COURSE REPORT

7th COURSE ON
APPLICATION OF GEOINFORMATICS IN DISASTER MANAGEMENT
(UNDER THE AEGIS OF GSITI AND ISRO COLLABORATION PROGRAMME)
(3rd March 2014 to 4th April 2014)

INTRODUCTION:

As part of the MoU between Geological Survey of India and Indian Space Research Organisation (ISRO), GSI Training Institute has been conducting training programs under National Natural Resources Management Survey (NNRMS) in the fields of mineral Exploration and disaster management using Remote Sensing and GIS techniques. The programme is aimed to develop human resources from different Central/state Government Organisations/ Educational and Research Institutes, in the respective domain. So far, GSITI has conducted six courses, in Disaster Management and after the successful execution of six courses, the PGRS division had planned and executed the present (7^{th}) training program on Application of Geoinformatics in disaster Management.

14 candidates from GSI/State Government/Educational Institutes participated in the 5 week long training program on application of Geoinformatic in Disaster management.

COURSE DETAILS:

The course was of about 5 week's duration (33 days to be exact) starting from 3 rd March and ending on today i.e 4^{th} April 2014. The participants were introduced to Digital Image Processing which covers digital data formats, data acquisition, image preprocessing, radiometric and geometric correction of raw data, various image enhancement techniques (radiometric, spectral and spatial enhancements including filtering in frequency domain), multispectral classification, accuracy assessment, image mosaicing and map composition using ERDAS Imagine software. The various aspects were covered in detail through a series of lectures, demo and hands on practice followed by a project work where the participants have applied all these techniques to the data product of selected blocks and appreciated the results. Topics were as follows

Remote sensing and digital image processing

1. Fundamentals of Remote Sensing such as, principles of remote sensing, electromagnetic radiation, sensors and platforms, satellite orbits, multispectral scanning, colour composites, various remote sensing data products, formats and remote sensing in optical, thermal and microwave regions of the Electromagnetic spectrum.
2. Digital Image Processing, Geometric rectification of the spatial data, Statistical analysis of digital data, various Image Enhancement techniques viz. radiometric, spatial and spectral, Image classification techniques; Mosaicing and map composition.
3. Techniques of geological interpretation; geomorphology, discrimination of lithology and identification of structures.

Geographical Information System (GIS)

4. Geographic Information System covering general concepts of spatial data models, Introduction to Arc GIS, Spatial data capture techniques, Georeferencing, Vectorisation, Spatial data editing, Concepts of GPS. Spatial adjustments, GIS analysis and Modeling techniques.

Case studies

Case studies on application of Remote Sensing and GIS on different aspects of Disaster Management. Special lectures and case study presentations by scientists of GSI, NRSC and APSRAC were arranged.

Project Work

The participants were given group assignments in the form of project work. They have carried out Landslide susceptibility mapping of Mangan area of Sikkim.

Visit to INCOIS, Kukkatpally, Hyderabad

A visit to the Indian National Center for Ocean Information Service (INCOIS), at Hyderabad was organized. The participants were introduced to the Tsunami warning and alert system, Brief appraisal on the application of satellite data like NOAA AVHRR, MODIS , OCEANSAT P6 for ocean studies like potential fish zone demarcation, ocean colour monitor, coast zone management, coral studies were also dealt at INCOIS.

Course Schedule

7th COURSE ON APPLICATION OF GEOINFORMATICS FOR DISASTER MANAGEMENT
(03-3-2014 to 04-4-2014)
DAY WISE SCHEDULE

DATE	SESSION	TOPICS	FACULTY
03.3.2014	FN	Registration and Inauguration.	
		Remote Sensing. data acquisition to interpretation: an Indian odyssey	VK
	AN	Principles of Remote sensing: Propagation of EMR, Interaction with atmosphere, Laws of radiation, Atmospheric windows	VSR
04-3-2014	FN	Sensors and platforms. Image Resolution.	JPM
	AN	Concepts in Geomorphology	VPG
		Geomorphic features- Erosional and depositional landforms	VSR
05.3.2014	FN	Colour image representation	JPM
		Principles of image interpretation	VPG
	AN	Practical: Image interpretation (Hard copy)	PF
06.3.2014	FN	Interpretation criteria for sedimentary terrain,	VSR
		Interpretation criteria for igneous and metamorphic terrain	VPG
	AN	Interpretation criteria for Structure	JPM
		Practical: Image interpretation (Hard copy)	PF
07.3.2014	FN	Map Datum and Projections	VPG
		Lecture and demo on geometric correction of raster data	
	AN	Introduction to Digital Image Processing, image formats	VPG
		Demo on ERDAS IMAGINE, image loading, layer stacking, mosaicing sub-setting	
		Hands on Exercise: Georeferencing, Rectification of images	PF
08.3.2014	FN	Image Statistics	JPM
		Lecture and demo on radiometric enhancement techniques,	
	AN	Hands on practice on preparation of image mosaic and radiometric enhancements.	PF
09.3.2014		Sunday	
10.3.2014	FN	Lecture on spatial enhancement in image domain	JPM
	AN	Hands on practice on spatial enhancements	PF
11.3.2014	FN	Lecture on Spectral enhancement.	JPM
	AN	Hands on practice on spectral enhancements	PF
12.3.2014	FN	Lecture on image classification techniques.	DV
	AN	Hands on practice on image classification	PF
13.3.2014	FN	Principles of Thermal Remote sensing	TRM
		Exercise on Thermal Remote sensing	TRM
14.3.2014	FN	Introduction to Digital Photogrammetry and Digital image Orientation (IO, EO)	DKC
	AN	Demo and Hands on practice on use of aerial photographs	
15.3.2014	FN	Lecture on ortho-photo generation and application	DKC
	AN	Demo and Hands on practice on generation of orthophoto and stereo feature extraction	
16.3.2014		Sunday	
17.3.2014		Holi	
18.3.2014	FN	Principles of Microwave Remote sensing	JM
	AN	Exercise on Microwave Remote sensing	JM

