

Vegetation and Fire Weather

We need real-time or near-real-time data on conditions of vegetation, etc.

The NWS Storm Prediction Center (SPC) provides fire weather forecasts at:

http://www.spc.noaa.gov/products/fire_wx/

A web site that has satellite derived fire detection is:

<http://cimss.ssec.wisc.edu/goes/burn/abba.html>

Regarding vegetation health, NESDIS produces vegetation index products from Polar satellites. With GOES-R in the 2012 or later time frame, a .86-micrometer channel is planned which will improve the capability to monitor the health of vegetation.

Hyperspectral Imaging

Where are hyperspectral imagery and data products?

NOAA is investigating two parts of the spectrum for potential application of hyperspectral data, visible to near IR (with wavelengths from about 0.2 to 5 micrometers) and IR (about 3 to 15 micrometers). In the visible to near IR, NASA launched an instrument on EO-1 called Hyperion. Samples of these data can be seen at: <http://eo1.gsfc.nasa.gov/Technology/Hyperion.html>. Sensors in this region may be useful for coastal zone, open ocean, and coral reef purposes, if they are designed for that purpose. In the IR band, concept studies are underway to provide a Hyperspectral Environmental Sensor (HES) as an atmospheric sounder for the GOES-R series. HES will be an interferometer-class instrument and will be based on technology demonstrations from NASA's Geostationary Imaging Fourier Transform Spectrometer (GIFTS). NOAA, NASA, and the Navy are partners on the GIFTS effort. NOAA will be responsible for all data receipt, calibration, and initial data distribution of GIFTS data.

Soil Moisture

Soil moisture is not in the list of the NESDIS products—is that because the technology/algorithms are not ready?

NPOESS will carry the Conically Scanned Microwave Imager/Sounder (CMIS) on all spacecraft. Measurements are made in the 6GHz range for soil moisture. The program has procured algorithms for calculating soil moisture. More information is available on the NPOESS website. NESDIS does produce soil moisture products. They can be found at:

http://psbsgi1.nesdis.noaa.gov:8080/PSB/SHARED_PROCESSING/SHARED_PROCESSING.html

These products will be improved in the NPOESS era.

NPOESS Environmental Data Records (EDRs)

Current NPOESS EDR's are defined for operational and forecast support and climate monitoring. I suggest development of event products or exploration of potential thereof. The host of new sensors and quantity of channels will provide a lot of data for "knowledge through data development" activities. The addition of an active-fire monitoring EDR is along these lines, as also is consideration of an Aerosol Polarimetry Sensor (ASP). Also, polar tropospheric winds could be done by VIIRS, as has been initially demonstrated by the University of Wisconsin.

We have placed the Algorithm Theoretical Basis Documents for our products (Environmental Data Records) on our web site so both users, labs, and the academic community will have access to the science behind the product. This yields the result mentioned and also provides the opportunity for an informal peer review.

Archival

Archive data and ensure accessibility to secure long-term benefits.

One way that NOAA plans to improve access is through the Comprehensive Large Array-data Stewardship System (CLASS) project. The vast NOAA data holdings are collected and stored at various data centers that are responsible for the perpetual stewardship, archiving, and dissemination of environmental data. Instead of having customers track down specific data at one of the various data centers, NOAA is planning to build a "one-stop" point of access to these data.

The CLASS project goal is to provide a simple WEB-based interface that will allow customers to access data from NOAA data holdings. CLASS will afford efficient management of high volumes (petabytes) of critical environmental data. CLASS will also provide expansion in storage capacity, increased communications bandwidth, and automation of data management activities to deliver rapid access to the NOAA data holdings. Placing data on-line for access via the World Wide Web is a high priority in accordance with the federal government's e-Government initiative. There are time frames for the project, with schedule goals organized around various

data campaigns. Some of the key start dates are:

GOES campaign - January 2003
E-Commerce capability - June 2003
NPP campaign - January 2004
EOS campaign - June 2005
METOP campaign - June 2005

Overlapping Operations

Emphasize overlapping operations to ease the transition time.

This recommendation has been turned over to the GOES Users' Working Group. In the case of Emergency Managers Weather Information Network (EMWIN) and Weather Facsimile/Low Rate Information Transmission (WEFAX/LRIT) services, special transition plans have been developed.

