Contract Report 081281

Final Report

Conference on Remote Sensing Education
(CORSE-81)

Contract No: NAS5-26406

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I. Objectives of the Conference

The possibility of making quantitative observations of the Earth's surface from aircraft- and satellite-borne sensors has led to our nation's growing dependence on remote sensing as a means of obtaining valuable information for earth resources management.

Since 1977 NASA has conducted a vigorous program to acquaint state and local government personnel with the potentials of this technology and has assisted them in using it. To an extent this program has touched college and university instructors, in particular those who have been actively involved in state and local projects, but the rapid development of remote sensing since 1972 has put many excellent teachers at a disadvantage, especially those who have not been in an environment conducive to remote sensing research. Without a concomitant research program it has been difficult for them to gain enough fluency in the technology to add in-depth treatment of remote sensing to existing courses, to create new courses, or to encourage graduate students to carry the technology further.

To strengthen remote sensing education in our nation's colleges and universities and thereby to strengthen the preparation of college-educated scientists in the use of the technology, a 1981 Conference on Remote Sensing Education was organized by Purdue University under the sponsorship of NASA/ERRSAC and NOAA. The five-day conference, held May 18-22, 1981, consisted of discussions, plenary sessions, panel discussions, a poster session, and tutorial workshops, all aimed at encouraging the 189 conference participants to communicate with each other, to identify others who share their interests, and to exchange information, ideas, and materials.

The specific objectives of the conference were stated thus:

1) Bring together remote sensing educators for exchange of information and ideas with each other and with federal agencies on setting up or improving remote sensing curricula and on developing and utilizing the resources of their institutions for teaching and research activities.

2) Help these educators keep abreast of current technological developments flowing from other universities, NASA, and other federal or state agencies, industry, and other segments of the user community.

3) Provide tutorial workshops to increase participants' level of understanding of the fundamentals of the technology.

In addition there was a strong commitment on the part of the Planning Committee to view this conference as another step toward creating a tone of effective and mutual support among remote sensing educators. CORSE-81 was a follow-on to CORSE-78, a NASA/WRAP-sponsored workshop for remote sensing educators from the western states held at Stanford University in 1978. That conference was regional in character, while CORSE-81 was the first national conference in the U.S. dealing solely with the topic of remote sensing education. The Planning Committee supported the need for these conferences to continue and sought to identify ways that this might be accomplished.

II. Planning for CORSE-81

In recognition of the diversity of interests among remote sensing educators, a Conference Planning Committee was formed to help cast the content and tone of the conference in a way that would meet the most needs. The committee members were chosen to represent all three of the regions served by NASA's Regional Applications Centers and to represent as well the breadth of disciplines that were expected. Committee members were:

John Lindenlaub, Purdue University, co-chairman
Shirley Davis, Purdue University, co-chairman
Thomas Lillesand, University of Minnesota
Edward Martinko, University of Kansas
Ron Marrs, University of Wyoming
Roger Hoffer, Purdue University
Marion Baumgardner,Purdue University
Nicholas Short, NASA, Eastern Regional Remote Sensing Applications Center
Harry Jones, NASA, Western Regional Applications Program
Buddy Atwell, NASA, National Space Technology Laboratories

Through its advisory function, the committee insured that the conference was planned with a realistic view of the needs of remote sensing educators. In addition, many of the committee members helped by recruiting speakers, selecting papers for presentation, chairing sessions, presenting tutorial workshops, and by being available to assist in numerous other ways.

The work of the Planning Committee began with a two-day planning meeting held at Purdue on November 10-11, 1980. It was at this time that the major topics were decided upon and the overall format of the conference was established. Furthermore, it was decided then that the tone of the conference would be informal to encourage discussion and interaction among participants. Presentations were not to focus on research results but on concerns of remote sensing education. In keeping with these decisions, it was further decided that in lieu of conference proceedings, summaries of presentations would be available individually at the conference and afterwards in a published Conference Report.

At the time of this intensive planning session, members of the Planning Committee saw the tutorial workshops as having such merit that they urged the expansion of this aspect of the conference over what had been initially suggested. Committee members mentioned additional key topics to be presented and, in some instances, offered to teach sessions. It was intended that these workshops serve a two-fold purpose: first, to give participants the opportunity to expand their own understanding of specific aspects of remote sensing, and, second, to enable participants to observe and experience the educational strategies adopted by other educators in presenting remote sensing topics.

Publicity for the conference was through newsletters and direct mail. A news release (Appendix A) was prepared in December and sent to 22 newsletters identified by Planning Committee members as key means of communication among the target audience. A ten-panel brochure and registration flier, reproduced in Appexdix B, was assembled and mailed by NASA in January to approximately 3500 people, specifically those who at that time

were on the ERRSAC mailing list for "Reflections" and the chairmen of all the departments in U.S. Colleges and Universities in which a course on remote sensing is offered. The source of this list was the American Society of Photogrammetry, which had partially supported its compilation during 1980 by Dr. Richard Dahlberg, Northern Illinois University.

III. Program

To meet the objectives of the conference, a five-day program of presentations, discussions, and tutorial workshops was held. The detailed program appears in Appendix C of this report.

The tutorial sessions were grouped before and after the central part of the conference; that is, they were held throughout Monday of the conference week, on Thursday afternoon and evening, and on Friday morning. In all, nine different tutorial workshops were presented, with five of these offered twice and one offered three times. Workshop titles and presenters were:

1. Basic Principles of Satellite Remote Sensing by Dr. Nicholas Short, NASA/Goddard

2. Digital Image Processing Techniques by Dr. Philip Swain, Purdue University, and Ronald Boyd, Computer Sciences Corporation

3. Energy Sources, Spectral Reflection Properties, Atmospheric Effects, and Sensors by Dr. Thomas Lillesand, University of Minnesota and Dr. Ralph Kiefer, University of Wisconsin

4. GIS Analysis: An Academic Approach and Experience by William Campbell, NASA/Goddard; Joseph Berry, Yale University; and Richard Hyde, Butler University

5. Acquisition and Use of 35mm Aerial Photography in Instruction and Research by Dr. Merle Meyer, University of Minnesota

6. Laboratory-Manual Approach to Remote Sensing Instruction by Dr. Floyd Sabins, University of California, Los Angeles

7. Non-Landsat Remote Sensing from Space by Dr. Nicholas Short, NASA/Goddard

8. Introduction to Photogrammetry by Dr. Edward Mikhail and Joe Thurgood, Purdue University

9. Remote Sensing Field Research by Dr. Marvin Bauer, Barrett Robinson, and Larry Biehl, Purdue University

Pre-registration for these workshops was very active with several sessions declared "full" through pre-registration before the conference started; because of this some additional sessions were also added. It was not necessary to cancel any workshop because of low enrollment. Summaries of the workshops are included in the Conference Report, described below.

The heart of the conference program was the two-and-one-half-day period from Tuesday morning through mid-afternoon on Thursday. Through a series of plenary sessions, panel discussions, and small-group discussions, the first two primary purposes of the conference were met. The conference program was designed to flow from the definition of what remote sensing education is now to what it needs to become and how to best accomplish this in the college and university environment. Presentations and discussions dealt with such topics as the current status of remote sensing courses nationwide, the needs of

employers for students trained in remote sensing, and strategies and resources available for teaching remote sensing. This latter topic included a review of textbooks and audio-visual materials and led to a discussion of computer hardware and software and strategies for making low-cost hands-on experiences available to students. Attention was given, as well, to what remote sensing technology will likely become in the next several years and what effect this has on planning educational programs.

Two summary documents exist that attempt in different ways to capture the content of this central part of the conference. One is the Conference Report, described in detail in Section V of this final report. The other is a paper by Dr. Thomas Lillesand that was presented at the 1981 Machine Processing Symposium and is included in the conference proceedings. It can be located as follows:

> Lillesand, Thomas M. Remote Sensing Education: A Special Report on the Conference of Remote Sensing Educators (CORSE-81), Proceedings of 1981 Machine Processing of Remotely Sensed Data Symposium, June 1981, Purdue University, West Lafayette, IN, pp. 205-211.

IV. Conference Attendees and Logistics

The conference attracted a total of 189 people, with all but five of these from the United States. The full list of participants is included in the Conference Report. There was significantly greater participation from the Eastern states, with the largest numbers from Indiana and New York, 29 and 20, respectively. The distribution is shown graphically on the following page.

