

## ITEMS OF INTEREST

- \* NASA recently released the news that the launching of ERTS-B is being delayed 18 months, until Spring 1975, for reasons of budget limitations. The encouraging side of the announcement, however, is that ERTS-1 is currently performing so well that it will likely continue to operate effectively much longer than its 1-year design lifetime. This announcement has some repercussions for those currently writing ERTS-B proposals: grants for the period starting in the fall will be for research using ERTS-1 data, which will continue to be available. Lacking an official name, the proposals due at NASA January 31, 1973, have acquired the in-house designation "ERTS-1.5 Proposals."
- \* Set aside Tuesday, Wednesday, and Thursday, February 13, 14, and 15, 1973 for the *Second Annual LARS Program Review*, an overview for all lab employees of the significant accomplishments of the lab during the last year. The Review will be held in the Krannert Auditorium mornings and afternoons for part or all of the three days. *John Peterson*, the coordinator of the Review, asks that staff members give him suggestions for general programs they would like to see and for specific topics that should be discussed. Secondly he asks that people who would like to report on work they have done contact him and designate their topic, a time estimate for the presentation, and the audio-visual equipment they will need in the auditorium. Last year's Review was widely appreciated as an effective communication tool and lauded as having a unifying effect on the disparate groups of researchers in the lab.
- \* Plans are developing for the *Conference on Machine Processing of Remotely Sensed Data* under the direction of *Clara McGillem*; the conference will be held from October 16-18, 1973 at Purdue and LARS. Several professional societies have been contacted as possible co-sponsors. Present plans for the three-day conference call for about 60 papers to be presented; the *Call for Papers* has been mailed to the 1,500 people on the LARS short-course mailing list and to the ERTS principal investigators. It will be mailed to those on other appropriate lists as they become available.

- \* National recognition was again bestowed on *Marion Baumgardner* when he was appointed by President Handler to the National Academy of Science/National Research Council's Biology Panel of the Committee on Remote Sensing Programs for Earth Resource Surveys in the Division of Earth Sciences. This appointment is for a 3-year period, ending December 31, 1975.
- \* The December, 1972 issue of *Industrial Art Methods* contains a response to *Debbie Rensburg's* article "Growing Up With Scientific Illustration" which appeared in the August 1972 issue of IAM. To quote briefly from the article:

"The story is remarkable, not because Ms. Rensburg is a woman, but because she has paralyed four years of high school art into a full-fledged graphic communications career. By using her intelligence, wits, imagination, perserverance and willingness to work hard, she is setting an example for all of us, male or female, in visual graphics to follow. The university was lucky. It is obvious from the illustrations that accompanied her article that Ms. Rensburg has an innate sense of design and a developing ability to put it to work."

A copy of the complete article is posted on the bulletin board in Flex 1. Congratulations, Debbie.

- \* Anyone who missed the article in the Journal Courier (1/8/73) or the excellent interview on Channel 18 missed hearing the thoughtful and sympathetic comments of *Luis Bartolucci* about the situation in Managua, Nicaragua resulting from the December 23 earthquake. Gino was there for about a week helping in the relief efforts for the Bolivians who were victims of the quake. As a geophysicist, Gino is interested in the cause of the earthquake in this city that had previously been struck by earthquakes in 1885 and 1931. He said that the disaster can be understood through plate techtonics: continental drift, caused by the sea floor pushing against the continents, was perhaps responsible for the earthquake. The mafic rocks in the ocean floor beneath the continents, changing from a solid to a fluid under pressure, cause a great release of energy, and this Gino said was probably the cause of the Nicaraguan quake.
- \* LARS will soon be taking a larger part in the *Illiac Project* of the University of Illinois by providing consultation and training for the scientists at Illinois.

## VISITORS

- \*On December 31, 1972, LARS bid farewell to three scientists from Greece who had been here for two weeks studying LARSYS and getting "hands-on" experience at the terminal. *Dr. Nicholas J. Yassoglou*,

head of the Earth Sciences Department at the Greek Nuclear Research Center, is the principal investigator of an ERTS contract. Accompanying him were Mr. Skordalakis from the Greek Nuclear Research Center, and Mr. Koutalos from the Greek Ministry of Agriculture. While at LARS they did analyses of ERTS data from test sites in Greece.

- \* Dr. Marshall Askley, University of Maine, visited *Marion Baumgardner* and Byron Blair on December 15, 1972 to discuss data analysis for the Phenology Satellite experiment.
- \* *Dr. James Gammon*, Professor of Zoology, DePauw University, brought a class of ten to LARS on Thursday, December 14 to see the lab and to discuss water resources research with Roger Hoffer and Luis Bartolucci.
- \* Richard Allen of the SRS and Rick Dusterhouse of the SCS in New York visited *Marv Bauer* January 11, 1973. They came as members of a special executive committee of the USDA which is looking at rural development projects.
- \* About thirty members of the undergraduate Purdue chapter of IEEE toured both labs on Wednesday evening, January 10. *Rex Tracy*, a LARS computer operator, was responsible for making the arrangements. John Clevenger and Fred Phillips served as "tour guides" in Flex 1.
- \* George Kurney, from Honeywell to see Tom Martin.
- \* Dr. A. S. Ohlrogge, agronomy department to see Marv Bauer.
- \* January 3, 1973 - Warren R. Keammerer and Debbie Keammerer from INSTAAR, University of Colorado.

## SPECIAL NOTICES

- \* *LeRoy Silva* announced that the Barnes T-102 camera has been leased by LARS until February 11 and is available for laboratory use. This is a high-resolution, fast-scan camera which Ken Brown is using primarily. Additional studies using the camera are welcomed.
- \* Two LARS color-coded classifications from the Texoma frame were used in an article on ERTS in the Swedish science magazine "Forskning och Framsteg." *Bud Goodrick* has a copy. Does anyone read Swedish?
- \* The *Call for Papers* brochure for the LARS Conference on Machine Processing of Remotely Sensed Data is now available in quantity. Anyone going to conferences, meetings, etc. is requested to take a handful to distribute. They are available through Dave Nelson.
- \* Deadline for ERTS-1 proposals: January 31, 1973.

## ADDRESSES

- \* On December 15, 1972, *Terry West* presented a paper at a two-day conference on Applications of Remote Sensing to Urban and Regional Planning at the University of Wisconsin-Extension in Madison, Wisconsin. The objective of the institute was to explore the merits of various remote sensing devices as tools to help solve urban and regional planning problems. Approximately 50 people attended the institute. Terry's paper was entitled "Related Physical Data: Geology, Hydrology, Vegetation and Topography."
- \* *Phil Swain* presented an invited paper at the recent Electronic Industries Association Conference on "Imagery Recognition and Pattern Processing Techniques, Imagery Analysis and Interactive Processing Facilities" in Washington, D. C. The title of the paper presented January 10 is "The Application of LARSYS to Multispectral Imagery from ERTS-1."

## PUBLICATIONS

- \* LARS publications recently made available for distribution:

Information Note 092972

An Early Analysis of ERTS-1 Data

D. A. Landgrebe, R. M. Hoffer, F. E. Goodrick and Staff  
(a major revision of the one previously distributed)

LARS Print 111172

Determining Density of Maize Canopy: 1. Digitized Photography  
E. R. Stoner, M. F. Baumgardner, and P. H. Swain

LARS Print 111272

Determining Density of Maize Canopy: 2. Airborne Multispectral  
Scanner Data

E. R. Stoner, M. F. Baumgardner, and J. E. Cipra

LARS Print 111372

Determining Density of Maize Canopy: 3. Temporal Considerations  
E. R. Stoner, M. F. Baumgardner, P. E. Anuta and J. E. Cipra

## TRAVEL

- \* *Roger Hoffer* and *Dick Mroczynski* were in Denver on January 10 meeting with members of the U.S. Forest Service to discuss ERTS-1 analyses and to plan for work with Skylab and ERTS-B in the Colorado test site.

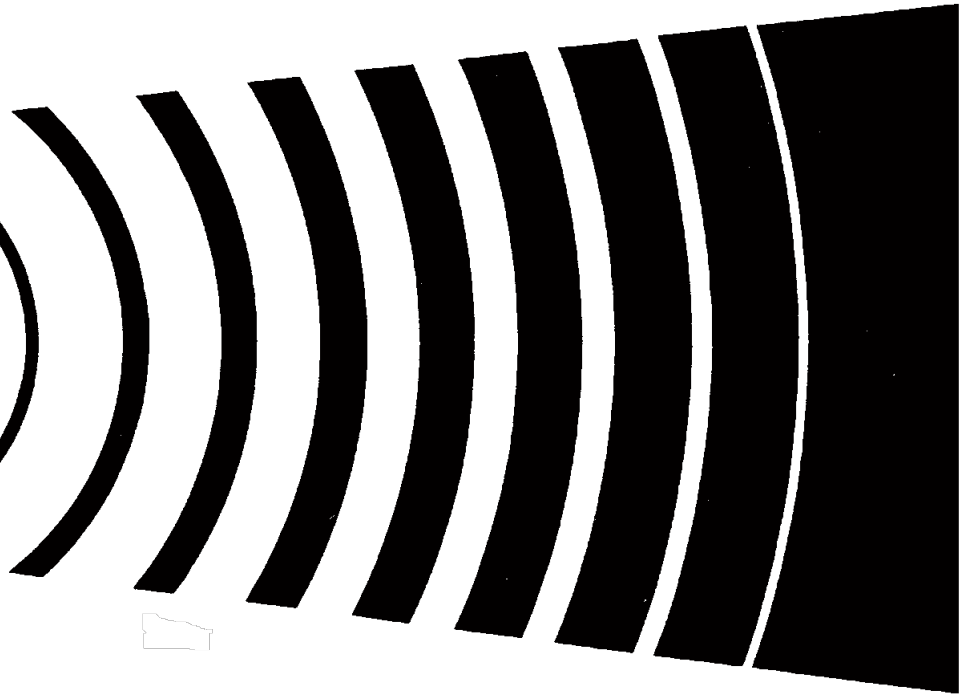
- \* *Roger Hoffer* will spend the month from January 15 to February 15, 1973, in Bangkok, Thailand at the request of the U.S. Geological Survey. While there he will give a 4-week short course in remote sensing and analysis of ERTS data to about 50 scientists from Thailand, 6 from Bangladesh, and one each from South Vietnam and Laos. Taking advantage of this opportunity to "see the world," Roger has scheduled his return flight to continue east-to-west, touching down in India and Turkey. En-route to Thailand he is spending a weekend with friends in Tokyo and making a brief stop in Hong Kong.

## PERSONNEL CHANGES

- \* Friday January 19 is the last day at Purdue for *Rex James*. He came to Purdue in June, 1970, and has been the Business Representative at LARS since August 15, 1970. His new job takes him to Indianapolis where he will be an employee of Eli Lilly in Industrial Engineering. We wish him good luck and happiness in his new position and thank him for his conscientious work in keeping the soft money at LARS on a firm basis.
- \* The new face in the Business Rep's office is *John Wunder*, a December, 1972, recipient of the B. S. in Industrial Management from Purdue. While at Purdue he was a member of Beta Gamma Sigma, an industrial management honorary. As a springboard in getting to know him -- his home town is Flossmoor, Illinois; he enjoys photography; is living in Beau Jardin apartments; and marriage is immanent.
- \* *Vic Fletcher* began work at LARS on January 2, filling the position left vacant by the death of Ted Sheets. Vic was last an employee of our neighbor Midwest Applied Science Corporation and comes with a background in industrial electronics and machine development and design. Welcome!
- \* A LARS-welcome to two part-time secretaries now on the staff with appointments through the end of May. *Joyce Williams*, who started here in December, is finishing her undergraduate degree in chemistry this semester. She has been assigned to Flex Lab II. *Barbara Pratt*, however, hardly knows which lab to call home. In the short time she has been here she has worked in both labs and will soon have the distinction of being one of the few people around who know the staff on both sides of the research park. Barbara has a degree in radio and TV communications from the University of Illinois.
- \* *Ed Belcher*, a grad student in E. E., started work under John Lindenlaub's direction on January 8. He will be working in the area of educational materials development.

