

GEOSPATIAL  
media + communications



**C O N F E R E N C E S**

**MARKING OUR JOURNEY OF CREATING VALUE AND  
MOMENTUM FOR THE GEOSPATIAL INDUSTRY WORLDWIDE**



**INDIA**  
GEOSPATIAL  
FORUM

**5-7 FEBRUARY, 2014**

Hyderabad International Convention Centre Hyderabad, India

Conference Report

## INTRODUCTION

Ever since its inception, Geospatial Media & Communications has been championing the cause of raising the profile and expanding the horizons of the geospatial industry. Its conferences have endeavoured to create awareness, connect industry communities, advocate policy reforms, and promote business development initiatives. In keeping with its mission, India Geospatial Forum 2014 was a momentous occasion as it was the 100<sup>th</sup> conference organised by Geospatial Media.

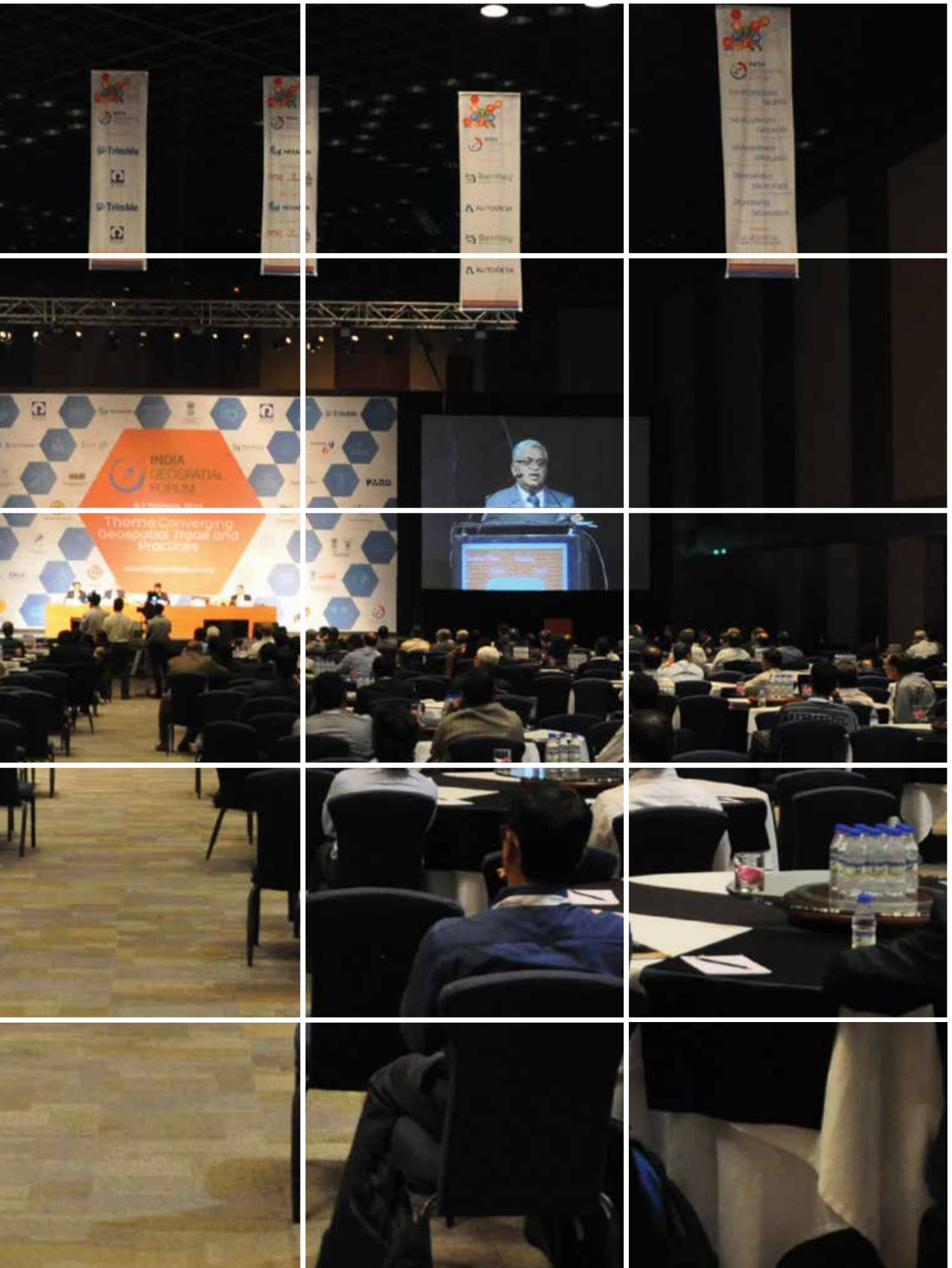
Over the years, India Geospatial Forum has emerged as the premier annual conference for the Indian geospatial industry. As the geospatial technology continues to grow in importance and influence, this conference plays an integral role in keeping the professionals and users across the country connected and educated. This 16<sup>th</sup> edition of India Geospatial Forum, organised from February 5-7 at Hyderabad International Convention Centre, brought out the relevance and importance of geospatial technology solutions and location information, to the many vertical industries that contribute to the Indian economy and also provided a platform to various stakeholders of geospatial industry to network, interact and learn from each other.

The thematic sessions successfully brought out the utility and benefit of geospatial technology for application sectors like agriculture, mining, water management, energy, forest management, city governance, weather services and land management.

The exhibition, the largest of its kind in South Asia, featured 44 exhibitors representing the technology providers and the government who showcased the latest and the cutting-edge geospatial solutions.

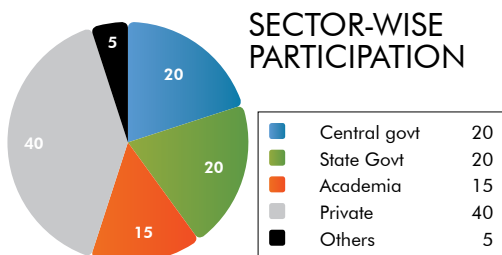






## IGF 2014 AT A GLANCE

**1400<sup>+</sup>** NUMBER OF PARTICIPANTS  
**325<sup>+</sup>** ORGANISATIONS REPRESENTED  
**16** COUNTRIES REPRESENTED



## Testimonials



This is the first time I attended IGF and I was thoroughly impressed by what I experienced over three days. It is a confluence of industry experts, policy makers, academia and future GIS professionals who talked about and showcased their vision, product roadmap and technology demonstrations through presentations and exhibitions."

**Suren Ruhela**

Director, Google Maps, Content Operations & Product Manager  
India Maps



India Geospatial Forum 2014 at HICC Hyderabad. It was a good opportunity to showcase Bhuvan during India Geospatial Forum 2014. The overwhelming and active response received for Bhuvan presentation/demonstration is well appreciated. Such events not only provide a good platform to showcase the new happenings in the field but also increase the outreach of products and services."