It is interesting to note that 43 different U.S. colleges and universities were represented at the conference and that those institutions represented a large range of sizes. The size of the universities, based on the number of students is shown in the table below:

Size	Total
under 5,000	4
5,000 - 10,000	11
10,000 - 20,000	11
20,000 - 30,000	11
30,000 and above	5

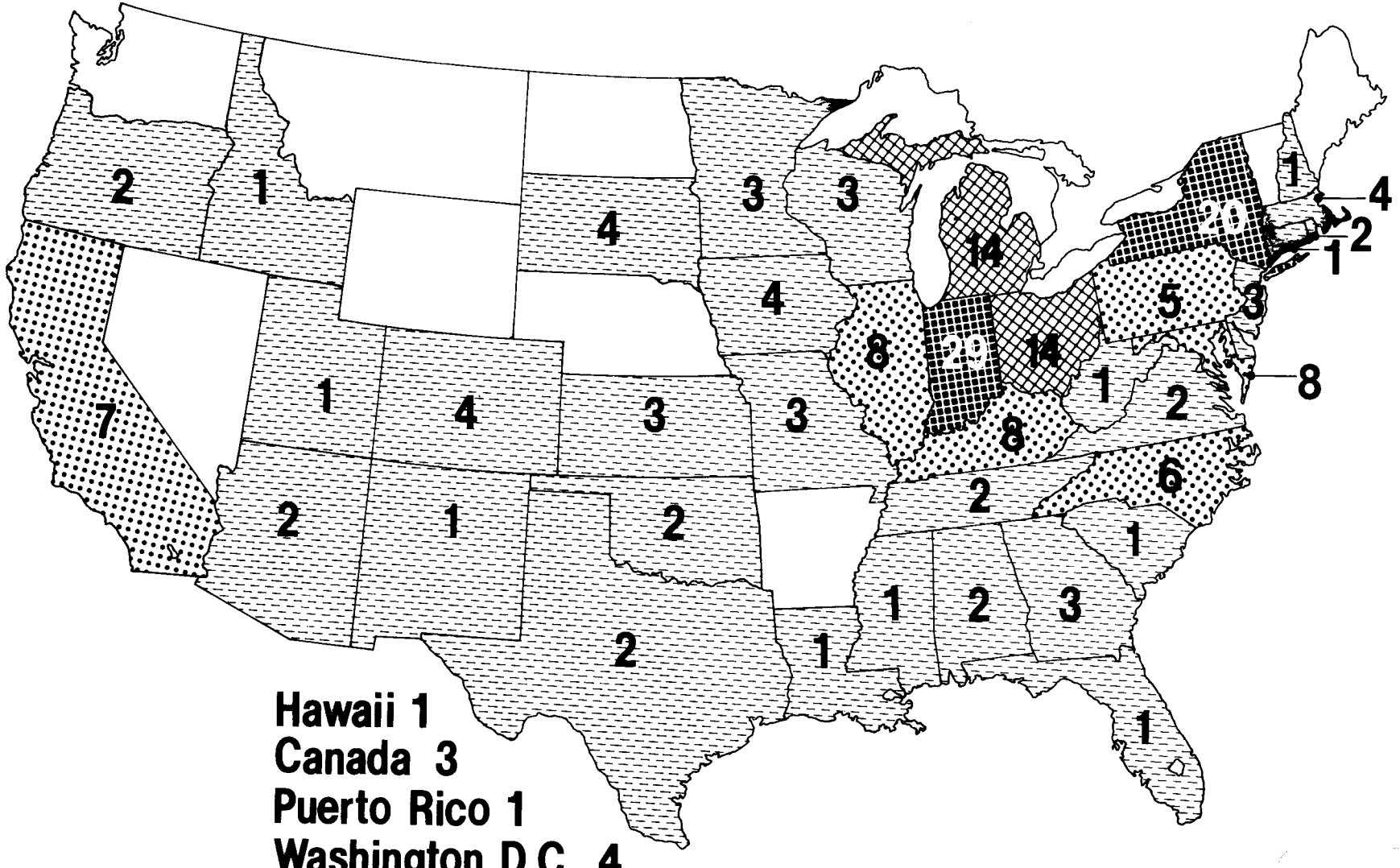
It is fair to conclude that these colleges represent both institutions that have been deeply involved with remote sensing research as well as those that are only now beginning to establish teaching programs.

The logistics of the conference served the objectives well and furthered the intended tone of informality. The majority of the discussion sessions and tutorial workshops, the poster session, the registration/information center, and the exhibits were held in Heavilon Hall. In a few instances the unexpectedly high response caused over-crowding, but not to the serious detriment of the conference. The plenary sessions were held in Stewart Center, the next building to the south where a 425-seat auditorium was available. It was in the Memorial Union building, just to the east, that cafeterias were located for the participants' use. Lodging was predominately in the graduate houses, just to the south, with some participants staying in the Union. Modest, student-type lodging as well as food was available to most participants at no cost to themselves; those who were currently teaching remote sensing or planning to teach remote sensing at U.S. colleges and universities qualified for this category of attendence. Others (e.g., attendees from private industry or government) were able to use the conference housing facilities at their own expense. There was no conference registration fee for any attendee.

Exhibits of educational materials, informative brochures and remote-sensing-related equipment were provided from educational institutions, governmental bodies, and private industry. Eleven exhibitors were given space to display or demonstrate their products, and an additional 20 to 30 organizations sent printed materials to display or distribute.

The effort to encourage exchange of educational materials among participants was not successful. Only five people provided materials to share even though the request was made through the initial brochure and in the mailing to registrants. The slide-copying service that was provided was not used heavily by participants, if at all.

Total participants of CORSE-81



V. Conference Report

A Conference Report was prepared, designed to capture the essence of the conference. This 382-page report outlines the purpose of the conference and the overall program and includes a short summary of each presentation.

In addition, notes compiled by session reporters document the primary topics that arose in the plenary sessions as well as the parallel discussion sessions. In the case of the parallel sessions, the names of persons who attended are also given so that further details may be obtained through individual contact. The report concludes with a brief description of each tutorial workshop, a list of participants, a list of exhibitors, and an index by author to the summary papers.

The report was compiled by Purdue University and will be printed and distributed to conference participants by NASA/ERRSAC.

The table of contents for the Conference Report is reproduced as Appendix D.

VI. Evaluation by Participants

An evaluation of CORSE-81 was conducted not so much to provide comment about the 1981 conference as to gain guidance for planning future conferences. Since it appears that in the future NASA will not be assisting remote sensing educators directly, the evaluation sought to identify those willing to help work for future conferences, ideas for possible sources of funds, as well as opinions concerning time, location, and program emphases. Evaluations were mailed to the 189 participants, and responses were received from 75 of them, or 40%. The form used appears as Appendix E. The comments below are based on these responses.

The goal of bringing together remote sensing educators to exchange information on establishing and improving remote sensing curricula was achieved. Overall, respondents felt the conference was very well organized, and everything from the workshops and discussions to the facilities and accommodations received favorable comment. For almost everyone, the "student" accommodations, staying at the Graduate Houses and eating in the Memorial Union, contributed much to the conference. The relaxed atmosphere arising from these arrangements led to informal discussions among participants during unscheduled times, such as at meals and in the evenings.

The active participation by so many recognized authorities in remote sensing education was one of the major attractions for many. Through this, participants felt they received up-to-date information and news from those who were most knowledgable. Furthermore the participation from private business and governmental agencies made an important contribution to the conference. Several business people, on the other hand, were impressed with the concern of the academicians for the future of their students and for meeting the future needs of the technology. The low participation from the Western states was commented on by a few as a serious disadvantage.

Both the variety and focus of the topics included in the presentations and discussions pleased many, with appreciation expressed for being allowed to focus on educational matters without having to sift through papers on technical advances. Some questions were raised, however, about the relevance of the presentations by some of the federal government representatives. The discussion sessions were particularly well received, and several commented favorably on the way they were scheduled to avoid conflicts of simultaneous interests and were run to facilitate good interchange; some others, however, felt there were too many parallel sessions that overlapped to the disadvantage of the participants. Another programming concern expressed was a desire for more separation between introductory and advanced sessions; this problem was especially present in the computer-focused sessions where lack of familiarization with terminology and concepts meant some were unable to participate actively in the sessions. Several commented favorably on the benefits of having the papers available during the conference.

