



INPE Space News

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SÃO JOSÉ DOS CAMPOS - SP - BRAZIL

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EDITORIAL

During the month of June INPE organized and participated in two major international events - the World Forest Watch Conference, an International Space Year (ISY'92), official project, and the United Nations Conference on Environment and Development, UNCED. The recommendations that came out of the WFW Conference, and the UNCED consensus for a global effort to preserve the environment,

including better understanding of, and support for, the needs of developing countries, made clear that access to applied environmental technologies is essential for the monitoring of regional and global changes.

Space techniques certainly constitute some of the most important tools available for achieving a better understanding of the Earth's ecosystems. Brazil is one of the few developing countries making regular use of

space technology and applications for the monitoring of its earth resources. With the support of the United Nations, INPE gives regular training courses on space applications to Latin American and African countries. This type of endeavor can be improved and expanded in order to promote a better and more balanced use of space technologies to help the developing nations solve their environmental problems.

INTERNATIONAL MEETING PRESENTS RECOMMENDATIONS FOR FOREST MONITORING

The last session of the World Forest Watch Conference, held on May 27-29, 1992, at the Novotel, in São José dos Campos, state of São Paulo, Brazil, presented its conclusions with a Panel of Discussions and Recommendations. Here are some excerpts:

- The International Space Year (ISY) WFW Project has demonstrated that continuous monitoring of forest cover at regional and global scales using space remote sensing is technically feasible. Furthermore, the experience gained during the

last few years supports the possible establishment of a system of regular observation from space, until a global operational system is created.

- Given the importance of forest issues in terms of biodiversity, climate, biochemical cycles and economic development, there is a need for a concentrated effort to develop effective utilization of remote sensing data in an operational forest monitoring program.

- A detailed concept and corresponding planning for the implementation of such a regular monitoring program is now needed. The chairmen of the ISY WFW Working Group have taken the initiative to prepare such a

document, which will be delivered at the International Society of Photogrammetry and Remote Sensing (ISPRS)* Congress, in Washington, DC, August 1992, and at the last ISY WFW Working Group meeting at the Asia-Pacific ISY Conference, in Tokyo, November 1992.

- Current efforts at monitoring forest cover at all scales are hampered by inadequate data acquisition. Current pricing policies are also a major obstacle at this time. There is a need for a long-term global acquisition and price structuring policy addressing the specific requirements of forest monitoring, applying to both low and high resolution data.

INPE/IAE LAUNCH ROCKET PAYLOAD FOR UPPER ATMOSPHERE STUDIES

The MULTIFOT rocket experiment, described in the last edition of INPE Space News, was successfully launched from the Alcântara Launch Center at 2351 hours local time on May 31. The

payload, which reached an apogee of 282 km, measured a series of airglow emissions, in the UV, visible and IR regions, electron density and electron temperature. A laser radar and a multichannel photometer, installed at the launch site, made simultaneous ground-based measurements. Among other things, the MULTIFOT

experiment made the first ever simultaneous measurement of the vertical distributions of atomic sodium concentration and Na D-line emission intensity. These measurements will further our understanding of atmospheric chemistry and excitation mechanisms in the middle atmosphere.

CONFERENCE PRESENTS RECENT STUDIES ON WORLD FORESTS

The World Forest Watch Conference on Global Forest Monitoring (WFW) included the participation of 192 specialists from 25 countries. The Conference included presentations on World Forest Situation; Satellite Based Forest Monitoring; The Role of Space Agencies, Research and Application Organizations on Forest Monitoring; The Role and Contribution of Remote Sensing for Global Change Studies; and Amazonia Deforestation Patterns and Trends.

TRAINING IN ASSESSMENT AND MAPPING OF DEFORESTATION

As part of the WFW Conference activities, a Training Course in Deforestation Assessment and Mapping was held at INPE's headquarters, in São José dos Campos, from May 18th to 26th. The program had speakers from INPE, NASA, the European Space Agency (ESA),

Presentations on more specific studies included: Tropical Forest Assessment 1990 Summary; The ISY European Remote Sensing Forest Atlas of Europe; Ecosystem Fragmentation; Amazônia - Inventory of Net Carbon Emissions from Deforestation; and Fire Detection: Methodological Aspects. The Conference included sessions dedicated to regional projects on forestry and remote sensing in Africa, Asia, Europe, and Latin America. There was also a complete session to discuss Programmatic Aspects of Forest Monitoring, Current and Future Programs. Some of the specialists who made

presentations during the WFW were: J.P. Malingreau (Joint Research Centre -JRC/Europe); I. Rasool (International Geosphere-Biosphere Programme/IGBP/France); Norman Myers (consultant in Environment and Development/UK); K.D. Singh (FAO/Italy); C.J. Tucker (NASA/USA); Luiz Gylvan Meira Filho, Roberto P. da Cunha and Paulo R. Martini (INPE/Brazil); G. Stevens (NOAA/USA); M.G. Chandrasekhar (ISRO/India); Tong Qingx (China); R. Pfeiffer (ESA/Europe); Ramir Salsedo (SAGECAN/Venezuela); Takashi Suzuki (NASDA/Japan); and Thomas Lovejoy (Smithsonian Institution/USA).