See <http://iwin.nws.noaa.gov/emwin/index.htm> and <http://iwin.nws.noaa.gov/wefax/index.htm> for details.

Polar User Conference

Many references were made to the GOES User Conference. Since there will be so many changes in the Polar Program in the future with Metop and NPOESS, it seems it would be advantageous to NESDIS to hold a similar Polar User Conference.

NPOESS has a similar event, the MAXI Review. Unfortunately, events of 9/11 resulted in the 2001 session being cancelled; however, the next MAXI is scheduled for October 28-30, 2002. In the MAXI, users and interested parties will be able to hear from and question builders and designers of sensors and systems and to learn more about products that will be available from NPOESS. NESDIS is currently planning the NOAA-sponsored GOES and POES "Satellite Direct Readout Users Conference for the Americas." This Conference will be held in Miami, FL Dec.9-13, 2002. NOAA point of contact is Wayne.Winston@noaa.gov

More Polar Data

We need more polar data—sometimes it's all that we have

Significant NOAA resources are going into maintaining and improving polar capability both with the current POES and the future NPOESS systems. NESDIS realizes the importance of polar data at high latitude sites like Fairbanks, Alaska. NESDIS is currently working with NWS to make more satellite data available to NWS field offices via AWIPS and has plans to upgrade direct readout capabilities at Fairbanks

NOAA Satellite Systems Forum American Meteorological Society Annual Meeting

Orlando, FL

January 17, 2002

Forum Report

NESDIS hosted a Satellite Systems Forum on January 17, 2002 at the 84th Annual Meeting of the American Meteorological Society in Orlando, Florida as part the continuing NESDIS outreach to the user community. This 90-minute lunchtime event attracted over 300 satellite data users, associated industry and government staff.



U.S. Department of Commerce
National Oceanic and Atmospheric Administration (NOAA)
National Environmental Satellite, Data, and Information Service (NESDIS)

The NOAA Assistant Administrator for Satellite and Information Services, Gregory W. Withee, opened the forum with an overview of future NOAA satellite system developments. The forum focused on four key questions that were posed to the participants. Taking each question in turn, Gerry Dittberner presented a brief overview of NESDIS' current efforts in each area.

The floor was then opened to participants to offer comments, questions or feedback to a panel of NESDIS satellite systems experts comprised of James Gurka (GOES Requirements Manager), Tom Schott (POES Products Manager), and Mike Haas (National Polar-orbiting Operational Environmental Satellite System [NPOESS] User Interface). Panel members responded to participants'

Communication: NOAA recognizes the need for 2-way dialogue with the user community. What methods of communication would best serve this need?

Education: Benefits from improved observing systems and improved weather forecasts cannot be fully realized if users are not aware of the systems' full capabilities and limitations. How can NOAA educate the user community on emerging satellite capabilities and techniques for fully utilizing satellite data and products?

comments and questions on each topic, before opening the floor to general comments and questions. Several recommendations emerged during the session and from those submitted afterward.

Based on the keen interest of participants, it was clear that the forum's goals to exchange information and provide future program status were well met. The NOAA Satellite Systems Forum proved to be a useful part of our outreach efforts and will be continued at future AMS Annual Meetings. The next session will be at the AMS Annual Meeting in Long Beach, CA on February 9 through 13, 2003.

Benefits: What benefits do you expect the improved space-based observations to provide to your organization, to your customers, and to society in general?

Integration: Geostationary Operational Environmental Satellite (GOES) and Polar Orbiting Environmental Satellite (POES) satellites are extremely valuable national and international technological resources. What can be done to ensure the user community is ready to fully integrate the new data into operations immediately following post-launch checkout?

Key Recommendations

NESDIS Dialogue with Users

Continue and expand NESDIS' current efforts to engage the user community.

We welcome active participation from all interested parties, and recommend that they participate in one or more of the upcoming user conferences:

GOES Users' Conference on October 1-3, 2002; (see <http://www.osd.noaa.gov/announcement/>)

NPOESS MAXI Review, October 28-30, 2002; (see: <http://npoesslib.ipo.noaa.gov/maxi2002.htm>)

The NOAA-sponsored GOES and POES *Satellite Direct Readout Users Conference for the Americas* (see <http://noaasis.noaa.gov/miami02/>) Comments may also be forwarded to Pam Taylor, Requirements Product Team (Pam.Taylor@noaa.gov).

