

## **Thematic Session - Geo-information Systems**

Chair: Dr. Ajai, Group Director, Marine and Earth Science Group, SAC, Ahmedabad

Co-Chair: Dr. V.S. Hegde, Director, DMS Programme

Rapporteur : Dr. V.K Sehgal, Senior Scientist, IARI

Facilitator: Sreeja S. Nair, Assistant Professor, NIDM

### **A. Introduction**

Geoinformation technologies include Geographic Information Systems (GIS), Spatial Decision Support Systems (SDSS), global positioning systems (GPS), and Remote Sensing (RS). This also includes object-relational database (ORD) or object-relational database management system (ORDBMS) and Geostatistics. Geoinformatics combines spatial analysis and modeling, development of spatial and temporal databases, information systems design, human-computer interaction and both wired and wireless networking technologies. Geoinformatics provides wider application ranging from collation and interpretation of data, managing large amount of information in form of maps and tables, providing comparability and overlaying of various spatial information and combining various geographical, socio-economic, environmental and administrative datasets.

Space-technology i.e. Remote sensing and Global positioning systems has added advantage of comparing various geo-environmental and man-made features on various time-scales and when combined with GIS, it helps in understanding changing hazards scenario, vulnerability and is rapid assessment of disaster related damages and losses. The advanced high-resolution and multispectral sensors has provided immense scope to the scientists for mapping and analysis of earth surface features. Hyper-spectral analysis helps in near accurate identification of various objects. With the help of Geographic Information Systems (GIS) it is now possible to model, develop scenario related to floods, drought, earthquake, landslides, coastal hazards and industrial/chemical accidents, in an interactive manner that significantly helps planning and implementation process.

GIS can also integrate various other information systems, for example, bioinformatics and chemoinformatics as well. Spatial Decision support Systems are equally effective in pre-disaster risk assessments and post-disaster impact assessments, relief and recovery planning by facilitating effective decision support system at various levels, not only limited to scientists or technocrats but equally useful to the administrators and field level managers.

### **B. Context**

Availability of readily accessible, 'easy-to-understand and use' form of information is key challenge in disaster management. Efficient decisions, accurate planning and organized response are the key functions in disaster management where Remote sensing, GIS and GPS offers a vital role for providing relevant, authentic and interpretable information in time and cost effective manner. Geospatial technology now is increasingly being used in managing disasters globally. Government of India has initiated various programmes for promoting the applications of Geospatial technology in Disaster Management, notable amongst are Decision Support Centre at NRSC, National Agricultural Drought Assessment and Monitoring System (NADAMS), Indian Forest Fire Response and Assessment System (INFFRAS), National

Database for Emergency Management (NDEM), GIS based Emergency Preparedness and Response Systems (GEPR) tool by National Informatics Centre for offsite emergency planning etc.

Basic information for disaster management i.e. technical studies, geographical data etc. exists, but is not readily available in a usable form to local authorities and other stakeholders. There is still a wide gap between the Geoinformatics and the disaster management functionaries at various levels. The technology has attained significant advances during the past decades but its applications in disaster management is limited due to lack of accessibility to realtime information, awareness and skilled professionals at user level. The session on Geoinformation System is intended to bridge the gap between the geospatial community and disaster management functionaries

### **C. Objectives**

- To review the various national, regional and international initiatives on geo-spatial technologies and application relevant to disaster management
- Identify various tools, techniques and methodologies for Geospatial information management with case studies related to application in all phases of disaster management cycle and for various hazards
- Review the status and identify the gaps in existing approaches, tools, techniques and methodologies to suggest improvements
- To address the gaps between the geo-spatial and disaster management functionaries at various levels.