## MISCELLANEOUS

- \* Congratulations to Ken and Janice Brown on the birth of a son, Brook Newman, December 16, 1972.
  
- \* Happy Birthday to:  
Chris Stohr-January 28



# LARS/Purdue Update

Number 65  
February 8, 1973

## ITEMS OF INTEREST

- \* "Proposal Time" brought its customary flurry of activity at the end of January when LARS submitted four proposals to NASA for funding for research using ERTS-B data. In all cases the funding would cover research carried on from October, 1973, through March, 1975. Summaries of the proposed research follows.

*Utilization of Machine Analyzed Data for Land Use Applications*  
Principal Investigator: John Peterson

The general objective of the research proposed is to develop a low-cost, machine-based technique for using satellite data in inventorying large areas of the landscape and to use this technique to study land use phenomena.

The four sub-projects of the research and their specific objectives are:

- 1) Development of a natural resource and land use inventory of Indiana, in map form, through machine analysis of ERTS-B data, supported by detailed ground information from six counties representing major landscapes in Indiana and major land patterns; and to compile data in a computer system in such a way that they may be recalled as individual items or combinations of items for any area; allow for the inclusion of additional information at any time; focus on greater or lesser detail; and permit repetition over time in order to follow land use changes.
- 2) Development of efficient, timely and economical techniques for making "Conservation Needs Inventories" through automatic data processing procedures, as required in the Rural Development Act of 1972.
- 3) Observe the changing land use in six representative counties along the route of I-65 in Indiana with special attention to metropolitan areas and adjacent areas which are changing from rural to urban.
- 4) Identification and measuring of land use changes resulting from interchanges in six sample counties selected along the I-65 corridor from Chicago to Louisville; and a comparison of interchanges in the recently completed, 1972, sections of I-65 with those which have been in existence since 1965.



*Mapping and Monitoring Arid and Semiarid Land, Water, Vegetation, and Mineral Resources with ERTS MSS Data*

*Principal Investigator: Marion Baumgardner*

This experiment is designed to evaluate the utility of satellite scanner data in providing significant information related to the quality and quantity of the resources of the arid and semiarid regions of the world.

Research will center in an arid-semiarid region of West Texas and New Mexico; the problems of economic development and land management in this region typify those of other such regions throughout the world.

Specific objectives include (1) a study of the relationships between ERTS-B measurements and the surface and subsurface water resources; (2) use of ERTS-B data for identifying, mapping, and measuring agricultural crops under irrigated systems; (3) use of ERTS-B data to delineate and map important soils, landforms and geologic features; (4) a study of the relationships between water use differences as observed from ERTS imagery and the water use laws of Texas and New Mexico; (5) assessment of storm damage to crops through interpretation of ERTS-B measurements; (6) location and mapping of active wind erosion sites; (7) study of rangelands to delineate areas of overgrazing, undergrazing, and optimal grazing.

The major contribution expected from this study is a significant addition to the techniques for inventorying and monitoring the resources of the arid and semiarid world.

*Application of Machine-Processed ERTS MSS Data to Natural Resource Inventories in the Colorado/Wyoming Rocky Mountains*

*Principal Investigator: Roger Hoffer*

The research proposed now is an interdisciplinary study designed to apply digital automatic data processing techniques to identifying, classifying, and mapping major vegetative cover types. The two major phases of research are:

Ecological Inventory-Identifying and mapping of major forest cover types and determining the accuracy of ADP techniques to measure the areal extent of each type; development of vegetative cover maps including timber, woody and herbaceous groups and areal coverage of each; and identification of spectrally representative areas possessing a complete profile of background information for use as training sites over extended areas using MSS data.

Hydrological Features Survey-Development of an operational model for accurate prediction of summer runoff.

All phases of research will involve joint efforts of LARS and INSTAAR (University of Colorado) with close cooperation and guidance from involved government personnel.

*Crop Identification and Acreage Estimation over a Large Geographic Area Using ERTS MSS Data*

*Principal Investigator: Marvin Bauer*

The long term objective of the proposed investigation is the development of procedures utilizing ERTS data not only to identify, but more

importantly, to determine the areal extent and distribution of earth surface features over large geographic areas. The specific objectives of this proposal are to:

- 1) achieve accurate crop identification over a large geographic area using multivariate pattern recognition and machine processing techniques applied to ERTS MSS data;
- 2) estimate the acreages of the major crops (corn, soybeans, wheat and cotton) present in the three Corn Belt states of Indiana, Illinois, and Missouri; and
- 3) compare and evaluate the quality (precision and timeliness) and resource requirements of acreage estimates obtained from ERTS data and ground-based systems.

These project objectives require the interdisciplinary cooperation of staff for disciplines such as agronomy, economics, statistics, computer sciences, photogrammetry, and others.

- \* Dr. Richard Ellefsen from the Department of Geography, University of California at San Jose (formerly San Jose State) visited Phil Swain January 24-30 in connection with the Illiac IV proposal. We have proposed, together with the Center for Advanced Computation at the University of Illinois, to implement a portion of LARSYS on the Illiac IV parallel computer. To demonstrate the abilities of that system, an analysis is to be carried out on both LARS' computer and Illiac IV. Ellefsen, under sponsorship of U.S.G.S.'s EROS Program is assisting in the definition of the analysis, which is to involve urban land use. Nancy Shen is also participating in this project as programmer and data analyst.
- \* *Ken Wenner* has recently accepted a position offered to him by Ohio State University and will be leaving LARS and Purdue on April 1, 1973. His work at LARS has been in the area of land use, and in accepting this new position in research and teaching in Ohio State's School of Natural Resources he will have further opportunities to develop this area of specialization. Since Ken's B.S. and M.S. degrees came from Ohio State, he is returning to familiar territory. We are happy for the opportunity to know Ken and wish him happiness in his new position.

## SPECIAL NOTICES

- \* Beginning with this issue of UPDATE, a listing of recently issued LARS Information Notes and Library Acquisitions will be attached as the last page. Several people have asked for this information in a form that can be filed. Tear it off and save it for future reference.
- \* The Internal Program Review for LARS staff only is scheduled at the Kranert Building Auditorium February 13, 14, and 15. All staff members are urged to be present. A follow-up Program Review is tentatively set for the following week that will be open to government representatives and interested Purdue Staff.

- \* Dave Nelson announces with joy that Volume II of the Corn Blight Report has been mailed to NASA. Only one Volume to go now! Projected date: July 1.
- \* Skylab program director William C. Schneider recently announced that longer-than-expected testing will cause a delay of about two weeks in the launch of the Skylab orbiting workshop. Preflight work is now 10 working days behind schedule. Firm launch date, originally April 30, will not be reset until after completion of the Flight Readiness Test at the end of March. One reason for the delay is that some experiments, such as the Earth Resources Experiments Package (EREP), have been added since the test schedule was established almost two years ago. LARS has made two proposals for research using Skylab data: *LeRoy Silva* has proposed a "Study of the Utilization of EREP Data from the Wabash River Basin" and *Roger Hoffer*, "An Interdisciplinary Analysis of Multispectral Satellite Data for Selected Cover Types in the Colorado Mountains, Using Automatic Data Processing Techniques." NASA has not yet announced which Skylab proposals will be funded.
- \* The Peace Corps is looking for professional agronomists to work on projects in the following countries:

Costa Rica	Peru	Mali
Honduras	Columbia	Zaire
Nicaragua	Kenya	Iran
El Salvador	Ethiopia	Morocco
Ecuador	Swaziland	

Service assignments are for two-year periods. See Dr. Paterson for more details.

## NEW FACES

- \* *Dr. Byron O. Blair*, Professor of Agronomy, is welcomed to the LARS family. Dr. Blair has been a staff member of the Purdue Agronomy Department since 1954 and has as his principal teaching and research interests soil ecology and phenology. In the past Dr. Blair has provided much of the initiative and leadership in establishing an extensive phenology network of indicator plants in the midwestern and other states and served as Chairman of the U.S. Phenology Committee of the International Biological Program from 1967 to 1969. He is coordinator of phenology research in Indiana.

## TRAVEL

- \* *Marion Baumgardner* will be enjoying a bit of spring weather early when he spends February 14-20 in Texas; his busy schedule there, however,

hardly allows for strolls in the sunshine. He will present a paper entitled "The Agronomic Utility of Remote Sensing" at the annual meeting of the Texas Chapter of the American Society of Agronomy and will tour the remote sensing facilities and discuss remote sensing research programs at Weslaco. From there he will fly to Lubbock to meet with county agents and cooperating ground observers for the Central States project and report to them on preliminary results of analyses of ERTS data from the Lubbock Regional Test Site. They will also plan ground observation operations for the 1973 growing season.

## ADDRESSES, SEMINARS

- \* LARS' staff has been treated to a number of seminars this semester - given with the intent of keeping members of the lab informed about current work and progress in the various program areas. On January 24 *Paul Anuta* gave a talk on the Problems of Multitemporal Data Handling; on February 5, *C. L. Wu* presented a Technical Review on his research on layered classifiers. The February 6 meeting of the Remote Sensing Seminar held at LARS featured *Phil Swain* speaking on Topics in Remote Sensing Data Processing. Both the Remote Sensing Seminar (Forestry 573) and the LARS Seminars are open to all members of the lab staff.
- \* *Steve Kristof* was in Winnipeg, Manitoba, Canada, February 5-6, 1973, to present an invited paper at the *Workshop on Remote Sensing Applications* in Manitoba. The objective of this workshop was to communicate the findings and results of the evaluation of remote sensing imagery to the Manitoba community of resource managers, researchers and administrators. Steve's paper entitled "Analysis and Interpretation of ERTS Data" was one of six "Special Presentations" scheduled for the workshop.

## VISITORS

- \* *Jerry Richards* and *Clark Hazzard* of ITEK (Lexington, Mass.) visited *Dave Landgrebe* January 11, 1973.
- \* *Harold Balbain*, *S. E. Kloster*, and *Rebecca McWard* visited LARS January 16, 1973.
- \* *Mr. Ben Bush* of Cummins Engine Company and *Mr. Benjamin King* of Columbus Biological visited the lab as the guests of *LoRoy Silva* on January 19, 1973.
- \* On January 31, eight students from *R. D. Miles'* Advanced Photointerpretation Seminar (CE 667) toured the lab.
- \* Deputy Director *R. K. Whitford* of the Department of Transportation's Research Center at Cambridge, Massachusetts, will visit LARS from 2:30-4:00, February 15, 1973.

## MISCELLANEOUS

\* Don German called January 30 for some information on LARSYS. He did much of the original programming of LARSYS several years ago when he was a graduate student. He is now nearing the end of a Ph. D. program and sends his regards to all.

