3-6. Disaster Analysis Based on Satellite Information

Tens of satellites equipped with sensors are continually observing the earth at various wavelength, observation ranges, resolution powers and observation cycles, and some of the image data collected by these satellites are open to the public. Making the best use of satellite information facilitates effective disaster reduction activities such as analysis and forecasts of disasters (see Table 3-6-1).

Table. 3-6-1 Observation satellite data open to public (by NASDA, 2001)

Japanese Satellite

| Satellite Name	Sensor Name	Band Number	Wavelength Band Range	Effective Life	Observation Frequency	Resolving Power	Observation Width
MOS-1, 1b	MESSR VTIR MSR	4 4 1	Visibility・Near-infrared Visibility・Thermal infrared Microwave	87.2~96.4	Saved data Saved data Saved data	50m 900&2700m 32km	100x90km 1500kmx1Path 320kmx1Path
JER-1	VNIR SWIR SAR	4 4 1	Visibility・Near-infrared Medium infrared L Band	92.9~98.10 92.9~93.12 92.9~98.10	Saved data Saved data Saved data	18m 18m 18m	75x75km 75x75km 75x75km
ADEOS	AVNIR-Mu AVNIR-Pa OCTS	4 1 13	Visibility・Near-infrared Visibility Near-infrared Visibility~Thermal infrared	96.10~97.6	Saved data Saved data Saved data	16m 8m 700m	80x80km 80x80km 1400km
TRMM	PR VIRS TMI	2 5 5	Microwave Visibility~Thermal infrared Microwave	97.11-	0.75 days 0.33 days 0.33 days	4.3km 2km 6~50km	~215km ~720km ~760km
ADEOS-II	GLI AMSAR	36 8	Visibility~Thermal infrared Microwave	02.03-	4 days 4 days	0.25&1km 5~50km	1600km 1600km
ALOS SAR→	AVNIR-2 PRISM PALSAR	4 1 1	Visibility・Near-infrared Visibility Near-infrared L Band	04.6-	2 days 46 days 5 days	10m 2.5m 10&100m	70km 70km /35km 20 - 350km

Foreign Satellite

Satellite Name	Sensor Name	Band Number	Wavelength Band Range	Effective Life	Observation Frequency	Resolving Power	Observation Width
EOS-AM1 (Economy/Industry/Commerce→)	MODIS ASTER	36 14	Visibility~Thermal infrared Visibility・Near-infrared、 Medium infrared、Thermal infrared	99.12-	1.5 days 16 days	0.25, 0.5, 1km 15, 30, 90m	2330km 60km
LANDSAT-1.2.3	MSS	4	Visibility・Near-infrared	79.1~83.3	Saved data	80m	185x170km
LANDSAT-4.5	MSS TM	4 7	Visibility・Near-infrared Visibility・Near-infrared、 Medium infrared、Thermal infrared	82.10-	Saved data 16 days	80m 30&120m	185x170km 185x170km
LANDSAT-7	ETM+	8	Visibility・Near-infrared	99.4.15-	16 days	15, 30, 60m	185x172km
SPOT-1.2.3	HRV-XS HRV-P	3 1	Visibility・Near-infrared Visibility Near-infrared	88.5-	3 days 3 days	20m 10m	60x60km 60x60km
SPOT-4	HRV-Xi HRV-P	4 1	Visibility・Near-infrared Visibility Near-infrared	98.3-	3 days 3 days	20m 10m	60x60km 60x60km
IRS-1C IRS-1D	PAN LISS-3	1 5	Visibility Near-infrared Visibility Near-infrared、 Medium infrared	95.12- 97.9-	5 days 5 days	5.8m 23&70m	70x70km 141x141km
ERS-1 (SAR) ERS-2 (SAR)	AMI	1	C Band	91.8~00.3 95.4-	Saved data 35 days	30m 30m	80x80km 80x80km0
RADARSAT	SAR	1	C Band	95.11-	2 days	10~100m	2.5-250,000km2

High Resolution Satellite

| Satellite Name	Sensor Name	Band Number	Wavelength Band Range	Effective Life	Observation Frequency	Resolving Power	Observation Width
IKONOS	MULTI PAN	4 1	Visibility・Near-infrared Visibility・Near-infrared	99.9-	3 days 3 days	4m 1m	11x11km 11x11km
EROS-A1	PAN	1	Visibility Near-infrared	00.12-	2 days	1.8m	12.5x12.5km
Quick Bird	MULTI PAN	4 1	Visibility・Near-infrared Visibility Near-infrared	01.10-	3.5 days 3.5 days	2.5m 0.61cm	17~32km 15~17km

