

RSSG Newsletter

Association of American Geographers
Remote Sensing Specialty Group



November 1993



From the Chair

These are certainly exciting times in remote sensing...Lockheed and Worldview and the joint venture of Orbital Sciences Corporation/Itek Optical Systems/GDE all proposing high resolution commercial systems. And Landsat 7 is in jeopardy because NASA and Congress did not hear a loud hue and cry when Landsat 6 failed to reach orbit. If you want your voice heard about Landsat 7, now is the time to write your Senators and Representatives.

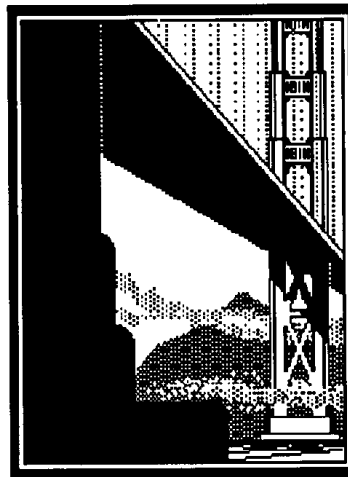
On another subject, you will find elsewhere in this issue Professor Earle's reply to the letter I sent on your behalf regarding publication of remote sensing articles in the *Annals* (see page 2.). The responsibility is now on us to submit material for consideration. And we cannot reasonably expect that 100% of what we submit will be accepted. That does not relieve us of the responsibility to offer our manuscripts first to the journal which can communicate our results to geographers. I encourage you to give it a try.

Also of note, it is again time for us to nominate officers. Nominate a colleague, a friend, an enemy, yourself...! This is an opportunity to influence how the Remote Sensing Specialty Group will serve you.

Tina Cary, RSSG Chair
Earth Observation Satellite Company
4300 Forbes Boulevard
Lanham, MD 20706
Telephone: (301) 552-0542
FAX: (301) 552-5476

RSSG 1994 AAG PROGRAM TAKES SHAPE

Kevin Price (University of Kansas) and Duane Nellis (Kansas State University), RSSG 1994 Program Co-chairs, have announced the preliminary RSSG program for the 1994 AAG Annual Meeting to be



held in San Francisco next Spring. The twelve remote sensing sessions outlined in this issue of the RSSG Newsletter will likely be complemented by several more as additional remote sensing papers are directed to RSSG by AAG headquarters.

In addition to the paper sessions, Vince Ambrosia (NASA/Ames Research Center) is attempting to organize a site visit to the NASA/Ames Research Center. The 1994 annual meeting is shaping up to be a very special event. *See page 8 for details.*

Nominations Requested

See page 3



NEW ANNALS EDITOR ADDRESSES REMOTE SENSING ISSUES

June 23, 1993

Ms. Tina Cary, Chair
Remote Sensing Specialty Group
4300 Forbes Boulevard
Lanham, MD 20706

Dear Ms. Cary:

Thank you for your thoughtful letter of June 26, 1993. I too am concerned about the representativeness of articles published in the Annals. In the case of the Remote Sensing SG, an equity model would suggest that your Group (with some 5-6% of AAG membership) should have published since 1988 somewhere between 6 and 7 articles in the Annals as compared to the two articles that you cite. This disparity is a concern, yet it is one that I believe can be addressed and resolved. First, the numbers are small. If just two articles on remote sensing were to appear in the next issue of the Annals, the disparity would be halved; if four, it would be eliminated altogether. Second, an equilibrium equity model (once disparities are eliminated) would suggest publication of 1-2 RS articles per year. Surely as a minimum standard, that's doable.

The key, in my opinion, is submissions. To ensure 1 to 2 RS Annals articles per year, given current acceptance rates, will require somewhere between 4 and 8 RS submissions. How we are doing on that front I cannot yet say. I can say, however, that of the seven articles that have crossed my desk in this period of editorial transition, at least one involves a RS essay and an associated map supplement. That seems a good start - but it's not enough.

What can we do to encourage more high-quality submissions in remote sensing? My suspicion is that the RSSG needs to exercise a certain moral suasion on the kinds of scholars who are capable of writing

mature and thoughtful essays which: 1) apply RS to substantive problems (thus broadening the audience for RS); 2) demonstrate the utility of RS for particular classes of research problems; 3) clarify and codify the scientific research programs within the domain of remote sensing; or 4) broach novel techniques and technologies in RS. These scholars need to be mobilized. Let me pass along my opinion on this matter by excerpting from my statement to the Council in my April interview for the Editorship: "I believe that the kinds of scholars who are capable of doing the best in geographical scholarship too often abdicate that responsibility to those of us who may be less qualified." I believed this when I said it in April - and I believe it now. The leaders of our various subdisciplines - those "very distinguished and highly productive scholars" noted in your letter - are less forthcoming than they need to be. All of which suggests that the RSSG - or any other SG for that matter - needs to identify its best and brightest and oblige them to submit their best essays to the Annals. I cannot imagine that their efforts would not be warmly received and justly reviewed.

Lastly, I have restructured the associate editorships in ways not unlike your recommendation. I have an associate editor for each of physical geography, human geography, nature-society relations, and methods and theory. John Paul Jones will do the latter. As for the editorial board, it includes various representatives of the mapping sciences including, among others, John Jensen, Michael Goodchild, Joel Morrison and Sona Andrews.

Again let me thank you for your thought-provoking letter. Do trust that efforts on your behalf in securing the best in Remote Sensing for the Annals will be reciprocated on mine. Please stay in touch.

Regards,

Carville Earle, Editor
Annals AAG



NOMINATIONS SOUGHT FOR RSSG OFFICERS

The AAG Remote Sensing Specialty Group seeks nominations for the following offices:

Vice Chair (1994-1996)
Secretary-Treasurer (1994-1996)
Director (1994-1996)
Student Director (1994-1995)

All persons nominated must be current members of the AAG and RSSG. Voting will take place prior to the San Francisco annual meeting of the AAG, and results will be announced at the 1994 RSSG annual business meeting. Nominations should be mailed by **January 15, 1994** to:

Tina Cary, RSSG Chair
Earth Observation Satellite Company
4300 Forbes Boulevard
Lanham, MD 20706
Telephone: (301) 552-0542
FAX: (301) 552-5476

USE YOUR NEWSLETTER

The RSSG Newsletter is your vehicle for communicating with colleagues interested in remote sensing. You are invited to send news regarding publications, awards, honors, academic programs, research activities, commercial ventures, students, jobs and other announcements to:

James W. Merchant
Conservation and Survey Division
University of Nebraska-Lincoln
113 Nebraska Hall
Lincoln, NE 68588-0517
Telephone: (402) 472-7531
FAX: (402) 472-2410
Internet: jm1000@burn.unl.edu

If possible, please submit contributions on a disk in Wordperfect or ASCII format.