\* The following words from Eric Stoner were quoted in the Purdue/Peace Corps bulletin "Voices from Brazil" in December, 1972:

"You ask about interesting experiences - they just don't seem to stop, and I hope things stay this way. My first job as a Volunteer was to fly to Brasília from Cuiaba (capital of Mato Grosso) to talk with Dr. Henrique Brandao Cavalcanti, General Secretary of the Ministry of the Interior. Dr. Brandao wanted an impartial outsider (preferably a Peace Corps Volunteer with background in remote sensing) to evaluate the usefulness of ERTS data to agencies in the Ministry of the Interior, such as SUDECO...When I'm not travelling, I'm located in Campo Grande at IPEAO (Federal Agricultural Experiment Station)...I have the job of "technical coordinator" for a cost-of-production study in rice and cotton in Dourados and Rondonopolis....I HOPE INTEREST IS HIGH AT PURDUE FOR THIS YEAR'S INTERN PROGRAM. IF YOU NEED ANY TESTIMONIALS, JUST ASK."

---Eric Stoner, Agronomy, M.S. '72 in Campo Grande,  
Southern Mato Grosso

\* Congratulations to Bill Shelley, a computer operator, who became a father during January. His wife Gene Ann gave birth to a baby girl whom they named Jennifer.

\* ERTS imagery will probably never show it - but rice is being scattered for two members of the LARS staff. *John Wunder* and his new wife Gail will celebrate future January 27's as their anniversary. And *Dave Nelson* and his fiancée have set a date in early August, though Dave still claims he's a confirmed bachelor. Best wishes to all!

\* Happy Belated Birthday to:

Debby Remsburg-February 1  
Dr. Baumgardner-February 7

Happy Birthday to:

John Stockton-February 9  
John Clevenger-February 17  
Susan Henderson-February 17  
Bud Goodrick-February 19  
Carl Westfall-February 20  
Vern Vanderbilt-February 23

February 8, 1973

---SAVE THIS FOR FUTURE REFERENCE---

RECENT LARS PUBLICATIONS-----issued during the past few weeks

LARS Print 101472

Landgrebe, D. A.

Automatic Classification of Soils and Vegetation with ERTS-1 Data

LARS Print 110972

A. L. Zachary, J. E. Cipra, R. I. Diderickson, S. J. Kristof, and M. F. Baumgardner

Application of Multispectral Remote Sensing to Soil Survey Research in Indiana

LARS Print 111072

E. R. Stoner and M. F. Baumgardner

Multispectral Determination of Vegetative Cover in Corn Crop Canopy  
(M.S. Thesis)

LARS Information Note 111572

Philip H. Swain

Pattern Recognition: A Basis for Remote Sensing Data Analysis

LARS Information Note 111672

P. N. LeBlanc, C. J. Johannsen, and J. E. Yanner

Land Use Classification Utilizing Remote Multispectral Scanner Data  
and Computer Analysis Techniques  
(M.S. Thesis)

## LIBRARY ACQUISITIONS

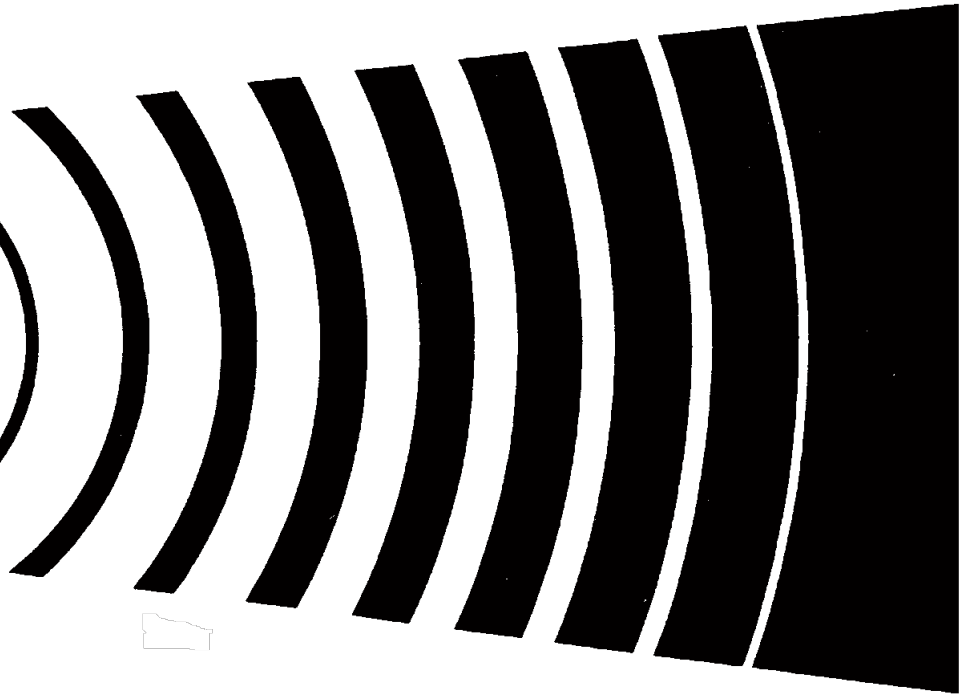
Polyurethane as an Oil Filter: A Research Study, Final Report. Canadian Plant and Process Engineering Limited, 1972.

Soil Surveys and Land Use Planning, Edited by L. J. Bartelli, A. A. Klingebiel, J. V. Baird and M. R. Heddleson, Pub. by the Soil Science Society of Amer. & Amer. Soc. of Agr., 1966.

Nematode Community Structure - A Tool for Evaluating Water Resource Environments. V. R. Ferris, J. M. Ferris, C. A. Callahan, November, 1972. P. U. Water Resource Research Center.

Man and His Urban Environment, A manual of specific considerations for the seventies and beyond, Fred Smith. November 1972.

---SAVE THIS FOR FUTURE REFERENCE---



# LARS/Purdue Update

Number 66  
March 7, 1973

## ITEMS OF INTEREST

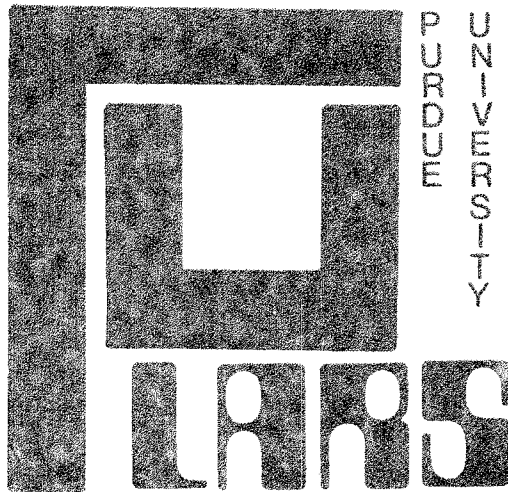
- \* Nine LARSians are attending the ERTS Symposium at NASA's Goddard Spaceflight Center in Greenbelt, Maryland. Four papers will be presented by LARS as representative of the results of analyses of ERTS-1 data:
  - Recognition of Surface Lithologic and Topographic Patterns in Southwest Colorado with ADP Techniques, by *W. N. Melhorn* and *S. Sinnock*
  - Preparation of Urban Land Use Inventories by Machine-Processing of ERTS MSS Data, by *William Todd*, *Paul E. Mausel* and *Kenneth A. Wenner*
  - Identification and Mapping of Soils, Vegetation, and Water Resources by Computer Analysis of ERTS MSS Data, by *M. F. Baumgardner*, *S. J. Kristof*, *J. A. Henderson* and LARS Staff
  - Identification of Agricultural Crops by Computer Processing of ERTS MSS Data, by *Marvin E. Bauer* and *Jan E. Cipra*.

Those attending the symposium from LARS are Dave Landgrebe, Marion Baumgardner, Marv Bauer, Clare McGillem, Bill Melhorn, Tina Klotz, Scott Sinnock, Bill Todd, and Steve Luther.

- \* *Clare McGillem* announced that to date two organizations have agreed to sponsor the Symposium scheduled for October 16-18, 1973: IEEE Group on Geoscience Electronics and the Computer Society of IEEE. King S. Fu is the representative of the latter group.
- \* Forrest Hall, Dave Pitts, John Dietrich, Ronald Blilie and Drew Potter from NASA/MSC visited LARS during the week of February 19, 1973, to discuss SR&T contract and a discussion of potential future SR&T activities. This meeting included a Program Review on projects currently funded under the SR&T activities. At the request of the team from NASA, time was saved for a discussion of classification accuracy on an operational level for a proposed NASA/USDA/ASCS project.



\* There's a new look coming! LARS' logo, adopted at the March 1 program leaders meeting, will soon be appearing on LARS publications and stationery. Designed by *Dave Nelson*, the logo uses the Purdue centennial seal as its unifying idea.



Laboratory for Applications of  
Remote Sensing

- \* Welcome to *C. William Weiss* and *Patricia Ann Sprague*, two half-time assistants to Tom Martin in data management. Bill, a graduate student in Industrial Management, is responsible for checking in and maintaining ERTS data, and Pat, a Forestry undergraduate, will be handling the aircraft data that arrives at the lab. Both of them are calling 170D in Flex 1 their "home."

## TRAVEL

- \* Phil Swain attended a NASA Conference on data analysis techniques in Houston, February 27-28, 1973.
- \* Tom Martin was in Houston February 26 for a meeting of people using 24 channel multispectral scanner data and was in Ann Arbor March 1 at ERIM for a planning session for underflights with the University of Michigan scanner.

## VISITORS

- \* Deputy Director Robert K. Whitford from the Department of Transportation Research Center, Cambridge, Massachusetts, on February 19, 1973, to discuss land use research with Dave Landgrebe.
- \* W. R. Philipson, Cornell University, visited Jan Cipra on February 9, 1973.
- \* Bob Knight, IBM, February 12, 1973.
- \* John Paul Cook and W. Lee Pitre from Indiana State University.
- \* Paul Hopkins, SRS/USDA, to see Marv Bauer March 2, 1973 about SRS and LARS cooperative research.
- \* Doyle Larkin, R. L. Duffy, Bruce A. Drew, and Ovel Johnsrud of the Pillsbury Company (Eldorado, Arkansas and Minneapolis) met with L. M. Eisgruber and Marv Bauer on February 28, 1973 concerning use of remote sensing for crops survey.
- \* Lamont Eltinge, Cummins Engine Company, March 2, 1973 to see LeRoy Silva.

## SEMINARS

- \* February 22, 1973 - presented by Edward G. Matthews, Strategy Manager for Advanced Systems in IBM System Development Division.

- \* February 27, 1973 - "Space Shuttle - A Platform for Earth Observation" by David A. Landgrebe.
- \* February 28, 1973 - "Recognition of Surface Lithologic and Topographic Patterns in Southwest Colorado with ADP Techniques" by W. N. Melhorn and S. Sinnock
- \* March 2, 1973 - Preview of papers presented this week at the Program Review on ERTS-1 Research at NASA/Goddard by M. E. Bauer, M. F. Baumgardner, and W. Todd.

