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NATURAL RESOURCES INVENTORY AND LAND EVALUATION IN SWITZERLAND

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Principal Investigator:

Prof. Dr. Harold HAEFNER  
Department of Geography  
University of Zurich  
  
Blümlisalpstrasse 10  
8006 Zurich  
Switzerland

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## 1. INTRODUCTION

The reporting period may be characterized primarily by a successful effort to better coordinate all the different groups engaged in remote sensing in the area of Zurich for a better use of the available hardware. Therefore the main activities were in digital preprocessing of the data. In addition new classifiers were implemented for different systems and evaluated for different purposes.

## 2. ACCOMPLISHMENTS

### 2.1 Data processing

At present three groups are actively engaged in digital processing of satellite data in Zurich, having various hardware at their disposition:

Dept. of Photography, Swiss Federal Institute of Technoloy (Prof. Berg/Dr. Seidel):

- CDC 6400/6500
- Photomation P 1700
- Quantimet

Dept. of Geography, Swiss Federal Institute of Technoloy (Prof. Steiner):

- CDC 6400/6500
- PDP-11/40 combined with RAMTEK-disply system (to be ready in July 1976)

Dept. of Geography, University of Zurich (Prof. Haefner/Dr. Itten):

- IBM 370/155

For a better communication and exchange of data between the different groups and their various preprocessing functions for an easier application of the data in the different instruments a single uniform format for image data files was created. The data may be of variable origin, such as LANDSAT, Skylab-EREP-S-192, Multispectral Scanners ( $M^2S$ ) etc. A comprehensive study on these aspects was published by SEIDEL (Chap. 3). The following activities were undertaken:

CDC 6400/6500: Adaptation of all "PHOTOS"-programs to the new data format

Photomation 1700: Fig. 1 shows a graph of various parts combined in the photomation system at present.

The controlling software was enlarged and improved, especially in respect to a more simple and consumer-oriented manipulation of the system and to a more sophisticated radiometrically as well as geometrically corrected output of the classified data in form of photographic, maplike pictures. It is possible now to directly

- select any part out of a frame
- to reproduce this part in a linear or none linear fashion
- to influence the grayscale reproduction (MTF)
- to create a grid system on the image.

In addition there are options included to analyse the image data and to facilitate the use of the system, such as

- histograms of a magnetic tape file (e.g. for an optimal tone reproduction)
- input and editing capabilities of the transference characteristic in tabulation form
- adding of synthetic information on the output film for controlling and identification purposes, such as step wedge (SW), registration and location marks (KR); text in alphanumeric form (LT).

For the extraction of the data a parallel epiped classifier was adapted. The class boundaries can be directly introduced for each channel. Therefore we have the possibility to directly extract the information and present the results in pictorial form without using the big computers. This procedure has great economical advantages when classifying large areas. It is justified when based on a thorough statistical evaluation of the samples.

IBM 370/155: A new software system was composed for the preprocessing of the various data and for the feature extraction, including the following main steps:

- programs for reformatting, printing and statistical analysis of the data in batch mode
- classification program (PPD) with output options on the photomation system
- other existing classifiers include A-Class, D-Class, D-Clus from the Penstate-ORSER system.
- interactive image information system (IBIS) with time sharing option (TSO) for step wedge reproduction, statistical information, PPD-classification. The system is easy to operate thus user oriented.

## 2.2 Measurement of spectral reflectance of snow

The measurements on snow with an EXOTECH-100 from the ground and from a helicopter were completed. The results were processed and interpreted. They will be published in a forthcoming M.A. thesis (Chap. 3).

## 3. PUBLICATIONS

SEIDEL, K.: Digitale Bildverarbeitung. Techn. Bericht, Photogr. Institut ETH, Zürich, 1976 (in print).

STAENZ, K.: Radiometrische Untersuchungen über das Reflexionsverhalten von Schnee. M.A. Thesis, Dept. of Geography, Univ. of Zurich, 1976 (unpublished).

Fig. 1 Photomation 1700 system at the Department of Photography, Swiss Federal Institute of Technology, Zurich, with peripheral equipment available at present

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