

Reprinted from

**Symposium on
Machine Processing of
Remotely Sensed Data**

June 29 - July 1, 1976

The Laboratory for Applications of
Remote Sensing

Purdue University
West Lafayette
Indiana

IEEE Catalog No.
76CH1103-1 MPRSD

Copyright © 1976 IEEE
The Institute of Electrical and Electronics Engineers, Inc.

Copyright © 2004 IEEE. This material is provided with permission of the IEEE. Such permission of the IEEE does not in any way imply IEEE endorsement of any of the products or services of the Purdue Research Foundation/University. Internal or personal use of this material is permitted. However, permission to reprint/republish this material for advertising or promotional purposes or for creating new collective works for resale or redistribution must be obtained from the IEEE by writing to pubs-permissions@ieee.org.

By choosing to view this document, you agree to all provisions of the copyright laws protecting it.

NEEDED: A BETTER APPROACH TO STATE AND FEDERAL AGENCIES

Chris J. Johannsen

State Extension Agronomy Specialist - Land Use
University of Missouri, Columbia, Missouri

INTRODUCTION

Remote sensing projects in Missouri were conducted by several state agencies, the University of Missouri, the University of Kansas, and several federal agencies during the 60's. Many used aerial photography before that time period. During the 70's, remote sensing efforts continued among the participants but with better communication and coordination.

The Missouri approach is not unusual. Basically we have been attempting to teach state and federal agency personnel how to use aerial photography and space images to assist them with their work. Research efforts have been closely tied to the needs of the user with actual involvement in the research.

Researchers in most disciplines are becoming more aware that the user has an interest in output. Remote sensing researchers need to consider the users interest and problems, especially when working with agency personnel. Too often in the past, the researcher has provided a completed product to the user and said "I bet you can use this." It has become more apparent that with this approach, the researcher does not solve the problem but in fact becomes part of it.

BACKGROUND

Missouri's history concerning the output of remote sensing projects is typical of many states. Research grants were received and projects were conducted with final reports sent to the sponsoring agency. Little coordination or communication of the effort was made between agencies because of distance, organizational structures and many other factors which are all too familiar.

In 1972, a preliminary assessment of aerial photography coverage within the state showed some duplication of effort and lack of communication of the existence of aerial photography among state agencies. A Governor's Committee on Remote Sensing was formed with all state agencies who use remote sensing products as participants. The Governor charged the committee with the responsibility of reviewing the remote sensing efforts in the state

and asked for a plan to coordinate remote sensing activities in the future.

After three months of biweekly meetings, it was concluded by the participants that they not only lacked information about remote sensing concerning each others activities but there were technical data and information that could be shared. The name of the committee was changed to the Governor's Committee on Technical Data Sharing and the discussions continued. Personnel from other states who were facing these same problems were invited to meet with the committee and discuss their programs. Programs of the different participants were reviewed and discussed.

Reorganization of state government occurred at this time and the committee emerged as the Inter-agency Council on Natural Resources Data Sharing. Natural resources seemed to be the common focal point of most of the participants. An effort was made to determine the sources of information of all natural and cultural features pertaining to natural resources.

The council was not without controversy. Discussions went back to discussing our objectives, membership, voting rights, etc which included almost everything but remote sensing. However the central theme and spirit prevailed and now has emerged into the Interdepartmental Council on Natural Resources Information.

THE COUNCIL

The council functions primarily as a board of directors for the department heads of the different state agencies that have an interest in natural resources. It defines areas of concern and develops project plans but does not become task oriented. There are three major committees which are the Mapping Advisory Committee, the Remote Sensing Applications Committee and the Natural Resources Information System Committee. The latter group being concerned with catalog of data sources, geocoding, and EDP systems.

The Remote Sensing Applications Committee is studying the need for and the scope of a state remote sensing information center and will coordi-

nate research efforts of the state departments and the universities. This committee will also attempt to develop a coordination of obtaining remote sensing imagery and aerial photography in the future in order to avoid duplication of effort and expense and to coordinate or assist in the use of these materials.

REMOTE SENSING EFFORTS

Educational Activities

Several conferences and workshops on remote sensing were encouraged by the council and conducted by the University of Missouri. The conferences were primarily designed to present an overview of remote sensing and to illustrate the different applications that might be made of the technology. Representatives from state and federal agencies participated.