**D. Sub Themes** – The session will highlight following important issues:

- Regional/National / State Level Initiatives
- Information needs on various stages of disaster management
- Hazard Mapping, Risk and Vulnerability Assessments
- Various Modeling Tools and integration with Geoinformatics
- Applications in Resource Mapping, Disaster Management Planning, Emergency Response, Damage & Impact Assessment and Recovery planning
- Open Source GIS , Web GIS and applications in DM

### **E. Expected Outcome**

The session on Geoinformation technology will act as a platform for facilitating interaction between the data managers, academia and the user groups for promoting geospatial technology application at various levels for different functions related to Disaster Management. This will help in identifying the gaps in existing tools, techniques and methods, and the strategies to overcome those challenges.

## THEMATIC CLUSTER: D

### THEMATIC SESSION: GEOINFORMATION SYSTEMS

HALL NO: 2 – 1<sup>st</sup> Floor

Time: 14:00 – 17:00 (3 Hours)

Total Number of Presentations is 12

#### SESSION PLAN

<b>14:00 – 14:30</b>	<b>Inaugural Session</b>
14:00- 14: 05	Welcome Address: Sreeja S. Nair, Assistant Professor, NIDM
14:05 – 14:15	Inaugural Address: Dr. Ajai, Group Director, Marine and Earth Science Group, SAC, Ahmedabad
14:15 – 14:35	Key Note Address: Dr. V.S. Hedge (Co chairperson), Director, Disaster Management Support Programme

#### TECHNICAL SESSION I: 14:30– 15:45

14:30 – 14:45	Space Technology For Decision Support In Natural Disaster Management – Decision Support Centre Initiatives <i>Shri V. Bhanumurthy, Incharge - Decision Support Centre, NRSC</i>
14:45 – 15:00	International Charter “Space and Major Disasters”: Response to Global Disasters <i>Dr. N.K. Shrivastava, ISRO Member Executive Secretariat, Dr. V. Jayaraman, Dr. V.S. Hegde, Director DMS &amp; S.K. Shivakumar, Director, ISTRAC, ISRO</i>
15:00 – 15:15	Web GIS for Offsite Emergency Planning in MAH Units <i>Dr. Sanjay Gahlout (DDG) and Arpita Gupta (Scientist D), NIC</i>
15:15 – 15:30	Customizing Geographical Information Systems (ArcGIS) for Earthquake Disaster Management <i>Dr P Jothimani, CDM, Vellore Institute of Technology</i>
15:30 – 15:45	Multi-source land use land cover classification in a hilly terrain for landslide study <i>Dr. D. P. Kanungo and Dr. S. Sarkar, CBRI</i>
15:45 – 16:00	GIS based slope stability evaluation of a landslide complex-case study from Paglajhora, Darjeeling Himalaya, India <i>Saibal Ghosh, Niroj K. Sarkar , Dr. Chinmoy Paul, GSI</i>

**TECHNICAL SESSION II: 16:00 – 17:00**

16:00 -16:10	Fire Management System using Geospatial Technology: A Case Study of Delhi <i>A.K. Sharma, Chief Fire Officer, Prof. Amarjeet Kaur and Kiranmay Sarma, School of Environment Management, IP University</i>
16:10 – 16:20	Accuracy Aspects in the use of GPS Technology for Geoinformation System <i>Dr. S. K. Katiyar, Assistant Professor, Maulana Azad National Institute of Technology, Bhopal</i>
16:20 -16:30	Free Geospatial Information for Natural and Induced Disaster Risk Management - Indian Perspective <i>G. Prasad Babu, RMSI, Noida</i>
16:30 – 16:40	Application of GIS and Remote Sensing for Disaster Prone Areas: A Case Study in Coastal Kerala <i>Manjush Koshy, Aneesh A. and Jayalekshmi A.B.</i>
16:40 -16:50	Predicting Seismic Vulnerable Zones Using GIS <i>K.S.A. Dinesh Kumar, Chennai</i>
16:50 -17:00	Ranchi Utility Information System (RUIS) <i>Kiran Jalem &amp; Sreeja S. Nair</i>
17:00 -17:10	Discussion and Summary