The poster session and panel discussions were liked by a few but in general were not as highly regarded as the discussion sessions. The primary comment about the poster session was that it was too crowded for effective interchange with the presenters. With regard to the panel discussions, many felt that the room was too large for audience interaction and that panel members did not restrict their comments well enough to the questions or adhere

to the time limits, further limiting audience reaction.

The tour of LARS was mentioned positively by a few but also negatively by others who felt it was too crowded, had too few demonstrations, and was too short.

The biggest attraction by far was the series of tutorial workshops, included to help meet the third goal of the conference, helping increase participants' level of understanding of the technology. Those who commented were not specific about the aspects of the workshops that pleased them most, but in general the availability of printed tutorial materials and personal assistance ranked high. In some of the workshops overcrowding was disconcerting, but in every instance the instructor had opted to allow all to attend who could fit in the room, regardless of previously stated limits. Some felt that the workshops still needed to be longer and more detailed to be really beneficial, and several faulted some of the workshop instructors (generally unnamed) as being unorganized and inadequately prepared. Others would have like more hands-on opportunities to work with equipment.

Since the group attending was primarily academic, it seemed appropriate to have an overall grade given for the conference. The grading scale established was A (best) to D, and the responses were as follows:

A+	5
A	28
A-	10
B+	12
B	15
B-	1
C	1

In anyone's terms, certainly this overall evaluation has to be interpreted as giving the conference a "superior" rating.

Looking toward future such conferences, respondants gave a 100% "yes" to the question of whether there should be another CORSE. Opinions were not so unified on questions of location, time of year, and frequency. The majority chose the end of May as the best time, however several felt inconvenienced with the May date since their institutions are still in session at that time. (It should be noted that many who were unable to attend because of difficulties with May have had no input to the evaluations.) The second most favored time was summer. Thirty-five of those who responded to the question about year felt that CORSE would be of most benefit if held bi-annually; twenty felt it should be held annually, and fifteen voted for meetings every three years.

With regard to location, one-third of the participants felt that Indiana was a good central location and that Purdue was a convenient facility. The remaining two-thirds suggested locations from the East Coast to the West Coast, with a strong request for any central location. Some felt that universities would be the appropriate place while others felt the NASA centers or the EROS Data Center would be good locations. One persuasive suggestion was made to alternate bi-annual national conferences with regional conferences, providing an annual opportunity for meetings focusing on remote

sensing education.

When respondants addressed the question about features they would like to see in future conferences, tutorial workshops headed the list. They asked for demonstrations of instruments and new equipment as well as more hands-on opportunities. They wanted more opportunities to play the role of student, observing others' teaching techniques as well as learning new material. There was a strong request for different levels of workshops; the newcomers to remote sensing felt that the CORSE-81 workshops were somewhat too advanced, while those familiar with the topic felt they were too basic. But the overwhelming request was for more and more workshops.

For the central conference sessions, discussion sessions were requested over plenary sessions; in particular they wanted discipline-oriented discussions. A few requests were made to add a session related to oceanic and coastal work. Others would like information on entry-level jobs available and employment histories of past graduates, and still others sought discussions on teaching methods, instructional problems, starting introductory courses, and more philosophical issues related to future trends in remote sensing education. Keeping up-to-date with the technology and with new educational materials was cited by many as critical. More participation by private industry was viewed by many as desirable, as were more displays of hardware and teaching materials.

The question of funding sources for another conference brought some interesting responses, though not very many people had suggestions to make. The suggestions can be summarized as follows:

1. Various professional societies could pool their resources to get enough support

2. Petroleum companies and large equipment companies with interests in remote sensing should be approached for financial assistance as well as for promoting interest in the business world

3. Educational foundations, NSF

4. A United Nations organization could be approached if the conference is expanded to include Third World participants

5. Participants themselves could pay more of the costs through being responsible for providing their own food or by paying a small registration fee.

Of the 74 responses, 34 indicated a willingness to help in the planning of future conference on remote sensing education and another 13 indicated that they might be persuaded to help. The names and addresses of all of them are listed in Appendix F; after each entry, the professional societies with which each is affiliated are indicated as a guide for future planning.

The final question on the evaluation was a broad one that sought to identify the barriers the instructors feel exist to more effective teaching. At the top of the list were lack of equipment for hands-on instruction and lack of information about existing educational and laboratory materials.

Several requests were made for good, inexpensive sets of imagery, with many asking for sets of digital imagery, even registered multi-sensor data. Specific requests for low-cost software that was portable and easily implemented came from many people. Several, too, felt that educational materials and equipment that are available are often too costly for a new program, and this observation led a few to look to private industry for help and others to look to a remote sensing resource network for sharing these items. Another key concern expressed was the instructors' own need to develop more understanding of the fundamentals of the technology and to find effective ways to keep up-to-date.

As a final part of this evaluation section, it is appropriate to quote from the previously cited paper prepared by Dr. Lillesand. Dr. Lillesand's comments go beyond the specific ones addressed above to some more philosophical questions concerning the role educators and educational institutions should be playing in furthering the appropriate use of the technology:

> CORSE-81 was well-planned, well-run, well-attended, and well-liked by all who had the pleasure to attend. It was a first-ever event where remote sensing educators from across the nation could meet in an informal atmosphere and dwell on their favorite topic--education. Representative cross-sections of old-timers and neophytes were able to interact during the conference. In addition to fruitfully discussing the more traditional topics of how to get started in teaching a remote sensing course (or getting your dean to understand you, or getting your hands on good laboratory exercises), the conference highlighted some real needs in remote sensing in general and in remote sensing education in particular.
>
> Among the most evident problems and concerns defined during the conference were the major gaps and fragile linkages in the instructional profile nationwide. It would appear to the critical observer that the system, as currently configured, will not be capable of responding substantially to many existing and propsective resource management problems. For example, when one can count on one hand the number of remote sensing couses offered in an agricultural context, it appears that this might severely limit the role of remote sensing in meeting the needs of global agricultural management. Likewise, the inadequate treatment of land information systems and theory will limit the supply of graduates needed to design, implement, and operate multipurpose cadastral systems. At the same time, how can some 40 percent of accredited forestry programs nationwide lack adquate instruction in remote sensing?
>
> Overall, there is a need to continue support of a data base amenable to analytical assessment of remote sensing and the other mapping sciences. There is a need

to better synthesize these sciences within our institutional programs and technical societies. There is a need to better prepare our students (and ourselves) in both visual and digital image analysis. There is a dire need to facilitate the education of our future remote sensing educators. There is a need to teach more students about remote sensing at all levels, and on a continuing basis. Definition of, and support for, remote sensing research must be greatly improved in many application areas. Finally, there is an extreme need for remote sensing educators, agencies, and industries to get their collective act together. Technologically, we've accomplished a good deal in remote sensing in the recent past. We now have some profound institutional questions before us. The quality of life for future generations may well depend upon how we respond to them.

Not wanting to end on a note of gloom and doom, the author wishes to point out that CORSE-81 established a air of enthusiasm and colleagueship that was refreshing and encouraging. To the person, attendees were appreciative of the roles of NASA, NOAA, and LARS played in this important event. CORSE conferences should be held on a regular basis in the future.

VII. Conclusions and Recommendations

The many evaluations that were returned confirmed the appraisal of those who planned CORSE-81: that the conference was very beneficial for those who attended. Appreciation was expressed on many sides for the role NASA had played in making this conference a reality. The conference was not without its faults, but regardless of these, the overall benefits gained were well worth the cost and effort.

From reviewing the conference as a whole and the evaluations that were submitted, the following recommendations can be drawn:

1. That earnest efforts be made to find a way to hold a national CORSE again, either in 1983 or 1984.

2. That a "continuation committee" be established (or self-appointed) to serve as the coordinating body. Initially it is assumed that this committee must operate on a volunteer, no-expense basis; one of its first priorities should be to locate funding for its own operation.

3. That support and cooperation be sought through the educational committees of professional societies, both for personnel and for funds.

4. That private industry be approached to underwrite conference expenses, perhaps through some of the societies.

5. That tutorial sessions continue to be an important part of the program, perhaps with closer coordination to ensure quality, ascertain level, and access the length relative to material to be covered.