With an aim to encourage the use of satellite information among the disaster reduction personnel of the regional or local governments and individual residents by disseminating the knowledge on the satellite remote sensing technology, the Disaster Reduction Working Group of the Satellite Remote Sensing Promotion Committee, Remote Sensing Technology Center (RESTEC), put together a guidebook of disaster analysis in 2000. This guidebook "Introduction of disaster analysis methods using satellite information" (in Japanese only) explains the procedure using case reports of satellite data analysis conducted for actual disasters as examples. This book is available on http://www.restec.or.jp/eeoc/bousai/v11.htm. As shown in Fig, 3-6-2, the website has information of various cases and is designed for ease of search and selection by analytical method, time period, cause of disaster, location or area of occurrence, satellite and sensor.

Fig. 3-6-2 Cases by location of disaster occurrence
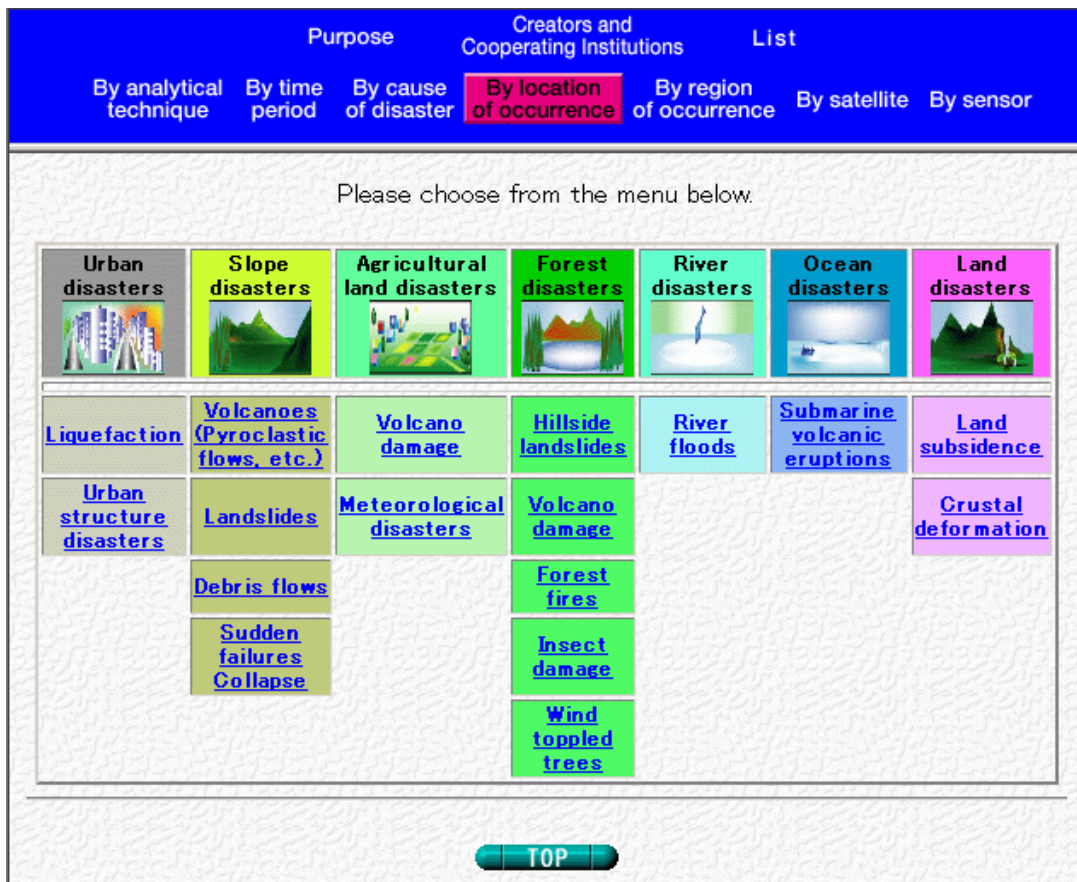
In addition to the text information, a lot of flowcharts and data used for analysis including image data are linked to the guidebook for ease of understanding how to use satellite data (see Fig. 3-6-3).

