

MAPS TODAY

Monthly Publication

6-3-1117, 602, Maruthi Sadan Apartments, Begumpet, Hyderabad-500 016, Telangana, INDIA
Tel: +91-40-66667776 Tel. & Fax: +91-40-66667333 E-mail: mapstodaygis@gmail.com



Patrons/Advisers

Dr. Hanuman Chowdary (Padmasri)
Mr. GS Oberoi

Steering Committee

Dr. DP Rao (Padmasri)
Prof IV MuraliKrishna
Dr. Swarna Subba Rao
Brig. JS Ahuja
Maj Gen R. Shiva Kumar
Mr. P.Satyanarayana
Mr. NK Agrawal
Dr.HC Mshra
GS Kumar (Convenor)

Managing and Editorial Committee

Mr. GS Kumar - President/Editor
Dr. V.Raghav Swamy - Co-editor
Maj. Dr. G. Shiva Kiran - Chief Executive
Mr. Rakesh Bhatnagar - Co- Executive
Mr.KK Pappan
Mr. Murali Mohan
Dr.KB Chari
M. BN Rao
Mr. MS Swamy

Executive Associates

Mr. Amresh Mathur
Mr. Arjun

Supporting Members

Mr. VSRao
Maj Gen B Nagarajan
Prof. B. Sridhar
G.Sunethra
G. Malvika

CONTENT

CONTENT

Editorial	3
Paradigm Shift in Sustainable Development	
RS & GIS PerspectiveD.P.Rao	4
Datum and Coordinate systems.....NK Agrawal.....	5
Why GeoSpatial Technologies ?... GS Kumar	11
A view on G I S.....IV Muralikrishna	12
Road map for drones	8
GIS for Smart Cities	9
Geomatics & Geography	14
<u>Abstract/Extracts:</u>	
India's map policy	
Land Disputes	13
Book Review- Essentials of Geodesy and Map Projections.. By N K Agrawal	20
<u>NEWS</u>	
World GIS Day	15
ISRO launches satellite	21
INCA Congress 2018-11-21	17
The Geospatial Industry	22
GeoMap Quiz, Hyderabad	19
VAADA - App for disabled to vote	20
Violators beware.....	18
Events	16

EDITORIAL

For various reasons GIS India started in 1992 had to be suspended in May 2017. Based on consultations and advices, it was decided to go for a journal with new name and new set-up. Registrar of Newspapers of India (RNI) finally cleared the title MAPS TODAY. RNI's letter states: This title has been verified in terms of the provision to Section 6 of the PRB ACT 1867. You may, therefore, authenticate.....It may please be noted that Act of 1867 has been quoted ! There are many rules/acts/laws made during British rule. These need to be reviewed. Read articles dealing with this issue.

The next step is registration with RNI, which is in process. Print copies of MAPS TODAY will be distributed from November 2018, the month of World GIS Day. However, digital copies of the issues / material can be accessed and downloaded from our website prepared by our member Malvika (Dubai): <https://swamagsk.wixsite.com/gisindia>

Those who paid subscription to GIS India for 2017, the period of subscription will be suitably extended/covered to cover for the period print copy of GIS India is not published.

GIS India started in 1992 was sustained mainly due to subscriptions from Engineering colleges and mapping related organisations. SECON, Bengaluru is the only Company that provided consistent support

from the inception (1992). MAPS TODAY is started in the hope that we may be able to attract subscribers/sponsors to sustain the monthly. There are several issues of interest to industry in particular, to be resolved for adoption of GIS in India.

Thus, MAPS TODAY, sponsored by GeoMap Society - GEMS (since 1990), will provide a pro-active platform to develop applications and deal with associated issues in the new emerging map-based IT and management systems, presently referred to as Geospatial Technologies.

This first issue of MAPS TODAY contains basic articles on Sustainable Development, Smart cities and Datums; thought provoking articles on Why GIS; India's map policy, Cadastral surveys; World GIS Day with news about GeoMap Society's involvement with Map Awareness Programmes (MAP's).

An interesting news is development of special application VAADA to help for disabled to vote at Municipality in Hyderabad. Mj Gen Dr. Siva Kumar's article about crowd sourcing experiment is a pointer that general people's involvement is a must for the technology to be adopted.

