described. DECnet users reiterated the necessity of SPAN's migration from DECnet Phase IV to Phase V. In contrast, TCP/IP

see NSI Users Working Group, *next page*

CCSDS Panel 2 Advances SFDU Standards at International Workshop in Toulousse, France

From April 2–6, the Consultative Committee for Space Data Systems (CCSDS) Panel 2 met at the CNES facility in Toulouse, France, for its Spring International Workshop on the Standard Formatted Data Unit (SFDU) concept. Over 40 individuals represented the CCSDS member and observer agencies. The NASA delegation was led by Don Sawyer and included 13 participants from GSFC and JPL.

The SFDU is being developed as a set of CCSDS Panel 2 Recommendations designed to improve the interoperability of data systems by providing standards for data understanding. These standards are being adopted by projects and individual scientists for data exchange not only within NASA, but internationally as well. Particularly noteworthy was the increased level of effort from CNES, ESA, and BNSC in terms of SFDU usage and associated software development.

For the first time, a complete software implementation of the basic SFDU concept of data labeling and data describing was demonstrated by CNES. Their implementation involved the use of the description part of ADA as the data description language, but it was not tied to an ADA complier. A coordination group on SFDU software development was formed with Joe Witt (JPL) as the head, and a coordination group on application testing was formed with Don Sawyer (GSFC) as the head.

Over 50 documents and presentations were registered at the workshop and discussed to some level either in plenary sessions or in one of three subgroups known as Data Administration, Languages, and Models/ Services. Don Sawyer chaired the Models/Services group, which addressed the following:

- Emerging issues on the Structures Red Book, now out for formal agency review
- The need for an alternative SFDU label (version 3)
- Underlying protocols for use with SFDUs, techniques for describing complex data products
- A user view model of the SFDUapproach
- A description of formal SFDU services for automation

Agreements on most of the Red Book issues were reached and it is recognized that another version of the document will be required. Scenarios supporting the need for SFDU use with other than simple binary protocols (e.g., magnetic tape) will be required before the panel will fully consider an alternative SFDU label.

The underlying protocol paper was recommended as a draft Green Book with Don Sawyer as editor, and the complex product description work was found to be in need of justification through applicable scenarios. The SFDU services draft Green Book (CNES) was found in need of an expansion of material describing the services. In addition, BNSC will produce a draft compilation of the overall SFDU requirements which are now found in various Green Books.

The Language group recommended that TSDN (a data description language) not be available for formal agency review as a Red Book until after the completion of additional verification work. Emerging issues on the Parameter Value Language (PVL) Red Book were addressed but no major change in panel members' views occurred. However, the need for some corrections in the document, including a better statement of the intended role for PVL, were noted. The multiple language concept paper was continued with a call for additional material on usage of these languages.

The Data Administration group identified the need for additional material in the Control Authority (CA) Operations Draft Green Book covering internal CA procedures, data description dissemination, and change control. Enhancements to the CA Automated Services document will take into account the experience of GSFC in conducting CA operations both at NSSDC and in the UARS project.

With more than 30 action items generated and the formal review of three Red Books in progress, each agency has much to do in preparation for the next Panel 2 meeting scheduled for Los Angeles in late September.