## MISCELLANEOUS

- \* Happy Birthday to:

Tom Martin - March 8  
Steve Luther - March 15  
Phil Swain - March 27

- \* Happy Belated Birthday to:

Luis Bartolucci - March 4

----SAVE FOR FUTURE REFERENCE----

LARS PUBLICATIONS DURING FEBRUARY, 1973

- \* Information Note 120271  
Use of Scan Overlap Redundancy to Enhance Multispectral Aircraft Scanner Data  
J. C. Lindenlaub and J. Keat
  
- \* Information Note 100972  
Agricultural and Forest Resource Surveys from Space  
Roger M. Hoffer  
(Presented at the 23rd International Astronautical Congress, Vienna, 1972)
  
- \* Information Note 111772  
Moire Patterns and Two-Dimensional Aliasing in Line Scanner Data Acquisition Systems  
C. D. McGillem, T. E. Riemer
  
- \* Information Note 011573  
Atmospheric Effects on Radiation Measurements  
G. M. Jurica
  
- \* Technical Memorandum T-11  
Data Acquisition Control Module: An Interface for the Exotech Model 20-C Spectroradiometer  
Robert D. Haselby
  
- \* Addendum to Technical Memorandum T-1  
Use of CMS for Updating LARSYS Programs  
S. K. Hunt, H. L. Grams, T. L. Phillips

REPRINTS RECEIVED DURING FEBRUARY, 1973

- \* Information Note 102871  
Relating Organic Matter and Clay Content to the Multispectral Radiance of Soils  
A. H. Al-Abbas, P. H. Swain, and M. F. Baumgardner  
(Reprinted from Soil Science, Vol. 114, No. 6, 1972)
  
- \* Information Note 111571 - Abridged Version  
Calibration Techniques for Remote Sensing Measurements of Water Temperatures  
R. M. Hoffer and L. A. Bartolucci  
(Reprinted from Proc. of the Indiana Academy of Science for 1971)
  
- \* Information Note 111771  
Engineering Soils Mapping in Indiana by Computer from Remote Sensing Data  
T. R. West  
(Reprinted from Proc. of the Indiana Academy of Science for 1971)

----SAVE FOR FUTURE REFERENCE----

-----SAVE FOR FUTURE REFERENCE-----

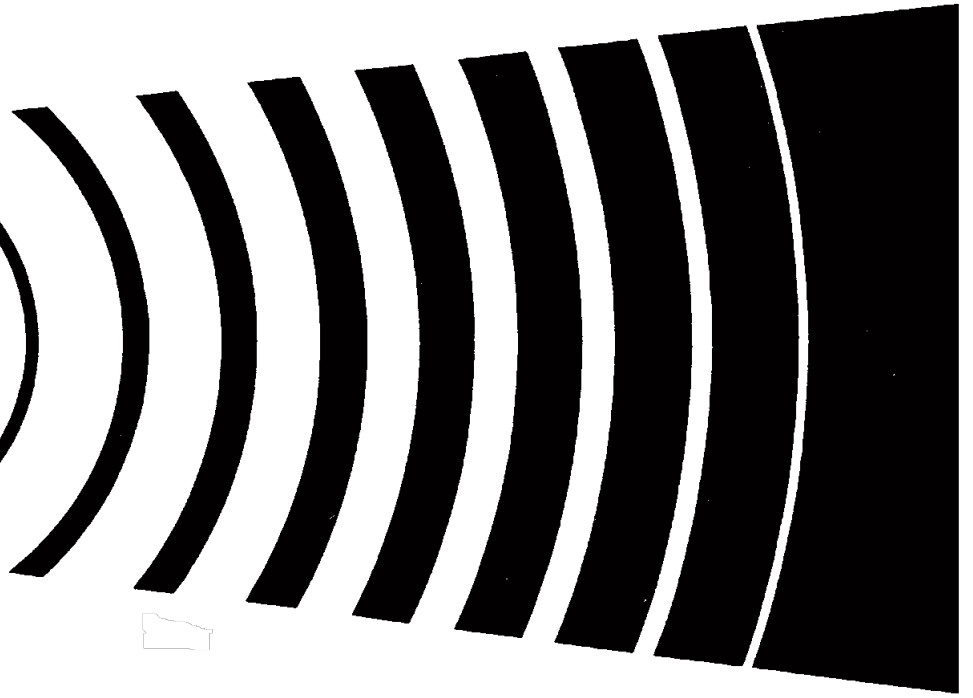
LIBRARY ACQUISITIONS - FEBRUARY, 1973

\* R. O. Duda and P. E. Hart, Pattern Classification and Scene Analysis, Wiley, 1973. Both authors are associated with Stanford Research Institute. Shelved in Phil Swain's Office.

\* Currently Circulating:

1. Techniques for Change Detection. R. L. Lillestrand, IEEE Trans. July, 1972.
2. A Design Tool for the Modeling and Analysis of Spectral Signature Variability TRW, Earth Resources Tech Note 99900-H018-RO-00.
3. High Speed Image Correlation for Change Detection. Major C. F. Lam, R. R. Hayt, prepared for NAECON, May, 1972.
4. An Introduction to ERIM, August, 1972.

-----SAVE FOR FUTURE REFERENCE-----



# Update

Number 67  
April 5, 1973

## ITEMS OF INTEREST

- \* *Mr. J. A. Vitale* of the NASA Office of University Affairs visited LARS Monday afternoon and Tuesday morning March 19 and 20 to hear a review of results obtained during the past year under OUA funding and to discuss a new program for the coming year.
- \* A milestone has been reached in the LARSYS contract. IBM completed their programming and documentation task on March 23, 1973. Their materials have been turned over to Terry Phillips for final typing and publication. The materials are expected to be ready for printing approximately May 1, 1973 and back from the printer on June 1. The programs are available now to LARS personnel who have approximately two years experience with LARSYS Version 2. Terry recommends that users without experience on LARSYS Version 2 not attempt to use Version 3 until documentation is available. Experience has already shown that people without either familiarity with the software or the documentation will have many problems when using Version 3.
- \* Congratulations are due to *Marion Baumgardner* whose summer promotion to Professor of Agronomy was just announced. At LARS he serves as Program Leader of the Earth Sciences Research Programs, coordinating and directing the research efforts of 20 scientists and graduate students. After having obtained his baccalaureate degree from Texas Technological College in 1950, Dr. Baumgardner served three years as lecturer in soils and crop production at the Allahabad Agricultural Institute in India. Holding M. S. (1955) and Ph. D. (1964) degrees from Purdue, he is active in university affairs and a dozen national and international professional organizations. From 1964 to 1966 he served as an agricultural program specialist with the Ford Foundation in Argentina and is now a consultant to the Food and Agricultural Organization and other agencies of the United Nations. He has traveled and lectured in 40 countries and was recently honored by the Agricultural Institute of Canada by being selected their 1972 Klinck Lecturer. Dr. Baumgardner began working at LARS in 1966.

- \* When the LARS contingent of nine presented results of their work with ERTS data at NASA's symposium at Goddard March 5-7, 1973, the paper credited to *Marion Baumgardner, Steve Kristof, Jay Henderson* and the *LARS Staff* was selected as one of four to be presented to a select audience of congressional leaders, federal budget officials and NASA administrators. The paper, presented by Marion Baumgardner, discusses interpretation of ERTS data with a view toward mapping soils, vegetation and water resources. (The complete list of LARS participants and titles at the symposium is in the Update for March 7, 1973.)

## SPECIAL NOTICES

- \* *Dr. Ludwig Eisgruber*, Program Leader of Requirements Analysis and Professor of Agricultural Economics, announced his resignation from Purdue to accept a position as head of the Department of Agricultural Economics at Oregon State University. He will be assuming his new responsibilities this summer. This is an outstanding opportunity for Lu, and we wish him all the best.
- \* We are happy to welcome back *Dr. Peterson*, who recently spent a painful few weeks recuperating from being kicked by a horse. Although the mare broke a few of his ribs and he was hospitalized for a while, Dr. Pete is now happily back at his desk.
- \* The first issue of a new LARS publication is now available. The series, entitled Focus, is a set of one-page, illustrated discussions of specific subjects in the field of remote sensing. The pamphlets are being written primarily for educational use, with students and visitors unfamiliar with remote sensing being the major audience. The first number "The Multispectral Scanner" is available now from Beth. Number 2 "Cover Type Classification" is close to completion, and Numbers 3 and 4 on "Pattern Recognition" and "Soil Type Classification" will be available soon. *Shirley Davis* is the general editor of the series and as such has written the copy for some of the initial issues. *Ed Belcher* is also working on the project, and it is hoped that others in the lab will help in suggesting additional topics to the current proposed list of 14 titles and will also contribute informational copy when appropriate.
- \* *Mr. Hughes* requests --- PLEASE DON'T PUT CIGARETTES INTO THE COKE BOTTLES. There are lots of ashtrays around for that purpose, he said.

## VISITORS

- \* *Dr. G. N. Lance*, Chief of the Division of Computing Research in the Commonwealth Scientific and Industrial Research Organization (CSIRO), Canberra, Australia, was at LARS March 26-27 to visit Marion Baumgardner. Dr. Lance has been active in the field of computer-aided classification systems for several years.



- \* Mr. Howard Goldman, graduate student AND professor of electrical engineering at Illinois Institute of Technology, Chicago, visited Phil Swain on March 14. Mr. Goldman is interested in some remote sensing data processing problems and has received a grant from the National Science Foundation which will permit him to spend two months this summer at LARS to further his (and our) research in that area.
- \* Mr. Charles Burner from the Bureau of Sport Fisheries and Wildlife, U. S. Department of the Interior, was at LARS March 27-29, 1973, to work with photographs from the 1971 Corn Blight Watch Experiment. He is interested in inventorying areas of strip mines in Indiana and has found the CBWE photography very helpful.
- \* On Friday April 6, Professor Donald Maxfield from the Department of Geography, Northern Illinois University (DeKalb), will bring members of a remote sensing class to visit the lab.
- \* H. R. A. Cleghorn-Brown, London, to visit Marion Baumgardner - March 29, 1973.
- \* Timothy Peters and Laurence Martin, HEW Audit Agency, to see John Wunder.
- \* R. S. Swigh, University of Wisconsin, to see Tom Martin.
- \* Hans P. Bähr, Technische Universität, Hanover, Germany, to see LeRoy Silva.
- \* Bruce Steiner, National Bureau of Standards, to see LeRoy Silva.
- \* Brain Koch, Boston College, to see Chris Stohr.
- \* C. C. Reeves, Jr., Texas Tech University, to visit Marion Baumgardner and Jay Henderson - March 19, 1973.
- \* Mr. Thomas Lillesand, a Water Resource Specialist from the University of Wisconsin, to visit Dave Landgrebe and Roger Hoffer - March 28, 1973.
- \* Gene Walsh, Indiana Planning Commission - March 22.

## TRAVEL

- \* *Marv Bauer* was at NASA/JSC, Houston, March 19 and 20 to discuss a proposed application development experiment. The application to be developed and tested is identification and acreage estimation of corn, soybeans, and wheat.
- \* *Jan Cipra, Gerry Jurica, and Jay Henderson* attended the University of Tennessee Space Institute Conference March 26-28 in Tullahoma, Tenn. Included in the program was a paper authored by Jay Henderson, J. V. Gardner, and J. E. Cipra entitled "An Interpretation of a Geologic Map of Fannin County, Texas. Prepared by ADP Techniques from ERTS MSS Data."

- \* *Terry Phillips* traveled to NASA, Houston, on March 21 and 22 to discuss progress of the remote terminal experiment.