User Information

Provide information to users—not only NESDIS products but also products/data from other foreign satellites and agencies, because users may have limited knowledge about all the remote sensing data sources that are available.

NESDIS is looking into establishing a single point that would link (electronically) to individual system home pages, data, etc. In this way, users would go to a single point and be "electronically" escorted to the proper site for updates and required information. For example, the change from HRPT on POES to the equivalent capability on NPOESS is rather dramatic. NPOESS will have two real-time data rates/capabilities. The first will be at L-band at about 3.5Mbps and will contain a subset of the sensor data. The second will be at X-band at a 20Mbps data rate and will contain all data. Both links are in Consultative Committee for Space Data Systems (CCSDS) format. Format details will be published on the NPOESS website after the prime contractor is selected. Also to support this recommendation, a briefing on the Cooperative Program for Meteorology, Education and Training (COMET) outreach program ([\[www.comet.ucar.edu/outreach/index.htm\]\(http://www.comet.ucar.edu/outreach/index.htm\)\) was given to NESDIS management. Sponsored by the University Corporation for Atmospheric Research, the goal of the COMET Outreach Program is to improve local forecast and warning services by providing support for applied mesoscale and synoptic-scale research and education. Since its beginning, the program has funded over 150 research projects. These projects have involved more than 60 different universities and 70 National Weather Service \(NWS\), Navy, and the Air Force Weather Agency \(AFWA\) forecast offices. More than 70 university faculty members have participated. Findings from the projects are shared through student theses and dissertations, conference presentations, and journal publications. An important feature of the Outreach Program is the fostering of partnerships between the academic research community and operational weather forecasters that improves both on-the-job performance and classroom education. With regard to current satellite meteorology training activities, NESDIS and NWS are conducting an active program through the Virtual Institute for Satellite Integration Training \(VISIT\). VISIT is comprised of staff from the Cooperative Institute for Meteorological Satellite Studies \(CIMSS\) at the University of Wisconsin, the Cooperative Institute for Research in the Atmosphere \(CIRA\) at Colorado State University, NESDIS, and the NWS training division. The majority of the training is done via instructor led teletraining sessions. An interactive training tool called VISITview was developed by the VISIT program. VISITview is platform-independent distance learning and collaboration software that allows multiple users in different locations to view and manipulate images, animations, graphics and text via the Internet. Since the VISIT teletraining program began in 1999, over 7,000 NWS forecaster sessions were completed. Other NOAA staff and Department of Defense staff also were trained in Satellite Meteorology and other operationally relevant forecasting and analysis techniques. The need for satellite meteorology training will continue to increase as the space-based observations expand rapidly over the next decade. The expectation is that](http://</p></div><div data-bbox=)

NOAA will continue to support and expand the VISIT program: (<http://www.cira.colostate.edu/ramm/visit/visithome.asp>).

The NPOESS and NESDIS POES programs are supporting the development of a user information and training portal Website at COMET. This site will provide access to a growing library of Web-based training materials. Several Web-based training modules on polar orbiting and geostationary satellites are available at the Integrated Sensor Training (IST) website at the NWS training portal site: (<http://www.nwstc.noaa.gov/nwstrn/d.ntp/meteor/istpcu6.html>) and at the COMET web site: (<http://meted.ucar.edu/ist/index.htm>).

Many user questions can be answered on the NOAASIS Website:

<http://noaasis.noaa.gov/NOAASIS/ml/gateway.html>.

They have a hot link to "satellite information team" for questions.

In regard to satellite data volumes, a link for the GOES I-M data book is: <http://rsd.gsfc.nasa.gov/goes/text/goes.databook.html>. Data rates of various instruments are mentioned on pages 9, 10, 37, 96, 98, and 145. Search for the phrase 'Mb/s' (without the quotes). Other GOES links that may be helpful are at <http://goes2.gsfc.nasa.gov/> and <http://rsd.gsfc.nasa.gov/goes/>

Some POES links can be found at either of the following Web addresses:

<http://www2.ncdc.noaa.gov/docs/podug/index.htm>

<http://www2.ncdc.noaa.gov/docs/klm/>

We recommend the official World Meteorological Organization (WMO) web site for information on foreign satellites. See <http://www.wmo.ch/index-en.html>

User Involvement

Involve a broader range of users both nationally and internationally.