NOMINATIONS SOUGHT FOR RSSG OUTSTANDING CONTRIBUTIONS AWARD

Nominations for the 1994 AAG/RSSG Award for Outstanding Contributions in Geographic Remote Sensing are being sought. The award, a medal and citation, is the highest honor conferred by RSSG and recognizes excellence in research, teaching or other related activities. Past recipients of the award are: The late Professors David Simonett and Ben Richason, Jr., and Professor Alan Strahler.

Nominations may be sent to any member of the RSSG Awards Committee (see below). Nominations must include, for each nominee, a complete resume along with pertinent evidence of scholarly and service contributions. All materials submitted will remain confidential and only the name/s of recipients will be announced by the committee. Please forward all nominations by **February 1, 1994** to one of the following persons:

Kamlesh Lulla, Chair
NASA/Johnson Space Center
Mail Code SN 5
Houston, TX 77058
Tel: 713/483-5159
Fax: 713/483-2911
Internet: lulla@sn.nasa.gov

Michael Hodgson
Department of Geography
University of Colorado
Boulder, CO 80309
Tel: 303/492-8312
Fax: 303/492-7501

Ray Lougeay
Department of Geography
State University of New York at Geneseo
Geneseo, NY 14454
Tel: 716/245-5571
Fax: 716/245-5005



HONORS AND AWARDS

Thomas R. Loveland (USGS/EROS Data Center) has been appointed co-chair of the Land Cover Working Group of the International Geosphere-Biosphere Programme's Data and Information Systems (IGBP-DIS). Tom serves as co-chair with **Alan Belward** of the Joint Research Center, Ispra, Italy. Tom and Alan succeed **John Townshend** (University of Maryland), former chair of the Working Group. John will now chair the IGBP-DIS Standing Committee. Other geographers on the LCWG include **Chris Justice** (University of Maryland) and **Jeff Eidenshink** (USGS/EROS Data Center). The LCWG serves as a catalyst for the development of a suite of land cover data sets needed by the IGBP Core Projects.

Kamlesh Lulla (NASA/Johnson Space Center) serves as the Chief Editor of Geocarto International -- A multidisciplinary journal of remote sensing. The December 1993 issue will be a special issue on the theme of "Global Environmental Change." Many geographers are contributors to the issue both as authors and reviewers. Among the authors are: **John Jensen**, **Stan Morain**, **Sue Grimmond**, **Paul Mausel**, **J.K. Lee** and **K. Lulla**. Kam chairs the "In-Space Imaging and Astronaut Observations" Technical Committee for the American Institute of Aeronautics and Astronautics (AIAA). Recently he was named Associate Fellow of AIAA for his contributions to imaging from Space Shuttle flights. A photo-album entitled Cities of the World as seen from Space, compiled by K.N. Au and Kam Lulla has been published by Geocarto International. Kam also wrote the "Foreword" and an essay on the space shuttle database for urban applications. Other contributors include scientists from ERIM and ESA.

Danny M. Vaughn (Weber State University) received a \$87,000 Instrumentation and Laboratory Improvement Grant from the National Science Foundation. This will be used to purchase equipment to supplement the remote sensing/GIS laboratory at Weber State University. Danny also presented three papers at the annual NASA/JOVE retreat held at Johnson Space Center, Houston, TX.

OSCAR, the Online Satellite Catalog and Request System

An online inventory of NOAA meteorological satellite data

Data collected by NOAA's meteorological satellites are archived and disseminated by the Satellite Data Services Division (SDSD) of NOAA's National Climatic Data Center. Although the main facility of the National Climatic Data Center is located in Asheville, North Carolina, the SDSD is located in close proximity to NOAA's satellite operations offices in the Washington, DC metropolitan area. Inventory information about SDSD holdings of data and data products from NOAA polar-orbiting satellites is available through the Online Satellite Catalog and Request System (OSCAR). OSCAR currently resides on a MicroVax 3300 with access through local and domestic 8-800 numbers. The system will soon be available through the Internet.

The first phase of the system contains inventories of data holdings from the Advanced Very High Resolution Radiometer (AVHRR) and from the TIROS Operational Vertical Sounder (TOVS), which produces atmospheric profiles of temperature and humidity. Subsequent phases or follow-on systems will handle data from the Special Sensor Microwave Imager (SSM/I), an instrument system of the most recent DMSP (Defense Meteorological Satellite Program) satellite, and the Coastal Zone Color Scanner (CZCS), an instrument system aboard the NASA Nimbus-7 satellite.

Users are free to query one or more inventories of satellite data. However, they are strongly urged to contact an SDSD data specialist to obtain the required user IDs and information regarding any changes or recent revisions to procedures for accessing OSCAR. These inventories contain information that uniquely describes each digital data set such as satellite name, data type, data set names, date and time. The access software uses the inventories to calculate areas of coverage and to select only those data within the user-defined area. The system returns this information to the user, along with an input tape count and estimated number of output tapes for the order.

Continued in page 17...OSCAR

NASA SPACE SHUTTLE EARTH OBSERVATION PROJECT (SSEOP) PHOTOGRAPHY DATABASE AND DIGITIZED PHOTOS

Database

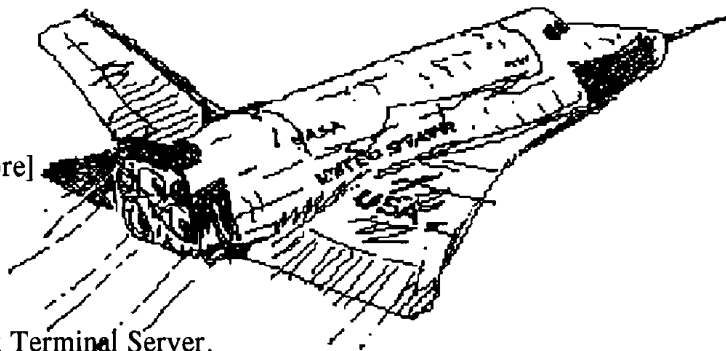
The Space Shuttle Earth Observations Project (SSEOP) photography database of the Flight Science Support Office (FSSO) at the NASA Lyndon B. Johnson Space Center is now operational on VAX node SSEOP. It contains references to more than 80,000 photographs of the Earth made from space during the last three decades. This system, which will be available 24 hours a day except during preventive maintenance, is free and accessible to users in the United States as well as overseas if the proper communication system is available. Other features will be added to this public service in the near future.