6. That more hands-on experiences and more hardware demonstrations be available.

7. That consideration be given to holding bi-annual regional meetings alternately with national meetings.

8. That a planning committee with national membership review the CORSE-81 reports and evaluations and be used to determine the best conference date, place, and program topics.

It is the intent of the principal investigator on the current contract to pursue, on a voluntary basis, some of the activities to help ensure the continuation of CORSE. The extent of this effort will be determined by the availability of funds and time. Any suggestions from NASA about ways to accomplish this task effectively would be most welcome.

VIII. Acknowledgements

Acknowledgement for significant contribution to CORSE-81 is expressed to all the members of the Planning Committee, in particular to Dr. John Lindenlaub who served as Conference Co-chairman; to Dr. Nicholas Short for conceiving the idea of CORSE-81, locating the funds necessary to make it a reality, and shepherding it through to completion; to Carolyn Pratt who compiled and summarized the evaluations; to Linda Couchon, who coordinated the physical arrangements, housing, and meals; to Dee Dee Dexter who provided clerical support throughout the project; and finally to all who attended, enthusiastically participated in the activities, and willingly shared their ideas and experiences so that others might benefit.

Purdue Hosts Educators' Conference

CORSE-81, Conference on Remote Sensing Education, will be held May 19-21, 1981, at Purdue University. Co-sponsored by NASA and NOAA, the conference is being organized and conducted by the Laboratory for Applications of Remote Sensing (LARS).

The goal of the conference, according to co-chairmen Shirley Davis and John Lindenlaub, is to bring together remote sensing educators from across the country to exchange information on establishing and improving remote sensing curricula in institutions of higher education.

A panel presentation during the opening session will seek to identify the kinds of skills and knowledge that will be needed by those involved in remote sensing in the years ahead. The remainder of the conference will explore ways for education to meet this challenge.

An honest look at resources needed for effective teaching of remote sensing and also at strategies for teaching in various disciplines will lead into concurrent, discipline-oriented sessions where educators can tackle specific problems in small groups. Several presentations and discussions will also address critical questions about obtaining and using digital image-processing capabilities for education.

Since the federal government has long been a supporter of developments in remote sensing, educators attending the conference will hear from and be asked to respond to NASA and NOAA representatives who will discuss the current and future relationship of these governmental agencies to remote sensing education.

Several tutorial workshops will be held in conjunction with the conference. These workshops, on the days preceeding and following the conference, will serve to acquaint relative newcomers with the basics of remote sensing and will

be a means for others to keep abreast of new technological developments. Whenever possible, educational materials used in these workshops will be distributed so that those attending may adapt them for use in their own classes.

Some spaces are still open in the program for presentations that focus on activities in specific disciplines and for poster papers that address any topic related to remote sensing education. Anyone interested in making a presentation should submit a title and a brief description by February 1, 1981, to Shirley Davis, Laboratory for Applications of Remote Sensing, Purdue University, 1220 Potter Drive, West Lafayette, Indiana 47906.

Attendance at CORSE-81 is limited to approximately 200 educators, with room and meals provided for many who attend. Registration information will be available in early February. For additional information contact Shirley Davis.

December 9, 1980

For further information contact: Shirley Davis (317) 749-2052

The 1981 Conference on
Remote Sensing Education

May 18-22, 1981

CORSE-81

Purdue University
West Lafayette, Indiana

A National Conference

Sponsored by NASA and NOAA

CONFERENCE OBJECTIVES

The purpose of CORSE-81 is to bring together remote sensing educators from across the country for fruitful exchange of information and experience in establishing and enhancing remote sensing instruction in institutions of higher education. To meet this objective, the conference planning committee has prepared a program of informative and thought-provoking presentations, interspersed with many opportunities for exchange among all conference participants and presenters, in small groups and large.

The tone of the conference will be informal, to encourage discussion and interaction among participants. Presentations will not focus on research results but on concerns of remote sensing educators. In lieu of published proceedings, summaries of key presentations will be available at the conference and afterwards in a conference report. Participants are urged to bring multiple copies of instructional materials they would like to share or trade with other educators. There will be an opportunity for discipline-oriented review and discussion of some such materials.

Tutorial workshops, before and after the conference, will enable participants to increase their own understanding of the technology and, in addition, to obtain materials and observe educational approaches that may be appropriate for their own courses.

Submitted Papers

Anyone wishing to make a presentation at CORSE-81 should send a description of the paper to the conference chairmen as soon as possible. As many good presentations as time permits will be included in the parallel discussions on Wednesday morning and afternoon. Furthermore a poster session will be held Tuesday evening for important related presentations that do not logically fit into the existing program.

Summaries should be sent soon to win a good place in the program. Those accepted after March 15, 1981, will not be available in multiple copies for distribution at the conference.

Planning Committee

The conference planning committee is composed of the conference co-chairmen, educators from each of the three areas served by NASA's Regional Applications Centers, and the NASA training directors. The committee members are:

John Lindenlaub, Purdue University, co-chairman
Shirley Davis, Purdue University, co-chairman
Thomas Lillesand, University of Minnesota
Edward Martinko, University of Kansas
Ron Marrs, University of Wyoming
Roger Hoffer, Purdue University
Marion Baumgardner, Purdue University
Nicholas Short, NASA, Eastern Regional Remote Sensing Applications Center
Harry Jones, NASA, Western Regional Applications Program
Buddy Atwell, NASA, National Space Technology Laboratories

PROGRAM HIGHLIGHTS

Tuesday Morning, May 19, 1981

Overview of Remote Sensing Education — what it now is and what it needs to become.

Perspective on remote sensing technology
Roger Holmes, General Motors Institute

A university dean's look at remote sensing
Grant Walton, Rutgers University

Report on the status and content of remote sensing education in the U.S.
Richard Dahlberg, Northern Illinois University and
John Jensen, University of Georgia

Panel Discussion: Skills, Needs, and Opportunities in Remote Sensing —a Challenge to the Educational Community
Chairman of Panel: Roger Hoffer, Purdue University
Panel members represent potential employers of today's students and include Robert Porter (Earthsat Corporation), Gary Johnson (Technicolor Graphic Services, Inc.), James Davis (Phillips Petroleum), Robert LeBlond (IDRC, Canada), and Richard Gilbert (USDA).

Tuesday Afternoon, May 19, 1981

Resources and Strategies for Teaching Remote Sensing, Considerations in Course and Curriculum Development.

Survey of instructional materials available for teaching remote sensing
Stanley Morain, University of New Mexico

Equipment and approaches for teaching image interpretation
Joseph Ulliman, University of Idaho

Panel Discussion: Requirements of teaching an interdisciplinary technology, considerations in course design from various discipline perspectives.
Chairman of Panel: Thomas Lillesand, University of Minnesota
Panel members represent the principal educational disciplines where remote sensing is taught. Participants include Marion Baumgardner (Agronomy, Purdue University), Ralph Kiefer (Civil Engineering and Water Resources, University of Wisconsin), Philip Swain (Electrical Engineering, Purdue University), Merle Meyer (Forestry and Range Management, University of Minnesota), John Estes (Geography, University of California, Santa Barbara), and Floyd Sabins (Geology, University of California, Los Angeles).

Wednesday Morning, May 20, 1981

Concurrent discipline-oriented discussion sessions feature submitted papers that pertain to teaching in a specific discipline. Sessions will also include discussion and exchange of laboratory materials that participants bring to share, and inquiry into teaching and research needs and activities. The five concurrent discussions and their chairmen will be:

Agriculture, forestry, and range management — Marion Baumgardner and Merle Meyer

Engineering and water resources — Ralph Kiefer

Geography — John Estes

Geology — Floyd Sabins

Other topics, including interdisciplinary programs — Philip Swain
See Tuesday afternoon panel discussion for specific information on each chairman.

Wednesday Afternoon, May 20, 1981

Low-cost Digital Image Processing for Instruction

A Perspective on low-cost digital image processing
Edward Martinko, University of Kansas

Low-cost digital image processing on a university main frame computer
Lee Williams, University of Kansas

Digital image processing on a microprocessor computer system
Harvey Wagner, EROS Data Center

Digital image processing on a small computer system
Ronald Danielson, University of Santa Clara

Considerations in developing geographic information systems based on low-cost digital image processing
Floyd Henderson and Michael Dobson, State University of New York, Albany

Concurrent discussion sessions on these topics during which realities and practical considerations can be shared. Submitted papers that contribute to these discussions will also be presented.