## SEMINARS

- \* Topics scheduled for the April meetings of the Remote Sensing Seminar:

April 3 - "Remote Sensing in France" by Michael Blanc

April 10 - "Physical Considerations in the Interpretation of Thermal Infrared Remote Sensor Data" by Luis Bartolucci

April 17 - "An Introduction to Terrain Analysis" by Chris Stohr

April 24 - "Skylab -- Manned Earth Resource Space Platforms" by LeRoy Silva

- \* A three-part seminar entitled "Exotech System Experiments" was held during March as part of the Interdisciplinary Remote Sensing Seminar. Barrett Robinson spoke on "Planning and Conducting the Measurements," Bill Simmons on "Exotech Software," and Marv Bauer on "The Functioning and Use of the Exotech Field Spectrometer."
- \* The March 13 Remote Sensing Seminar featured a report on Remote Sensing in Thailand by Roger Hoffer.

## MISCELLANEOUS

- \* Thinking about joining the Peace Corps? Packets of information about opportunities for overseas service in the environmental sciences for the summer of 1973 are in the hands of *Susie Taylor*. Many of the assignments are field research projects; others are primarily administrative positions. Areas covered are Agricultural Research, Botany, Forestry, Wildlife Biology, Plant Pathology, Pest Control, Air and Water Quality, National Parks, Soil Science and Range Management, Fisheries and Marine Sciences, University Teaching, Entomology/Genetics/Ecology.
- \* Congratulations to *John and Marilyn Clevenger* on the birth of a daughter, Julie Lynne, on March 17.
- \* *Tina Klotz* is showing off a sparkling, new diamond these days. Her marriage to Joe Cary is planned for late summer. Joe, the happy owner of a much labored-over bean bag chair (created by Tina), came to Purdue from Colorado and is a Ph. D. candidate in Analytical Chemistry.
- \* Welcome to *Gene Short*, an undergraduate who joined the Measurements staff as an Assistant Instrumentation Technician.
- \* Happy Birthday to:  
Ray Frederking - April 4      Jan Cipra - April 13  
Stan Woodring - April 10      Gail Santner - April 19  
Dr. Landgrebe - April 12      Sid McAhren - April 25

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Number 3

LARS PUBLICATIONS DURING MARCH, 1973

Information Note 110972

Application of Multispectral Remote Sensing to Soil Survey Research in Indiana

by A. L. Zachary, J. E. Cipra, R. I. Diderickson, S. J. Kristof, and M. F. Baumgardner

Focus, Number 1

The Multispectral Scanner

REPRINTS RECEIVED DURING MARCH, 1973

Information Note 010772

Engineering Soil Mapping from Multispectral Imagery using Automatic Classification Techniques

by Terry R. West

in Highway Research Record, Number 421, "Remote Sensing for Highway Engineering," Highway Research Board, 1972. (Proceedings of 51st Meeting)

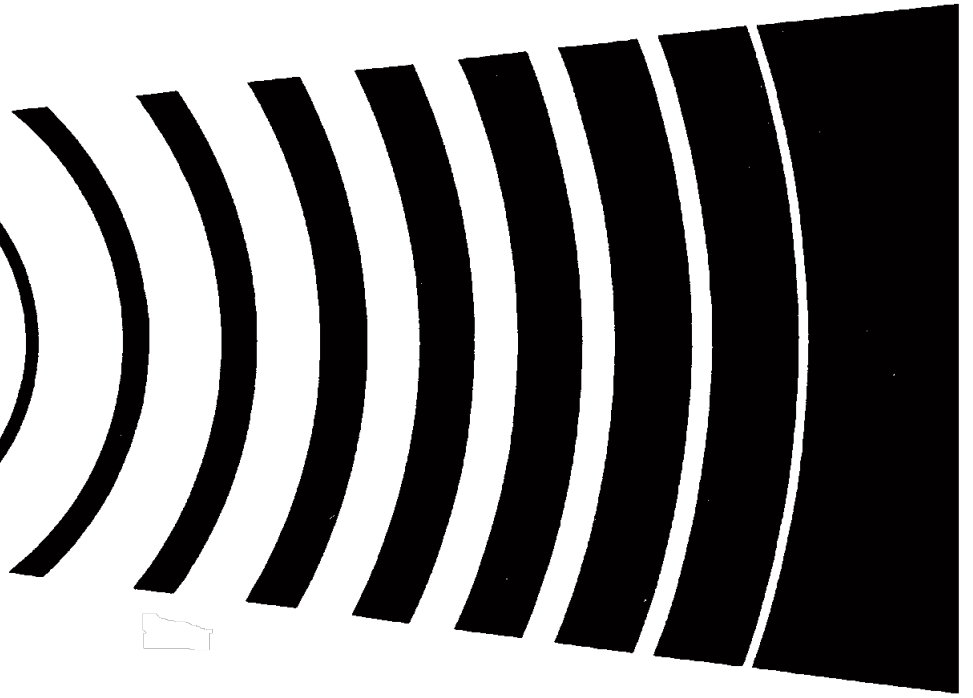
LIBRARY ACQUISITIONS DURING MARCH, 1973

Excerpts from "Annual Report to the NASA FY 1972 Earth Resources Observations Systems Cartographic Applications Program."

Proceedings of the Conference on Parallel Image Processing for Earth Observations Systems, Goddard, March 1972.

Cooper, E. R., Breen, L. Z., and Patter, H. R. Systematic Development of Methodologies in Planning Urban Water Resources for Medium Size Communities, P. U. Water Resources Center, 1973.

Quinn, M. C. The Impact of Institutional and Political Factors on Water Management in the Upper Wabash Basin, P. U. Water Resources Center, 1973.



# Update

Number 68  
May 1, 1973

## ITEMS OF INTEREST

- \* Congratulations to *Dr. Edward Mikhail* on his promotion to Full Professor of Civil Engineering, effective July 1, 1973. Dr. Mikhail is currently on the LARS staff part time.
- \* *Clare McGillem* reports that a large number of papers has been received for consideration for the October Maching Processing Conference. The selection process is now going on and the Conference Program Committee will meet in the next few weeks to arrange the details of the program. Five agencies have agreed to cooperate in the conference: American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Geo-Science Electronics Society of IEEE, and Computer Society of IEEE.
- \* LARS staff member *Paul Wintz* has organized and will lead a short course entitled "Image Processing, Coding, and Transmission" April 30 - May 4 at Purdue. *Dave Landgrebe* will speak on Tuesday, May 1, on Multispectral Image Processing, and Paul Wintz will lecture on Thursday, May 3, on Image Coding.
- \* The end of the academic year always brings with it the departure of staff members, and this year again we must say "farewell and good luck" to several long-time LARSians. *Lu Eisgruber* is leaving to become chairman of the Department of Agricultural Economics at Oregon State University; *Tom Martin* will be working as Systems Engineer at Infra Systems, Inc. (a subsidiary of Industrial Nucleonics Corporation) in Columbus, Ohio; *Gail Santner* will be accompanying her husband to Cornell - after enjoying the heat of a Georgia summer at the request of the army; *Kay Hunt* is moving to Valparaiso - courtesy of her husband's employer, General Telephone; and *Diana Dockter* is leaving to spend more time with her two children. To all of you - farewell and good luck!

## PROPOSALS

- \* Three proposals were submitted April 16, 1973 by *Dave Landgrebe* to NASA for SR&T, PY, and Security Funding. The first one covers the on-going work of the lab for "Research in Remote Sensing of Agriculture, Earth Resources, and Man's Environment." The second one, "The Application of Remote Sensing Technology to the Solution of Problems in the Management of Resources in Indiana" was submitted to NASA's Office of University Affairs and emphasizes applications. In part the aim of the research is to work cooperatively with municipal, county, regional, and state officials and planning agencies in the application of aerospace remote sensing technology to the problems defined by the various officials and agencies and then to develop the materials and conduct the training necessary to solve these problems.
- \* Skylab launch date is now set at May 15, and a number of LARSians will be following its success with more than passing interest. Word was recently received that the two LARS-based proposals for research using **Skylab** data have been funded by NASA for the period April 1, 1973 - May 31, 1974. LeRoy Silva received \$97,106 as principal investigator of a "Study of the Utilization of EREP Data from the Wabash River Basin" and Roger Hoffer received \$90,650 as principal investigator of "An Interdisciplinary Analysis of Multispectral Satellite Data for Selected Cover Types in the Colorado Mountains, Using Automatic Data Processing Techniques."
- \* *Terry West* submitted a proposal to Teledyne Terrametrics for research entitled "Evaluation of Terrain Using Remote Sensing Techniques Related to Excavation of Rock and Soil."
- \* *Terry West's* LARS proposal to the Department of Transportation was funded at \$84,543 for the period through December 31, 1973.

## SPECIAL NOTICES

- \* *Stevan Kristof* suffered a heart attack on Tuesday, April 24. He is in Intensive Care at St. Elizabeth's Hospital.

## TRAVEL

- \* Two LARS members (and one wife) are spending the week of April 26 - May 3 in Panama attending the First Pan American Symposium on Remote Sensing. LARS papers to be given are:

"Computer-Aided Analysis of Multispectral Remote Sensing Data Applied to Engineering Geology" by Terry R. West

"Effects of Altitude and Atmospheric Windows on Remote Measurements of the Thermal Effluent in the Wabash River" by Luis Bartolucci, R. M. Hoffer and Jim Gammon. (Presented by Luis Bartolucci).

*Steve Kristof* was to have presented a paper entitled "Land Use Studies with Multispectral Satellite Data" co-authored with Paul Anuta and Marion Baumgardner, but illness prevented his going.

- \* *Dave Landgrebe* was in Washington on Thursday, April 19, visiting NASA/ARPA and the U.S. Geologic Survey. Imagery of the Mississippi flood situation was selected for analysis at USGS.
- \* Another whirlwind week for *Marion Baumgardner* as he travels first west and then east in the cause of remote sensing....

April 26, 1973 --- Present a seminar and lead a discussion on "Remote Sensing - A Tool for the Soil Surveyor" at the Annual Missouri Soil Survey Work Planning Conference, Columbia, Missouri.

April 27, 1973 --- Present a seminar and lead a discussion on "Remote Sensing - A Valuable Tool for Urban and Regional Planning" at a meeting with the Division of Planning of the Mid-American Regional Council, Kansas City, Missouri.

April 30, - May 1 --- Attend meeting of the Biology Panel of the Committee on Remote Sensing Programs of Earth Resource Surveys (CORSPERS), National Academy of Sciences, Washington, D. C.

May 2 --- Present a seminar and lead a discussion on "Interpreting ERTS MSS Data Relating to Geology and Agriculture," University of Delaware, Newark, Delaware.

May 3 --- Present a seminar and lead a discussion on "The Use of Remote Sensing in Soil Survey" for the Cartography and Soil Survey Divisions, Soil Conservation Service, USDA, Washington, D. C.

May 3 --- Present a seminar and lead a discussion on "The Use of Remote Sensing for National Resource Inventories" for the staff of the North American Office, Food and Agriculture Organization, United Nations, Washington, D. C.

Whew!

## VISITORS

- \* A review of LARS activities was held on April 16 for the School of Electrical Engineering faculty and graduate students. During the afternoon *LeRoy Silva* and *Barrett Robinson* set up measurements equipment for view at the EE building, and in the evening *Dave Landgrebe* gave a seminar at Flex Lab I reviewing the last seven years of work at LARS. This was followed by a demonstration of the computer and digital display.
- \* *Richard Gilbert*, USDA/SCS to see *Marv Bauer*, April 14, 1973.
- \* *Joseph Kitler*, Cambridge University, England, to see *Dave Landgrebe* and *Phil Swain*, April 4.