The WMO is very active in the satellite meteorology arena. The WMO Commission for Basic Systems Open Programme Area Group (OPAG) on Integrated Observing Systems established the Expert Team on Satellite Systems Utilization and Products (ET SSUP). Under the guidance of the WMO, the ET SSUP has planned, developed, and implemented the Virtual Laboratory (VL) for Education and Training in Satellite Meteorology. The VL is a global network of specialized training centers created to meet the needs for increased skills and knowledge in using satellite data. The strategic goals for the VL are:

- To provide high quality and up-to-date training resources on current and future meteorological and other environmental satellite systems, data, products and applications; and
- To enable the "centers of excellence," Regional Meteorological Training Centers (RMTCs) to facilitate and foster research and the development of socio-economic applications at the local level by the National Meteorological and Hydrological Services (NMHSs) through the provision of effective training and links to relevant science groups.

For more information on the WMO activities and the Virtual Laboratory, go to <http://www.wmo.ch/index-en.html>, and search "satellite activities," then click on "Education and Training Materials".

Disseminating Information to Users

Maximize current technology such as interactive, searchable web pages and a user community list-serve to reach as many users as possible in order to disseminate information and data, solicit input and maintain consistent communication.

At a recent GOES-R planning meeting, reference was made to the European Organisation for the Exploitation

of Meteorological Satellites (EUMETSAT) Satellite Application Facilities (SAF) as an effective way to establish and maintain consistent communication with as many users as possible. For information about SAF:

<http://www.eumetsat.de/en/index.html?area=left4.html&body=/en/area4/saf/internet/&a=430&b=1&c=400&d=400&e=0>

The SAF are specialized development and processing centres within the EUMETSAT Applications Ground Segment. Utilizing specialized expertise in Member States, they complement the production of standard meteorological products derived from satellite data at EUMETSATs Central Facilities in Darmstadt, Germany and also distribute user software packages.

Educational Materials

Improve and disseminate education "packages" to teachers and schools at all levels—from K-12 through graduate programs.

The DataStreme Project is a major precollege teacher enhancement initiative of the American Meteorological Society (AMS). Its main goal is the training of Weather Education Resource Teachers who will promote the teaching of science, mathematics and technology across the K-12 curriculum in their home school districts, using weather as an instructional vehicle.

The initial step in the training of Resource Teachers is their participation in the DataStreme (<http://www.ametsoc.org/dstreme/>) distance-learning course. The 13-week course is offered twice a year to selected participants. It focuses on the study of the atmospheric environment through the use of electronically transmitted weather data and learning materials combined with Study Guide readings and investigations.

The Project is funded by the National Science Foundation with assistance from the U.S. National Weather Service and the State University of New York College at Brockport. DataStreme expects to train over 4,000 teachers nationally.

Aerosol Products

Explore the wide variety of potential uses for data from new satellite systems. This should include aerosols, and particulates sensing.

NOAA has identified such a need through the requirements process for future systems and NPOESS has added a sensor (Aerosol Polarimetry Sensor) to provide data on Aerosol Optical Thickness; Aerosol Particle Size; and Aerosol Refractive Index, Single Scattering Albedo, and Shape. While designed for long-term climate applications, the products will also enhance operations, especially in input to Numerical Weather Prediction (NWP). Current NESDIS aerosol products can be found at:

<http://psbgsi1.nesdis.noaa.gov:8080/PSB/EPS/Aerosol/Aerosol.html>.

Land Observation

There is a need for data on land observation for land use, crop production, etc.

While not a total solution, NPOESS will provide data on Land Surface Type, Land Surface Temperature, Soil Moisture, NDVI, and an Enhanced Vegetation Index. Data will be available from all three NPOESS orbital planes. Details are available on the NPOESS Web Page. (<http://npoesslib.ipo.noaa.gov>)

There are a number of other land observation products available from NESDIS. A list of NESDIS products can be found at:

http://satprod.osd.noaa.gov:8081/satprod/products/prod_frameset.cfm?prodid=-1.

Once a product of interest is found there frequently is a web link that will take you to that product.