Thursday Morning, May 21, 1981

The NASA/NOAA Role in Remote Sensing Education

Remote sensing education in NASA's Regional Applications Program
Richard Weinstein, NASA Headquarters
Development of the University of Massachusetts remote sensing program: a grass-roots approach by Kevin Richardson, University of Massachusetts
The University of Kansas Applied Remote Sensing Program: an operational perspective by Edward Martinko, University of Kansas
Oregon Trails Re-Visited by Anthony Lewis, Oregon State University

NOAA report on transition activities; NASA updates on Landsat-D system progress; NOAA operational system products and services options; NOAA retrospective services planning; NOAA concerns about training in remote sensing
NOAA and NASA officials

Sources of support for remote sensing education
John Estes, University of California, Santa Barbara

The NASA University Applications Program
Joseph Vitale, NASA Headquarters

An overview of the future of remote sensing: Landsat-D and the MLA systems
James Welch, NASA Headquarters

Thursday Afternoon, May 21, 1981

During the first part of the afternoon, working groups will be formed and chaired by educators to foster interaction with NOAA representatives on systems and training issues related to operational, earth remote sensing by satellite. These forums will contribute to the on-going dialogue that NOAA is engaging in with non-Federal users of land remote sensing data.

ADDITIONAL ACTIVITIES

Poster presentations that encourage one on-one discussions with other educators.

The Mobile Training Facility developed at NASA/Goddard will be open for half-hour demonstrations of the minicomputer image processing capabilities installed in the van. Demonstrations will be scheduled frequently throughout the week.

A banquet and speaker that will raise our sights from the earth to the planets. Dr. Thomas McCord of the University of Hawaii will provide a visual excursion through the solar system and a look at remote sensing of the planets.

An Open-House at LARS to see facilities and review research in progress.

Exhibit of commercial and educational materials of interest to remote sensing educators.

TUTORIAL WORKSHOPS

From the initial planning for CORSE-81 there was a strong commitment by those involved to offer conference participants a selection of strong tutorial workshops presented by recognized experts. These workshops, of two and three-hour duration, will be offered Monday, May 18, 1981, prior to the opening of the conference, and on Thursday and Friday, May 21 and 22, after the close of the conference.

These workshops serve a two-fold purpose; first they give participants the opportunity to expand their own understanding of specific aspects of remote sensing, and second, they enable participants to observe and experience the educational strategies adopted by other educators in presenting remote sensing topics. To the extent possible, workshop instructors will provide materials appropriate for classroom use by participants.

Workshops are limited to twenty or thirty participants, and pre-registration for the workshops is essential. The Conference Chairmen reserve the right to cancel a workshop for which fewer than five pre-register.

WORKSHOPS OFFERED

1. **Basic Principles of Satellite Remote Sensing** by Dr. Nicholas Short, NASA/Goddard
   Provides an introduction to and overview of the Landsat and related earth-resources satellites, systems and applications. *2 hours, offered twice*
2. **Digital Image Processing Techniques** by Dr. Philip Swain, Purdue University, and Ronald Boyd, Computer Sciences Corporation
   Introduction to the fundamentals of image processing in remote sensing (including image enhancement and analysis), with consideration given to teaching this technology in a multidisciplinary environment. *3 hours, offered twice*
3. **Energy Sources, Spectral Reflection Properties, Atmospheric Effects, and Sensors** by Dr. Thomas Lillesand, University of Minnesota and Dr. Ralph Kiefer, University of Wisconsin
   An introductory-level presentation on the characteristics and behavior of the energy that generates remote sensing data. *3 hours, offered once*
4. **GIS Analysis: An Academic Approach and Experience** by William Campbell, NASA/Goddard; Joseph Berry, Yale University; and Richard Hyde, Butler University
   A presentation on the concepts underlying Geographic Information Systems will lead into in-depth discussions on how to teach GIS analysis and on practical matters in data base development. *3 hours, offered twice*
5. **Acquisition and Use of 35mm Aerial Photography in Instruction and Research** by Dr. Merle Meyer, University of Minnesota
   A brief introduction to cameras, lenses, and filters; followed by a discussion of costs and operational procedures for acquiring photos and handling and processing film. Use of acquired imagery. *2 hours, offered once*
6. **Laboratory-Manual Approach to Remote Sensing Instruction** by Dr. Floyd Sabins, University of California, Los Angeles
   A review and demonstration of a successful technique for training students in image interpretation. This method, based on the use of a laboratory manual, is applicable to all disciplines. Participants will have an opportunity to do an interpretation project in an area of their own interest. *2 hours, offered twice*
   Note: Participants in this workshop will need to purchase laboratory materials and an instructor's key at a cost of $15.00, payable with conference application.
7. **Non-Landsat Remote Sensing from Space** by Dr. Nicholas Short, NASA/Goddard
   Develops a foundation in thermal, microwave and other remote sensing systems, emphasizes results from Seasat, HCMM, Nimbus, and aircraft sensor-simulation programs. *2 hours, offered twice.*
8. **Introduction to Photogrammetry** by Dr. Edward Mikhail, Purdue University
   Broad overview of photogrammetry with a demonstration of stereoplotters and other photogrammetry equipment in the School of Civil Engineering. *2 hours, offered once*
9. **Remote Sensing Field Research** by Dr. Marvin Bauer, Purdue University
   Experiment design, instrumentation, data processing and results of field research on the spectral properties of crops and soils will be discussed. Experiments and data collection at the Purdue Agronomy Farm will be demonstrated. *3 hours, offered once*

APPLICATION FORM

Return to: **Continuing Education Business Office** 2126-C
Room 110, Stewart Center
Purdue University, West Lafayette, IN 47907

Please enroll the following person in the Conference on Remote Sensing Education, May 18-22, 1981. Application deadline April 27, 1981.

Name _____

Address _____

City _____ State _____ Zip _____

Telephone _____

Check type of Application

☐ Type A — if you are a teacher of remote sensing at a U.S. college or university

☐ Type B — if you are an employee of a government agency, private business, or non-U.S. educational institution.

Please state briefly why you qualify as a Type A participant:

_____

Fees enclosed: $10 banquet fee (for Type B) $ _____

$15 lab manual fee (workshop 6) $ _____

Total enclosed $ _____

Make checks payable to Purdue University

Workshops

Please indicate first, second, and third choice workshops in each time block. Applications accepted on a first-come, first-served basis.

Monday, May 18, 1981

9:30-11:30 a.m. ____ 1a. Principles

1:30- 5:00 p.m. ____ 2a. Processing

____ 3. Energy

____ 4a. GIS

7:30- 9:30 p.m. ____ 1b. Principles

____ 5. Photography

____ 6a. Lab Manual*

Thursday, May 21, 1981

3:30-5:30 p.m. ____ 6b. Lab Manual*

____ 7a. Non-Landsat

____ 8. Photogrammetry

7:30-9:30 p.m. ____ 7b. Non-Landsat

Friday, May 22, 1981

8:30-noon ____ 2b. Processing

____ 4b. GIS

____ 9. Field Research

*$15.00 lab materials fee

Housing

Please check preferred accommodations. Per night costs indicated below are payable upon arrival at the Graduate House.

	Type A	Type B
Student (corridor bath)		
Single room	____ no cost	____ $11.66
Double room	____ no cost	____ $ 9.06
Hotel-type (private bath, T.V., phone)		
Single room	____ $12.72	____ $24.38
Double room	____ no cost	____ $14.84

Arrival Date: _____ Departure Date: _____

Roommate preference _____
(roommate requests cannot be honored unless applications are submitted together)

Applications to Attend

A primary purpose of the conference is to bring together those who teach or plan to teach remote sensing in U.S. colleges and universities. Applications to attend CORSE-81 will therefore be accepted first from those who fall into this group. These participants, referred to as Type A, will receive modest, student-type lodging and food at no cost while at Purdue. (Some hotel-type rooms are available at an additional cost). Up to 150 Type A participants will be accepted.

Others wishing to attend (such as employees of government agencies, private businesses, or non-U.S. universities) will be accepted as Type B participants. They are responsible for paying for their own food and lodging, following the cost schedule on the Application Form. Fifty Type B participants can be accepted.

There is no conference registration fee for any attendee.

Please fill in and return the application form before April 27, 1981. Applications received past this deadline may not have housing arrangements guaranteed.