**Dr Vinod Bothale**

Group Director, Geoportal and WebGIS Services  
National Remote Sensing Centre



It was a pleasant surprise to see the overwhelming response, not only in terms of number of delegates but in terms of their cross-section too. I could meet and discuss with various eminent personalities working in water sector in our country. It was a wonderful and indeed a thought provoking experience to visit the exhibition. It was like a gathering of "Who-is-Who" in the field of geospatial technology. I could interact with a number of exhibitors and could have in-depth discussions with specific focus on the potential of the technologies demonstrated by them. My participation in India Geospatial Forum 2014 was an enlightening experience that I shall be cherishing for a life time."

**Dr. M. B. Joshi**

General Manager  
Sardar Sarovar Narmada Nigam Limited



Attending India Geospatial Forum 2014 was nice experience for me to learn so many things. The use of geospatial is growing at Gujarat Mineral Development Corporation for mineral and mining related activity. I thank the organizers for inviting me for this forum and allowing me to present our activities in this field."

**D U Vyas**

General Manager (Geo & Tech.)  
Gujarat Mineral Development Corporation Ltd.

- ▶ AAM
- ▶ Abraham John Architects
- ▶ ADCC Infocad
- ▶ Adepto Geoinformatics
- ▶ Agriculture Insurance Co. of India
- ▶ Agriculture Statistics & Crop Insurance
- ▶ Aibotix
- ▶ Aimil
- ▶ Air Force
- ▶ Airbus Defence and Space
- ▶ Akara Research & Technologies
- ▶ Al Moammar Information System
- ▶ Alabama Power Company
- ▶ Altair India
- ▶ Amigo Optima
- ▶ Amity University
- ▶ Andhra Pradesh Department of Mines and Technology
- ▶ Andhra Pradesh Forest Department
- ▶ Andhra Pradesh Ground Water Department
- ▶ Andhra Pradesh State Remote Sensing Applications Centre
- ▶ Andhra Pradesh Town and Country Planning
- ▶ Andhra Pradesh Urban Finance and Infrastructure Development Corporation
- ▶ Anna University
- ▶ AP Department of Municipal Administration and Urban Development
- ▶ AP Southern Power Distribution Company
- ▶ AP Survey, Settlements & Land Record Department
- ▶ Apex Technologies
- ▶ Army Digital Mapping Centre
- ▶ Association of Geospatial Industries
- ▶ Atkins India
- ▶ Atomic Mineral Directorate
- ▶ Autodesk
- ▶ Avineon
- ▶ Bangalore Metropolitan Region Development Authority
- ▶ Bentley
- ▶ Bharat Associates & Consultancy
- ▶ Bharat Coking Coal
- ▶ Bharat Institute of Engineering and Technology
- ▶ Bharathidasan University
- ▶ Bidhan Chandra Krishi Vishva Vidhalaya
- ▶ Bihar Minor Water Resources Department
- ▶ Bruhat Bangalore Mahanagara Palike
- ▶ Cache Technology
- ▶ Capricot
- ▶ CDM Smith India
- ▶ Center for infrastructure, Sustainable Transportation and Urban Planning
- ▶ Central Coalfields Ltd
- ▶ Central Ground Water Board
- ▶ Central Mine Planning & Design Institute Limited
- ▶ Central Pollution Control Board
- ▶ Central Research Institute for Dryland Agriculture
- ▶ Central Statistical Organisation
- ▶ Central University of Karnataka
- ▶ Central Water Commission
- ▶ Centre for Development of Advanced Computing
- ▶ Centre for Regional Studies
- ▶ CHC Navigation
- ▶ Chennai Regional Meteorological Centre
- ▶ Coal India Ltd.
- ▶ College of Military Engineering
- ▶ CRC for Spatial Information, Australia
- ▶ D. P. A.C.
- ▶ Dahasahasra Waternet Solutions
- ▶ Dandeli Municipal Council
- ▶ DAT/EM Systems International
- ▶ Defence Research & Development Organisation
- ▶ Department of Environment and Primary Industries, Victoria, Australia
- ▶ Department of Land Resources
- ▶ Department of Science & Technology
- ▶ Department of Space
- ▶ Digi Collect GIS
- ▶ DigitalGlobe
- ▶ Directorate of Wheat Research
- ▶ DNC Technologies
- ▶ DSM Soft
- ▶ ECIL
- ▶ Egis Geoplan
- ▶ Elcome Technologies
- ▶ Esri India
- ▶ European Union
- ▶ Excel Geomatics
- ▶ Faro Business Technologies
- ▶ Federation of Indian Mineral Industries
- ▶ Financial Services Group, City of Vancouver, Canada
- ▶ Food Corporation of India
- ▶ Forest Survey of India
- ▶ Galaxy Geomatics
- ▶ Gandhigram University
- ▶ Genesys International
- ▶ Geo Resources Development Company
- ▶ Geoconsult International
- ▶ Geokno India
- ▶ Geological Survey of India
- ▶ Geomares
- ▶ Geomax
- ▶ Geovista
- ▶ GHD Australia
- ▶ GISDICE
- ▶ Global Resources Management Consultancy
- ▶ GMR
- ▶ Goa University
- ▶ Google
- ▶ Greater Hyderabad Municipal Corporation
- ▶ Group on Earth Observations, Switzerland
- ▶ Gujarat Mineral Development Corporation Ltd
- ▶ Gujarat State Monitoring Cell
- ▶ Gulbarga Electricity Supply Company
- ▶ Guru Nanak Institutions Technical Campus
- ▶ Haryana Directorate of Land Records
- ▶ Haryana Space Applications Centre
- ▶ Hexagon Geospatial
- ▶ Himachal Pradesh Department of Land Records
- ▶ Hindustan Zinc
- ▶ Hitachi India Ltd
- ▶ Honeywell