The system can be accessed three ways:

1. Through SPAN -- Enter SET HOST SSEOP or SET HOST 9299 [uppercase or lowercase] via the keyboard. When queried for "Username" and "Password", type in PHOTOS at each prompt.
2. Through INTERNET -- Enter TELNET SSEOP.JSC.NASA.GOV via the keyboard. When queried for "Username" and "Password," type in PHOTOS at each prompt.
3. Via modem -- The modem can be 300, 1200, or 2400 baud; no parity; 8 data bits; and 1 stop bit. If calling long distance, the area code is 713. You may have to press the return key several times at the "CONNECT" or "CALL COMPLETE" message to get the next prompt. Here is the way the conversation should go:

You: ATDT 483-2500
Computer: CONNECT
ENTER NUMBER
You: sn_vax [This must be lower
case with an underscore]
Computer: CALLING 63109
CALL COMPLETE

You: J31X
Computer: Welcome to the Xyplex Terminal Server.
Enter username>
You: ANONYMOUS
Computer: Xyplex >
You: C SSEOP [The "C" is for "connect."]
Computer: Xyplex -010- Session 1 to SSEOP established
Username:
You: PHOTOS
Computer: Password:
You: PHOTOS



Continued on page 6...SSEOP

Digitized Photographs

The Flight Science Support Office at Johnson Space Center also has a second account which provides downloading and copying capability for Space Shuttle Earth Observations photographs that have been digitized. The account name is ANONYMOUS, and the password is GUEST. This account can be accessed through the File Transfer Protocol (FTP) or through SPAN (THENET, etc.). The files are in band-sequential format with a 512-byte header; they contain 512 by 512 bytes each of red, green, and blue. These files are easily read by many microcomputers and mainframes. A program to convert to TARGA format is now available. The photograph files that are currently available are as follows:

These new file names indicate mission-roll-frame numbers.

Directory DUA1:[ANONYMOUS]

STS008-32-0748.DAT	Tahas, Bora Bora, and Tupal atolls, Pacific Ocean
STS008-48-1000.DAT	Great Dike, Zimbabwe, Africa
STS008-48-0924.DAT	Dust storm, Cerro Galen, Argentina
STS008-45-0973.DAT	Great Barrier Reef, east coast of Australia
STS008-50-1798.DAT	Granitic intrusion, Chanaral, Chile
STS41D-31-096.DAT	Altocumulus formed from midlevel divergence
STS41D-33-005.DAT	Thunderstorms extending through smoke pall
STS41D-34-005.DAT	Peneplain cut by canyons, Andean Slopes, Peru
STS41D-34-010.DAT	Debris avalanche deposit, Tata Babaya, Bolivia
STS41D-34-017.DAT	Ring intrusion, Jebel Uweinat, Sudan/Egypt/Libya
STS41D-37-072.DAT	Von Karman vortices, leeward of Guadalupe Island, Pacific Ocean
STS41D-39-034.DAT	Massive volcanic debris avalanche, Socompa volcano, Chile
STS41D-41-028.DAT	Gosses Bluff Meteorite Crater, Australia
STS41D-41-033.DAT	Superimposed drainages, Macdonnell Ranges, Australia
STS41D-44-083.DAT	Sandbar, Bala de Sepetba, Brazil
STS41D-45-053.DAT	South African gold mines
STS41G-31-043.DAT	Glaciers, lakes, and fault zone, Tibet Plateau
STS41G-31-099.DAT	Jet stream cirrus with shadow on lower cumulus
STS41G-37-105.DAT	Anticlines and salt domes, Gulf Coast, Iran
STS41G-39-028.DAT	Oblique view, Sinai Peninsula, Egypt
STS41G-41-058.DAT	Polar jet cirrus and open-cell cumulus
STS41G-41-088.DAT	Oblique view, Galapagos Islands
STS037-73-043.DAT	Mauna Loa Volcano, Hawaii
STS037-73-047.DAT	Kuwait oil fires
STS037-74-082.DAT	Etosha Pan, Namibia, Africa
STS037-77-015.DAT	Inland delta of Niger River
STS037-79-047.DAT	Paranalba Sands, Brazil
STS037-82-091.DAT	Jiddah, Saudi Arabia (Red Sea side)

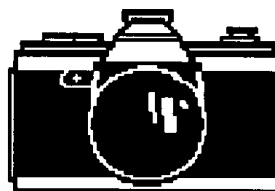
The following is an example of an FTP session to download a file from the SSEOP database. At busy times, it may take 10-15 minutes or longer to download.

Continued on page 7...SSEOP

Computer: \$
You: FTP SSEOP.JSC.NASA.GOV [uppercase or lowercase]
Computer: SSEOP.JSC.NASA.GOV MultiNet FTP user process 2.2(100)
Connection opened (Assuming 8-bit connections)
< SSEO JSC.NASA.GOV MultiNet FTP Server Process 2.2(11) at Fri 26-Apr-91
4:36PM-CDT
SSEOP.JSC.NASA.GOV > [or some other prompt]
You: LOGIN
Computer: Foreign username:
You: ANONYMOUS
Computer: < anonymous user ok. Send real ident as password.
You: [Enter your name]
Computer: < Guest User PITTS logged into DUA1:[ANONYMOUS] at Fri 26-Apr-91 16:40, job
1545
< Directory and access restrictions apply
SSEOP.JSC.NASA.GOV > Type Binary
You: GET (ANONYMOUS)STS008-50-1798.DAT
Computer: To local file:
You: [Enter your name for the downloaded file.]
Computer: < VMS retrieve of DUA1:[ANONYMOUS]STS008-50-1798.DAT;1 started.
< Transfer completed. 786988 (8) bytes transferred.
SSEOP.JSC.NASA.GOV >
You: QUIT
Computer: < QUIT command received. Goodbye.