- \* James Wada and Goro Matsunaga, NAC Inc., Monterey Park, California, to see Dave Landgrebe, April 5, 1973.
- \* John Ferguson, LeRoy Hope, Ron Culbertson, Dan Kercher, and Vernon Krueger, from the University of Missouri, April 6.
- \* Six students from Eastern Illinois University, to see Paul Mausel on April 6, 1973.
- \* David Cox, Cotton, Inc., Raleigh, N. C. to see Marion Baumgardner, April 23.
- \* Malcolm D. Higgins, Syracuse University, to see Roger Hoffer and Bud Goodrick, April 26.
- \* Dick Smith, SDS, Columbus, Ohio, to see Tom Martin.
- \* Harold Matthews, NASA
- \* Twelve students from Freshman Engineering under leadership of Al McDonald.
- \* Nine students - members of Advanced Photogrammetry class - CE 603.
- \* John Barlow, Charleston, Illinois.

## SEMINARS, ADDRESSES

- \* *Dave Landgrebe* took part in the Grissom-Chaffee Memorial Lecture at Purdue on Friday, April 13. After the presentation by Astronaut Gene Cernan, Dave acted as a discussor, presenting a five minute comment on the presentation.

## MISCELLANEOUS

- \* If you noticed a certain festive air around the lab last week, it was probably the effect of National Secretary's Week - and the chance that the staff had to say special words of thanks to **those** who are responsible for making the whole operation operational. So --- thank you all, again.
- \* Welcome to *Pam Roberts*, a new member of the secretarial staff in Flex 1. Her husband is an undergraduate at Purdue and they have a baby girl at home.
- \* *Mr. Hughes* asks -- please be more ecologically-minded. Don't put throw-away pop bottles in the wastebasket; return them to the coke machine (or if you simply can't manage that, leave them on your desk) and Mr. Hughes will take them to the recycling center.



- \* And further...*Mr. Hughes* asks that we be more careful about returnable bottles. Please don't take them away from the lab or take them to Flex II (and you in Flex II are asked not to bring your bottles to Flex I). Both soft drink machines are privately owned and operated, and by different people.
- \* For Sale: Ticket to the Policeman's Ball - \$5.00 or best offer. See *Gail Santner*.
- \* Translation exercise for budding ERTS analysts - and full-blown ones, too.

Peter Piper picked 8.81 liters of pickled peppers.  
Missed it by 1.609 country km.  
Beat him within 2.54 cm of his life.  
It hit me like 907 kg of bricks.

What's there to say -- metrication is on the way!

\* Happy Birthday to:

Bill Simmons - May 7  
Lea Thomas - May 15  
Paul Spencer - May 28  
Shirley Davis - May 29

---SAVE FOR FUTURE REFERENCE---

Number 4

LARS PUBLICATIONS AVAILABLE DURING APRIL 1973

Information Note 030573

Basic Forest Cover Mapping Using Digitized Remote Sensor Data  
and ADP Techniques

by M. E. Coggeshall and R. M. Hoffer  
(M. S. Thesis)

Information Note 032973

Urban Land Use Mapping by Machine Processing of ERTS-1 Multi-  
spectral Data: A San Francisco Bay Area Example

by R. Ellefsen, P. H. Swain, and J. R. Wray

Information Note 031673

An Interpretation of a Geologic Map of Fannin County, Texas,  
Prepared by ADP Techniques from ERTS MSS Data

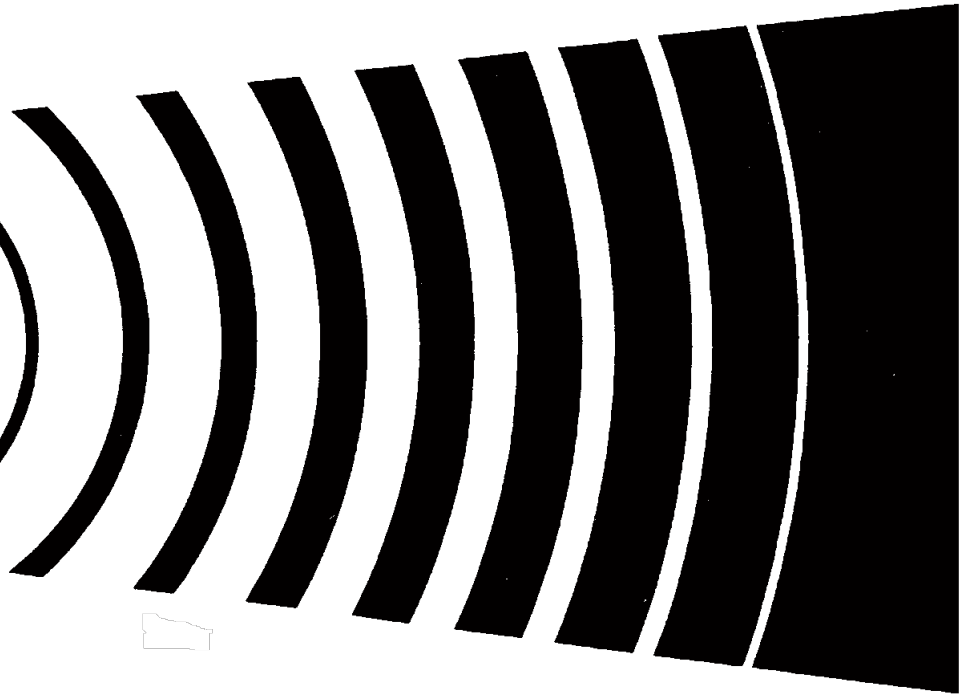
by J. A. Henderson, Jr., J. J. Gardner, and J. E. Cipra  
(Presented at the University of Tennessee Remote Sensing Con-  
ference, March, 1973)

Technical Memorandum T-13 (040473)

An Investigation of Classification Results Based on Use of  
Direction Components

by Philip H. Swain

---SAVE FOR FUTURE REFERENCE---



# Update

Number 69  
October 17, 1973

## ITEMS OF INTEREST

### \* A Busy Time for LARS - A Conference and Open Houses

As you probably already know, the conference on "Machine Processing of Remotely Sensed Data" is being held October 16 - 18 at the Stewart Center. Consisting of 38 invited papers and a number of short papers, it may become the first in a series. Dr. McGillem, the conference chairman, has arranged to have the invited papers printed in a Conference Proceedings to be available during the meeting.

An Open House for the conferees is scheduled for Thursday afternoon, from 1:30-4:30 at Flex Labs I and II. Introductory talks will be given at 2:00, 2:30, 3:00, and 3:30 in each of the following four locations:

1. Unit D - Flex Lab II. Display panels will be set up to show aspects of LARS' applications work.
2. The Computer Area - Flex Lab II.
3. The Hi-Ranger and Mobile Lab Van, to be located in the Flex Lab II parking lot.
4. The Remote Terminal - Flex Lab I.

This same setup will be used again on Friday, October 19, from 2:00-5:00 p.m., as LARS opens its doors to the University and the public.

These are the first public open houses at LARS since before the Corn Blight Watch Experiment in 1971. Much has happened in the interval -- ERTS and Skylab for instance -- and enthusiasm will run high among both guests and LARSians, who will have a long-awaited chance to show their associates what is going on "out there at LARS."

- \* Representatives from approximately 20 agricultural companies will be meeting with LARS/Purdue researchers on October 23-24 for a dialog on how the agricultural industry can participate in the design and development of new information systems utilizing remote sensing. Marion Baumgardner is in charge of the conference.
- \* Activity is increasing on the Technology Assessment Project under the direction of Marv Bauer. Bill Simmons' team is busy with preparation of the ERTS data, specifically overlay and geometric corrections. The next major task will be to locate the coordinates of training and test fields in the imagery. Then, we will be ready to use the data analysis procedures developed for this project by Phil Swain.

- \* The LARSYS Educational Package has been updated (and upgraded!) for LARSYS Version 3, and the revised package is now available for use both at LARS and at the remote terminal locations. The Version 2 educational materials are no longer available.

Anyone planning to use the Educational Package for instructing new personnel in the use of LARSYS should make an effort to become familiar with the new package. A good way to start is to obtain from Sharon Mayo a personal copy of the Instructor's Notes and of the Guide to Multispectral Data Analysis Using LARSYS.

John Lindenlaub and Phil Swain would very much appreciate your comments concerning the new Educational Package. A special thanks from Phil Swain to Shirley Davis, Sharon Mayo, Deb Remsburg and others on the clerical staff for a fine job of reproducing and assembling the materials and getting them shipped to the remote terminal sites by the promised date of October 1. Shirley has been shepherding this job (and it was a big one!) since early in the summer.

- \* Several LARS personnel have logged over 20 hours flying time in the CES Cessna 310 collecting ground information and 70mm color and color infrared photography over the Great Lakes Watershed. The camera system has performed beautifully, and with some unusually good weather the crews have ranged as far as Watertown, N. Y., and Marquette, Michigan. Crews have included Jay Henderson, Bud Goodrick, Larry Biehl, LeRoy Silva, Dick Gilbert, and Carl Walker.
- \* We hardly had time to say hello to Mike Coggeshall before we had to say good-bye. Mike had returned to LARS after spending his time with Uncle Sam, but he has now accepted a job with the Department of Natural Resources, State of Indiana, starting October 15. Mike has produced some outstanding research results during his association with LARS so we know he is looking forward to getting into the field. We wish him and Kay good luck in his new job. In case you get down that way, Mike says his new address is Merry's Trailer Court, RR 1, Mitchel, Indiana 47446.

## PROJECTS FUNDED

- \* LeRoy Silva from NASA for \$97,160 for the period April 1, 1973 through May 31, 1974.
- \* Roger Hoffer from NASA for \$90,650, April 1, 1973 through May 31, 1974.
- \* Dave Landgrebe from NASA, \$333,435, June 1, 1973 through May 31, 1974.
- \* Dave Landgrebe from NASA, \$395,000, June 1, 1973 through May 31, 1976.