- ▶ HP
- ▶ Icon Cadsoft
- ▶ iConcept Software Services
- ▶ IGIS
- ▶ IIC Technologies
- ▶ IIT Bombay
- ▶ IIT Roorkee
- ▶ IL&FS Technologies
- ▶ Indian Bureau of Mines
- ▶ Indian Council for Agricultural Research
- ▶ Indian Institute of Information Technology
- ▶ Indian Institute of Remote Sensing
- ▶ Indian Institute of Surveying & Mapping
- ▶ Indian Maritime University
- ▶ Indian Meteorological Department
- ▶ Indian School of Mines
- ▶ Indian Space Research Organisation
- ▶ INEGI, Mexico
- ▶ Infotech
- ▶ Institute of Forest Genetics & Tree Breeding
- ▶ Institute of Photogrammetry & Geo Informatics
- ▶ Intergraph
- ▶ International Center for Agricultural Research in the Dry Areas
- ▶ International Water Management Institute
- ▶ IVRCL Ltd
- ▶ Jawaharlal Nehru Architecture and Fine Arts University
- ▶ Jawaharlal Nehru Technological University Hyderabad
- ▶ Jharkhand Dept. of Land
- ▶ K K Geosystem
- ▶ Kalinga Nagar Development Authority
- ▶ Karnataka Department of Town Planning
- ▶ Karnataka Directorate of Municipal Administration
- ▶ Karnataka Forest Department
- ▶ Karnataka State Council of Science & Technology
- ▶ Karnataka State Spatial Data Infrastructure
- ▶ Kaytronics Exim
- ▶ Kerala State Land Use Board
- ▶ Kerala State Remote Sensing and Environment Centre
- ▶ KK Geosystems
- ▶ Kolkata Municipal Corporation
- ▶ KPMG
- ▶ L&T Construction
- ▶ L&T Shipbuilding Limited
- ▶ Leica Geosystems
- ▶ Madhya Pradesh Agency for Promotion of Information Technology
- ▶ Madhya Pradesh Town and Country Planning
- ▶ Maharashtra Department of Information Technology
- ▶ Maharashtra Dept of Land Records
- ▶ Maharashtra Forest Department
- ▶ Maharashtra Remote Sensing Application Centre
- ▶ Mangalore Electricity Supply Company
- ▶ Mangrulpeer Education Society
- ▶ Mapworld Technologies
- ▶ Meghalaya Department Of Agriculture
- ▶ Microgenesis
- ▶ Ministry of Defence
- ▶ Ministry of Earth Sciences
- ▶ Ministry of Home Affairs
- ▶ Ministry of Rural Development
- ▶ Mission for Elimination of Poverty in Municipal Areas, Andhra Pradesh
- ▶ MOGSGS
- ▶ Motilal Nehru National Institute of Technology
- ▶ MP Council of Science & Technology
- ▶ MP Land Records & Settlement Department
- ▶ Mumbai City Survey & Land Records
- ▶ Naksha Tech
- ▶ Nansen Environmental Research Centre
- ▶ Narsee Monjee Institute of Management Studies
- ▶ National Atlas & Thematic Mapping Organisation
- ▶ National Bureau of Plant Genetic Resources
- ▶ National Bureau of Soil Survey & Land Use Planning
- ▶ National Centre for Medium Range Weather Forecasting
- ▶ National Council of Applied Economic Research
- ▶ National Dairy Development Board
- ▶ National Disaster Management Authority
- ▶ National Geophysical Research Institute
- ▶ National Hydrographic Office
- ▶ National Informatics Centre
- ▶ National Institute of Rural Development
- ▶ National Remote Sensing Centre
- ▶ National Security Council Secretariat
- ▶ National Spatial Data Infrastructure
- ▶ Navayuga
- ▶ NDC
- ▶ NDPL
- ▶ Neyveli Lignite Corporation Limited
- ▶ NHPC Ltd.
- ▶ NIIT University
- ▶ NJS Engineers India Ltd
- ▶ NMDC Ltd
- ▶ North East Center for Technology Application & Reach
- ▶ NPA
- ▶ Nvidia
- ▶ O/O E.I.C.P.H (URBAN), ODISHA
- ▶ Odisha Forestry Sector Development Project
- ▶ Odisha Revenue and Disaster Management Department
- ▶ Office of Registrar General of India
- ▶ Open Geospatial Consortium
- ▶ Oracle
- ▶ Osmania University
- ▶ Pan India Consultants
- ▶ PCI Software
- ▶ Penn State Univ, USA
- ▶ Pitney Bowes
- ▶ Pan India Consultant
- ▶ Planning and Road Asset Management Centre
- ▶ Planning Commission
- ▶ Power Finance Corporation Ltd
- ▶ Punjab Department of Governance Reforms
- ▶ Punjab Remote Sensing Centre
- ▶ Punjab Vigilance Bureau
- ▶ Rajasthan Department of Science and Technology
- ▶ Rajasthan Dept of Revenue
- ▶ Rajasthan Ground Water Department
- ▶ Rajasthan State Remote Sensing Application Centre
- ▶ Raksha Shakti University
- ▶ Remote Sensing Instruments
- ▶ Remote Software Solutions
- ▶ Reprographics India
- ▶ RIEGL Laser Measurement Systems
- ▶ RMSI
- ▶ Robert Bosch Engineering and Business Solutions
- ▶ Rolta
- ▶ RSI Softech
- ▶ Sagar Institute of Technology
- ▶ Saharanpur Nagar Nigam
- ▶ Sardar Sarovar Narmada Nigam Limited
- ▶ Satra I-Man
- ▶ Scanex
- ▶ Secon
- ▶ Shiv Nadar University
- ▶ Shri Vankateshwara Collage of Engineering and Technology
- ▶ SimActive
- ▶ Sinclair Knight Merz
- ▶ SKN Agricultur University
- ▶ Skymap Global
- ▶ SM Electronic Technologies
- ▶ South Eastern Coalfields
- ▶ Speck Systems Limited
- ▶ State government of Victoria, Australia
- ▶ Stesalit
- ▶ Survey of India
- ▶ Swift Electrocomp Solutions
- ▶ Symbiosis institute of Geoinformatics
- ▶ Synchronoss Technologies
- ▶ Tamil Nadu Agriculture University
- ▶ Tamil Nadu Electricity Board
- ▶ Tamil Nadu Planning Commission
- ▶ Tech Mahindra
- ▶ Tej Navitech
- ▶ Terna Engineering College
- ▶ Terrasolid
- ▶ Thane Municipal Corporation
- ▶ The Andhra Pradesh Mineral Development Corporation Ltd.
- ▶ The Energy and Resources Institute
- ▶ The Singareni Collieries Company Ltd
- ▶ Thiess Minecs India
- ▶ TomTom
- ▶ Trans Global Geomatics
- ▶ Tricad
- ▶ TriCAD Design
- ▶ Trimble
- ▶ Troas Engineering Services
- ▶ United Nations Development Programme
- ▶ University of Hyderabad
- ▶ University of Madras
- ▶ University of Peradeniya, Sri Lanka
- ▶ UP Forest Department
- ▶ Urthecast
- ▶ Value Labs
- ▶ Watershed Organisation Trust
- ▶ Western Coalfields
- ▶ WIPRO
- ▶ World Bank
- ▶ Xinthe



# Opening Session



**STEVEN W. BERGLUND**

PRESIDENT AND CEO  
TRIMBLE NAVIGATION

Technology arena is undergoing a rapid change and evolving technologies themselves would drive some of these changes. Parallel technology trends have converged to redefine what was possible. The current trend of increasing processing power and software intelligence, data shortage, and visualisation and interaction are leading to sensor integration, real-time data, cloud computing, Bid Data and 3D models. The geospatial economic impact is shifting from a mandated discrete use to systematic value addition. Convergence will impact the expectations placed on the geospatial industry. Professionals in this domain to mark this change in the way they work. This requires them to move from the traditional comfort zone of data collection to data management. For this, they need to embrace 3D modelling, adopt technology early, adapt to specific industry needs, enlarge their role to data and quality management and collaborate across entire workflows.



**DR VK DHADWAL**

DIRECTOR, NATIONAL  
REMOTE SENSING CENTRE

The benefits of geospatial data and technologies can be seen in the case of Cyclone Phailin which hit the state of Orissa in 2013. Even though the intensity of the cyclone was as severe as the one in 1999, there was considerable less damage to lives and property. This was possible because of the efforts of the state government and disaster management authorities which used satellite imagery, mapping and other related technologies to mitigate this disaster. The value of this technology can also be seen in the aftermath of the killer floods and landslides in the Himalayan state of Himachal Pradesh when satellite imagery, mapping and crowd sourcing was used extensively to locate danger-prone areas and save many lives.