JRC, the Canadian Center for Remote Sensing (CCRS), SPOT Image, and NASDA (Japan). The objective of the course was to train project managers in subregion (state and country levels) deforestation mapping, assessment and monitoring, and on the use of remote sensing and Geographic Information System (GIS) techniques in the rainforest region. The 25 trainees selected to attend

the course belong to institutions which work on remote sensing in rainforest regions, and are expected to be able to make professional use of the experience gained in the training course. The 7 day program included case studies on the following satellite systems: LANDSAT, ERS-1, SPOT, and AVHRR; the use of GIS, and of RADARSAT and JERS-1 new sensors systems applied to rainforest regions.

GUEST SCIENTISTS AT INPE DEVELOP STUDIES IN MESOSCOPIC PHYSICS

From the end of last year to July of this year, INPE's Sensors and Materials Laboratory received six guest scientists from China, Czechoslovakia, Finland, India and Norway. They all came with grants from the Brazilian Secretariat of Science and Technology to develop studies in the area of condensed matter physics and microelectronics.

They have been working with INPE's specialists in mesoscopic systems (nanostructures) a rapidly developing area in microelectronics.

So far, INPE is the only Brazilian institution working in nanostructures, an area that in the near future is expected to have industrial applications in micromechanical structures, thin membranes, sensors and detectors, passive optical devices, and opto-electronics devices.

These applications are expected to bring considerable advances in the areas of space, aeronautics, medicine, electronics, and biotechnology.

Throughout the month of July, INPE is receiving the visit of the physicist Boris Altshuler, from the Massachusetts Institute of Technology (MIT/USA), a major specialist in the area of mesoscopic physics.



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SPACE TECHNOLOGY AT THE EARTH SUMMIT

Brazilian space activities related to environmental issues were displayed at three different exhibition areas during the United Nations Conference on Environment and Development, in Rio de Janeiro, June 1-14, 1992. At the RioCentro, venue of the UN official meeting, INPE was one of the 29 projects from Brazilian organizations selected for exhibition. The institution displayed panels showing space research and application studies undertaken in the Amazonian region and the most recent results of deforestation monitoring covering the Brazilian rainforest.

INPE TO HAVE AN UNEP ENVIRONMENTAL DATABASE CENTER

The Brazilian Secretary of Science and Technology, Hélio Jaguaribe, and the General Secretary of the United Nations Environment Programme, UNEP, Mostafa K. Tolba, signed a Memorandum of Understanding on June 10, in Rio de Janeiro, for the establishment in Brazil of a Global Resources Information

ANGLO-BRAZILIAN PROJECT STUDIES AMAZONIAN CLIMATE

In the coming months of August and September, Brazilian and British scientists will be undertaking the third field campaign of the Anglo-Brazilian Amazonian Climate Observations Study, The ABRACOS Project. This is a collaboration between the Institute of Hydrology (IH/UK), INPE and 15 other Brazilian research institutes and universities, sponsored by the UK Overseas Development Administration, as a result of a Memorandum of Understanding signed between the governments of Brazil and Great Britain. In September 1990, the Abracos Project made ground-based mea-

Also shown were International cooperative projects, such as the Anglo-Brazilian Amazonian Climate Observation Study (Abracos), Transport and Chemistry Near the Equator-Atlantic (Trace - NASA/INPE), and the South American Radar Experiment (Sarex - Brazil/Canada). There were also thematic panels on studies on atmospheric chemistry, climatology, the Brazilian Complete Space Mission (MECB), and the China-Brazil Earth Resources Satellite (CBERS).

A full-size mock-up of INPE's Data Collection Satellite 1 (SCD-1) was visited by hundreds of people at ECOTECH'92, a parallel environmental technology exhibi-

tion installed nearby the RioCentro. INPE's larger exhibit area at the Earth Summit was at one of the federally run Integrated Centers for Child Support (CIAC), in Rio de Janeiro, inaugurated with an ecological projects exhibition from 15 Brazilian organizations. Together with photographic panels, equipment and satellites models, INPE, in cooperation with IBM Brasil, also put on a multimedia computer show. This program showed Amazonian ecosystems, based on satellite imagery and photographs.

Database, GRID. This environmental database, the first one of its type in a Latin American country, will be installed at INPE, in São José dos Campos, state of São Paulo.