Fig. 3-6-3 Example of analytical process flowchart
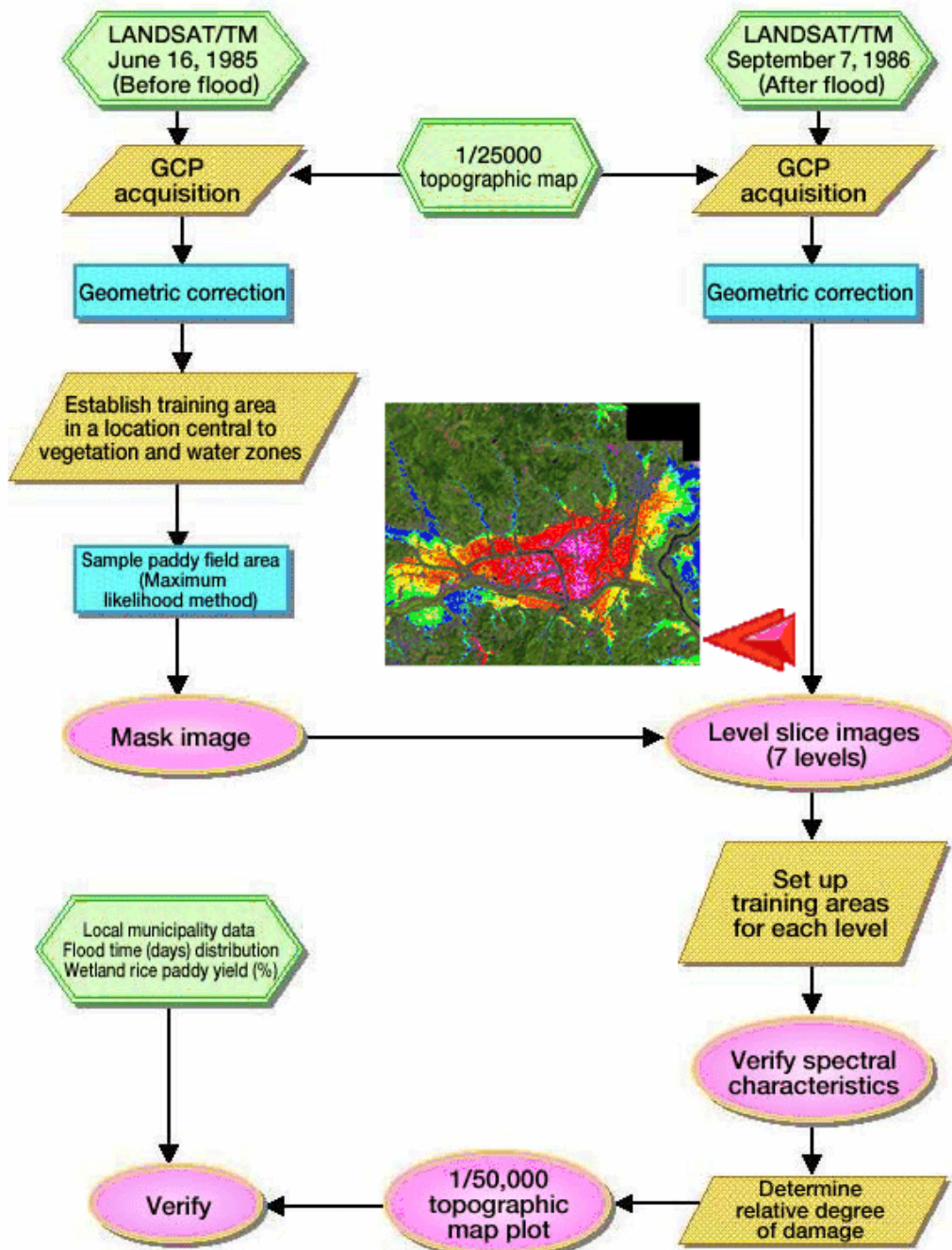
This education effort is considered to be valuable for all researchers and administrative personnel in charge of disaster reduction not only in Japan but also in all Asian countries. ADRC acquired the right to create and open to public an English version of the web pages in order to contribute to the promotion of disaster reduction activities in member countries. ADRC will be continuously accumulating the case reports of disaster-related researchers for more sophisticated database of disaster analysis methods using satellite information (http://www.adrc.or.jp/dmweb/index.html, English only).