For additional details, comments or suggestions to:

Dr. David E. Pitts, Manager
Flight Science Support Office
Mail Code SN15
NASA Johnson Space Center
Houston, TX 77058
SPAN: 9247::PITTS
INTERNET: PITTS@SN.JSC.NASA.GOV





RSSG 1994 AAG PRELIMINARY PROGRAM

Session 1: REMOTE SENSING OF SOILS AND WATER

Organizers: Duane Nellis, Kansas State University and Kevin Price, University of Kansas
Chair: Barry Haack, George Mason University

Stephen Walsh, Philip Townsend, University of North Carolina and Sam Pearsall, The Nature Conservancy
Roanoke River bioreserve: Development of hydroperiods through an integrated GIS

Allen Hope, Douglas Stow, Derren Duburguet, San Diego State University and Gary Petersen, Pennsylvania State University
Arctic landscape wetness derived from Landsat Thematic Mapper satellite imagery

Cynthia Evans, M. Justin Wilkinson, David Helms, Robert Mohler, Lockheed Engineering & Science Company, NASA Johnson Space Center and Steven Ackleson, Office of Naval Research
Land, sea, and air interactions on the coast of Namibia: Hypotheses concerning the origin and distribution of gypsum-rich desert soils

Wenli Yang, University of Nebraska-Lincoln
Relationship between normalized difference vegetation index and soil associations

Barry Haack, Jeanette Baier and Joseph Messina, George Mason University
Changes in the Kenyan Omo River delta using remote sensing

Session 2: U.S. FISH AND WILDLIFE GAP ANALYSIS

Organizer: R. Douglas Ramsey, Utah State University
Chair: R. Douglas Ramsey, Utah State University

Thomas Edwards, Jr., Utah State University and Michael Scott, U.S. Fish and Wildlife Service
GAP analysis: A tool for the management of biodiversity

Kathryn Thomas, David Stoms, and Frank Davis, University of California, Santa Barbara, CA
GAP analysis of the Mojave Desert region of California

Thomas Edwards, Jr., Collin Homer, Allan Falconer, R. Douglas Ramsey, and Douglas Wight, Utah State University

GAP analysis: A national biodiversity study built with geographic tools

Michael Scott, U.S. Fish and Wildlife Service
GAP analysis: A spatial approach to identifying representative areas for maintaining biodiversity

Session 3: IMAGE ANALYSIS STRATEGIES

Organizer: Michael E. Hodgson, University of Colorado
Chair: Duane Nellis, Kansas State University

James Merchant, University of Nebraska-Lincoln
Improving land cover assessment through integrated spatial data analysis

Kevin Price, University of Kansas
Characterization of forest canopies using 3-dimensional digital canopy models

Curtis Woodcock, Boston University
Nonlinear estimation of scene parameters from digital images using zero-hit run-length statistics

Michael E. Hodgson, University of Colorado
What size geographic window for image classification?

Alan Strahler, Boston University
MODIS: Flagship EOS instrument for remote sensing in the twenty-first century

Session 4: REMOTE SENSING OF AGRICULTURE AND NATURAL VEGETATION

Organizers: Kevin Price, University of Kansas and Duane Nellis, Kansas State University
Chair: Daniel Brown, Michigan State University

Chris Keithley and Fiona Renton, University of Nebraska-Lincoln
Mapping cropland using combined Thematic mapper and ERS-1 SAR data

Michael T. Stublitz, California State University at Hayward
Remote sensing and GIS applications to the new phyoxera infestations in northern California vineyards

Continued on page 9...RSSG/AAG

Sean Ahearn, Hunter College
A temporal analysis of tillage area in the Kwara State, Nigeria using satellite remote sensing

Zhangshi Yin, University of Oklahoma
AVHRR/NOAA images for analyses of vegetation and other environmental factors in conterminous USA

Kathleen G. Landis, University of Georgia
Examination of forest cover change in Haiti from 1972 to 1985 using Landsat MSS imagery

Session 5: REMOTE SENSING OF VEGETATION

Organizers: Kevin Price, University of Kansas and Duane Nellis, Kansas State University
Chair: Kevin Price, University of Kansas

Christine McMichael, Derren Duburguet, and Allen Hope, San Diego State University
Grassland radiative and aerodynamic temperatures: Effects of soil moisture

Derren Duburguet, Christine McMichael, and Allen Hope, San Diego State University
Grassland radiative and aerodynamic temperatures: Effects of vegetation density

John Dunham and Kevin Price, University of Kansas
Hyperspectral characterization of prairie treatments using multiple-view angle multitemporal measurements

Douglas Stow, Arman Eshrigi, David Van Mouwerik, and Allen Hope, San Diego State University
Environmental monitoring with and airborne digital multispectral imaging system

Mark Jakubauskas and Kevin Price, University of Kansas
Landsat Thematic Mapper characterization of coniferous forest succession

Session 6: SPATIAL ANALYSIS OF REMOTELY SENSED DATA

Organizers: Kevin Price, University of Kansas and Duane Nellis, Kansas State University
Chair: Michael E. Hodgson, University of Colorado

Stuart Phinn, San Diego State University
Image classification and exploratory spatial data analysis techniques

Bonnie Ingram and Kevin Price, University of Kansas
Differentiating pheasant habitat using the semivariance of satellite data

Daniel Brown, Michigan State University
Linking landscape pattern information across multiple resolution satellite digital data sets

R. Douglas Ramsey, David Winn, and Eric Olsen, Utah State University
Visualization of landscape diversity from classified Landsat TM imagery

William Tyler and Charles Lake, Environmental Research Institute of Michigan (ERIM)
Use of machine vision technology to derive digital elevation models from scanned map sources

Session 7: REMOTE SENSING OF WETLAND ENVIRONMENTS I

Organizers: Sunil Narumalani, University of Nebraska-Lincoln
Chair: Sunil Narumalani, University of Nebraska-Lincoln

Roy Welch and Marguerite Remillard, University of Georgia
Airborne and satellite remote sensing for studies of wetlands in southeastern United States

John Jensen, University of South Carolina, Sunil Narumalani, University of Nebraska-Lincoln, Miles Hayes, and Jacqueline Michel, Research Planning, Inc.
Multi-sensor imagery for evaluating the impact of the Gulf War oil-spill on the wetlands of two Saudi Arabian bays

Donald Rundquist, Rolland Fraser, Lydia Liu, Steven Payton, and Brian Tolks, University of Nebraska-Lincoln
Multitemporal hyperspectral characterization of hardstem bulrush and broadleaf cattails

John Althausen, John Jensen, Christopher Kendall, University of South Carolina, Sunil Narumalani, University of Nebraska-Lincoln, and Maylo Murday, M.C. Corporation
Remote sensing of the geomorphic and wetland environments of the Abu Dhabi (UAE) coast

David Van Mouwerik and Douglas Stow, San Diego State University
*Assessing vegetation abundance of *Spartina foliosa* using remote sensing*

Session 8: REMOTE SENSING OF WETLAND ENVIRONMENTS II

Organizers: Duane Nellis, Kansas State University and Kevin Price, University of Kansas
Chair: Donald Rundquist, University of Nebraska-Lincoln