Don Sawyer

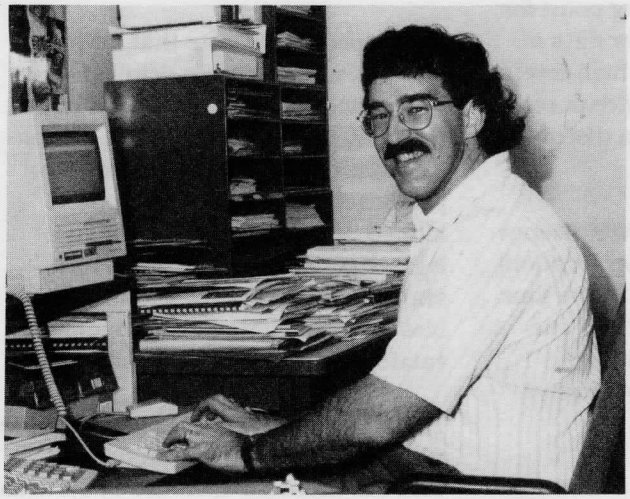
NSI Users Working Group, *from p. 9*

concerns were whether or not NSN and PSCNI should interoperate at the NASA Centers (they cannot interoperate now because of protocol differences), and the need for an NSN_NIC. Both communities are interested in OSI migration. Rebecca Nitzen, NSI/ NASA Headquarters, and Linda Porter, SPAN OSI Migration Manager/ MSFC, will work together to develop the NSI OSI Migration Plan. Having the SPAN and NSN users working together in this NSIUWG meeting gave each of these communities a better understanding and appreciation of the interests and concerns of the other.

Overall, the NSIUWG meeting was a great success. Major meeting objectives were achieved, i.e., organizational, informational and participational, in spite of there seeming to be just not enough time. The new NSIUWG meeting got off to a great start and should be the predecessor of many more for years to come.

Valerie L.Thomas

Lloyd Treinish Moves to Career with IBM



NSSDC will miss Lloyd Treinish's talent and hard work.

"It was a hard decision to make," remarked Lloyd Treinish in a recent interview, referring to his departure from NSSDC. As of May 1, Treinish left his 11-year career with Goddard to pursue a research career with the IBM Corporation at its Thomas J. Watson Research Center in Yorktown Heights, New York.

"I feel a lot of loyalty to the NSSDC organization and its mission. I have a lot of friends here," he said. An MIT graduate with masters degrees in physics as well as earth and planetary sciences, Treinish began his tenure in 1979 on NASA's Atmospheric Explorer Program. He came to NSSDC in late 1984 as a data analysis mathematician. Capping off with NASA a career that has been marked by the publication of several significant research papers, Treinish most recently has been involved in researching data visualization techniques.

In February, he co-chaired an SPIE/SPSE-sponsored conference "Extracting Meaning from Complex Data," which was considered by many scientists to be the first truly technical symposium on scientific visualization and related research. He also presented an invited paper, "The Role of Data Management in Discipline-Independent Data Visualization."

His proposal for a SIGGRAPH '90 Workshop was accepted (to be held in Dallas in August) and is entitled "Data Structures and Access Software for Scientific visualization." Treinish also will be delivering an invited presentation at the Second Scientific Visualization Workshop in June at Stanford University in conjunction with NASA/ARC.

Treinish indicated that NSSDC "provided a lot of catalyst for a lot of my research over the past several years. Extracting data presents an enormous challenge." Although the importance of the data visualization discipline has been recognized at many other institutions only recently, NSSDC has been actively performing research in this complex area for a number of years.

Remarking that while he will miss the NSSDC environment, Treinish said that IBM's offer was simply "too good a career opportunity to turn down." He added that it represents a new challenge to him and "a chance to apply my ideas to other disciplines."

Len Blasso

Director's Message, *from page 2*

Planetary Physics

The NASA Planetary Data System (PDS) is a confederation of distributed, discipline-specific nodes, with central coordination and a data catalog provided at JPL. PDS covers the range of disciplines from planetary geology through atmospheres and ionospheres to magnetospheric electrodynamics. PDS was created by the merger of a preexisting PDS and the technology-oriented Pilot Planetary Data System (PPDS) a few years ago. The discipline nodes were selected in 1989 as the result of a competitive NRA issuance. These superseded the prior PPDS nodes.

Among the achievements of the PDS are the aggressive introduction of CD-ROM technology into the NASA environment, the system of peer review of data and associated metadata entering the NASA data archive environment, and the creation of a system of "PDS Labels" intended as a standard way of attaching metadata to a wide variety of data file types.

