

Biospheric Sciences Branch Highlights for November – December 2000

**** EO-1 launches**

The Earth Observing One (EO-1) satellite was successfully launched from Vandenberg Air Force Base (VAFB) on Tuesday, November 21, 2000 at 10:24 am on board a Boeing Delta II rocket configured with three solid booster engines. Two additional satellites, SAC-C (Argentina) and Munin (Sweden), were co manifested with EO-1 and were successfully placed in orbit. Dr. Stephen Ungar of Code 923, EO-1 Mission Scientist, participated in the traditional pre-launch briefing held on Friday November 17, 2000. His presentation, which described the role of science validation for the EO-1 mission was extremely well received by launch participants and their families. All phases of the EO-1 orbital insertion and subsequent maneuvers have been nominal. The three EO-1 observing instruments, Advanced Land Imager (ALI), Hyperion (TRW's hyperspectral imaging spectrometer), and the LEISA Atmospheric Corrector (LAC) are performing up to expectation. Initial engineering grade earth images were obtained from ALI on Saturday, November 25th, LAC on Sunday, November 26th, and Hyperion on Monday, November 27th. These images have been processed by Code 923 at the Science Validation Facility (SVF). Results look very promising. EO-1 is expected to be in formation flying one minute behind Landsat on December 15, 2000. The only significant problem to date has been difficulties in consistently receiving 100% error-free X-band data downloads. This problem is currently believed to be related to relative antenna orientations and ground station reception practices. A set of procedures have been implemented which effectively curtails the transmission anomalies but somewhat reduces the data transmission opportunities each day. Ongoing characterization of the conditions under which transmission anomalies arise is expected to result in procedures guaranteeing transmission reliability far exceeding acceptable levels for retrieving EO-1 data in a timely fashion.

**** LBA Meeting in Brasilia with EMBRAPA President**

Don Deering recently returned from Brazil, where he met on December 6 with the President of EMBRAPA, the Brazilian agricultural research agency. Dr. A. Duque Portugal had earlier visited GSFC and met with Code 923 staff regarding remote sensing technologies that might be applied to agricultural problems. Don Deering, who was not available to meet with him at that time, followed up on this visit at Dr. Portugal's request to discuss further the NASA-EMBRAPA linkages in LBA, which had been introduced to him by Dr. Deering's LBA-Ecology Project Office staff members during his visit to GSFC. Don met with Dr. Portugal and his senior staff, including EMBRAPA's head of research and development programs, at EMBRAPA Headquarters in Brasilia to discuss possibilities for enhancing the present institutional collaboration between NASA and EMBRAPA, particularly with regard to LBA projects

supported by NASA. Dr. Deering explained the mechanisms available for foreign scientist participation in NASA-funded research and made suggestions for improving collaborations, including participation in the upcoming LBA-Ecology Open Science Meeting in Atlanta in February. His suggestion for increasing EMBRAPA's support for LBA communications outreach, infrastructure and logistics, particularly at the LBA Regional Offices that are currently supported by NASA, was well-received by the EMBRAPA leadership. The result was a plan for EMBRAPA to take specific actions for developing a more productive partnership, including contacting the LBA Central Office for implementation advice and planning to participate actively in responding to the next NASA call for proposals for phase two of the NASA LBA-Ecology Project during 2001. Also, during his visit to Brasília, Dr. Deering met with U.S. Embassy science counselors to discuss the meeting at EMBRAPA, the NASA aircraft program scheduled for early 2002, special processing of U.S. visas for Brazilian scientists attending the LBA-Ecology Open Meeting in Atlanta next February, and other LBA-related issues.

**** Imhoff serves as a panelist and keynote speaker at two separate international workshops**

Marc Imhoff recently served as a panelist and keynote speaker at two separate international workshops on remote sensing and geo-spatial technology for international treaty compliance and verification and law enforcement for international eco-crimes.