The workshops provided "hands on" experience to those individuals who were seriously considering the use of remote sensing in their work. The participants are taught how to plan a remote sensing mission, asked to plan a project for their discipline using remote sensing images and taught how to use different types of photography, photographic scales and images in accomplishing their project. A packet of photography and images obtained at different altitudes, different types of cameras, different seasons of the year and many other variables were accumulated for a specific study site.

Workshops have been planned to work specifically with planning organizations, extension personnel and selected interested groups. These workshops are made possible through a NASA grant, Extension Division programs and the University teaching program.

Forest Cover Mapping

The Forestry Division of the Department of Conservation pursued a project in the northwestern portion of Missouri to develop a map showing the forest cover area for a seven million acre project area. This area is not the traditional forest area of the state but contains many woodlots and grouping of trees along streams. Copies of ERTS and Skylab images were used with a variety of interpretative techniques and enhancements for identifying the forest cover. Copies of Agricultural Stabilization Conservation Service photography were used as ground truth.

Procedures were also developed to determine the management levels of these forested areas. Indication of forest land erosion was obtained by special ground control checks. The suitability of the different timber classes for wildlife production was determined by a conservation biologist.¹

General Soil Map

One of the participants in one of the remote sensing conferences was a soil scientist with the Soil Conservation Service. He became interested in the possibility of delineating soils on the satel-

lite images. He explored the possibility of using digitized tapes and the LARSYS program to accomplish the task. The Soil Conservation Service through a contact with the Laboratory for Applications of Remote Sensing (LARS) has been researching the feasibility of developing a semi-detailed soil map for Central Missouri.

A more generalized soil map of the state is being developed using black and white images of band five to distinguish topographic and physiographic features depicting soil differences. Similar products have been completed in other states and have been found to be extremely useful for general planning functions.

Photographic Index

The Interdepartment Council identified that there was a need for knowing what photography had been flown for all locations within the state. This effort was accomplished through a grant from the Rural Development Center of the University of Missouri.² This photographic index contains a series of regional planning maps of the state with an accompanying listing of all the available federal, state and private photography that has been flown. Separate state maps were included to show the coverage of Landsat and Skylab flights.

To assist the users in obtaining photography, information was provided on how to obtain copies from each of the different agencies or organizations. Additionally, listings of photography held within the state were provided in the appendix. This index is very valuable to use in workshops in showing users what photography is actually available for their specific locations.

Even though the index is dated, the effort has shown the amount of photography that has been collected and will likely stimulate the use of more of our existing photography. Efforts are now underway to digitize the maps so that future requests for photography can be fulfilled on a request basis. The index can also be updated by entering new photography flown into the computer system.

A BETTER APPROACH

The Missouri approach to the use of remote sensing products may not be optimal. However, the user has been kept in the forefront of the efforts so that the user can direct the approach and therefore the quality of the products.

It has been obvious that users have different needs. In fact, it may be difficult to find two users that have exactly the same needs. Two foresters, for example, may be interested in a map showing forest cover of an area. But one of the foresters may be interested in the total area of hardwoods while the other is interested in the erosion potential of the forest sites.

We need to remember that satellite images cannot replace aerial photography. They do give us a regional perspective and the images can be rapidly obtained (some users will debate that point).

Additionally, the real value comes in the repetitive coverage that is obtained at the same scale over the same location. This will ultimately be the primary benefit to most users, especially those users which still are to be brought on board.

There probably isn't one correct approach for all users. However, experience has shown us that the user who has become acquainted with the use and interpretation of aerial photography will have a better appreciation for the use of satellite images. The progression from aerial photography to space images seems to be a natural one and can be accomplished with little difficulty. It would appear that discussions of the use of automatic data processing with that user at this stage appears more feasible. The use of machine processing is more readily understood by the individual that is familiar with the product but wants it done much more rapidly and in many cases more accurately.

References:

1. Anderson, Robert. 1975. Procedures for the Grand Platte River Basin Multi-Objective Land Use Planning Study. Missouri Department of Conservation. 76 pp.
2. Barney, T. W. and Chris J. Johannsen. 1976. Index to Aerial and Space Photographic Coverage of Missouri. Extension Division Publication M 102. University of Missouri-Columbia. 114 pp.