PDS is actively interacting with future planetary missions in the development of NASA mandated Project Data Management Plans, a responsibility delegated to PDS by NSSDC in a Memorandum of Understanding between NSSDC and PDS. NSSDC distributes more than ten CD-ROMs that have come out of the PDS effort, and this number will exceed 50 of the PDS CD-ROMs in the next several years.

Astrophysics

A series of Headquarters-sponsored science community meetings were held in 1987 and 1988 under the title of the Astrophysics Data System Workshop. These meetings had participation of over 200 astrophysics personnel from universities, government, and industry. The purpose of these meetings was to define an Astrophysics Data System (ADS) to be designed for use by all scientists; the ADS would gain ready access to science data that NASA had collected and was going to collect during the next ten years. This ADS can be thought of as a superstructure that integrates these programs.

The final report from the workshop recommended many new activities

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Director's Message, *from page 11*

and thrusts for the community. Only a few of the important recommendations include the distribution of key archived data on CD-ROM, the establishment of a FITS standards office, and the establishment of Science Archive Coordination Centers (SACC), to oversee that the appropriate astrophysics data is flowing into the archives.

Space Physics

NSSDC has just recently begun to work with the Space Physics Division Office at NASA Headquarters and the space science community to define the elements of a Space Physics Data System (SPDS). Headquarters has formed a panel of space physics data systems experts that will strawman the major elements of SPDS. Their first meeting will be held in July.

Master Directory

The Master Directory (MD) is a major step forward in facilitating the coordination of the other discipline data systems described above in addition to other information and data systems that have been developed by several government and space agencies. The MD is the starting point for a computer-aided search for data of interest. It contains brief, high-level descriptions about existing data sets and how to get at them in a distributed data archive system.

The figure below shows how a science user at a university (or other location) logs into the MD at NSSDC. The four major discipline areas that MD currently supports are astrophysics, earth science, solar and space physics, and planetary physics.

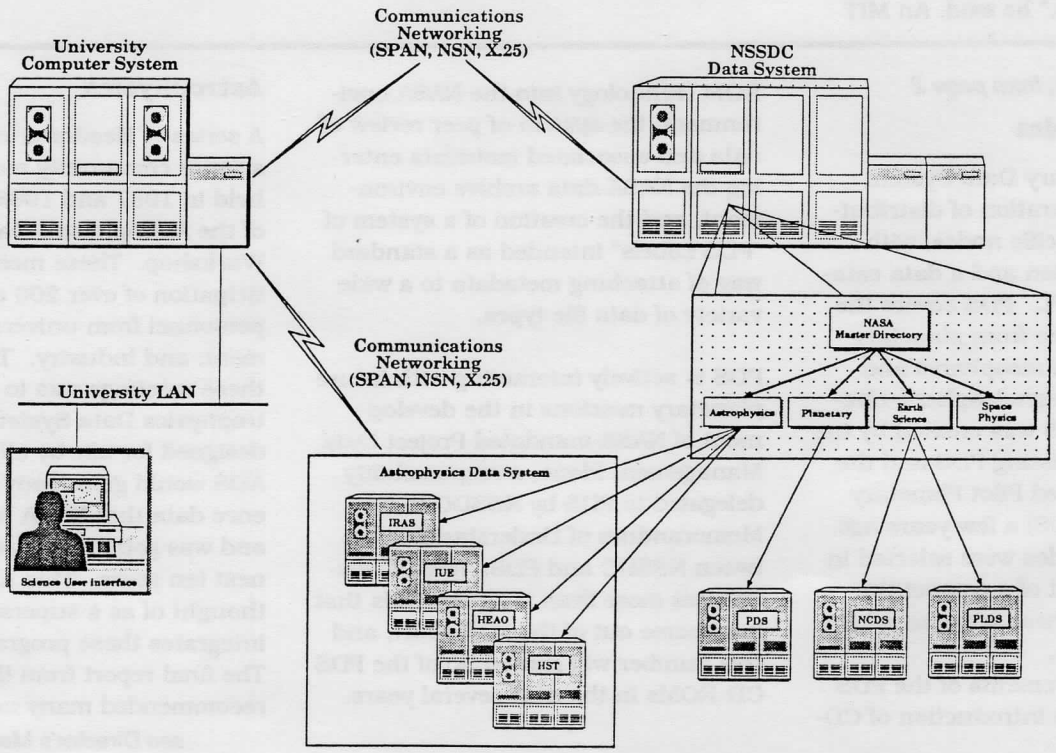
From the discipline areas, a data set of interest can be found, and, in many cases, a connection to the remote site where the data is located can easily be achieved. The MD describes over 1000 major data sets of importance (and growing rapidly) and over 30 distributed data systems for which I have briefly described only a few in this article. The unique aspect of the MD is that once the remote node of interest has been identified, the user may directly connect to that node at a later date without going through the MD to get to the system.