Please subscribe and encourage others also to subscribe to support the cause of "Adoption of GST in India" on a wider scale. It will benefit the society, industry and nation;

PARADIGM SHIFT IN SUSTAINABLE DEVELOPMENT RS & GIS PERSPECTIVE



D P Rao
(Former Director NRSC)

One of the most talked about topics applicable to all nations is sustainable development (SD). The World Commission on Environment and Development in 1987 defined it as "development which meets the needs of the present without compromising the ability of future generations to meet their own need". United Nations conducted discussions on several occasions and held summits at various places around the world. The principles of SD enunciated in RIO Declaration in 1992 and once again reaffirmed at the Johannesburg World Summit on SD in 2002 explicitly define the roles of stake holders. It is incumbent on all countries to strictly follow the principles and implement them in practice to realize the benefits of SD. The last UN SD Summit held in 2015, attended by 193 nations aimed to end poverty, fight inequalities and tackle climate change with an agenda of 17 goals to be achieved by 2030.

Monitoring of natural resources and of environmental changes has seen new light with the availability of these technologies.

Sustainable Development needs the support of a) sustainable society b) sustainable economy and c) sustainable environment. The integrated effort of these three should aim at improving the quality of life while living within the carrying capacity of finite natural resources.

New Technologies like Remote Sensing (RS), Geographic Information System (GIS) Global Positioning System (GPS) and many more, together commonly referred as Geo-informatics, have been in use for last several years to identify and analyze sustainability indicators. Monitoring of natural resources and of environmental changes has seen new light with the availability of these technologies. Not only mapping of earth's resources, like land use / land cover, water bodies, geological and mineral wealth but also in change detection which helps in disaster management for rescue and rehabilitation operations. The multirole opportunities in RS applications provides data base that can be dynamically monitored due to repeated coverage. This data base becomes a vital instrument, legally valid for spatial planning. Geographic Information System (GIS) can store, manipulate, analyze, manage and present spatial data for planners.

India is fortunate to have developed its own remote sensing satellites in multiple numbers with high to medium sensor resolutions that help in acquiring spatial information of any part of the country any time. In reality these "eyes in the sky" have been

meeting the needs of the country, states, regions and rural to urban areas in a sustained manner. Indian experience in SD using RS and GIS were presented in UN conferences in Bangkok (1983) and Vienna (1999).

Essentially, geo-informatics has the capability to gather all parameters that are needed for implementing actions for SD

The withdrawal of US from Paris Agreement on Climate Change Mitigation in 2017 is a major setback for international cooperation in SD. Globally, SD does not appear to be receiving attention that it did as in the past. It is time to do introspection on the attitudinal changes of governments and their policies in adopting the highly reliable technology of Geo-informatics.

In India we have had several success stories in the use of geo-informatics, like mapping of: 1. Forest cover, 2. Wastelands, 3. Mineral and ground water resource areas, 4. drought affected areas 5. Disaster affected areas 6. Areas of illegal activities like forest and mining encroachment 7. Urban planning needs 8. Surface water bodies and many more. Essentially, geo-informatics has the capability to gather all parameters that are needed for implementing actions for SD.

Most of these successes have come with the cooperation of implementing agencies from centre and states, convinced on the benefits of geo-informatics. However a critical analysis is yet to be made if the trend is increasing or decreasing. There is a fear among many that interest in geo-informatics is decreasing and selective. If one looks at state level, we have the politicians in power, bureaucrats in administering the policies of government and district and local level implementing agencies. Unless there is unison among all levels in understanding the benefits of geo-informatics there will be no visible change in the ground scenario.

Technology can identify where the lights are not working but the rest is up to the administration

An example of urban planning in Hyderabad: NRSC in cooperation with urban planners of Hyderabad made an urban development plan

Contd.....13

Declaration:

Printed and published by Maj Dr G. Shiv Kiran on behalf of GeoMap Society

Printed and published at 6-3-1117, 602, Maruthi Sadan Apartments, Begumpet, Hyderabad-500 016, Telangana, INDIA

--- Editor **G.S. Kumar**

DATUM AND COORDINATE SYSTEMS

To understand datum better let us first define The earth, The Geoid and The reference ellipsoid.

The Surface of the Solid Earth

The surface is earth shaped i.e. the earth as it is with all its undulations (Mountains and depressions).

This is roughly an oblate ellipsoid (obtained by revolving an ellipse about its minor axis), with semi axes of nearly 6378 and 6357 km. but it may depart from the ellipsoidal shape by some

The mean sea level or geoid is the datum for measurement of heights above it. The geoid may depart from the ellipsoidal form by varying amounts, up to 100 metres or even more

kilometers.

The Geoid

It is an equipotential surface of earth's attraction and rotation. It is nearly ellipsoidal but a complex surface.

The geoid is almost the same as mean sea level, i.e. it may be described as surface coinciding mean sea level in the oceans and lying under the land at the level to which the sea would reach if admitted by small frictionless channels. The geoid on an average coincides with the mean sea level in open oceans.

The geoid may also be defined as that level surface of the gravity field which best fits the mean sea level and may extend inside the solid body of the earth.