**JUERGEN DOLD**

PRESIDENT, HEXAGON  
GEOSYSTEMS

Businesses need to change the way work to manage the growing population, increasing urbanisation and the resulting demand for resources. This is a challenge for the geospatial industry too to help the world in addressing some of these challenges. There is also a constant flow of information that fuses the real world (as-in/as-built) with the digital world (as-planned/as-designed). 3D models of cities are required to prevent floods, mitigate disasters and move towards sustainability. India's 12th Plan talks of geospatial technology and this will be a key in its way to becoming the third largest economy of the world.



**K.K. SINGH**

PRESIDENT AND CEO  
ROLTA GROUP

Geospatial technologies are playing a big role in a wide spectrum of fields – from navigating on roads to capturing the world's biggest terrorist. The good news is that niche technologies have become mainstream and converging geospatial technologies with others is producing new solutions and increasing productivity across new domains. There is naturally an increased demand for augmented innovations and technologies. Robust and sustainable geospatial infrastructure and accessibility to all will improve lives and increase productivity.

# Plenary Session

## DEFINING BUSINESS DIRECTIONS OF GEOSPATIAL INDUSTRY



**MAJ GEN (DR)  
R SIVA KUMAR**

CEO, National Spatial  
Data Infrastructure



**GOPAL SINGH**

Chairman & Managing  
Director, Central  
Coalfields Limited



**PRADEEP NAIR,**

MD, India and SAARC  
Autodesk



**BHUPINDER SINGH**

Senior Vice President  
Bentley Systems  
USA



**SUREN RUHELA,**

Director, Google  
Maps Content  
Operations & Product  
Manager, India Maps

**||** Huge strides have been made by the Government of India in the geospatial sector. The government is contemplating to invest around Rs 3,000 crore to establish the National Geospatial Information System (NGIS) for the country.

**||** There is a huge gap between the demand and supply of coal in the country and around 54% of electricity generation in India is based on coal. Keeping this in mind, there is a need for the use of geospatial technology in the mining sector. GIS can be used for mine planning and topographical survey, exploration, mining operation, infrastructure development, site selection for thermal power projects, route alignment etc."

**||** There is a huge gap between infrastructure demand and supply. "Almost 60% of major projects fail to meet the cost and schedule deadlines. This however, can be overcome by the use of geospatial and building information technology (BIM). BIM allows planners and engineers to design in the context of real-world data and run simulations which can help them in anticipating and solving problems."

**||** Sustainable infrastructure, which can promote a qualitative life, can only be achieved by GIS. By combining infrastructure processes with GIS, one can merge CAD and GIS, support open standards, turn digital landfills data to digital goldmines and promote sustainability."

**||** GIS technology should be available for all. The technology is getting democratised and is no longer restricted to just the big industries. A new set of enterprises like emergency services, delivery services, banks etc. are increasingly using GIS. Around 45-50% of small and medium businesses are interested in using GIS. However, the challenges of talent, affordability, awareness still serve as a hindrance."

# Plenary Session

## ENABLING INDUSTRIALISATION WITH GEOSPATIAL WORKFLOWS



**DR ANDREAS ULLRICH**

CTO, RIEGL Laser Measurement Systems, Austria



**RAJESH KALRA**

Managing Director, Atkins India



**STEVEN HAGAN**

Senior Vice President Oracle Corporation USA



**ALAN ABRAHAM**

Joint Principal Architect, Abraham John Architects

**LiDAR** technology is revolutionising the work lifecycles of industries. LiDAR can reduce the work that was earlier accomplished in weeks and months to just hours. The technology can be used for topographic mapping, utilities and corridor mapping, as-built surveying etc.

**Geospatial** technology can develop future cities which are economically, socially and environmentally prosperous. Urbanisation at an unprecedented rate is posing serious threats to cities. Geospatial and allied technologies are the need of the hour.

**Mankind** will generate around 35 zetabytes of data by 2020. As a result, there is an urgent need to process, analyse and store this data."

**The Bombay Greenway Project** aims to improve the green corridor of Mumbai. The project envisions a greenway over the existing railway lines; 114 kms of continuous, flat, traffic and stress free space to encourage active modes of transportation and healthy city living. The project's estimated cost is around Rs 94,050 million. The company has extensively used Trimble's SketchUp solution and Google Maps to create 3D models of their ambitious project."



# Plenary Session

## CONVERGENCE: FOSTERING INNOVATIONS IN APPLICATIONS



**BN SATPATHY**

Senior Advisor –  
Environment & Forest &  
Science & Technology,  
Planning Commission



**BARBARA RYAN**

Secretariat Director,  
GEO, Switzerland



**AGENDRA KUMAR**

President, Esri India

“In order to enhance the usage of geospatial information by different central and state departments, Planning Commission is seeking inputs and suggestions from geospatial enthusiasts, private industry and general public. These suggestions would be quite useful for policy making in the country in the years to come.”

“The value of earth observation data is not in data itself but in its utility. The US government’s decision to make Landsat data freely available in 2008 has dramatically increased data access from 53 scenes per day in 2001 to 5700 scenes per day in 2013. Regional, national and international collaboration is required to take the benefits of EO closer to the general public.”

“Technology is evolving and the way we engage with technology is also evolving. And with easy availability of location information, a number of questions get answered for small and large businesses. This is true for all industries including agriculture, mining, retail, insurance, government, finance, forestry and real estate. GIS also brings together information existing in silos within an enterprise and analyses the same for better decisions for various departments and for the organisation as a whole.”

# Symposium

# GEOAGRI

## KEY OUTCOMES

- ▶ GIS tools are of significant importance in transforming agriculture with respect to planning, growing and harvesting.
- ▶ There is a need to harness the potential of geospatial technologies for sustainable natural resource management and food Security.
- ▶ Geospatial technologies are used on a larger scale to improve dryland and rainfed agriculture.
- ▶ Modern geospatial technologies are providing solutions to precision farming.
- ▶ High resolution satellite imagery like Quickbird with 2.4m resolution, being used for mapping agricultural land, has shown significant results in improving productivity.
- ▶ There is a need to define agricultural sustainability and using satellite data to carry the spatial evaluation within a geographical area like watershed.
- ▶ RS and GIS based mapping of orchards results in better management and planning.

## PANEL DISCUSSION OUTCOMES

- ▶ Private players should bring applications which are cheaper and more useful for farmers on the ground.
- ▶ There is need of more precise recommendation from the scientific community in terms of improvisation of the existing solutions by the industry.
- ▶ There is a lot of scope for the industry to localise the products with respect to the Indian agriculture scenario.