It is important to note that for astrophysics, an even more detailed directory service is being developed under the ADS program that will be reachable from the MD. This new astrophysics directory service supports limited amounts of data from catalogs, descriptions of analysis tools and software holdings and also enables access to detailed astronomical catalogs and lists of observations.

These data system developments have truly been exciting to watch along with the dramatic increase in systems capability and user access in just the last few years. In the era of the 90s, NASA will be involved in acquiring a tremendous wealth of observations. And the extraordinary data systems development of the 80s is what assures scientists worldwide that the handling of the explosion in NASA data holdings will be a manageable task. The new data holdings will become more readily accessible around the globe than ever before possible.

REMOTE INFORMATION AND DATA SYSTEM ACCESS

James L. Green



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1990 Data Listing Summarizes NSSDC Data Holdings

The 1990 NSSDC Data Listing has been published by NSSDC to permit its user community to identify, in a highly summarized way, the Data Center's data holdings available for distribution. Many of the data sets shown in this Data Listing are described in the current NSSDC Data Catalog Series.

The NSSDC Data Listing begins with a brief description of each of NSSDC's special services/systems which offer data: Astronomical Data Center (ADC), Coordinated Data Analysis Workshops (CDAWS), NASA Climate Data System (NCDS), Pilot Land Data System (PLDS), Crustal Dynamics Data Information System (CDDIS); and NSSDC's no-password account on its SPAN/Telenet-accessible VAX, through which the NASA Master Directory and Selected online data bases are accessible, and through which any data shown in the Data Listing may be ordered.

The Satellite Data Listing, which immediately follows the descriptive material referred to above, is made up of offline data sets (most on magnetic tape or as film/print products of various sizes) from individual instruments carried on spacecraft. Descriptive names, time spans, data form, and quantity of the data sets are identified in the Listing, which is sorted alphabetically– first by spacecraft name and then by the Principal Investigator's or Team Leader's last name.

The NSSDC Supplementary Data Listings (one for astronomy data and the second for non-astronomy data), which follow the Satellite Data Listing, identify data sets not associated with individual spaceflight instruments. Included here are composite spacecraft data sets, ground-based data, models, and computer routines.

Two appendices complete the report. Appendix A is a fold-out listing of the data form codes, so that the user can readily identify the data medium while viewing the listing. Appendix B contains NSSDC Data Request Forms to order any data identified in the Data Listing.

Requests for copies of the 1990 NSSDC Data Listing should be addressed as specified on the back page of this newsletter.

Richard Horowitz

Pilot Land Data System Works with Aircraft Operational Flight Facilities

In late February, members of the Pilot Land Data System (PLDS) attended the Land Aircraft Science Management Operations Working Group (LASMOWG) semiannual meeting in Seattle, Washington.

At this meeting, PLDS project manager Blanche Meeson presented a proposal for a collaborative effort between the PLDS and the aircraft operations facilities at Ames Research Center (ARC) and Stennis Space Center (SSC). The proposed collaboration would meet two objectives.