Those whose applications are accepted are urged to notify the Conference Coordinator promptly if they are unable to attend so that their place may be offered to another.

Registration

Registration will take place in Heavilon Hall, Room 002 on Monday, May 18, 1981, from 8:00 a.m.-9:00 p.m., and at Fowler Hall, Stewart Center from 8:00-10:00 a.m. on Tuesday, May 19.

Housing

Housing arrangements will be made for you at the Purdue Graduate Houses. On a first-come, first-served basis, we will assign rooms with the facilities and costs described on the application form. Your accommodations will be confirmed to you before the conference begins. Housing is limited on Sunday evening; Monday arrivals are preferred.

This conference is a Continuing Education Activity of Purdue University, an equal access/equal opportunity university.

Meals

All meals except the banquet will be in the Purdue Memorial Union. There will be an evening banquet on May 20, 1981, for which transportation will be arranged. Type B participants may buy banquet tickets at $10.00, payable with conference application.

Transportation

West Lafayette is 60 miles northwest of Indianapolis and 120 miles southeast of Chicago. Public transportation includes Air Wisconsin Airlines and Greyhound, Trailways, and Indiana Motor Coach bus lines. Air Wisconsin presently serves Lafayettte from Chicago with eight daily flights.

Imperial Travel Service provides bus transportation from the Indianapolis Airport to Purdue, (317) 447-7666.

Exhibitors

Exhibit space for materials and equipment of interest to remote sensing educators will be available to organizations or businesses wishing to display. Exhibit areas will be open all day Tuesday, Wednesday and Thursday in one of the two buildings used for conference activities. There is no charge for exhibiting. Contact Shirley Davis for additional information.

For further information about submitting papers and technical content of conference or workshops contact:

Shirley Davis, Conference Co-Chairman
Laboratory for Applications of Remote Sensing
1220 Potter Drive
West Lafayette, Indiana 47907
(317) 749-2052

For information about housing arrangements, registration and facilities, contact:

Linda Couchon, Conference Coordinator
Conference Administration
Stewart Center
Purdue University
West Lafayette, Indiana 47907
(317) 749-2533

This Conference is supported through funding provided by NASA's Eastern Regional Remote Sensing Center at Goddard Space Flight Center and by NOAA's National Earth Satellite Service (NESS).

Appreciation is expressed to the American Society of Photogrammetry and Remote Sensing for their special assistance in promoting this conference.

The 1981 Conference on Remote Sensing Education

May 18 - 22, 1981

Purdue University
West Lafayette, Indiana

Monday, May 18, 1981

Registration 8:00 am - 9:00 pm, Heavilon Hall, Room 010

9:30 - 11:30 am

Workshop 1a, Heavilon Hall, Room 128
Basic Principles of Satellite Remote Sensing
Nicholas Short, NASA/Goddard

1:30 - 5:00 pm

Workshop 2a, Heavilon Hall, Room 128
Digital Image Processing Techniques
Philip H. Swain, Purdue University and Ronald K. Boyd,
Computer Sciences Corporation

Workshop 3, Heavilon Hall, Room 124
Energy Sources, Spectral Reflection Properties, Atmospheric Effects,
and Sensors
Thomas Lillesand, University of Minnesota and Ralph Kiefer,
University of Wisconsin

Workshop 4a, Heavilon Hall, Room 129
GIS Analysis: An Academic Approach and Experience
William Campbell, NASA/Goddard; Joseph Berry, Yale University; and
Richard Hyde, Butler University

7:30 - 9:30 pm

Workshop 1b, Heavilon Hall, Room 128
Basic Principles of Satellite Remote Sensing
Nicholas Short, NASA/Goddard

Workshop 5, Heavilon Hall, Room 124
Acquisition and Use of 35mm Aerial Photography in Instruction and Research
Merle Meyer, University of Minnesota

Workshop 6a, Heavilon Hall, Room 120
Laboratory-Manual Approach to Remote Sensing Instruction
Floyd Sabins, University of California, Los Angeles

1. Tuesday Morning, May 19, 1981 - Fowler Hall, Stewart Center

Session Chairman: John C. Lindenlaub, Purdue University

8:30 Opening Comments

Welcome to Purdue
Dr. Robert Greenkorn, Vice President & Associate Provost & Vice President for Programs in PRF

8:50 - 10:05 Overview of Remote Sensing Education

Perspective on Remote Sensing Technology
Roger A. Holmes, General Motors Institute

A University Dean's Look at Remote Sensing
Grant Walton, Rutgers University

Report on the Status and Context of Remote Sensing Education in the U.S.
Richard Dahlberg, Northern Illinois University and
John Jensen, University of Georgia

Break

10:30 - 12:00 Panel Discussion: Skills, Needs, and Opportunities in Remote Sensing -- a Challenge to the Educational Community

Chairman of the Panel: Roger Hoffer, Purdue University

J. Robert Porter, Earth Satellite Corporation
Robert LeBlond, IDRC, Canada
James R. Davis, Phillips Petroleum Company
Gary Johnson, Technicolor Graphic Services, Inc.
Richard H. Gilbert, U.S. Department of Agriculture, Soil Conservation Service

Session Chairman: Thomas Lillesand, University of Minnesota

1:00 - 2:15 Resources and Strategies for Teaching Remote Sensing

Survey of Instructional Material for Remote Sensing
Stanley A. Morain, University of New Mexico

Equipment and Approaches for Teaching Visual Image Interpretation
Joseph J. Ulliman, University of Idaho

Break

2:45 - 5:00 Panel Discussion: Requirements of Teaching an Interdisciplinary Technology; Considerations in Course Design from Various Discipline Perspectives

Chairman of the Panel: Thomas Lillesand, University of Minnesota

Agronomy
Marion Baumgardner, Purdue University

Civil Engineering and Water Resources
Ralph Kiefer, University of Wisconsin

Electrical Engineering and Interdisciplinary Programs
Philip Swain, Purdue University

Forestry and Range Management
Merle Meyer, University of Minnesota

Geography
John Estes, University of California, Santa Barbara

Geology
Floyd Sabins, University of California, Los Angeles

3. Tuesday Evening, May 19, 1981 - Heavilon Hall, Room 011

7:30 - 9:30 Poster Session
Session Chairman: Douglas Morrison, Purdue University

Multimedia in Remote Sensing Education
Fred J. Gunther, Computer Sciences Corporation

Remote Sensing - Present and Future
H. H.L. Bloemer, Ohio University

Digital Image Data Sets for Remote Sensing Instruction
J. Ronald Eyton, University of South Carolina

Some Considerations in Low-Cost Image Processing on a University Main Frame. The Penn State (ORSER) Experience
Brian J. Turner, Pennsylvania State University

Ground Photography for Improved Image Interpretation Training
Ray Lougeay, State University College, Geneseo, NY

Project Omega: An Introduction
Joseph M. Kirman, University of Alberta

Characteristics and Advantages of Using Return Beam Images from Landsat 3
Simon Baker, East Carolina University

Low-Cost Digital Image Processing at the University of Oklahoma
John Harrington, University of Oklahoma

Customized Short Courses in Remote Sensing
Shirley Davis and Luis Bartolucci, Purdue University

Remote Sensing of the Environment: Course Objective
Olin Mintzer and John Ray, Ohio State University

Landsat Technology Transfer to the Private & Public Sector through Community Colleges and Other Locally Available Institutions
Robert Rogers, Environmental Research Institute of Michigan;
Elaine Wallace, Wayne Community College
Robert Karowski, Michigan Planning and Development Commission
Eugene Jaworski, Eastern Michigan University

Performing and Updating an Inventory of Oregon's Expanding Irrigated Agricultural Lands
Madeline J. Hall, Oregon State University
(Presented by Anthony Lewis)

8:30 - 11:30 Five concurrent discipline-oriented discussion workshop sessions that focus on resources and strategies for teaching remote sensing.