## Deliberations By

- ✍ **Joseph Plappallil**  
CMD from Agriculture Insurance Company, New Delhi, India
- ✍ **Chris Gibson**  
Vice President, Executive Committee Member, Trimble, USA
- ✍ **Dr. Chandrashekhar Biradar**  
Head – Geoinformatics, ICARDA
- ✍ **Dr. Kaushalya Ramachandran**  
Principal Scientist and ICAR National Fellow, ICARDA
- ✍ **Dr. Bijendra Pateriya**  
Director, Punjab Remote Sensing Centre
- ✍ **Dr. G P Obi Reddy**  
Sr. Scientist and Incharge – GIS Section, National Bureau of Soil Survey and Land Use Planning
- ✍ **Prasenjit Gupta**  
Practice Head, GNSS Solutions, Stesalit
- ✍ **Dr. R.S. Hooda**  
Chief Scientist, Haryana Space Application Centre
- ✍ **Girish Jain**  
Business Head – Machine Control Division, Elcome Technologies, India
- ✍ **Amit Bhardwaj**  
Dy. Head (Research & Analysis), Indian Sugar Mills Association
- ✍ **Dr. MVR Sesh Sai**  
Group Director – Agriculture, National Remote Sensing Centre
- ✍ **Dr. Rowan Barling**  
Group Manager Government and Environmental Agencies, Sinclair Knight Merz Australia

# Symposium

## GEO LAND

### KEY OUTCOMES

- ▶ The key challenge is not technology, but getting a 'system' in place and addressing land disputes
- ▶ Land encroachment is a reality and very tricky area to address. This needs immediate attention or we move on with what is clear and let the fuzzy resolve itself over time
- ▶ There is a need to address socio-cultural-political issues, which are bigger hindrance to growth in this sector
- ▶ There is a need to make the general public and grass root level implementers understand what they lose out if this system is not in place. Push has to come from masses - creation of demand
- ▶ Some states like Gujarat have achieved quite a lot and are ready for the next leap forward – how can the centre help in making them achieve this growth spurt
- ▶ Computerise and interconnect systems and stakeholder offices, which reduces turnaround time for land registry, change of land use and other procedures. This would ensure transparency and monetisation
- ▶ The role of industry is crucial. They need to ensure efficient ways of existing data integration, provide services in reasonable costs and ensure good maintenance plans (this is very crucial for geospatial data, as land related features/attributes change over time - like land use, built environment, ownership records etc.)
- ▶ Industry can only do so much and they do have capabilities to deliver, as is clear by examples from all over the world. However, in the Indian context the push has to now come from the administrators.
- ▶ There is a strong need for capacity development
- ▶ Resistance to change needs to be tackled with patience and innovation - example of efforts in Sirsa highlights this. There was a chain reaction of user need right from patwaris to citizens who then pushed the politicians for installing new technologies
- ▶ There is an urgent need in states for updating the cadastral mapping
- ▶ Stronger connection/communication/integration of stakeholders is required: Policy makers, administrators, implementers, industry and the citizens



## Deliberations By

- ✎ **Bruce Thompson**  
Deputy Secretary, Dept of Environment & Primary Industry, Govt of Victoria, Australia
- ✎ **Dr T Ravishankar**  
Group Head (LRUMG), NRSC, India
- ✎ **Kevin Daugherty**  
World Wide Sales Manager – Land Administration Solutions, Trimble Navigation, USA
- ✎ **Actuary Rolando Ocampo – Alcantar**  
VP - National Geographic & Environment Information, INEGI, Mexico
- ✎ **Dr. Alok Upadhaya**  
Head - GIS & International Business Development, Navayuga, India
- ✎ **N.S. Shankaranarayana**  
Senior Director- Government Programs, DigitalGlobe, India
- ✎ **Dr. Sultan Singh**  
Senior Scientist, HARSAC, Haryana
- ✎ **Ratan Awasthi**  
Sr. General Manager, Elcome Technologies, India
- ✎ **Bharti Sinha**  
Executive Director, Association of Geospatial Industries, India



# Symposium

# GEOWEATHER



## Deliberations By

- ✎ **Barbara J. Ryan**  
Secretariat Director, Group on Earth Observations (GEO), Switzerland
- ✎ **Dr S C Kar**  
Scientist G, National Centre for Medium Range Weather Forecasting
- ✎ **Girish Jain**  
Business Head - Machine Control Division, Elcome Technologies, India
- ✎ **Kaushik Chakraborty**  
Regional President, India Hexagon Geosystems
- ✎ **Mark Reichard**  
President & CEO, Open Geospatial Consortium, USA
- ✎ **Dr K Hanumantha Rao**  
Group Head, Ocean Sciences Group
- ✎ **L . Harendu Prakash**  
Senior Consultant, Nansen Environmental Research Centre
- ✎ **Rahul Saxena**  
Scientist E, India Meteorological Dept
- ✎ **Munish Malhotra**  
Regional Sales Manager- INDIA & SAARC region, Trimble

## KEY OUTCOMES

- ▶ GPS Meteorology has the following present and future advantages: it gives near real time weather forecasts; it delivers weather information in active weather when conventional systems are not effective; it provides the total amount of Integrated Precipitable Water Vapor above zenith. Current GPS meteorology applications include: near real time weather forecasts; flash flood monitoring; long-term weather studies.
- ▶ A coherent effort to develop GIS within the atmospheric science community might best be served by incorporating a broad definition of a GIS in an effort to develop an atmospheric information system.
- ▶ The inability of existing GIS models to easily represent four-dimensional (space and time), real-time data is one of the primary reasons for the lack of GIS usage in meteorology and associated geosciences.
- ▶ The meteorological community has a long history of interoperability at human/paper level. Given the continual change of coordinate systems and projections and myriad sensors worldwide, evolving standards through consensus and collaboration will only become more important over time where climate change and weather are concerned.
- ▶ A key requirement ahead in the use of geospatial technology in weather services is to create a seamless system of generating and issuing forecasts at time scales of: nowcasting, very short range and short range forecasting, medium range forecasting, extended range forecasting and seasonal scale.
- ▶ Water vapour is one of the most variable characteristics of the atmosphere. It is the ultimate source of all forms of condensation and precipitation and its latent energy, which is the driving source of formation of cyclones/storms and tornadoes etc needs to be measured quantitatively. Ground based GNSS stations network is used across the globe for measurement of total precipitable water vapour in the atmosphere.
- ▶ Information from geostationary meteorological satellites can be used in identifying and locating primary synoptic systems like surface lows, troughs and ridges, jet streams, regions of intense convective activity, inter-tropical convergence zone etc, snow cover, dust storm, cloud motion vectors, rainfall estimation, precipitation and numerical weather predictions.
- ▶ Atmospheric developments over last 50-100 years can serve as a model for terrestrial and oceanic domains.