The first is to streamline the operations between these facilities and the PLDS, thereby providing a smooth transfer of information about existing aircraft data. Second, the collaboration would provide common data formats or data structures for data collected by the same sensor and, if possible, for all of the land science data collected by the facility class instruments.

The proposal was accepted at a high level by the aircraft operations facilities. The next step will be a meeting among the aircraft operations facilities personnel, the relevant NASA Headquarters personnel, and PLDS management to discuss specific actions to streamline the data flow.

Blanche Meeson

Global Change Researchers Use Master Directory

A recent change to the main menu of NSSDC's Online Data & Information Service (NODIS) is the identification of a Global Change Directory along with the original NASA Master Directory option.

The Master Directory has been adopted by the Interagency Working Group on Data Management for Global Change (IWGDMGC) to serve the global change research community.

The IWG consists of representatives from NASA, NOAA, USGS, NSF, DOE, etc. These IWG agencies have agreed to establish a common logical directory that offers researchers in the Global Change program a single point of contact for comprehensive and consistent information concerning Earth science (and other relevant, e.g., solar terrestrial) data sets. The IWG has accepted an evolutionary approach to the establishment of an IWG Directory, beginning with the current implementation of an initial Global Change Directory using the existing NASA Master Directory.

The NASA Master Directory has already been populated with descriptions of data sets from NASA, NOAA, USGS, DOE, and other agencies and institutions, through a cooperative ef-

see next page

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fort of the Catalog Interoperability (CI) Group, the IWG, the Committee on Earth Observation Satellites (CEOS) Working Group on Data Management, etc. A more direct involvement of the IWG in Master Directory population efforts will facilitate the interagency cooperation necessary for identification and description of all data sets relevant to global change or of interest to global change researchers.

Joy Beier

Progress Made in Support of Orbiting Solar Laboratory

The Space Data and Computing Division's efforts in support of the Orbiting Solar Laboratory project (OSL) continue on several fronts, coordinated by Dr. David Batchelor. The ST Systems Corporation contractor team, led by Dr. Kit Harvel, has accomplished several of the critical tasks that are needed before OSL's Non-Advocate Review (NAR) on May 15.

Cost estimates for development and operations of the Division's proposed OSL Science Data Operations Center (SDOC) have been produced, including staffing plans. Interviews of the principal investigators of the XUVI instrument in Turin, Italy, were held and assessments were made of the impact on science data processing that will result from evolving plans for this instrument (a newcomer to an observatory comprising four other instruments). A presentation on plans for SDOC has been prepared for the "Delta" NAR by ST Systems Corporation. It will:

- Include summaries of cost estimates
- Address anticipated questions from the reviewers about processing load impact from possible instrument upgrades and data compression issues
- Address, one by one, comments from the previous NAR

Because of his long and successful guidance of the Division's OSL work (formerly HRSO), Dr. Robert Price has kindly consented to give the NAR presentation.

Dr. Batchelor has prepared a Preliminary Project Data Management Plan for OSL, a document which will be reviewed annually and revised by the OSL project to reflect the evolving project decisions about data products and management.

Upcoming activities include attending an OSL session at the AAS meeting in Albuquerque, New Mexico (6/13), identifying new technology needs of the SDOC and assessing their availability via trade studies, developing detailed hardware and software specs, and deriving updated cost estimates for the SDOC based on the results. We also plan to modify and update the old SOT Science Operations Plan for OSL.

The OSL project recently provided funds for this effort at the level of 2.5 FTE. Our proposal to begin hardware prototyping for the SDOC workstations is being considered for the future. The latest estimate of OSL's launch date is May 1, 1997.

Dave Batchelor

Definition of CD-ROM Disk for High School Continues

The Joint EDucational Initiative (JEDI) is a cooperative effort of Washington-area junior and senior high school science teachers and various Federal agencies involved in creating CD-ROM disks holding various space and Earth science data sets. The early objective of JEDI was to define whether a CD-ROM having appropriate data sets and retrieval and display software would be an effective teaching tool. This has been answered in the affirmative by the teachers. Two CD-ROMs are being created now, and appropriate workbooks will be created by the teachers in early summer. Use is anticipated for the 1990-91 school year.