Session IV.a - Heavilon Hall, Room 111
Chairmen: Marion Baumgardner, Purdue University, and Merle Meyer, University of Minnesota

Topic: Agriculture, Forestry, and Range Management

Contributors:
David Lusch, Michigan State University

Session IV.b - Heavilon Hall, Room 124
Chairman: Ralph Kiefer, University of Wisconsin

Topic: Engineering and Water Resources

Contributors:
Warren Philipson and Ta Liang, Cornell University
Robert Ragan, University of Maryland, and
J. Alan Royal, General Electric Company
Jack Hill, Louisiana State University
Harold Rib, U.S. Department of Transportation

Session IV.c - Heavilon Hall, Room 126
Chairman: John Estes, University of California, Santa Barbara

Topic: Geography

Contributors:
Arthur Hawley, University of North Carolina at Chapel Hill
Noel Ring, University of Lowell
Aulis Lind, University of Vermont
Paul Baumann, State University of New York at Oneonta
John Bounds, Sam Houston State University
Samuel Goward, Tina Cary, and Helene Wilson, Columbia University

Session IV.d - Heavilon Hall, Room 128
Chairman: Floyd Sabins, University of California at Los Angeles

Topic: Geology

Contributors:
R.W. Blair, Jr., Fort Lewis College
Kenneth Kolm, South Dakota School of Mines and Technology

(continued)

Session IV.e - Heavilon Hall, Room 129
Chairman: Philip Swain, Purdue University

Topic: Interdisciplinary Programs

Contributors:
Peter Murtha, University of British Columbia
Wayne Myers, Pennsylvania State University
Roy Chung, University of Northern Iowa
Roy Welch, University of Georgia

5. Wednesday Afternoon and Evening, May 20, 1981 - Fowler Hall, Stewart Center

Session Chairman: Edward Martinko, University of Kansas

1:00 - 3:00

A Perspective on Low-Cost Digital Image Processing
Edward Martinko, University of Kansas

Low-Cost Digital Image Processing on a University Main-Frame Computer
Lee Williams, University of Kansas

Microprocessor-Based Image Analysis Systems
Harvey Wagner, Technicolor Graphic Services, Inc, EROS

Digital Image Processing on a Small Computer System
Ronald Danielson, University of Santa Clara

Considerations in Developing Geographic Information Systems Based on Low-Cost Digital Image Processing
Floyd Henderson and Michael Dobson, State University of New York at Albany

Break

3:30 - 5:00 Four parallel discussion session related to above topics will focus on practical considerations of these approaches.

Session V.a - Heavilon Hall, Room 111
Chairman: Lee Williams, University of Kansas

Topic: Experiences in the Implementation of Image Processing for Instruction on a University Main Frame

Contributors:
John R. Jensen, University of Georgia
J. Ronald Eyton, University of South Carolina
Brian J. Turner, Pennsylvania State University
Robert Rogers, ERIM

Session V.b - Heavilon Hall, Room 126
Chairman: Harvey Wagner, Technicolor Graphic Services, Inc.

Topic: Experience with Digital Image Processing on a Microprocessor System

Contributors:
Fred J. Gunther, Computer Sciences Corporation
Kenneth Green, Howard University
Dwight D. Egbert, Egbert Scientific Software

(Continued)

Session V.c - Heavilon Hall, Room 128
Chairman: Ronald Danielson, University of Santa Clara

Topic: Digital Image Processing on a Small Computer System

Contributors:
Neil Weber, Murray State University
Ron Danielson, University of Santa Clara

Session V.d - Heavilon Hall, Room 129
Chairmen: Floyd Henderson and Michael Dobson, State University of New York at Albany

Topic: Geographic Information System Considerations for Low-Cost Digital Image Processing

Contributors:
Francis Conant, Hunter College
Roger Miller, University of Minnesota
Nicholas Faust, Georgia Institute of Technology

OPEN HOUSE AT LARS

4:30 - 6:00 pm

Flex Lab 2, 1292 Cumberland Road

Buses to LARS will leave from the West door of Stewart Center between 4:30 and 5:15.

5:30 Social Hour and Banquet

The Trails
325 Burnett Road, Lafayette

A presentation on planetary remote sensing will be given by Dr. Thomas McCord, Hawaii Institute of Geophysics, University of Hawaii.

Buses to The Trails will leave LARS between 5:15 and 6:00; one bus will leave Stewart Center (West Door) at 5:45 and go directly to the Trails.

Bus transportation will be provided at the close of the banquet for the return trip to Campus.

6. Thursday Morning, May 21, 1981 - Fowler Hall, Stewart Center

Session Chairman: Nicholas Short, NASA/ERRSAC

8:30 - 10:05 NASA's Role in Remote Sensing Education

Remote Sensing Education in NASA's Technology Transfer Program
Richard Weinstein, Manager of Regional Remote Sensing Application Program, NASA Headquarters

Development of the University of Massachusetts Remote Sensing Program: A Grass-Roots Approach
Kevin Richardson, University of Massachusetts

The University of Kansas Applied Remote Sensing Program: an Operational Perspective
Edward Martinko, University of Kansas

Oregon Trails Re-Visited
Anthony Lewis, Oregon State University

Sources of Support for Remote Sensing Education
John Estes, University of California, Santa Barbara

Break

10:35 - 11:45 NOAA's Role in Remote Sensing Education

The Status and Outlook for NASA's Land Remote Sensing Program
Richard Weinstein, Manager of Regional Remote Sensing Application Program, NASA Headquarters

The Outlook for the NOAA Operational Landsat Program
Harold W. Yates, Director, Office of Research, NOAA

The Department of the Interior EROS Data Center Assessment
Russell Pohl, Chief of Data Production, EROS Data Center

The Survey of the Landsat Data User's Needs
Daniel Cotter, Acting Director of User Affairs Office

7. Thursday Afternoon, May 21, 1981 - Fowler Hall, Stewart Center

Session Chairman: Nicholas Short, NASA/ERRSAC

1:00 - 2:30 Panel Discussion: Remote Sensing--The Shape of the Future

Western Regional Applications Program
Donald Schwarz, San Jose State University

Eastern Regional Remote Sensing Applications Center
Richard Hill-Rowley, Michigan State University

Earth Resources Laboratory
Roy Welch, University of Georgia

Geosat Committee
Frederick B. Henderson, San Francisco

Break

3:00 - 5:00

Workshop 6b, Heavilon Hall, Room 120
Laboratory-Manual Approach to Remote Sensing Instruction
Floyd Sabins, University of California, Los Angeles

Workshop 7a, Heavilon Hall, Room 128
Non-Landsat Remote Sensing from Space
Nicholas Short, NASA/Goddard

Workshop 8a, Civil Engineering Building, Room 123
Introduction to Photogrammetry
Edward Mikhail, Purdue University

Thursday Evening, May 21, 1981

7:30 - 9:30 pm

Workshop 6c, Heavilon Hall, Room 120
Laboratory-Manual Approach to Remote Sensing Instruction
Floyd Sabins, University of California, Los Angeles

Workshop 7b, Heavilon Hall, Room 128
Non-Landsat Remote Sensing from Space
Nicholas Short, NASA/Goddard

Workshop 8b, Civil Engineering Bldg, Room 123
Introduction to Photogrammetry
Edward Mikhail, Purdue University

Friday, May 22, 1981

8:30 - 12:00 noon

Workshop 2b, Heavilon Hall, Room 128
Digital Image Processing Techniques
Philip Swain, Purdue University and Ronald Boyd, Computer Sciences Corporation

Workshop 4b, Heavilon Hall, Room 129
GIS Analysis: An Academic Approach and Experience
William Campbell, NASA/Goddard; Joseph Berry, Yale University; and Richard Hyde, Butler University

Workshop 9, Heavilon Hall, Room 124
Remote Sensing Field Research
Marvin Bauer, Purdue University

(This workshop includes a visit to the Purdue Agronomy Farm.)

Appendix D: Table of Contents for Conference Report

Table of Contents

CORSE-81

NASA The 1981 Conference On Remote Sensing Education

We would like to have your opinions---

Please take a minute to answer the following questions related to CORSE-81. Many people are hoping for another such conference in the future, but we need your thoughts now to focus the efforts effectively. Please return this questionnaire to me at the address below by July 15, 1981.

Shirley M. Davis

1. What aspects of CORSE-81 did you especially like?

2. What aspects of CORSE-81 were disappointing to you? (Please be as specific as possible.)

3. On a grading scale of A to D, how would you rate the conference overall?___

4. Do you think there should be another CORSE?_____

   If yes, when?_____What time of year?_____Where?_____

   What features would you especially like to see included?

   Are you aware of any sources of funds that could be tapped to support this effort?

   Would you like to participate in planning the next CORSE?