# Symposium

# GEOFORESTRY

## Deliberations By

### ML Srivastava

Deputy Inspector General –  
Forests, Ministry of Environment  
& Forests

### Vinod Kumar

PCCF & Project Director, Odisha  
Forestry Sector Development  
Project

### Dr C S Jha

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Department

### Dr S P S Kushwaha

Head Forestry & Ecology  
Department, Indian Institute of  
Remote Sensing, ISRO

### Pallav Mathur

Solution Specialist – Mapping &  
GIS, Trimble

## KEY OUTCOMES

- ▶ A number of latest technological interventions and initiatives are under way using geospatial technology: national level mapping: forest type, forest cover; forest fire detection and monitoring; change analysis: forest cover, carbon stock; Green India Mission (GIM); coral/mangroves mapping; natural disaster assessment: tsunami; proposed ForestSat; Impact of land use land cover change; management plans; National Spatial Data Infrastructure; CEC Projects; CAMPA Monitoring-eGreen-Watch; Intensification of Forest Management Scheme.
- ▶ GIS can assist in systematic organization of forest land resources; provides solutions for effective planning and forest land management
- ▶ GIS-based land information system can be used as a digital repository of key forestry datasets;
- ▶ High resolution satellite images can accurately delineate ground features, vegetation type, density through land use analysis, DGPS surveys of forest blocks and accurate geo-referencing, notified forest blocks, boundaries for JFM treatment areas, forest infrastructure.
- ▶ Near real time forest cover change monitoring with remote sensing and GIS can identify the positive as well as negative changes in forest areas, to have protection and conservation planning and to increase the responsibility and accountability among Field Staff.
- ▶ Satellite imagery has proven its benefits in addressing the following forest management issues: Forest resources estimation; yearly estimation of timber/paper/palm oil; illicit crop cultivation amid forests; disaster relief planning (landslides and forest fires)
- ▶ Satellite imagery can be used in cadastral forest maps
- ▶ Complete inventory control and tracking, facilitated by integrated geospatial solutions, offer endless possibilities for the forest products market.



# Symposium

## Deliberations By

- ✎ **Geoff Zeiss**  
Editor (Energy & Building),  
Geospatial World
- ✎ **Arup Ghosh**  
Chief Technology Officer,  
NDPL
- ✎ **Francois Valois**  
Director of Product  
Management, Civil and  
Geospatial, Bentley Systems,  
USA
- ✎ **Pankaj Gupta**  
Enterprise Geospatial –  
MEA, Trimble
- ✎ **Subir Saha**  
General Manager  
(R-APDRP), Power Finance  
Corporation
- ✎ **James Weninegar**  
Manager – Transmission  
Line Services Dept, Alabama  
Power, USA
- ✎ **Jai Krishen Yachu**  
Chief (Geology), NHPC Ltd.
- ✎ **Jayachandran Mani**  
Vice President, GIS Business  
Solutions, Navyuga Infotech
- ✎ **Subrata Sengupta**  
General Manager, Stesalit
- ✎ **Vinay Babu Adimulam**  
Technical Sales Manager,  
Intergraph SG&I
- ✎ **Arul I**  
Assistant Executive Engineer,  
Tamil Nadu Electricity Board
- ✎ **Yogita Shukla**  
Research Fellow (Honorary),  
Association of Geospatial  
Industries
- ✎ **Alekhyia Datta**  
Research Associate, TERI

# GEOENERGY

## KEY OUTCOMES

- ▶ The electricity utilities world over are gradually realising the potential of geospatial technologies, and resultantly the henceforth one-way push from the geospatial industry into electricity sector is now slated for mutual interest based interactions.
- ▶ Using GIS Mapping tools, many distribution companies in India have modernised their business operations and have become more efficient. They have managed higher degrees of utility automation and drastically reduced their non-technical losses.
- ▶ Contrary to the popular belief, investments in GIS mapping have provided quick Rols to the user organizations. Some even claimed they recovered their investments in just three to four years as the benefits immediately started adding to their topline.
- ▶ The Government of India is pushing for GIS tools in electricity distribution by providing funds and incentives under policies such as R-APDRP and RGGVY. Under the mandate of these schemes, all state-owned utilities have taken up implementation of these projects in their identified distribution circle.
- ▶ Overall, non-availability of quality high-res imageries and delays in consumer surveys are the biggest bottlenecks for timely implementation of GIS projects under R-APDRP. The Government of India should simplify the procedure for the procurement of high-res imageries and should consider granting access to private players as well.
- ▶ Remote sensing technologies have proved to be a great boon for hydro-electric projects as they have reduced the room for variation between the information available at the planning stage and the actual on-the-ground scenario.
- ▶ The industry is facing a huge shortage of skilled manpower. The need of the hour is for the geospatial industry to collaborate with universities to launch relevant undergraduate programs and interact with students to spread awareness about career possibilities in this area.





# Symposium

## Deliberations By

- ✍ **Dr Sanjay Dahasahasra**  
Ex Member Secretary,  
Maharashtra Jeevan  
Pradhikaran and Ex- President  
Indian Water Work Association
- ✍ **Atanu Pattanayak**  
Vice President & Territory  
Executive, Bentley Systems
- ✍ **Dr MB Joshi**  
General Manager – Technical  
& Coordination, Sardar  
Sarwan Narmada Nigam Ltd.
- ✍ **SK Sinha**  
Sr Scientist, Central Ground  
Water Board
- ✍ **H. Hemanth Kumar**  
Head – Karnataka State  
Spatial Data Infrastructure
- ✍ **Venugopal Parasuraman**  
Vice President, Amigo Optima  
Software Solutions
- ✍ **Dr.V.V. Rao**  
Group Head – Water  
Resources, NRSC
- ✍ **Mahendra Mehta**  
Ground Water Management  
Expert, European Union
- ✍ **N. Srinivas**  
Deputy Director, AP Ground  
Water Department
- ✍ **Ashish Arora**  
Enterprise Solutions  
Consultant, Intergraph SG&I
- ✍ **Dr. Giriraj Amarnath**  
Researcher – Remote Sensing  
& GIS, International Water  
Management Institute
- ✍ **Dr. Subhash Chandra**  
Senior Scientist Ground  
Water Division, National  
Geophysical Research Institute

# GEO WATER

## KEY TAKEAWAYS

- ▶ Increasing urbanisation is stressing the current water resources. GIS-based hydraulic models can ensure continuous 24X7 water supply in Indian cities. Geospatial technologies can help in asset management of water infrastructure, district metric area creation, NRW reduction, digitisation of water records etc.
- ▶ GIS technology can promote economic, efficient & effective water management. Water treatment and desalination plants should be part of smart water initiatives
- ▶ Geospatial technology plays a significant role during the canal network construction, earthwork, identification of missing link, canal operation, and maintenance, command area development and irrigation activities.
- ▶ The issues of data sharing, recycle of water and limited applications of GIS plague the water industry
- ▶ Stakeholder participation, promoting authoritative crowdsourcing, PPP model for development of apps etc are the issues which SDIs for watershed management faces
- ▶ The use of modern LiDAR technologies can promote cost effective and efficient groundwater management.
- ▶ A number of significant projects have been initiated in water data management, including one in Rajasthan where groundwater data of past 25 years has been computerised and stored
- ▶ There are a number of solutions provided by the industry that are cost-effective and user friendly to even the non-GIS users
- ▶ The global nature of earth observation satellites helps to address the problems of data continuity in trans-national basins where complete and consolidated maybe difficult to obtain.
- ▶ Heliborne technology and GIS promote sustainable management of groundwater resources