After some earlier groundwork, an exploratory meeting was held at USGS/Reston in late February at which about ten speakers from the Federal Government (mainly USGS, NOAA, and NASA) presented to about 30 teachers various Earth and space science data sets and display tools, and discussed their perceptions of how their data sets (already or soon-to-be on CD-ROM) could be used in the classroom.

NSSDC is coordinating the NASA input to this effort. In particular, Dr. Ed Grayzeck (Interferometrics, NSSDC) discussed planetary imagery, cometary imagery, and astronomical source catalogs on CD-ROM at the Reston meeting. Dr. Per Gloersen (GSFC) discussed two Nimbus 7 data sets to be committed shortly to CD-ROM, namely the SMMR sea ice data, with which he is personally associated, and also TOMS daily gridded ozone concentrations, which Dr. Rich McPeters (GSFC/616) will shortly commit to CD-ROM.

These scientists are now helping interested teachers to better understand these data sets and their classroom potential. JPL support for the JEDI effort is also probable.

Joe King (NSSDC) commented at the meeting that NASA was pleased to support the JEDI effort as having the potential to stimulate young people to consider careers in space and Earth sciences, to the long-term benefit of NASA and of the nation.

Joseph King

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Coastal Zone Color Scanner Browse System Now Accessible via Internet Network

The Information Systems Development Facility of Goddard's Space Data and Computing Division has completed processing the Coastal Zone Color Scanner's (CZCS) data—more than 67,000 scenes—for the period of November 1978 through June 1986.

Those data are now available through INTERNET, SPAN, and TELEMAIL. Users can, via an ANONYMOUS FTP, copy the browse software to their own systems or access the video browse request function. In addition, the Information Systems Development Facility will be making available on line all the regional phytoplankton pigment concentration images and perhaps selected water-leaving radiance and statistical images.

Quality control of all processed CZCS data was completed by mid-March. Shortly after that, the final of three video browse disks was completed as well. The third disk will be duplicated and distributed to CZCS browse sites around the world. Currently, there are 31 browse sites up and running, including one each in Japan and Australia.

To date, the Information Systems Development Facility has shipped over 40 gigabytes of CZCS data requested through the browse system. Current CZCS data and browse disk information can be obtained directly from Gene Feldman at (301) 286-9428 or by addressing NCF::FELDMAN via the SPAN Network.

Gene Feldman

Associate Administrator (OSSA) Investigates NASA Master Directory

At the request of Associate Administrator Dr. L. Fisk and Chief Scientist for Global Change Dr. I. Rasool, the NASA Master Directory was demonstrated by Dr. J. Thieman and Ms. M. James (ST Systems Corporation) at NASA Headquarters on February 16. Other attendees at the presentation included Assistant Associate Administrator Dr. J. Alexander, Mr. J. Bredekamp (Code ECI), and Mr. T. Villasenor (Code ECI).

The main purposes of the demonstration were, first, to indicate the current availability of this tool to the science community for identifying and locating NASA as well as non-NASA data in the space and Earth sciences and, second, to show that access to the directory is easily made through ordinary PCs having communications software and dial-out or network connectivity. A Macintosh II outside Dr. Fisk's office was used.

Information about several data sets of interest to the participants was displayed and connections to other data information systems, such as the EROS Data Center in South Dakota and the ESA Earthnet Catalog in Frascati, Italy, were exercised. All were convinced that the system can play a significant role in making the science community aware of NASA and other data available for research.

A discussion following the demonstration emphasized the importance of completing the already reasonably comprehensive coverage of useful data sets within the directory. The possible exhibition of the directory at an upcoming international science meeting in Washington was also proposed.

