Title of Investigation: 28990

Investigation of Environmental Change Pattern in JAPAN



Principal Investigator: Takakazu MARUYASU
Science University of Tokyo
Noda City, Chiba ken,278, JAPAN

August 16, 1976

Quarterly Progress Report for period

April-June 1976

Name and Address of National Sponcering Agency: Science and Technology Agency
Kasumigaseki 2-2-1 Chiyodaku
Tokyo, 100, JAPAN

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of Resources.

Kiyoshi TSUCHIYA
National Space Development Agency of JAPAN

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Section Chief of Management Technology,Forest
Experiment Station,Forest Agency

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Tokyo, 100, JAPAN

Subject

1. Investigation of Soil Erosion in Hokkaido which is caused by Thawing of Soil Water in Late Spring

Co-Investigator: Shigechika HAYASHI
Upland Farming Division,
National Agricultural Experiment Station,
Memuro, Hokkaido, 082, JAPAN

## 1. Introduction.

This paper reports the results of the study about the analysis of the changes occured in the fields of Tokachi district, where we regarded as the test site of this study, using photographic treatment and the density slicing instruments.

This study was performed by following members: Michikazu Fukuhara of Upland Farming Division, Hokkaido National Agricultural Experiment Station, Yoshizumi Yasuda and Yasubumi Emori of Institute of Color Technology, Faculty of Engineering, Chiba University.

## 2. Techniques.

B &W bulk positives of 4, 5, 7 bands in the two scenes of LANDSAT data, the one obtained on 11 June 1975, the other, 24 May 1973, were prepared.

After they were enlarged to 1:200,000 scale, the ratio images of 1975/1973 of each band were made.

These images were analysed using slicing instrument (GRAF-COLOR 905), and the color-coded density maps obtained were interpreted.

## 3. Accomplishment.

1975/1973 ratio images are shown in photo-1 (band 4), photo-2 (band 5) and photo-3 (band 7). In these prints, the red colored portion indicates the increased reflectance, blue-colored, the decreased.

Pattern ; expressed in the prints of the color-coded maps are considered to be classified as follows:

1). The place where land management changed. For instance, the places where were allowed fallow in 1973 and became planted in 1975 (photo-3 ~~blue~~ red parts).

2). Seasonal variation of begetation. In natural or grazed grasslands, the ground surface is covered with dead grass in May, but in June, it is covered with vigorously grown grass (photo-1 blue, photo-2 blue).

3). Apparent change caused by difference of relative reflectance among objects in images. River beds or street area where no vegetation is seen (photo-1 red). Alluvial soils or volcanic ash soils mixed with subsoils (photo-2 red).

4). The part difficult to interprete (photo-3 blue).

4. Conclusion.

Multidate analysis of LANDSAT data was tested using ratio image method. As by this method, many informations have been obtained which cannot be obtained by means of single scene analysis, this method is expected to have ~~great~~ many possibility to interprete the imageries of agricultural fields which show large annual fluctuation.

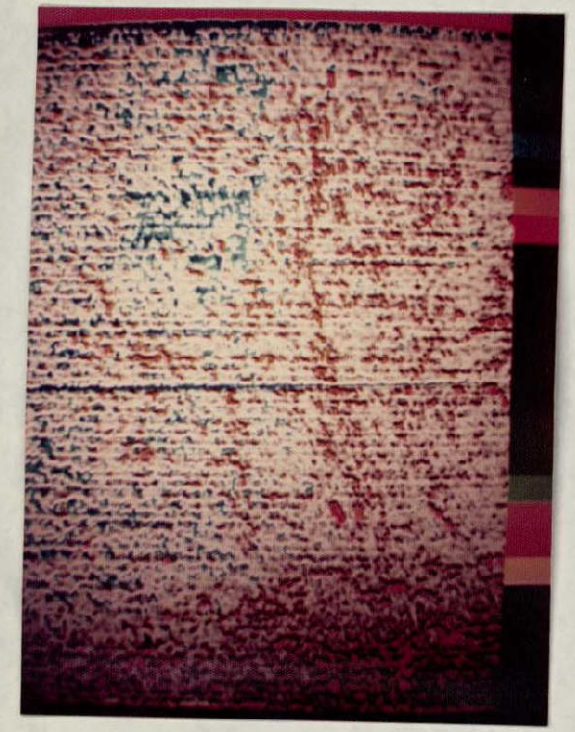

Photo.-1

(BAND 4)

Photo.-2

(BAND 5)

Photo.-3

(BAND 7)

1975/1973 ratio imges.