Douglas Goodin, Kansas State University and Jeffrey Peake, University of Nebraska-Omaha
Mapping the surface radiation budget and net radiation in a Sand Hills wetland using Landsat-5 Thematic Mapper data

Continued on page 10...RSSG/AAG

Rolland N. Fraser, University of Nebraska-Lincoln
Inferred water quality from Thematic Mapper and close-range spectroradiometer data

Nina M. Kelly, University of Colorado
Assessment of the functional health of wetlands in California: A landscape approach using remote sensing

Luoheng Han, University of Nebraska-Lincoln
The effects of suspended sediment on the spectral signal of algal chlorophyll in water

Lydia L. Liu, Rolland N. Fraser, Steven L. Payton, Brian Tolk, Stuart McFeeters, and Diana Reehorn, University of Nebraska-Lincoln
Using Landsat TM to estimate primary productivity of freshwater wetlands

Session 9: REMOTE SENSING TECHNIQUES

Organizers: Kevin Price, University of Kansas and Duane Nellis, Kansas State University
Chair: William Tyler, Environmental Research Institute of Michigan (ERIM)

Sally Westmoreland and Douglas Stow, San Diego State University
Characterization of relationship between multiresolution imagery from TM and TMS sensors

David A. Waits, Oklahoma State University
Radiometric correction effects on spectral index accuracy using Landsat Data

Steven S. Young, Clark University
Time series map analysis of China using IDRISI's standard principal component analysis of NOAA-AVHRR

Tung-kai Shyy, University of Oklahoma
Fuzzy representation of the landscape in a neural network classifier

Timothy A. Warner, West Virginia University
Improved analysis of image texture for land-cover classification

Session 10: REMOTE SENSING OF WETLANDS AND COASTAL ENVIRONMENTS

Organizers: Duane Nellis, Kansas State University and Kevin Price, University of Kansas
Chair: Nina M. Kelly, University of Colorado

Susan M. Berta., Indiana State University
Assessing the effectiveness of using TM data for updating wetland inventories

Martin Biles, University of Bergen
Remote sensing monitoring of the Nordic marine environment

Bruce Wullschleger, California State University at Fresno
Predicting adult mosquito population densities in central Belize: remote sensing

Byron L. Wood, NASA Ames Research Center
Identification and mapping of potential Encephalitosus in vector habitat following the 1993 midwest flood

Session 11: REMOTE SENSING APPLICATIONS

Organizers: Kevin Price, University of Kansas and Duane Nellis, Kansas State University
Chair: John Dunham, University of Kansas

Andrew C. Killington, University of Leicester
Monitoring geomorphological processes on playas using multitemporal ERS-1 SAR imagery

Mark Manone, Northern Arizona University
Monitoring sandbar stability in Grand Canyon on a daily time scale

Mark Friedl, Boston University
End-to-end scene simulation of remotely sensed data

Victor Mesev, University of Bristol
The role of image classification in urban density models

Session 12: USING SPACE SHUTTLE PHOTOGRAPHY FOR THE ANALYSIS OF THE PHYSICAL ENVIRONMENT (Co-Sponsored by RSSG and the Geomorphology Specialty Group)

Organizers: John R. Giardino, Texas A&M University and M. Duane Nellis, Kansas State University

M. Duane Nellis, Kansas State University, Kamlesh Lulla, Flight Science/Johnson Space Center/NASA and John M. Briggs, Kansas State University
Space Shuttle Photography for Monitoring the Landscape Ecology of Konza Prairie, Kansas.

John R. Giardino, Texas A&M University, Robert R.J. Mohler and M. Justin Wilkinson, NASA/Johnson Space Center
Space Photographs and Global Change: Application to Lacustrine Environments

M. Justin Wilkinson, Robert R.J. Mohler, NASA/Johnson Space Center, Risto Kalliola, Hanna Tuomisto, University of Turku, Finland, and Michael R. Helfert, NASA/Johnson Space Center
Altiplano Dust Plumes and Soil Nutrient in Amazonia

Iwan Guanawan, John R. Giardino and Earl R. Hoskins, Texas A&M University
Constructing a Record of Tropical Rain Forest Land Cover Change in Bengkulu, Sumatra, Indonesia Using Space Shuttle Photography

Michael R. Helfert, NASA/Johnson Space Center
Conversion of Tropical Forests as a Primary Process in Global Environmental Change

Earth Data Analysis Center

University of New Mexico



The *Earth Data Analysis Center* (EDAC), formerly the Technology Application Center (TAC), has served as a NASA center since 1964, with the objective of transferring Earth-observing technologies to user communities worldwide. EDAC supports and works with industries developing the technologies by collaborating with them to enhance their competitiveness and by assisting the adoption of these technologies by other users. EDAC also supports and works with public agencies applying Earth-observing technologies by demonstrating their utility and cost effectiveness and/or by counseling clients on the implementation of whole programs. In addition, EDAC supports and works with private citizens, not-for-profits, and educational and volunteer organizations by ensuring their ready access to NASA-generated space imagery, as well as other government and commercial data obtained by NOAA, EOSAT, SPOT, and other international satellite imaging systems.

Since 1991, EDAC has broadened its resource base by collaborating with the National Park Service and the New Mexico Natural Heritage Program in the field of spatial data analysis. By sharing location and resources, each organization has been able to enhance its individual mission while at the same time joining forces for new products. This collaboration has produced a consortium operating under the name Spatial Data Analysis Center. Members are collaborating to advance the use of geographic information systems (GIS), remote sensing, and global positioning systems (GPS) technology as they are applied to natural resources and the social, economic, and environmental issues that are common worldwide. EDAC's goal is to expand such collaboration with related federal and state entities working in spatial data analysis.



EDAC has four divisions, each specializing in different aspects of spatial data analysis. The Remote Sensing Division focuses on image processing of satellite and aerial data to assist users in applying this technology to a wide variety of situations. The Division uses ERDAS software on SUN workstations to process Landsat MSS and TM, SPOT MSS and panchromatic, AVHRR, radar, and other data. Final outputs are presented in digital or print formats.

The Geographic Information Systems (GIS) Division provides assistance to users needing analysis of multiple datasets. The relational database aspect of GIS allows map information, image data, and tabular information to be geographically referenced and merged to produce a customized output. Databases are built using ARC/INFO GIS software on a DEC 5000 workstation. The Division is also actively involved in the New Mexico Resource Geographic Information System (RGIS) Program, a state legislated program to build and maintain a GIS of New Mexico resource and socioeconomic data. The Program has a clearinghouse, operated by EDAC.