James Thieman

CODE CHANGE

Users of NSSDC data and other services, please note that on May 6, 1990, all mail codes within NSSDC in the 600 series were changed to 900. This means that the code for World Data Center A for Rockects and Satellites, formerly 630.2, is now 930.2. Codes previously starting with number 6 now begin with number 9 (such as 933.4, 933.8).

CALENDAR

June 18-19, 1990

IACG WG-2 Conference
NSSDC
NASA, Goddard Space Flight Center
Greenbelt, Maryland

August 29-31, 1990

CDAW 9.3
Research Institute for Atmospherics
Nagoya University
Toyokawa, Japan

AGU Special Session and Goddard Mini-Workshop Continue CDAW-9 Activities

Participants exchange information at the CDAW-9 mini-workshop. Pictured (left to right) are Antoinette Galvin, James Sharber, Ed Hones, Nickolai Tsyganenko, Susan Kayser (NSSDC), and Geoffrey Reeves (behind the monitor).

In early June, NSSDC made significant strides in its CDAW-9 analysis.

- The special session "Results from CDAW-9" was held at the Spring 1990 American Geophysical Union meeting in Baltimore.
- The CDAW-9 "Mini-Workshop" took place at Goddard on Saturday, June 2 (immediately after the AGU meeting), with NSSDC facilities open for informal discussions and data access on June 1 and 3.

The invited talks of the AGU special session thoroughly demonstrated the range of science understanding emerging from the CDAW-9 (PROMIS) effort, as well as some sense of the science not yet tapped from this very rich data base. Well over 100 scientists attended this session.

The mini-workshop involved some 20 CDAW-9 scientists at various times during the primary meeting on Saturday and informal working groups on Friday afternoon. The smaller and informal atmosphere of the "mini-workshop" created lively working conversations supported by the CDAW interactive data base access. Attendees were enthusiastic about the value of this effort, as attested by their willingness to sacrifice a weekend after an already difficult AGU week to participate in this meeting.

The next full workshop meeting, CDAW 9.3, will be held August 28–31 at the Solar-Terrestrial Environment Laboratory (formerly the Research Institute for Atmospherics), of Nagoya University inToyokawa, Japan. The activities at Nagoya will bring more Japanese magnetospheric data onto the CDAW-9 stage and will precedent the kind of joint analysis that will be key to the ISTP program and other collaborative programs between Japan and NASA.

Robert McGuire

NSSDC NEWS

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Code 933
NASA/Goddard Space Flight Center
Greenbelt, MD 20771 U.S.A.

NSSDC Services

Researchers can obtain information about NSSDC's data archive– how to contribute to it or how to request data from it (including cost and availability concerns)– by addressing their questions as follows:

INSIDE UNITED STATES

Data Submissions

Dr. H. K. Hills
NSSDC/Code 933.8
Goddard Space Flight Center
Greenbelt, MD 20771
Telephone: (301) 286-4106
FAX: (301) 286-4952
SPAN: NCF::HILLS

Data Requests

NSSDC/Code 933.4
Goddard Space Flight Center
Greenbelt, MD 20771
Telephone: (301) 286-6695
FAX: (301) 286-4952
Telex: 89675 NASCOM GBLT
TWX: 7108289716
SPAN: NCF::REQUEST

OUTSIDE UNITED STATES

Data Submissions

Dr. James L. Green, Acting Director
World Data Center A for Rockets and Satellites/Code 930.2
Goddard Space Flight Center
Greenbelt, MD 20771 U.S.A.
Telephone: (301) 286-7354
FAX: (301) 286-4952
Telex: 89675 NASCOM GBLT
TWX: 7108289716
SPAN: NCF::GREEN

Data Requests

World Data Center A for Rockets and Satellites/Code 930.2
Goddard Space Flight Center
Greenbelt, MD 20771 U.S.A.
Telephone: (301) 286-6695
FAX: (301) 286-4952
Telex: 89675 NASCOM GBLT
TWX: 7108289716
SPAN: NCF::REQUEST