

"Geographic experiment" and "earth scientific experiment" trial in junior high school with satellite data

Hideki Oshima^{1*}, Hiroshi OTA², Hiromichi FUKUI³

¹KEIO Univ. global security institution, ²KEIO Futsubu School, ³KEIO Univ. Faculty of Policy Management

1. Introduction

Nowadays many primary school and junior high school students have become to play the Google Earth. Spectral satellite images are published on Geography and earth science textbook for junior and senior high school. Japan Aerospace Exploration Agency also provides spectral satellite images to primary school and junior high school.

But satellite data should be used for not only making out of spectral satellite images, but also promoting analysis to abstract new high value added information.

In this study "experiment" is tried in a junior high school. It includes greenbelt coverage ratio analysis and heat island analysis using satellite data including multi spectrum image and thermal infrared image. It will be useful for developing Web GIS, satellite data set and instruction manual for junior and senior high school teacher for these experiments with on lined PC and web browser. Though Earth Remote Sensing Data Analysis Center and YAMAGUCHI et.al, (2004) have developed experiment materials with free soft, they have some problems such as: satellite data itself must be purchased with some cost.

2. Research methods

Class plans are discussed for experiment trial and questioner research in a private junior high school; KEIO Futsubu school.

3. Class plans

40 students cannot connect internet at once since the internet is almost 8~12Mbps in many junior and senior high schools. PC rooms are occupied by Technology or Information classes there. So, these situations are supposed: one PC is shared by 5 students for Web GIS, data in Web GIS are downloaded to be used in desktop GISs or printed on papers.

The experiment themes have relations with contents of not only textbooks but also remote sensing introduction classes in universities. They are selected from these view points: the functions of Web GIS(Arc GIS Server)and the copyright of satellite data. Some experiments are done by teacher with illustrations. The advanced high level analysis such as land move distance analysis or flood area analysis by SAR are introduced their result images.

* Composition of class plans

1. Let's study land history with satellite images

- (1) Illustration of satellites and sensors
- (2) Looking at landform with 3D satellite images and topographical maps
- (3) Looking at land use change with satellite images

2. Let's study natural disaster with satellite images

- (1) Illustration of satellites and sensors
- (2) Finding fault lines
- (3) Studying earthquake influences

- (4) Studying flood influences
- 3. Let's study green with satellite images
 - (1) Illustration of satellites and sensors
 - (2) Finding green with infrared satellite images
- 4. Let's look at temperature with satellite images
 - (1) Illustration of satellites and sensors
 - (2) Looking at night satellite images
 - (3) Looking at temperature with satellite images
- Extra. Let's look at yesterday's natural disaster site

* Items of the questioner

Q1 Select items what you were interested in and disinterested in, then write the reason.

Q2 Have you use satellite images in your PC?

Q3 What kind of fields do you want to major in university?

Q4 What kind of jobs do you want to take?

Q5 Do you want to use satellite data in your university study and business?

Note

Japan Aerospace Exploration Agency "JAXA satellite use promotion site"

<http://www.sapc.jaxa.jp/use/case-study/index.html#education> (Browsed 2009.12.1)

Earth Remote Sensing Data Analysis Center 2003 "Earth observation from space ?The synthetic study materials for high school students-"

<http://www.ersdac.or.jp/Others/kyoiku/RSEDUCD2/HTML/INDEX.HTM> (Browsed 2009.12.1)

Reference

YAMAGUCHI, Yasushi, YAGI, Reiko, ODAJIMA, Takayuki 2004. "Remote sensing for the first time - Looking at with earth observation satellite ASTER", Geotechnos Co., Ltd.

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