Workshops and training in remote sensing and GIS are the responsibility of the Division of International Programs. A four-week workshop each June provides "hands-on" exercises using training modules developed by EDAC. Individual workstations provide access to EDAC's image processing software and hardware for

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use by participants. Scientists from over 30 counties have participated in this course. The national and international Visiting Scientist Program (VSP) is designed to provide technical assistance in remote sensing and image processing. In an on-the-job atmosphere, individuals work on problems relevant to their own geographic and disciplinary needs.

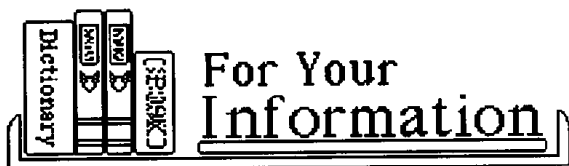
The Geographic Data Services (GDS) Division is the focal point for data acquisition and distribution. It has served as New Mexico's Earth Science Information Center (ESIC) since 1977, and as an outlet for space-generated photography since the late 1960s. The GDS staff are skilled in assisting clients in locating and obtaining aerial photography, satellite imagery, maps, digital data, and related geographic products. Searches are conducted using online databases to access information on Landsat, AVHRR, Space Shuttle, and other satellite imagery. Using a variety of research tools at hand, the staff are able to identify worldwide satellite coverage and nationwide aerial coverage. Browse files are available for clients to view photography, imagery and digital data. Educational materials focusing on remote sensing applications are available from GDS. Topic-specific annotated slide sets are available for classroom use. Topics include geologic features, coastal regions, metropolitan areas, arid regions, the Earth, Moon, and Mars. The Division also houses an Earth Resource Archive (ERA) which contains thousands of frames of historic aerial photography, mostly over New Mexico.

EDAC engages in special research projects. One of our most interesting is the development of a relational database to model the movement of flora in the Rocky Mountains over time. The project has many aspects, including building a database of the phytogeography of plant species in the Rockies and using virtual reality to "visualize" the migration of this flora. Special software packages will need to be developed to achieve this goal.

EDAC has hosted the Geography Department's curriculum in remote sensing, GIS, and GPS since 1990. This curriculum has grown from four to ten courses in the past three years, including six courses in remote sensing, three in GIS, and one in GPS. Students gain laboratory and project-oriented experience using ERDAS Imagine, ARC/INFO, and ARC/VIEW software packages. Each semester ends with a "user show" in which students present their semester projects in the form of posters or demonstrations. This event is usually part of the program for the New Mexico Chapter of ASPRS meetings. The training students receive from these courses frequently qualifies them for employment at EDAC, which transitions them to career positions outside of the university.

For more information about EDAC and its programs, contact **Dr. Stanley Morain**, Director or **Mike Inglis**, Associate Director at (505) 277-3622. Mail can be addressed to Earth Data Analysis Center, University of New Mexico, 2500 Yale SE, Suite 100, Albuquerque, NM 87131-6031.

Editor's Note: This article is one of a series on firms, agencies and educational institutions in which geographers are engaged in remote sensing and related activities. [RSSG Newsletter](#) readers are invited to send articles for this series to the editor, James Merchant (University of Nebraska-Lincoln).



ERS-1 USER GUIDE

On July 17, 1991 the European Space Agency launched ERS-1, its first remote sensing satellite. The platform carries a C-band imaging radar, a radar altimeter and a scanning radiometer. Recently, the Canada Centre for Remote Sensing has issued an ERS-1 Canadian User Guide that will be of interest to all users of this satellite. The well-illustrated 22-page guide contains sections on the satellite system, instruments, image products and ordering information. To obtain a copy of the guide contact:

Canada Centre for Remote Sensing
588 Booth Street
Ottawa, Ontario
CANADA K1A 0Y7
Telephone: (613) 993-0121

POSTER SHOWS MISSISSIPPI FLOODS NEAR ST. LOUIS

A full-color poster portraying the summer 1993 flooding in the vicinity of the confluence of the Mississippi and Missouri Rivers near St. Louis, MO is now available from RADARSAT International. The principal image on the poster was derived by combining a synthetic aperture radar scene from ERS-1 with a SPOT image. Persons interested in imaging radar and flood monitoring will also want to obtain a copy of the Fall 1993 issue of Reflections, RADARSAT's excellent newsletter. To obtain a copy of the poster and newsletter, contact:

RADARSAT International
275 Slater Street, Suite 1203
Ottawa, Ontario
CANADA K1P 5H9
FAX: (613) 238-5425

CONTERMINOUS U.S. LAND COVER CHARACTERISTICS DATA ON CD-ROM

The USGS/EROS Data Center has released a CD-ROM containing a unique land cover characteristics data base for the conterminous U.S. The product, developed as a prototype for a planned 1-km global land cover database, was prepared by geographers Thomas Loveland, Don Ohlen and Brad Reed (EROS Data Center) and James Merchant and Jess Brown (University of Nebraska-Lincoln). Land cover classification was based on interpretation of AVHRR 1-km data acquired during March-October 1990. For each of the 159 seasonal land cover classes defined in the data base, there are corresponding sets of attributes on elevation, climate and seasonal properties. The CD-ROM includes: (1) the 1990 AVHRR data used in the analysis, (2) the initial and final interpretations of land cover, (3) descriptive and quantitative attributes for each land cover region, and (4) derived thematic interpretations (e.g., Anderson Level II land cover analogues, and biophysical interpretations such as onset and length of greenness). The CD-ROM is available for \$32.00. For information on this product or other CD-ROMs available from EROS, contact:

Customer Services
USGS/EROS Data Center
Sioux Falls, SD 57198
Telephone: (605) 594-6151

POSTERS PORTRAY IMAGES OF EUROPE

Following the success of its 'London and the Home Counties' poster, the U.K. National Remote Sensing Centre (NRSC) has now prepared an updated version of the NOAA-AVHRR mosaic of Europe, a Landsat MSS mosaic of the U.K. and Ireland and a new Landsat mosaic of Scotland. All the posters have been produced in simulated natural color and are available as high quality lithographic prints or hard wearing laminated prints. To obtain additional details contact NRSC's poster distributor:

Map Marketing Limited
Freeport, London
United Kingdom SW6 3BR.