# Symposium

## Deliberations By

- ✎ **B. Surender Mohan**  
CMD, Neyveli Lignite Corporation
- ✎ **Prof. R.V. Ramani**  
Prof. Emiratus, Mining Engineering, Pen State University, Pennsylvania, USA
- ✎ **NP Singh**  
General Manager (Geomatics), CMPDI
- ✎ **Dheeraj Kumar**  
Associate Professor & Coordinator, M.Tech (Geomatics), Faculty In-Charge, Mine Surveying Section, Department of Mining Engineering, Indian School of Mines
- ✎ **AK Bhandari**  
Sr Advisor, Federation of Indian Mineral Industries
- ✎ **Narendra Kavdia**  
General Manager - Exploration, Hindustan Zinc Ltd
- ✎ **Dr. AK Chaturvedi**  
Head – Aerial Survey Remote Sensing Group, and Head – Exploration Geophysics Group, Atomic Mineral Directorate
- ✎ **D U Vyas**  
General Manager - Geology & Technical, Gujarat Mineral Development Corporation Ltd
- ✎ **V. K. Misar**  
Senior Mining Geologist, Indian Bureau of Mines
- ✎ **Shailesh Shankar**  
Manager – Sales Engineering – Asia Pacific, DigitalGlobe
- ✎ **Dwaipayan Dighal**  
Regional Sales - Geospatial Intergraph SG&I
- ✎ **Dinakar Devireddy**  
Sr Project Manager, Infotech Enterprises
- ✎ **Subhash Babu**  
Osmania University

# GEO MINING

## KEY TAKEAWAYS

- ▶ Transportation, energy, manufacturing, health, agriculture, construction are likely to remain heavily dependent on raw materials such as iron, copper, aluminium & industrial minerals. GDP from mining sector in 2011-12 (at current prices) was Rs.2,01,076 cr. Mining thereby is being seen as an important strategic sector for sustainable growth
- ▶ Profitability and quality of mineral extraction is increasingly dictated by use of IT & Geospatial technology. The technology enables rapid, flexible assessments which yield an easy-to-interpret visual product as an output
- ▶ Mining sector in India has been slow in adopting geospatial technology due to its fragmented nature
- ▶ The need for geospatial technology is increasing as the value of mined material continues to increase and regulatory agencies continue to impose safety regulations
- ▶ A well designed, implemented and supported GIS management structure is critical to the success of the mining operation.
- ▶ GIS can contribute in providing a safe working environment in underground mining by performing network analysis and determine the appropriate sites for refuge chambers and facilitate the prompt evacuation of mine personnel
- ▶ GIS and remote sensing assist the planners in identifying natural hazards such as potential landslides, floods, and earthquakes prior to the construction of production and housing installations
- ▶ 3D technologies give commercial benefits and promote transparency in mining activities
- ▶ Lack of awareness about technology amongst the mine owners and regulatory agencies is impending adoption of these technologies in the Indian context. Other factors include license cost, interoperability and IT infrastructure
- ▶ Acquisition of right data and its plausible interpretation is essential to minimise risk
- ▶ Outstanding managerial skills are required to recognise and implement superior solutions



# Symposium

## Deliberations By

- ✉ **Dr. Aniruddha Roy**  
Vice President, Navayuga Engineering Company Ltd.,
- ✉ **S B Honnur**  
Director, Town & Country Planning, Karnataka
- ✉ **Dr K Venu Gopal Rao**  
Group Head, US & GID, National Remote Sensing Centre
- ✉ **T. Sheshadri**  
Advisor and Head – IT, Bruhat Bangalore Mahanagara Palike
- ✉ **U N Tiwari**  
Institutional Expert, N.J.S. Engineers
- ✉ **Dan Campbell**  
Systems Analyst II - GIS & CADD Services Branch IT Dept, Financial Services Group, City of Vancouver, Canada
- ✉ **Arijit Roy**  
Google Enterprise
- ✉ **Dr. Julian Kardos**  
Director Global SG&I Project Services, Intergraph Corporation
- ✉ **Kumud Dhanwantri**  
Lecturer, Amity University Haryana

# GEOCITIES

## KEY TAKEAWAYS

- ▶ Aerial photos, high resolution satellite imagery and LiDAR techniques are being used in creating large scale maps in both 2D and 3D. Such data creation and updates provide value added applications for governance and citizen centric services. It is only after the applications are used, that the perception of the ROI is assumed to be achieved.
- ▶ Urban planning and applications require multi-scale scientific geo-spatial data. Remote sensing data is excellent, cost effective source for creating / updating cartographic data base.
- ▶ Some of the key areas of municipal governance where GIS is demonstrating its benefits include: identifying and categorizing the urban land use; urban planning using digital data; deriving property size and building density; Planning road maintenance based on width and condition; determining the slope of the terrain for storm water drains; estimation of dwelling units for various house hold types; and use of digital maps for vehicle tracking system to monitor solid waste management.
- ▶ Mobile ground-based attribute collections is useful way to integrate spatial and attribute data in near real time
- ▶ In view of the increased intensity of development in the LPA's, master plans are essential to plan, guide and regulate the growth.
- ▶ The latest trends in the use of geospatial technology by LPAs include GPS control Survey, digitization, thematic mapping from satellite imagery, digital terrain models, Web GIS and GIS Application tools.
- ▶ GIS maps facilitate analysis of different themes and can be used for planning of various activities
- ▶ The key requisites for better governance include process optimisation, more for less, public information and social engagement. Geospatial advantage is the key to success
- ▶ Successful geospatial implementation in municipal projects requires: ensuring and developing quality of manpower employed in the project; setting quality benchmark; facilitating and supporting the implementing agency; ensuring active stakeholders' participation; and following timelines





# Exclusive Session: NGIS

## Deliberations By

- ✎ **Dr Maj Gen R Siva Kumar**  
CEO, National Spatial Data Infrastructure
- ✎ **Dr PS Acharya**  
Scientist G, Dept of Science and Technology, Ministry of Science and Technology
- ✎ **Vinod Bothale**  
Group Director, Geoportals and Web GIS Services, National Remote Sensing Centre
- ✎ **Dr S Subba Rao**  
Surveyor General, Survey of India
- ✎ **Prof NL Sarda**  
IIT Bombay
- ✎ **RN Nanda**  
Survey of India
- ✎ **Ashwani Rawat**  
Trimble
- ✎ **Dr Aniruddha Roy**  
VP, Navayuga Engineering Company Ltd.
- ✎ **Steven Hagan**  
Senior Vice President, Oracle Corporation, USA
- ✎ **Dr Vandana Sharma**  
Deputy Director General, National Informatics Centre
- ✎ **P Shashidhar Reddy**  
Manager Computer Systems, National Remote Sensing Centre
- ✎ **Bradley Skelton**  
CTO, Hexagon Geospatial
- ✎ **Gaurav Mitra**  
Nvidia
- ✎ **Dr Alka Mishra**  
Sr Technical Director, NIC
- ✎ **Dr K Venugopal Rao**  
NRSC
- ✎ **Dr KS Rajan**  
IIIT Hyderabad
- ✎ **Vatsal Dave**  
VP, Esri India
- ✎ **Suren Ruhela and Arijit Roy**  
Google