UNEP has already established 11 GRID centers in different countries that are responsible for the maintenance of specific types of data set. These data can be ordered from any center at zero cost to the end user. The

measurements in Manaus, state of Amazonas. In July and September 1991, measurements were undertaken in two experimental areas - one in Marabá, state of Pará, and the other one in Ji-Paraná, in the state of Rondônia. In these areas the investigators made continuous meteorological and hydrological measurements, including the energy and water balance and near-surface climate for both tropical rainforest and cleared forest areas. The data will be fed into General Circulation Models (GCMs) in order to help understanding of how Amazonian deforestation might change the climate.

The upcoming Abracos mission for intensive data collection will carry out two different types of

advantage of GRID for Brazil, as it is in other countries where the system is already installed, will be access to reliable information on the Earth's environment. At the same time, as a GRID member, Brazil - via INPE - will be able to feed the system with information on Brazilian ecosystems. Such information will then become available to all GRID members. GRID/SJC, as the Brazilian center is being named, will be operational in about 2 years time.

experiment in the region of Ji-Paraná. One experiment will make measurements of the carbon flux above both the forest canopy and a cleared area, to aid in understanding the role of the carbon cycle in forests, as compared to cleared areas. The second experiment, named Rondônia Boundary Layer Experiment (RBLE), is a Brazilian-led initiative to study the dynamics of the boundary layer, 1 kilometer above the surface, in both forest and cleared areas. RBLE will be carried out in three phases, September 1992, March 1993, and August 1993. The Abracos Project will be concluded in 1994.

METEOROLOGY AND WATER RESOURCES UNITS ARE ESTABLISHED IN THE NORTHEAST OF BRAZIL

The eight northeastern states of Brazil, which are in the semi-arid region and frequently experience severe droughts, now have better facilities for weather and climate prediction and for water resources management. At the beginning of this year, meteorology and water resources units were established in each of the states in question, following the experience acquired by the Meteorology and Water Resources Foundation (FUNCEME) in the state of Ceará, which has been working for many years in close cooperation with INPE.

INTERNATIONAL PROJECT WILL INVESTIGATE GASEOUS TRANSPORT IN THE SOUTH ATLANTIC

A NASA DC-8 laboratory aircraft will make flights over the South Atlantic between the Brazilian and the African coasts to make measurements of gases in order to study burning effects in the atmosphere. The experiment, which will run from August 31 to September 10, is part of a project

These units were established with technical support provided by INPE's Center for Weather Forecasting and Climate Studies (CPTEC), plus equipment, technical and personnel grants provided by the National Secretariat for Science and Technology. The state governments are responsible for the installations and maintenance of the units, each of which has specialists in meteorology and water resources trained by INPE.

The establishment of these units in the northeast of Brazil is a result of INPE's Northeast Project, which allows the institute's experience to be transferred to operational centers capable of providing meteor-

ological and water resources information to the end user. With INPE's experience in climate studies, it has also been possible to make climate predictions, mainly with respect to the Northeast's dry season, usually influenced by the El Niño phenomenon. This year, for example, a moderate increase in the Equatorial Pacific ocean water temperature, a characteristic symptom of the El Niño, is causing a significant decrease of rainfall in the Northeast, usually associated with an increase of rainfall in the country's southern region.

named Transport and Chemistry Near the Equator-Atlantic (TRACE-A), a joint project between NASA (USA), INPE and the University of São Paulo (Brazil), and French and German scientists for the African part of the experiment. The main objective of the project is to study the transport and chemistry of gaseous carbon compounds and other emissions caused by burnings that occur during the dry season in Brazil.

The TRACE-A Project is a major scientific field campaign in the South Atlantic region covering the Brazilian and the African coasts, aimed at making measurements and observations in the area of atmospheric chemistry. This includes a number of disciplines in the atmospheric sciences, mainly related to chemistry, meteorology and particles, and also to biological implications of the phenomena being studied.

NASA APPOINTS INPE'S SCIENTIST AS A GUEST INVESTIGATOR

A unique spectroscope in the southern hemisphere, to study solar flares, is being developed by INPE's investigators Hanumanth S. Sawant, José Angelo C.F. Neri and Francisco C.R. Fernandes. Based on this development, Sawant has been selected as a NASA guest investigator for the Compton Observatory, previously named

Gamma-Ray Observatory Satellite. NASA placed this Observatory in orbit almost a year ago to observe background as well as transient phenomena such as gamma-ray bursts and solar flares in X-rays and gamma-rays.

INPE's equipment is a wide band decimetric (200-2500) MHz digital spectrometer, being used in conjunction with a large 9-meter diameter polar mounted antenna. The important questions about

solar flares are "where" and "how" the energy is stored and released. Clues to the solution of these questions can be obtained by combining decimetric solar burst observations, obtained at INPE, with measurements of hard X-rays, made by the Compton Observatory. This is the basic subject of the proposal submitted by Sawant and his group to the Compton Observatory Program and accepted by NASA's Scientific Committee.