## SPECIAL NOTICES

- \* NASA has given us the opportunity to revise previous proposals or offer completely new ones for ERTS-B funds. The deadline for such new proposals is December 21. Those of you who have some ideas along this line are encouraged to get them into the mill.
- \* Remote Sensing of Environment, Volume 2, Number 4, 1973 has been received by the Laboratory and is available from Dave Landgrebe upon request. The table of contents follows:

### Contents

#### Editorial

V. Klemas, J. F. Borchardt, and W. M. Treasure (Newark, Delaware)  
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The Comparison of Sensitivities of Atmospheric Echo-Sounders

Dennis Conway and Robert K. Holz (Austin, Texas)  
Use of the Near-Infrared Photography in the Analysis of Surface  
Morphology of an Argentine Alluvial Floodplain

C. M. R. Platt and A. J. Troup (Aspendale, Victoria, Australia)  
A Direct Comparison of Satellite and Aircraft Infrared (10 $\mu$ m-12 $\mu$ m)  
Remote Measurements of Surface Temperature

Gary C. Thomann (Bay St. Louis, Mississippi)  
Remote Measurement of Salinity in an Estuarine Environment

S. G. Tooma, Jr. and W. B. Tucker (Washington, D. C.)  
Statistical Comparison of Airborne Laser and Stereophotogrammetric  
Sea Ice Profiles

K. Ya. Kondratyev, O. B. Vassilyev, A. A. Grigoryev, and G. A. Ivanian  
(Leningrad, USSR)  
An Analysis of the Earth's Resources Satellite (ERTS-1) Data

#### Book Review:

G. J. Zissis  
The Surveillance Science: Remote Sensing of the Environment, edited  
by R. K. Holz

Author Index to Volume 2

Title Index to Volume 2

- \* A LARS-sponsored short course on Machine Processing of Remotely Sensed Data has been scheduled for June 3-7, 1974. Preliminary announcement fliers, containing the purpose of the course and a general schedule, are available from Dr. Peterson

## TRAVEL

- \* Dave Landgrebe took part in a summer school training course entitled "Remote Sensing of Earth Science" in Tarbes, France, on August 30 and 31. The four-week course, sponsored by the Centre National d'Etudes Spatiales, attracted participants from all over the world. Dr. Landgrebe was one of two invited participants from the United States, the other one being a spokesman from NASA who spoke on the present and future satellite programs. Dr. Landgrebe gave four lectures on multi-spectral scanners and on the machine processing of data.
- \* Marion Baumgardner, Roger Hoffer and Dave Landgrebe will be traveling to Goddard Spaceflight Center on October 26 to present summaries of the results obtained on three ERTS-1 projects. While they are there Roger and Marion will give an hour-long presentation to be video taped for updating the applications part of the LARS TV short course.
- \* Marion Baumgardner is serving as a member of a 4-man team on a mission to Niger from October 6th to 17th. The team was in Rome on October 8 for briefing with officials of the Food and Agricultural Organization of the United Nation; then in Paris on October 9 for briefings with French scientists and specialists in West African affairs. The team then flew to Niamey, Niger, on the Niger River 375 miles southeast of Timbuktu. Their mission, as requested by the President of Niger, was to study the possibilities of long-range development of animal and crop production in the Sahel region (sub-Sahara) of Africa as an alternative to continued short-range famine relief. The mission was foundation-sponsored.
- \* Dave Landgrebe and his wife returned October 14 from Baku, Russia, where they attended the XXIV International Astronautical Congress. Dr. Landgrebe presented a paper there on "Machine Processing Methods for Earth Observational Data" which he had co-authored with F. C. Billingsley (Jet Propulsion Laboratory, Pasadena, California) and J. D. Nichols (University of California, Berkeley). Dave and Ann also arranged stops in Vennia, Rome, and Moscow before their return to Lafayette.
- \* Terry West and his wife headed west to San Francisco to attend the September 17-21, 1973, Federal Highway Administration review of research programs sponsored by the Department of Transportation. Terry presented an address entitled "Computer-Aided Analysis of Multispectral Remote Sensing Data Collected by Aircraft over Several FHWA Test Sites."
- \* Phil Swain will attend the First International Joint Conference on Pattern Recognition October 30 to November 1, 1973 in Washington, D. C. He will present a paper entitled "Two Effective Feature Selection Criteria for Multispectral Remote Sensing," co-authored by Roger C. King.

- \* Marv Bauer and Phil Swain attended a meeting in Little Rock, Ark. on August 13-14 for the Technology Assessment Project.
- \* On September 20 Marv Bauer was at JSC/NASA to discuss crop production information models with NASA officials.

## VISITORS

- \* William Wigton, SRS/USDA, spent a week this fall at LARS working with Marv Bauer and Jeanne Etheridge on analysis of ERTS data for crop identification.
- \* Bruce Casserby and Richard Kirby from NASA/Houston were here Thursday, October 4 to address a Seminar.
- \* Dr. Pricilla Reining, Africa Study Group, Catholic University, Washington, D. C., visited the lab on September 7 to discuss LARS capabilities in relation to the Mali situation.
- \* Tom McGennley, President of Johnathan Group, visited LeRoy Silva September 4; his firm is interested in the I-65 Corridor Study.
- \* Dr. Richard Ellefsen and Len Gaydos, from University of California at San Jose, are visiting Phil Swain this week in connection with the USGS project. Dr. Gaydos will be here for approximately three weeks.
- \* Other visitors:

### August, 1973 -

William Denton, University of California, Riverside to see Tom Builta  
Robert E. Tynan, Clearwater, Florida, to see L. Silva  
James R. Wray, USGS Geographic Applications Program, to see P. Swain  
Samin Nahass, Douglas Trainini and Vitorio Oriansi, CPRM, Brazil  
Dr. Clarence Sakamoto, National Weather Service, Auburn, Georgia  
Dr. Dick Felch, National Weather Service, Washington, D. C.  
Dr. Eugene H'yashenko, Institute of Control Sciences, Moscow; B. Robinson  
Dr. Helmut Meier and Dr. Carl Weisman, Swissair, Switzerland, to see  
J. B. Peterson.

### September, 1973 -

Reuben Alimbo, University of Nairobi, Nairobi, Kenya, to see M. F. Baumgardner  
George Joseph and S. Raghunathaw, Indiana Space Research Org. to see M. F. Baumgardner  
Ray Diderickson, SCS, Washington, to see M. F. Baumgardner  
Andrew Potter and Robert Hanley, NASA, to see D. A. Landgrebe

## SEMINARS

- \* The LARS Seminar sequence has had several interesting speakers so far, and the list of ideas for future seminars goes on and on. The weekly seminar provides an opportunity to exchange ideas and allow some interdisciplinary communication. Roger Hoffer and Phil Swain, the coordinators



for the seminars, look forward to seeing as many of the LARS Staff as possible every Tuesday afternoon at 3:30.

- \* The LARS Seminar Series will be suspended October 16 and 23 due to conflicts with other activities. On October 30, Jan Cipra will discuss "Soils Mapping in Tippecanoe County" (or something like that). Marion Baumgardner and Bud Goodrick were the speakers at the September 25th LARS Symposium. Marion spoke on the proposed Great Lakes Land Use Inventory and Bud on the six-county pilot study.

## NEW FACES

- \* A LARS welcome to two new staff members on the Skylab Colorado project. Harry Hitchcock, who just completed his M.S. degree at Northern Arizona University under Dr. Gene Avery, will be working on his Ph. D. in the Department of Forestry and Conservation under Roger Hoffer. Until his full load of classes begins in January, Harry will be going through the LARSYS training program and working full-time on the analysis of Colorado Skylab data.
- \* Another newcomer is Jim Frater, a graduate student in the geosciences department, who will be working quarter time with Dr. Melhorn on the geomorphic interpretation of Skylab data.
- \* A LARS welcome also to Donna Dasaro, Joan Neill, Sherry Fisher and Paula Pickett. Donna is the secretary for Dr. Hoffer and the ecosystems program area; Paula is working half-time as the copy center operator; Joan is the Flex I receptionist and the secretary for the Great Lakes Project; and Sherry is the secretary for Dr. Silva and the measurements program area.
- \* Welcome also to Dr. Frederick Quiel, a visiting scientist from University of Munich, Germany. Dr. Quiel came to LARS in July, 1973, under the auspices of the European Space Agency. He expects to be here through June, 1974, and will be working under Dr. Levandowski on soil mapping of Marion and Morgan counties in Indiana. Dr. Quiel's work in Germany had primarily been with thermal mapping.

## MISCELLANEOUS

- \* Congratulations to Beth Altenkirch on the birth of a son August 25th. His name is Erich J.
- \* Congratulations to Ray Duan, whose wife gave birth to a daughter early this month.
- \* A warning from Mr. Hughes: Conserve the white paper towels in the lavatories, or else! We may have to go back to brown ones. The consumption of paper towels has doubled within the last few months, and the soft white ones cost twice as much as those lovely, old brown ones.

---SAVE FOR FUTURE REFERENCE---

Number 6

LARS PUBLICATIONS DURING AUGUST AND SEPTEMBER, 1973

Information Note 022673

A Linear Shift - Invariant Image Preprocessing Technique for  
Multispectral Scanner Systems  
by C. D. McGillem and T. E. Riemer

Information Note 041773

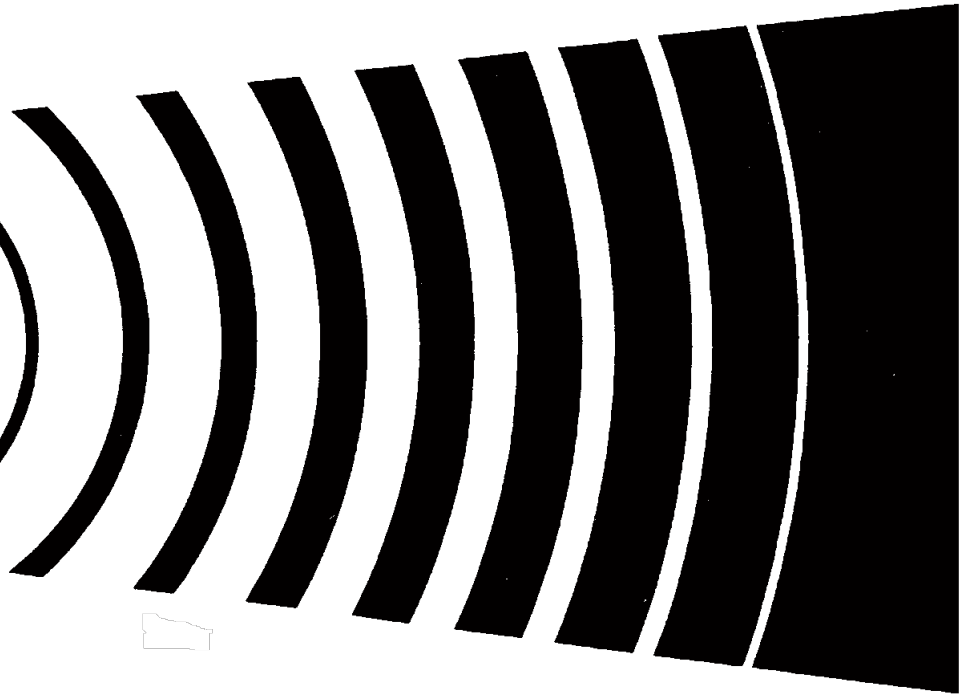
Automatic Boundary and Sample Classification of Remotely  
Sensed Multispectral Data  
by R. L. Kettig and D. A. Landgrebe

Information Note 042673

Two Effective Feature Selection Criteria for Multispectral  
Remote Sensing  
by P. H. Swain and R. C. King

Information Note 062873

Guide to Multispectral Data Analysis Using LARSYS  
by J. C. Lindenlaub



## ITEMS OF INTEREST

- \* Major awards were received recently by two LARS staff members in recognition of their accomplishments. Dave Landgrebe was presented NASA's Exceptional Scientific Achievement Medal in Washington, D. C. on October 25, 1973. Thirty-two such medals were awarded of which twelve were outside the government. Dave was selected for this award because of "his outstanding contributions to the space program." Congratulations to "our leader" for this recognition of the vision and direction he has provided. The second award recipient was Marion Baumgardner who was elected Fellow of the American Society of Agronomy, an award presented to about 20 members of the Society each year. The award was made in recognition of Marion's contributions to the field of agronomy.
- \* Have you seen the new LARS brochure entitled Remote Sensing of Agriculture, Earth Resources, and Man's Environment? This new edition of the color brochure includes the work done with ERTS data and updates of other material relative to remote sensing activities. The brochure is designed for a "general" audience and includes many photographs of the work done at LARS. Individual copies of the brochure are available from Sharon Mayo. Quotations will be made on requests for larger quantities.
- \* On December 3 a new full-time staff member will join LARS. Richard Weismiller holds a B.S. degree in agronomy from Purdue, an M.S. in soil minerology from Purdue, and a Ph.D. in soil chemistry minerology from Michigan State University (1969). Among his duties when he joins the staff will be to serve as project manager of the Great Lakes project under the direction of Marion Baumgardner. Dick is currently a captain in the U.S. Air Force carrying responsibility for soil stabilization and erosion control studies. He is a native of Elwood, Indiana, is married and has one child. We welcome him to the LARS staff.
- \* John Lindenlaub was appointed secretary-treasury of the IEEE Education group for 1973-74.
- \* On November 20 IBM held a seminar for LARS staff members on Text Processing Methods and Storage and Retrieval Software.