He was asked as ESSP Project Scientist to give an overview of NASA technology and NASA's ESE remote sensing resources in the context of environmental monitoring to a group of over 200 at the NYU School of Law--Combating International Eco-crime in a Global Economy (Nov 15-16).

Imhoff was also invited as a Panel member and Co-chair of a workshop on Remote Sensing and Environmental Treaties (Dec. 4 &5) at the Woodrow Wilson International Center in Washington DC. He was asked to take a leadership role in both of these workshops as a result of his previous involvement with ISPRS and the treatment of potential remote sensing application to issues related to the Kyoto Protocol.

The implications for remote sensing scientists and earth scientists in the context of both treaty monitoring compliance and law enforcement are becoming increasingly significant. A case was presented where Landsat and Spot Image data were being used to bring an international law suit in US courts against a major US corporation. If the prosecution is successful, the remotely sensed images and their interpretation will play a primary role as evidence resulting in 100's of millions of US dollars changing hands, long jail sentences being handed out, and possibly even executions being carried out in the country where the events occurred. The need for more coordination between the law, policy and the remote sensing and Earth science

communities was repeatedly voiced by all parties. The international policy and legal communities are now ready to use the research coming out of Earth science and NASA ESE activities in the formulation, compliance monitoring, and even enforcement of international laws and treaties. They are looking to the scientific community to help clarify all the issues concerned.

Marc Imhoff also gave an invited seminar at Boston University. Title "City Lights, Spy Satellites, and Urban Sprawl: Using Nighttime Views of Earth from Space to Assess the Impact of Urbanization on Agriculture and Photosynthesis"

****Terra Spacecraft Wins Award from Popular Science**

Popular Science magazine chose NASA's Terra spacecraft to receive a year 2000 "Best of What's New" Award in its Aviation and Space Category. The magazine's Technology Editor, Frank Vizard, presented the award to Jon Ranson (Code 923), Terra Project Scientist, at an award ceremony held on November 9 at Tavern on the Green in New York City.

According to Popular Science Editor-in-Chief Cecilia Wessner, "The year 2000 has been one of tremendous change and innovation. This year's [award] winners represent the very pinnacle of technological achievement."

Each year, the magazine's editors review thousands of new products and technological developments and select 100 of them to feature in their annual "Best of What's New" issue in December. This year, the 13th anniversary of the award program, readers can visit the Popular Science Web page (<http://www.popsci.com>) and vote for the product or technology that they consider to be the best innovation of 2000. On January 5, 2001, Popular Science will crown one of their 100 selections with the Reader's Choice Award.

In a December 2000 review of Terra, the Popular Science editors wrote, "Sometimes it's important to look inward. In that spirit, and with the most advanced Earth sensors ever launched, the satellite Terra is advancing our understanding of the complex processes that govern our climate." Plans are being made to display the award in the Terra Model display case located in the lobby of Building 33.

**** Contractor chosen to build up to eight Visible/Infrared Imager Radiometer Suites (VIIRS) for the National Polar-orbiting Operational Environmental Satellite System (NPOESS)**

On Nov. 20, the Interagency Program Office (IPO) in Silver Spring announced that Raytheon/Santa Barbara Remote Sensing Group was chosen to build up to eight Visible/Infrared Imager Radiometer Suites (VIIRS) for the National Polar-orbiting Operational Environmental Satellite System (NPOESS). The

NPOESS operational satellites will replace the NOAA TIROS polar orbiters and the DOD's DMSP satellites. VIIRS will replace AVHRR as the nation's operational wide field-of-view sensor, and will continue many of the products from EOS MODIS. The first flight of VIIRS will be in 2005 on the NPOESS Preparatory Project (NPP), a risk-reduction activity and EOS product continuity effort jointly headed by NASA and IPO. The NPOESS series will commence flight operation in 2009. The IPO consists of membership from NASA, NOAA and the Department of Defense. Jeff Privette (Code 923) is instrument scientist for NPP. Several members of the GSFC 900 Directorate, led by Bob Murphy, were involved in the VIIRS source selection.