## KEY TAKEAWAYS

- ▶ GIS is for all, not for any specific organisation
- ▶ NSDI has conducted a consensus among data sharing agencies to exchange data
- ▶ The Government of India is planning to establish NGIS with an estimated investment of INR 3,000 crore
- ▶ It is important for every agency to have data and metadata
- ▶ Survey of India will soon launch a virtual reference system
- ▶ Metadata, standards and interoperability are essential components of NGIS
- ▶ Semantics is a critical requirement for interoperability
- ▶ SDI gets order and efficiency using standards and it has to be open and interoperable
- ▶ Accelerated computing, which can perform analysis on large chunks of datasets, helps in collaborating real time environment
- ▶ There is a need for collaboration with the national mapping agencies for data sharing



## Session: 3D Modelling

### KEY TAKEAWAYS

- ▶ Over the past decade there has been a tremendous increase in demand for 3D modelling of cities and infrastructure and 3D city models have become an integral base for building and planning cities around the globe
- ▶ Digital representation of building models can eradicate costly mistakes and reducing unforeseen changes during actual design and construction phases
- ▶ With more and more planning and design tasks being executed digitally, an incredibly rich set of information is getting embedded in a 3D model with contribution from multiple stakeholders of a project. This 'as-built' 3D project model approach is essentially helpful in meeting quality deliverable on time and executing it without much errors and reworks.
- ▶ Collaborating and sharing of 3D models on clouds between various stakeholders of a project increases productivity, efficiency and transparency and reduces cost.
- ▶ Airborne LiDAR and images are an excellent data source to build 3D city models. The advantage compared to any other means of survey is that one can atomise the data processing, which means that the models can be very easily upgraded immediately after operation.
- ▶ A pertinent issue is, there are many exciting possibilities in this field, but when will India open up to this?
- ▶ 3D laser scanning has become a valuable tool with ever-improving quality of results in urban and mining environments

## Session: WEB GIS

### KEY TAKEAWAYS

- ▶ Semantic Web can be considered as an extension of the current web technology, which extends the capability of Web GIS system to incorporate geospatial information as per the well-defined meaning of their feature sets, better enabling computers and people to work in integration.
- ▶ Open source tools for image georeferencing over Internet are required, given the immense need for planning, resource monitoring, environment monitoring; increased availability of satellite images and more open source alternatives. This provides freedom from costly commercial software and no high-end workstation is required at user end.
- ▶ A Web-enabled decision support system (DSS) can provide an interface to analyse thematic natural resource maps and the secondary data from various sources.



## Session: Emerging trends & technologies

### KEY TAKEAWAYS

- ▶ GIS can be applied for identification and impact evaluation of road side friction points on urban traffic speeds
- ▶ GIS solutions are making their effectiveness felt in global supply chain management
- ▶ Rural sample surveys are important in dairy sector, which provide essential inputs for various businesses/ operational planning. GIS is demonstrating its effectiveness such surveys
- ▶ APIs allow the developers to extend the framework using custom modules. However, just GIS development skills are not good enough or just IT development skills are not enough. Innovative IT integration methods, tools, APIs combined with GIS industry knowledge, product knowledge need to be integrated to deliver high performing mobile GIS apps.
- ▶ An integrated camera system like an imaging rover, featuring position sensor, camera system, power rod, tablet, field software and office software, offers the capability of precisely capturing 360° digital panoramas used to visually document and measure the surrounding environment.
- ▶ Standards development is critical to a nation's success. Role of government, industry and academia are key to it. There is a need to socialise concepts and manage differences for national initiatives

## Session: NRDMS

### KEY TAKEAWAYS

- ▶ An agent-based LCC model can understand the land use and land cover dynamics and impact of drivers
- ▶ Geoinformatics has proven itself to play a significant role in natural resources data management, including cropping pattern, site suitability for crops, flood management, analysing the change of river course and loss of land, precision farming, canal and drainage network, soil content analysis
- ▶ State geoportals offer a number of services that are contributing to informed decision making in NRDMS, including Web map service, catalogue service on web, web feature service, query-based decision support, web coverage service, search and discovery.
- ▶ The tangible and intangible benefits accrued through International Charter on Space and Major Disasters, a collaborative model, are significant towards disaster management.
- ▶ GIS-based watershed planning can help in well-located farm pond with adequate water
- ▶ Very high resolution satellite images can be used in urban tree canopy detection. Urban tree census can provide decision makers with detailed metrics on the state of urban forest which enable decision makers to not only understand the urban forest in its current form, but to plan feasible approaches to increasing urban trees.





# India Geospatial Excellence Awards

## India Geospatial Leadership Awards

### Geospatial Company of the Year 2013

Secon Pvt. Ltd



### Capacity Development

Institute of Remote Sensing, Anna University



### Geospatial Business Leader – 2013

Kaushik Chakraborty, Regional President, India, Hexagon Geosystems



### Making a Difference

Dr. M P Narayanan, Chairman, Geospatial Media and Communications



### Life Time Achievement

Dr. B V R Mohan Reddy, Chairman, Infotech Ltd



## EXCELLENCE IN APPLICATION OF GEOSPATIAL TECHNOLOGY

CATEGORY	WINNER	PROJECT
Agriculture	Bidhan Chandra Krishi Viswavidyalaya and Stesalit	e-Pest Surveillance and Advisory System
Agriculture	Swiss Agency for Development and Cooperation / NABARD & WOTR	Use of Geo-Spatial Tools in Farm Pond implementation under Climate Change Adaptation
Biodiversity Conservation	CiSTUP, IISc Bangalore & Gubbi Labs	Frog Find - Android App
Disaster Management & Mitigation	DIT, Government of Jharkhand & Stesalit	e-Rahat, Emergency Services
Forestry	Principal Chief Conservator Of Forests (Kendu Leaves), Odisha & ORSAC	Kendu Leaves Procurement and Storage System
Governance	State Rural Road Development Agency, Mizoram, Tripura and Manipur & C-DAC	Web GIS Enabled Road Information Management and Monitoring System
Land Reforms	Department of Land Resources & Department of Revenue Government of Haryana	Haryana National Land Records Modernisation Programme
Public Safety	Raksha Shakti University, Gujarat & BISAG	GIS based Decision Support System for Crime Mapping and Analysis
Urban Planning	Bruhat Bangalore Mahanagara Palike	GIS Based Property Tax System
Utility Services (Water)	Rajasthan Ground Water Department & ROLTA India Ltd.	3D Aquifer Mapping for Groundwater Resource Estimation and Optimisation
Construction	L&T Shipping & L&T Construction	Construction of Shipbuilding cum Minor Port Complex at Kattupalli, Chennai

# Our Exhibitors



Andhra Pradesh Forest  
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ASSOCIATION OF GEOSPATIAL INDUSTRIES



Sustaining Infrastructure



Directorate of  
Information Technology  
Government of Maharashtra



Department of Science & Technology  
Government of India



Haryana Space Applications Centre



Creating Business Impact



Karnataka Forest Department



Karnataka State Council of  
Science and Technology



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India Meteorological Department



Directorate of Information Technology  
Government of Maharashtra



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