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Forests cover large areas of the land surface. To consistently and repeatedly monitor forests over these large areas, it is desirable to use remote sensing data and automated analysis techniques. While satellite imagery contains useful data about forest conditions, it is emphasized that field work remains essential when applying remote sensing techniques.

International collaboration in the EMEA project has been designed to promote cooperation in vegetation research with a particular focus on the remote sensing and field research. It started in April 1999 and will last for a total of 3 years. In this presentation, I will summarize the activities of the EMEA project until now.

1 Research

In this research, spectral reflectance in the solar spectrum was measured synchronously and compared using different platforms: near ground, aerial and satellite. Spectral reflectance of ground vegetation was measured between 350 and 1050 nm using a portable spectrometer. Test sites for remote sensing of trees and grass were located in Japan and in China. Data from Landsat, NOAA and a spectrometer are used in this project.

1.1 Japan

We measured the spectra of trees at three different distances and scales:

1) individual leaves,

2) part of a tree seen from a distance of 40 m,

3) mixture of several different trees seen from a helicopter, and investigated what affects the data during the scaling up of the measurements.

1.2 China

We measured two different types of vegetation in Inner-Mongolia: grass and trees. Using a spectrometer, a digital video camera, and an infrared CCD camera, reflectance of the major plant species was measured from different distances (0.1 m, 1 m, 100 m, and 1000 m).

2 Analysis of vegetation change using satellite data

Vegetation in forest is influenced by elevation and topographical features. Especially in mountain areas this is clearly seen. However, it is very difficult to conduct field work in such areas. Therefore the research of forest vegetation activity by multispectral data from satellite has become necessary. Temporal changes of forest activity around Mt. Hakusan related to slope direction was analyzed using Landsat TM data.

Meetings

The main objective of the meeting is to discuss and present new results, as well as make ns for future work. The venues of the meetings have been as follows:

- 19 October 1999 at Kanazawa University (Japan)
- 20 September 1999 at Chinese Academy of Sciences (China)
- 6 - 7 January 2000 at Forestry Research Institute (Korea)
- 20 May 2000 at Chinese Academy of Sciences (China)
- 22 May 2000 at Chinese Academy of Forestry (China)
- 31 July 2000 at Kanazawa University (Japan)
- 9 -10 January 2001 at Forestry Research Institute (Korea)
- 18 June 2001 at Chinese Academy of Sciences (China)

4 Symposium

An International Symposium on Environmental Monitoring in East Asia was held on October 1999 and August 2000. In 2001, the last year of this project, we have organized the symposiums both in Beijing and Kanazawa. The symposium aimed to give an overview of current trends in environmental research and to discuss recent scientific activities in this field. The symposium is open to anyone interested in environmental issues, whether or not connected with a member of the EMEA project.

5 International conferences

1) Ken-ihiro Muramoto, Ryotaro Komura, Feng Chen, Mamoru Kubo:
Analysis of temporal changes in vegetation in central Japan by remote sensing and ground data,
Proc. IEEE Int. Conf. Geosci. Remote Sensing, vol.II, pp.1090 - 1092, 1999.

2) Ken-ichiro Muramoto, Naoto Kamata, Takuya Kawanishi, Mamoru Kubo, Ryotaro Komura, Masayuki Fujita:
Comparison of vegetation measured from three different distances,
Proc. IEEE Int. Conf. Geosci. Remote Sensing, 1, pp.423-425, 2000.

3) Ryotaro Komura, Ken-ichiro Muramoto, Mamoru Kubo:
Temporal analysis of forest activity using remote sensing and DEM,
Proc. IEEE Int. Conf. Geosci. Remote Sensing, 1, pp.316-318, 2000.

4) Feng Chen, Ken-ichiro Muramoto, Mamoru Kubo:
Study of topographic factor effect and correction effectiveness using Landsat TM data,
Proc. IEEE Int. Conf. Geosci. Remote Sensing, 2, pp.618-620, 2000.

5) Mamoru Kubo, Hiroshi Koshinaka, Ken-ichiro Muramoto
Extraction of clouds from satellite imagery in the Antarctic using wavelet transform and Mahalanobis classifier
Proc. IEEE Int. Conf. Geosci. Remote Sensing, 2001.

6) Ryotaro Komura, Mamoru Kubo, Ken-ichiro Muramoto
Analysis of Relationships Between Image Data and Spectrum of Vegetation Measured from Helicopter
Proc. IEEE Int. Conf. Geosci. Remote Sensing, 2001.

7) Feng Chen, Ken-ichiro Muramoto, Mamoru Kubo
Calculation of NDVI in Mountainous Areas
Proc. IEEE Int. Conf. Geosci. Remote Sensing, 2001.