The Laboratory for Applications of Remote Sensing
1220 Potter Drive, West Lafayette, IN 47906

5. What professional societies do you belong to? (Put a * next to any in which you have held a national position.)

6. What is your current job title?_____

7. If you are a remote sensing educator (or plan to be), what do you perceive to be your greatest needs for improving your remote sensing courses?

Thank you very much for your help. Your name below is optional, but having it would be helpful to us. Additional comments are below.

Name_____Phone_____

Address_____

Appendix F

Participants offering to help plan a future conference.

An * next to person's name means he or she is eager and willing to help.
An * by professional societies means a national position was held.
A directory to professional societies follows.

Robert Arnold
27 Burroughs Street
Danvers, MA 01923
617-745-0556 Ext. 304 (Office
617-777-3831 (home)
ACSM, ASP

Paul R. Baumann
Dept. of Geography
State Univ. of New York
Oneonta, NY 13820
607-431-3150
ACSM, AGS, ASP, AAG, URISA

Joseph Berry
107 Lincoln Street
Hamden, CT 06518
203-436-4729
Yale School of Forestry
205 Prospect Street
New Haven, CT 06511
ASCM, *ASP, SAF

Ron Boyd
509 Joy Circle
Glen Burnie, MD 21061
301-768-6698
ASP

James Centorino
71 Columbus Ave
Salem, MA 01970
617-745-0556 Ext. 304
Salem State College
Salem, MA 01970
AMS, MME, NGS, NMEA, OS

*Percy H. Dougherty
Geography Department
University of Cincinnati
Cincinnati, OH 45221
513-475-3421
AAG, NCGE

*Ronald Eyton
1800 Highbrook
Columbia, SC 29210
814-865-3433
Pennsylvania State University
302 Walker Building
University Park, PA 16802

Jack Ford
Shippensburg St. College
Dept. of Geog./Earth Science
Shippensburg, PA 17257
717-532-1548
APA, AAG, NCGE

Dr. Ken Green, Project Coord.
IMAGES
National Zoo
Washington, DC 20008
202-673-4749

Fred Gunther
CSC/ c/o NASA-GSFC 902.1
Greenbelt, MD 20771
301-344-5155
AAAS, ASP, IEEE

Maurice Hackett
College Garden Apts.
Apt. 86
Maryville, MO 64468
816-582-7141
Northwest Missouri State Univ.
Geography-Geology
Maryville, MO 64468
ASP, AAG, NCGE

Vern Harnapp
Univ. of Akron
Dept. of Geography
Akron, OH 44325
216-375-7620
AAG, CLAG, NCGE

Jasper Harris
2608 Bexley Ave
Durham, NC 27707
919-683-6233
North Carolina Central Univ.
Dept. of Geography
Durham, NC 27707
AAG

Floyd M. Henderson
Dept. of Geography
State Univ. of NY/Albany
Albany, NY 12222
518-457-8683
ASP, AAG, IEEE, RSS

James Henry
University of Florida
Dept. of Geography
Gainesville, FL 32611
904-392-0494

Robert Howe
Dept. of Geog. & Geology
Indiana State University
Terre Haute, IN 47809
812-232-6311
ASPG, ASP, GSA, NAGT, SEPM

Joseph Kasile
3725 Seaford Drive
Columbus, OH 43220
614-422-2816
Ohio State University
2001 Fyffe Court
Columbus, Ohio 43210
*ASA, ASP, OAS

Anthony J. Lewis
ERSAL/Oregon State Univ.
Corvallis, OR 97331
503-754-3056
ASP, AAG, GSA

Aulis Lind
Dept. of Geog.
Old Mill 112
Remote Sensing Lab
Burlington, VT 05405
802-656-3060
AAA, AMQUA, ASP, NCGE

Ray Lougeay
Dept. of Geography
State University College
Geneseo, NY 14454
716-245-5238
AAAS, AMS, ASP, *AAG, *NCGE

**David Lusch
328 N. Hayford Ave
Lansing, MI 48912
517-353-7195
Center for Remote Sensing
201 UPLA Building
Michigan State University
East Lansing, MI 48824
ASP

Edward A. Martinko
University of Kansas
Space Technology Center
Lawrence, KS 66045
913-864-4775
ASP, ECSA, ENSA

Roger McCoy
1134 East 7th South
Salt Lake City, UT 84102
801-581-6500
University of Utah
Dept. of Geography
Salt Lake City, UT 84102
*ASP, *AAG

Olin Mintzer
2070 Neil Ave
Columbus, OH 43210
614-422-6889
ASCE, ASP

*Hazel Morrow-Jones
665 Manhattan Dr.
No. 214
Boulder, CO 80303
303-492-8642 (Office
303-494-8857 (Home)
Campus Box 260
Geography Dept.
University of Colorado
Boulder, CO 80309
AREUEA, ASP, AAG, PAA

Richard Phelps
15643 Pear Haven
Houston, TX 77062
718-749-4741
ACSM, ASCE, ASEE, NSPE

Kevin Richardson
50 Cottage Street
Amherst, MA 01002
413-549-6512
ASP, ECSA

Robert H. Rogers
ERIM
P.O. Box 8618
Ann Arbor, MI 48107
313-994-1200 Ext. 319
*ASP

*David E. Schwarz
DFSOG
U.S. Air Force Academy, CO 80840
303-472-2557
ASP, *AAG, NCGE

Mohan Shrestha
c/o Bowling Green State
Dept. of Geography
Bowling Green, OH 43403
419-372-2845 (or 2926)
AAG

Dr. Y. S. Soong
Millersville St. College
Dept. of Earth Sciences
Millersville, PA 17551
717-872-2442
AMS

Stephen Sperry
Ohio State Univ.
Dept. Landscape Architecture
Columbus, OH 43212
614-422-8263
ASLA

Carol Ulch
6012 N. Imperial Apt 104
Peoria, IL 61614
309-676-7611 Ext. 462
Bradley University
Peoria, IL 61625
AAG, NCGE

Gary Whiteford
FAC of Education
University of New Brunswick
P.O. Box 4400
Fredericton, New Brunswick E3B 5A3
Canada
CAG, NCGE

Edmund Woods
5 Rene Dr.
Spencerport, NY 14559
716-395-2647
SUNY College
Geography Dept.
Brockport, NY 14420
ASP, AAG

Participants indicating a possible willingness to help

Dr. Simon Baker
East Carolina Univ.
Dept. of Geography
Greenville, NC 27834
919-757-6230
ASP, AAG

Thomas Baucom
Rt 1, Box 26
Jacksonville, AL 36265
205-435-9820 Ext. 232
Dept. of Geography
Jscksonville State Univ.
Jacksonville, AL 36265
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Professional Societies Represented

AAAS-American Association for the Advancement of Science
AAG-Association of American Geographers
AAPG-American Association of Petroleum Geologists
ACS-American Chemical Society
ACSM-American Congress on Surveying and Mapping
AGU-American Geophysical Union
AMQUE-American Quarternary Association
AMS-American Meteorological Society
APA-American Planning Association
AREUEA-American Real Estate and Urban Economics Association
ASA-American Statistical Association
ASAG-American Society of Agronomy
ASCE-American Society of Civil Engineers
ASEE-American Society of Engineering Education
ASLA-American Society of Landscape Architects
ASP-American Society of Photogrammetry
BCS-British Cartographic Society
BPS-British Photogrammetric Society
CAG-Canadian Association of Geographers
CCS-Canadian Cartographic Society
CLAG-Conference of Latin Americanist Geographers
ECSA-Ecological Society of America
ENSA-Entomological Society of America
GSA-Geological Society of America
IEEE-Institute of Electrical & Electronics Engineers
ISPRS-International Society of Photogrammetry & Remote Sensing
MME-Massachusetts Marine Educators
MTS-Marine Technology Society
NAGT-National Association of Geology Teachers
NCGE-National Council for Geographic Education
NGS-National Geographic Society
NMEA-National Marine Education Association
NSPE-National Society of Professional Engineers
OAS-Ohio Academy of Science
OS-Oceanic Society
PAA-Population Association of America
RSS-Remote Sensing Society
SAF-Society of American Foresters
SCSA-Soil Conservation of America
SEPM-Society of Economic Paleontologists and Mineralogists
SPIE-Society of Photooptical Instrumentation Engineers
SSSA-Soil Science Society of America
TRB-Transportation research Board
URISA-Urban and Regional Information Systems Association