RUSSIAN SATELLITE DATA

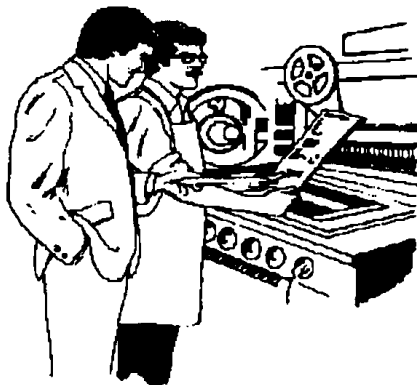
WorldMap Satellite Consortium is a joint venture of JEBCO Information Services Ltd., Russia's State Center PIRODA and the Russian firm, Rosvnesheo. The consortium is now making Russian high resolution satellite imagery, covering most areas of the globe, commercially available in film and digital formats. The data range in resolution from 5-20 meters. For additional details, costs and ordering information, contact:

WorldMap Satellite Consortium
JEBCO Information Services Ltd.
3120 Rogerdale Road, Suite 100
Houston, TX 77042-4125
Telephone: (713) 975-0202
FAX: (713) 975-9293

SPACE SHUTTLE EARTH OBSERVATIONS PHOTOGRAPHY VIDEO DISC

A Space Shuttle Earth Observations video disc is now available from NASA. The disc contains approximately 91,500 still images of the Earth taken during the Space Shuttle missions STS-1 through STS-44 (1981-1991). Included with the disc is a Guide to Images booklet, and two IBM formatted floppy disks containing the image description database. The package sells for about \$55.00. For details contact:

Ms. Bunny Dean
Mail Code AP4
NASA/Johnson Space Center
2102 NASA Road One
Houston, TX 77058
Telephone: (713) 483-8625



ATLANTIS SCIENTIFIC IMAGE ANALYSIS SOFTWARE

Atlantis Scientific Systems Group, Inc. has announced recent upgrades of its PC-based VGA/SVGA image analysis software including the EarthView Image Analysis Package 4.0, the SAR Application Module 4.0, and the Functional Development Kit 4.0. Prices for the EarthView package start at about \$800.00 U.S. For details contact:

Atlantis Scientific Systems Group, Inc.
1827 Woodward Drive
Ottawa, Ontario
CANADA K2C 0P9
Telephone: (613) 727-1087
FAX: (613) 727-5853

ALLIANCE FORMED TO EXPLORE COMMERCIAL REMOTE SENSING SERVICES

Orbital Sciences Corporation (OSC), Litton's Itek Optical Systems division (Itek) and GDE Systems, Inc. have formed a strategic alliance to explore the market potential of producing and selling high resolution imagery and services. Imagery would be collected by a new privately-owned and operated Earth imaging satellite system called Eyeglass. The alliance's intent is to be the first commercial operator to market high-quality/low-cost imagery systems and products. Company officials said the initial Eyeglass satellite could be operational by 1996.

The one-meter class Eyeglass system would provide sufficient spatial resolution for distinguishing objects as small as automobiles. Precision stereo imaging data available from the system would enable the cost-effective generation of geodetically correct 1:25,000 scale maps. A planned satellite revisit time of 1.5 days would permit the acquisition and distribution of imagery for timely coverage of news events and frequent change detection. The team intends to provide a complete line of imagery products and services ranging from raw imagery through value-added products, such as ortho-rectified maps and GIS overlays and analyses.

For additional details contact Laura Ayres (OSC), (703) 406-5000; Percy Myers (GDE), (619) 573-5309; or Dick Wollensak (ITEK), (617) 276-2696.

NEW PRODUCTS FOR REMOTE SENSING EDUCATION

JOINT EDUCATION INITIATIVE REMOTE SENSING CD-ROMs

The Joint Education Initiative (JEI) is an informal group of government agencies, companies, educators and individuals formed in 1990 "to broaden educational horizons and promote the advancement of science."

The first project, completed in 1991, resulted in three CD-ROM's containing science data and software in use in academia and USGS, NOAA and NASA. Now a fourth CD-ROM on remote sensing is available. It contains (1) a SPOT image of the Washington, D.C. area, (2) a detailed shaded relief map of the U.S., (3) a variety of NASA planetary images, (4) an illustrated tutorial program on remote sensing and volcanology, (5) a new version of the IMDISP PC image display software, and (6) a new user's manual and materials for teaching. [Editor's note: RSSG Newsletter readers will find a great deal of useful information in the free JEI News...Highly recommended!] The new remote sensing CD-ROM is available for \$24.95 (including shipping) from:

Joint Education Initiative
3433 A.V. Williams Building
University of Maryland
College Park, MD 20742-3281
Telephone: (301) 405-2324

Information on the first three JEI CD-ROM's (selling for about \$35.00 per disc) is available from:

Office of Technology Liaison
University of Maryland
4312 Knox Road
College Park, MD 20742
Telephone: (301) 405-4210

U.K. NATIONAL REMOTE SENSING CENTRE PREPARES NEW EDUCATIONAL PRODUCTS

The United Kingdom's National Remote Sensing Centre has an active program in remote sensing education. Three new products have been announced:

Local Area Satellite Image Programme (LASIP)

The 'Local Area Satellite Image Programme' (LASIP), enables schools to access digital satellite imagery of their local area at affordable prices. The scenes are 20km x 20km and supplied on 3.5" MS-DOS floppy disk.

Satellite Eye Over Europe

A new teaching pack, 'Satellite Eye Over Europe', has been introduced in partnership with Yorkshire Television to accompany the series Geography Eye. Keith Orrell, Midlands Examining Group Bristol Project, Geography GCSE Chief Examiner, wrote the notes and practical exercises. The pack meets the needs of the new National Curriculum for Geography (key stages 3 and 4 - pupils aged 11 and above), relating to contrasting European regions.

Satellite and Maps

'Satellite and Maps' is a new product produced by NRSC in consultation with the U.K. Ordnance Survey (OS).

The satellite images are gridded in map form (1:50,000 scale) and correspond exactly to current 1:50,000 OS project maps. To date, five areas have been produced: Keswick, Aviemore, Port Talbot, York and Kelso.

For more information on all NRSC educational products, please contact:

MJP GEOPACKS
Freeport 27
St. Just, Cornwall
United Kingdom TR19 7JS

Persons interested in U.K. NRSC remote sensing activities are encouraged to request a free subscription to the newsletter, ALBEDO. Contact: National Remote Sensing Centre, Delta House, Southwood Crescent, Southwood, Farnborough, Hampshire, U.K. GU14 0NL; FAX: +44 (0)252 375016

PEDAGeOG: Pictures of Earth - Display and Analysis for GeOGraphy

PEDAGeOG is a new software product that provides students with an opportunity to process satellite data on their school computers. PEDAGeOG is designed for use with the National Council for Geographic Education (NCGE) teaching modules developed under the Geo/SAT project.