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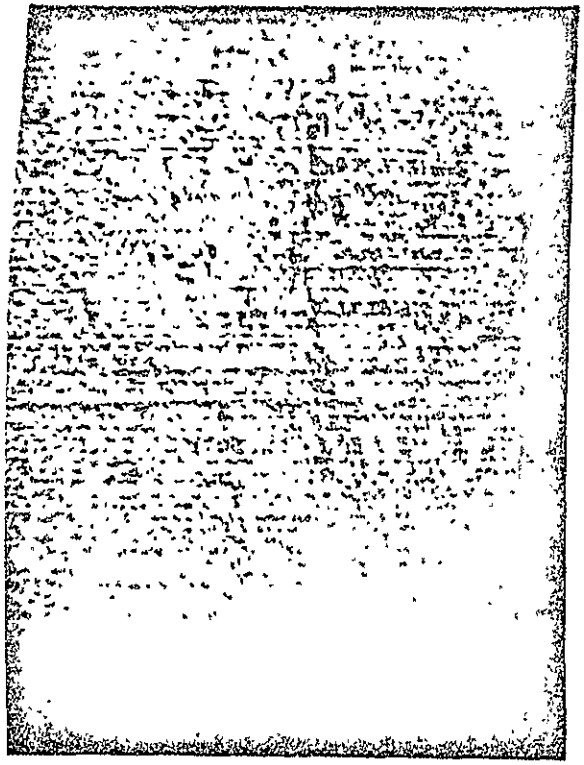

Photo.-1

(BAND 4)

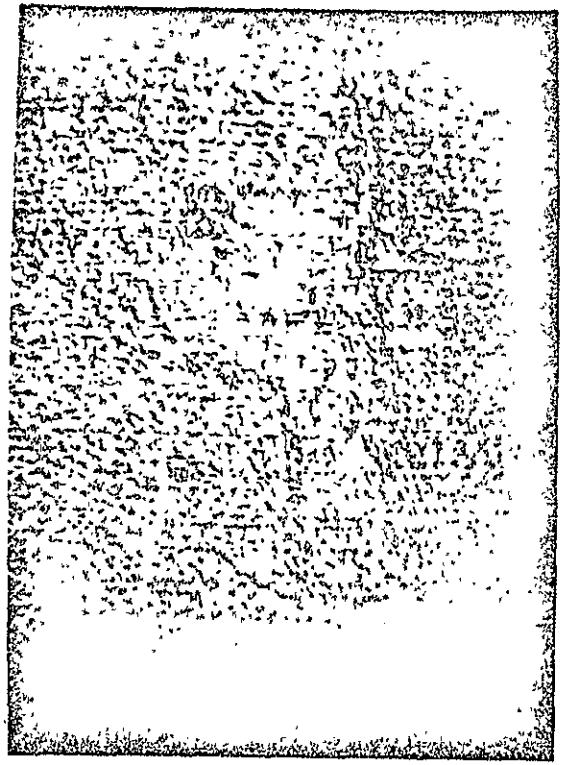

Photo.-2

(BAND 5)

Photo.-3

(BAND 7)

1975/1973 ratio imges.

@abs The author has identified the following significant results. Using MSS channels 5 and 7 and a supervised classification system with a PPD classification algorithm, it was possible to map the exact areal extent of the snow cover and of the transition zone with melting snow patches and snow free parts of various sizes over a large area under different aspects such as relief, exposure, shadows, etc. A correlation of the data from ground control, areal underflights and earth-resources satellites provided a very accurate interpretation of the melting procedure of snow in high mountains.