19.3.2014	FN AN	Introduction to GIS, Spatial data models. Demonstration on Arc GIS Desktop Hands on Exercise: Georeferencing, Rectification of images using ARC GIS	SD CF
20.3.2014	FN AN	Vectorisation and spatial data editing in Arc GIS Hands on exercise: Digitization of points, lines, and polygons in Arc GIS, spatial data editing	SD
21.3.2014	FN AN	Digitization of points, lines, and polygons in Arc GIS, spatial data editing Manipulation of Tabular data – Query, Join, Relate Hands on Exercise: Tabular Data Handling, Attachment of attributes in spatial features	MNM CF
22.3.2014	FN AN	Spatial Adjustment: Edge-match, Append & Dissolve Demo and Hands on Exercise Hands on Exercise on Spatial adjustment, Append & Dissolve	SD CF
23.3.2014		Sunday	
24.3.2014	FN AN	Concepts of GPS and Mobile Mapping, Data acquisition using GPS Download of GPS data on GIS platform, Use of Google Earth	MNM
25.3.2014	FN AN	Lecture & Demo on spatial analysis of Vector data Hands on exercise on spatial analysis Lecture & Demo on spatial analysis of Raster data DEM, its sources and its derivative	MNM CF SD CF
26.3.2014	FN AN	Exercise on raster spatial analysis. Comparison of DEM from different sources. Demo on Map Composition Exercise on Map composition	SD CF
27.3.2014	FN AN	Application of RS and GIS in Flood hazards Application of RS and GIS in drought hazards assessment Application of RS and GIS in Dam failure/lake bursts' assessment	RR VR
28.3.2014		Visit to INCOIS (Tsunami warning center), Kukatpallly, Hyderabad. Application of RS and GIS in coastal zone management	VPG
29.3.2014	FN AN	Lecture and demo on Raster and Vector data analysis. Hands on exercise on raster and vector data analysis	SD CF
30.3.2014		Sunday	
31.3.2014		Closed holiday-Ugadi	
01.4.2014		Lineament mapping and analysis Application of RS and GIS for landslide hazard and risk assessment Exercise on landslide zonation mapping	SR, LPS,PF&C F
02.4.2014		Project work	
03.4.2014		Presentation by trainees	PF&CF
04.4.2014	FN AN	Evaluation test Valediction	

	List of TI Faculty
VSR	V. Singa Raju, Supdtg Geologist, PGRS Division, GSITI, Hyderabad
VPG	V.P. Gaur, Supdtg Geologist, PGRS Division, GSITI, Hyderabad
JPM	J.P.Mohakul, Sr Geologist, PGRS Division, GSITI, Hyderabad
MNM	M.N.Mishra, Supdtg Geologist, CGMT Division, GSITI, Hyderabad
SD	Dr Sanjay Das, Supdtg Geologist, CGMT Division, GSITI, Hyderabad

CF	CGMT Faculty, GSITI, Hyderabad
PF	PGRS Faculty (VSR/VPG/JPM), GSITI, Hyderabad.
List of Guest Faculty – GSI	
SR	S.Ramamurthy, Director,Geodata Division, GSI,SR, Hyderabad
DKC	D.K.Choudhury, Director, M-I, GSI, SR, Hyderabad
LPS	Dr. L.P. Singh, Supdtg Geologist, PGRS Division, GSI SR, Hyderabad
List of Guest faculty – Outside GSI	
VK	Dr Vinod Kumar, Head, Geoscience Division, NRSC, Hyderabad
DV	Dr D. Vijayan, Head, Training Division, NRSC, Hyderabad
RR	Dr. Raghav Reddy, Senior Scientist, APSRAC, Hyderabad,
VR	Dr.V Raghu, Senior Scientist, APSRAC, Hyderabad,
TRM	Dr Tapas Ranjan Martha, NRSC, Hyderabad
JM	Dr John Mathew, NRSC, Hyderabad

Participants

Sl No	Name of the Applicant	Sponsoring Organization	Designataion
1	Devarajaiah E	Kuvempu University	Research Scholar
2	Vahid Sharifi	University of Mysore	Research Scholar
3	Nagaraju M	University of Mysore	Research Scholar
4	Manjunatha M C	University of Mysore	Research Scholar
5	Gundala Vijaykumar	Andhra University	Research Scholar
6	Suresh R	Annamalai University	Research Scholar
7	Indira sharma	DMG, Govt of Sikkim	Asst. Geologist
8	Prakriti Pradhan	DMG, Govt of Sikkim	Asst. Geologist
9	Rupa Ghosh	Wadia Inst of Himalayan Geology	JRF
10	Balaji Chandji Avhad	Marathwada University	Research Scholar
11	Ajaykumar N Asode	Karnataka University	Research Scholar
12	Mahesh C Swamy	Karnataka University	Research Scholar
13	Abhishek Kumar	GSI SU:TN	Geologist
14	Vineeta Kumari	FRI, Dehradun	Research Scholar


CSI TRAINING INSTITUTE