## PROPOSALS

- \* Proposals are now being prepared for research based on ERTS-B data. LARS-associated proposals include Bill Miller's on sedimentation in water bodies; Steve Luther's dealing with snow-cover mapping; a continuation of the ERTS-1 proposal with INSTAAR and the Forest Service; a proposal for forest-cover mapping over the land owned by St. Regis Paper Company in the south-eastern part of the United States; and additional proposals under the leadership of J. B. Peterson, M. E. Bauer and Marion Baumgardner. Proposals are due December 21.

## PROJECTS FUNDED

- \* Marion Baumgardner has received a "notice of award" for funding the Great Lakes Project from the Environmental Protection Agency for the period November 30, 1973 through June 30, 1974. The plans call for preparing a land use inventory of the U.S. Great Lakes drainage basin (an area of 33 million hectares) using some 40-50 frames of ERTS-1 multispectral data. Marion Baumgardner is the coordinator of the Great Lakes project; Dick Weismiller is the project manager; and Joan Neill is the secretary. Further responsibilities are being handled by Carl Walker (ground observations and photography for training and testing), Dick Gilbert (ERTS data ordering and receiving), Sue Schwingendorf (analysis procedures), Bud Goodrick and Jay Henderson (analysis operations), Terry Lehman (photo processing), and Dick Weismiller and Marion Baumgardner for documentation and preparation of reports. In addition seven data analysts are scheduled to work on the project as is a six-member Analysis Procedure Committee.
- \* John Lindenlaub has been notified of the intention of Purdue's Continuing Education Administration to fund a project for the development of individualized instruction modules in the fundamentals of remote sensing.
- \* NASA has funded the Langley Terminal Project for the period October 1, 1973 through May 31, 1974. The grant is for \$22,273 with Terry Phillips named as principal investigator.

## SPECIAL NOTICES

- \* The Proceedings from the Conference on Machine Processing of Remotely Sensed Data (October 16-18) were distributed to participants at the conference and to primary authors of the papers. Tom Builta will soon make additional copies available to program leaders on a "permanent loan" basis for use as they wish.

\* Bill Todd said farewell to LARS during November as he prepared to attend a seven-month course at ITC in the Netherlands. The course deals with techniques for making urban surveys using air photo interpretation. His work while at LARS was also related to urban surveys, particularly of the Milwaukee area. On the day before he left he commented on the probable "impoverished" state of his existence in the Netherlands and invited any friends to stop by, especially those willing to taking him out for a meal. He will notify LARS of an address where he can be reached.

## ADDRESSES AND SEMINARS

\* On December 10-13, 1973, three LARS staff members will make presentations at a NASA-sponsored symposium in Washington relative to ERTS-1 results. The symposium papers being presented are those selected from ones presented in October as part of a review of all ERTS-1 contracts. All three LARS reports were selected. The presentations are to be:

1. Marion Baumgardner on "Mapping Soils, Crops and Rangelands by Machine Analysis of Multitemporal ERTS-1 Data." This paper reports on the ability to delineate soil boundaries, to identify and map crop species and to locate patterns in rangelands which can be related to differences in soils and range management practices. Multiple ERTS passes over test sites provided the opportunity for overlay analysis.
2. Roger Hoffer on "Techniques for Computer-aided Analysis of ERTS-1 Data Useful in Geologic, Forest and Water Resource Surveys." This paper includes a discussion of several analysis capabilities that have been developed during ERTS-1 investigations including procedures to rotate and scale MSS data, the creation of false color-infrared composites of MSS data, and the temporal overlay of six sets of data. The results have proved the value of computer-aided analysis techniques even in areas of mountainous terrain.
- 3: Dave Landgrebe on "An Evaluation of Machine Processing Techniques of ERTS-1 Data for User Applications." This paper is a comprehensive evaluation of machine processing techniques as applied to ERTS-1 data and reports on the changes in preprocessing and analysis necessitated by the characteristics of the ERTS data.

Jan Cipra, Terry Phillips, and Marv Bauer will also be attending the meeting in Washington.

\* Marion Baumgardner and Jan Cipra attended the meetings of the American Society of Agronomy in Las Vegas during the week of November 11-16, 1973. LARS was represented by five papers at the Meetings.

1. Assessment of Erosion and Sedimentation by Computer-Implemented Analysis of Satellite Acquired Multispectral Data by John G. Stockton and Carl Walker.
2. Producing a Land Use Inventory by Computer-Implemented Analysis of Multispectral Data from Satellite Altitudes by M. F. Baumgardner and C. F. Walker.
3. Mapping of Soil Characteristics by Computer Analysis of ERTS MSS Imagery by J. E. Cipra, D. P. Franzmeier, and G. C. Steinhardt.
4. Multispectral Data from the Earth Resources Technology Satellite as a Tool for Soil Survey by S. J. Kristof and H. P. Ulrich.
5. Comparison of Indiana Soil Associations and Earth Resources Technology Satellite Imagery by G. C. Steinhardt, D. P. Franzmeier and J. E. Cipra.

\* On Tuesday, November 20th Bill Miller addressed the LARS seminar with a talk intitled "Economic Analysis to Enhance the Application of Remote Sensing Technology." Bill has been at LARS at 25% time since last summer. He is on the staff of Purdue's agricultural economics department and is pursuing work at LARS on cost analyses and cost-benefit studies relative to water resources research.

\* Bud Goodrick spoke to the Lafayette squadron, Civil Air Patrol, on November 12 briefing them on LARS activities.

\* Bill Melhorn and Scott Sinnock addressed the Purdue Interdisciplinary Committee on Modernization and Development on November 29, 1973. The title of their address was "Evolution of the Upper Colorado River as Interpreted from ERTS-MSS Imagery".

\* On November 15 Dave Landgrebe took part in a short course on Image Processing sponsored by Wintek. He spoke to the group on Earth Resources Image Processing.

TRAVEL

\* J. B. Peterson will be a member of a two-man team to appraise the quality of the doctorate program in Agronomy at Mississippi State University on December 2-4.

- \* Terry Phillips, Marv Bauer and Paul Anuta attended a Technology Assessment Project conference in Clear Lake City, Texas from November 26 through 28.
- \* Steve Luther and Dick Mroczynski will be in Boulder, Colorado to meet with the INSTAAR group and to work on new proposals for ERTS-B data. Steve will be arriving at Boulder after attending the International Hydrological Decade Conference in Monterey, California, December 3-6.

## VISITORS

- \* The November 15 dinner meeting of the Central Indiana section of IEEE featured a program presented by Dave Landgrebe and a visit to LARS with Terry Phillips as tour leader. Clare McGillem was the program chairman for the evening.
- \* On November 16, 1973 Martin Malloy from NASA headquarters visited LARS to review the Educational Materials recently prepared by John Lindenlaub in support of the remote terminal project.
- \* Mary Alice Eastwood and Philip Renfroe from Langley Research Center were at LARS for two weeks during November to learn to use the LARS data processing programs. While here they used the LARSYS Educational Package to familiarize themselves with the data processing methods and then began work on ERTS data relative to their own research projects at Langley. A remote terminal is scheduled for January installation there.
- \* On November 5, eight IBM scientists from Indonesia, Germany, Spain, Mexico, U.S.A. and Japan visited LARS.
- \* Meilyn Johnson of Handley and Miller Advertising firm in Indianapolis has visited LARS a few times in conjunction with a film being prepared for Public Service of Indiana. She is working to develop a set of materials relative to energy conservation and is interested in using thermal IR imagery to help locate homes having considerable heat lost.
- \* Representatives from SCS/USDA visiting the lab on November 28 included H. R. Sinclair, R. V. Boltman, Cletus Gilman and Leon Kimberlin. They are members of the Division of Planning and Zoning in the Department of Metropolitan Development, Indianapolis.
- \* On November 28 Don Levandowski hosted a group visiting the lab from the Indiana Geologic Survey.



\* Other Visitors

Phadej Sawasdibut, Thailand to see R. M. Hoffer.  
Hans Schmidt on October 23 from the University of Stuttgart, Germany  
J. Joriwako, Nagoya, Japan.  
Dr. K. Linkwitz, Stuttgart, Germany.  
Nine scientists from Indiana State University to see Paul Mausel  
and Bill Todd.  
Dr. Hans Nilsson, Agricultural College of Sweden.  
18 students from Benton Central High School, Oxford, Indiana.  
P. Saraga and D. Paterson, Mullard Research Labs, Surrey, England.

MISCELLANEOUS

- \* Lea Thomas wishes to call the attention of all LARSians to the invitation on the bulletin board to her wedding. She hopes that many members of her family at LARS will plan to share this happy day with her.
- \* Welcome to Carolyn Brissey, a new edition to the business office staff. Carolyn is a part-time working and will be handling purchasing, travel, and the supply cabinet. She is working with Lea Thomas.
- \* Another welcome to Joan Neill who joined the LARS staff during November. Joan is a native of Philadelphia and comes to Lafayette because of her husband's transfer here by the American Chemical Company. Joan and her husband selected Lafayette out of many possibilities for places to live and are finding it up to their expectations.
- \* Jenny Spear will be leaving LARS on December 7. She and Donn will be moving to Cincinnati, Ohio where Donn is employed with Proctor and Gamble.
- \* New faces at Flex II this fall include graduate students Robert Benson and Lewis Seberger and computer operators Tab Pritchett, Christine Kopitzke, Diana Carson, and Steven Frick. Robert is from Arlington Heights, Illinois and is working on ERTS/Wabash Valley; Lewis, from Highland, Indiana, is working on TAP.

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Number 7

LARS PUBLICATIONS DURING OCTOBER AND NOVEMBER, 1973

Information Note 030173

Identification of Agricultural Crops by Computer Processing of ERTS  
MSS Data

by Marvin E. Bauer and Jan E. Cipra

Information Note 062273

Analysis Research for Earth Resource Information Systems: Where Do  
We Stand?

by D. A. Landgrebe and Staff

Information Note 110173

The Corn Blight Watch Experiment: Economic Implications for Use of  
Remote Sensing for Collecting Data on Major Crops

by J. A. Sharples

Remote Sensing of Agriculture, Earth Resources, and Man's Environment  
A Color Brochure

Conference Proceedings:

Machine Processing of Remotely Sensed Data

October 16-18, 1973

Purdue University

REPRINTS AVAILABLE DURING OCTOBER AND NOVEMBER, 1973

Information Note 072673

An Application of Remotely-Sensed Data to Agricultural Land Use  
Distribution Analysis

by P. W. Mausel and C. J. Johannsen

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