PEDAGeOG capabilities include display of images up to 2000 x 2000 pixels in size on a VGA display adapter, zoom, contrast stretch, color composite generation, image enhancement and classification. Demonstration lessons and a complete users manual are included.

PEDAGeOG requires an IBM PC, PC/XT, PC/AT, PS/1, PS/2, 386, or 486 or compatible computer running DOS 3.3 or better; 640K main memory; a VGA display adapter and VGA color monitor; hard disk with at least 10 megabytes free. No math

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PEDAGeOG...Continued from page 15.

coprocessor is required; however, if a math coprocessor is present it will be used.

The software sells for \$150.00 plus \$11.00 shipping in the U.S. and slightly higher overseas (about \$160.00 U.S.). The School or College Department site license included in the purchase price allows one to run the software on as many computers as are available in a School or College Department. For additional details contact:

EIDETIC DIGITAL IMAGING LTD.
1210 Marin Park Drive
Brentwood Bay
British Columbia, Canada, VOS 1A0
Phone: 604/652-9326
Fax: 604/652-5269



NEW FTP SITE FOR SATELLITE IMAGERY FROM NOAA POLAR ORBITERS

Images derived from the High Resolution Picture Transmission (HRPT) data stream from the NOAA polar orbiters are now available via anonymous ftp from rainbow.physics.utoronto.ca (128.100.80.80) in the /pub/sat_images directory. These images are provided courtesy of the Satellite Processing Laboratory within the Department of Physics at the University of Toronto. The images posted are mosaics of successive passes of either NOAA-11 or NOAA-12. As such they cover an area that extends from 40 degrees W to 130 degrees W and from 70 degrees N to 20 degrees N. At present, only images derived from Channel 4 are being posted. Four mosaics will be posted daily that correspond to the morning and evening sequence of passes of the two satellites. Images will remain accessible for a period of two days. To assist in the interpretation of the images, coastlines, rivers and lakes have been superimposed. The resolution of the images has been reduced to approximately 4 km. The files will be 1280 x 1024 pixels in size stored in GIF format. The files will be named according to the following convention:

mmmdd_noaa##.am.gif for the morning mosaic from NOAA-##
mmmdd_noaa##.pm.gif for the afternoon mosaic from NOAA-##

All the processing is done automatically and as a result, there will be occasions where, for one reason or another, passes and/or images are missing. At present, the images for a particular day will be posted at 11:30 pm local time. In the near future, images should be posted in near real time. Higher resolution images of interesting phenomena will also be posted. Plans to provide the community with full resolution images of particular areas/phenomena of interest are taking shape. At present there is a 30-day rolling archive of all NOAA 11 and 12 passes received at Toronto. In the near future, this will be extended to a permanent archive. Because this is being run as a service to the community, the right to filter the requests for higher resolution imagery is reserved. These images may be freely used for personal, educational or research purposes provided that proper credit is given to Professor G.W.K. Moore, Department of Physics University of Toronto. Commercial users should contact Prof. Moore regarding reproduction.

Professor G.W.K. Moore
Department of Physics
University of Toronto
60 St. George Street
Toronto, Ontario
Canada M5S 1A7
Telephone: (416) 978-4686
FAX: (416) 978-8905
email: moore@rainbow.physics.utoronto.ca

OSCAR...Continued from page 4.

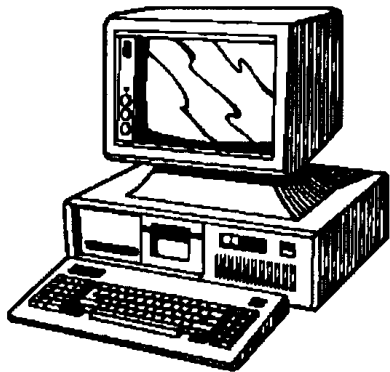
This information (with a current price list) may be used to calculate the price of the order. Once the data meeting the specified requirements have been selected, the user may submit the request for those data directly through OSCAR.

Inventories held in OSCAR span the time period from April 1985 to the present for 1-km resolution High Resolution Picture Transmission (HRPT), Local Area Coverage (LAC), and TOVS data sets, and from November 1978 to the present for 4-km resolution Global Resolution (GAC) data.

Access to OSCAR is available at no charge to users. The system is available 24 hours a day, 7 days a week, so users may inquire or order data at their convenience. Once a user ID has been assigned, further contact with SDSD is unnecessary except to pay for data orders. If a deposit account has been established, however, and it contains funds sufficient to cover an order, even payment can be made automatically. For additional details contact:

Laura K. Metcalf
Satellite Data Services Division
National Climatic Data Center
NOAA/NESDIS E/CC61
Princeton Building, Room 101
5627 Allentown Road
Camp Springs, MD 20746
Telephone: (301) 763-8400

*Reprinted from the NOAA Earth System Monitor Newsletter
(September 1993)*



HOW TO ACCESS OSCAR

NOAA's Online Satellite Catalog and Request System

Initial settings:

- Any modem speed up to 9600
- Parity to N
- Data bits to 8
- Stop bits to 1
- Full duplex
- Terminal emulation VT100 or ANSI

1. Dial: 301-702-1488 (Washington, DC metro area or international) or 1-800-528-2514 (other U.S.)
2. You will receive a "CONNECT" message, then a "LOGIN" message. All keyed inquiries of OSCAR must be made in lower case characters.
Type: oscar <return, or enter >
3. You will be asked for a password.
Type: oscar1 <return, or enter >
4. You are now automatically assigned to the OSCAR system. A menu will be presented, from which you may choose one of several options. Typically, users will either request the help function (option 1) or will search the NOAA Polar Orbiting Data Inventory (option 3).
5. If option 3 is chosen, you will be asked to enter an SDSD assigned user ID. If you do not have one, please contact SDSD, and one will be assigned to you and entered into the data base.
6. You are now ready to continue with the OSCAR system. This program is menu-driven, and should be simple to follow. Entries should be made with particular care. Backspacing to correct an entry is not possible at present, although this is expected to be corrected soon. If you make a mistake, simply complete the invalid entry, and the system will request a correction.
7. If at any time there is no activity for 5 minutes you will automatically be logged off. Once you exit OSCAR, you are automatically logged off.
9. To receive a password for using OSCAR, or to receive assistance if you encounter any problems, please contact SDSD personnel at 301-763-8400.

RSSG Newsletter

c/o James W. Merchant
Conservation and Survey Division
Institute of Agriculture & Natural Resources
University of Nebraska-Lincoln
113 Nebraska Hall
Lincoln, NE 68588-0517