Ambiguity is due to mean sea level not being exactly an equipotential surface or due to periodic changes in the form of the geoid due to earth tides, but these will not be more than a metre.

The mean sea level or geoid is the datum for measurement of heights above it.

The geoid may depart from the ellipsoidal form by varying amounts, up to 100 metres or even more.

The geoid unfortunately has rather disagreeable mathematical properties. It is a complicated surface with discontinuities of curvature, hence not suitable as a surface on which to perform mathematical computations.

The Reference Ellipsoid or Spheroid

Spheroid and ellipsoid are synonymous. Word Spheroid is used in India and Britain whereas Ellipsoid is used in America and Russia. A spheroid (1) is any surface resembling sphere and



BY N. K. AGRAWAL

(2) in particular an ellipsoid of revolution.

The geoid being unsuitable we use an arbitrarily defined geometrical figure. It could be a sphere but an oblate ellipsoid of revolution, which closely approximates to Geoid, is more suitable.

It is important to note and understand that the definition of ellipsoid is arbitrary. Subject only to convenience any spheroid can be adopted.

Datum

A datum may be defined as a set of numerical or geometrical quantities which serve as a base or reference for other quantities. In geodesy we consider two types of datum; Horizontal datum and Vertical datum. Datum are defined in relation to the surface of the earth as measurement of angles and distances are carried out on the surface of the earth for surveying and mapping. The maps represent a part of the surface of the earth. The surface of the earth is extremely complex and unsuitable for reduction/computations of angles and distances, hence an arbitrary imaginary surface such as ellipsoid of rotation is chosen as a reference surface. Departures of the earth's surface from the reference surface are determined to find out the real surface of the earth.

Horizontal Datum

Datum to which the horizontal control (planimetric control) data, say latitude and longitude are referred. Ellipsoid of rotation (a figure obtained by rotating an ellipse about its minor

The surface of the earth is extremely complex and unsuitable for reduction/computations of angles and distances, hence an arbitrary imaginary surface such as ellipsoid of rotation is chosen as a reference surface.

axis), with nearly the same size as that of the earth is suitable for mathematical operations, hence it is used to define horizontal datum after orienting the same with respect to the earth. Axes of ellipsoid of rotation are assumed to coincide with or parallel to that of the earth.

Vertical Datum

Geoid or Mean Sea level is used as vertical datum to represents above this surface due to water flow criterion as water flows from one potential or energy level to another. Geoid is the equipotential surface of earth's attraction and rotation and on an average coincides with the Mean Sea Level.

Mean Sea Level

Sea level is monitored at tidal observatories by hourly or continuous measurement of tides. Mean of high and low tides of measurements over a metonic cycle of 19 years is taken as Mean

Sea Level (MSL). A 19 year metonic cycle is used in order to include all possibly significant cycle through the 18.67 years period for the regression of the moon's nodes while still terminating on a complete yearly cycles. As there are irregular apparent secular trends in sea-level, averaging of tidal observations over a specific 19 year cycle (National Tidal Datum Approach) is necessary so as to have a common reference.

Indian Mean Sea Level

In India the vertical datum for heights has been chosen as the Mean Sea Level at a group of nine tidal observatories situated at Indian ports. Observations at these ports were carried out for a number of years and it was assumed that the Mean Sea Level at these ports belong to the same level surface. All these ports serve as issue points for the level net.

Geodetic Datum

A geodetic datum is defined by a set of at least five parameters; semi major axis a, flattening f or semi major axis b, and coordinates of the origin x0, y0, z0..of the ellipsoid of rotation adopted as reference surface. Estimation of a and b is done by measurements of the meridian. Usually the following assumptions are made:-

- 1) Center of the ellipsoid coincides with the center of gravity of the earth.
- 2) Minor axis of the ellipsoid coincides with polar axis of the earth. In many cases minor axis is assumed to be parallel to the polar axis.
- 3) Ellipsoid rotates from West to East with the same speed as that of the earth.
- 4) Mass and volume of the ellipsoid are same as that of the ellipsoid.

To realize the datum , an initial point is chosen on the surface of the earth. Coordinates (Latitude and longitude) of this point are estimated by astronomical observations to stars. Height is obtained by spirit leveling above Mean Sea Level from the value of known bench-mark. Azimuth of one line is also obtained by astronomical observations. Coordinates of this point obtained by astronomical observations and spirit leveling, are estimates of Natural Coordinates of the initial point. It is assumed that these coordinates are the same as geodetic coordinates of the initial point. Control networks then provide control points all over the country by adopting various methods. In case of India Kalyanpur in Central India was chosen as the initial point. Potsdam is initial point for Europe and Meades Ranch for North America.

Indian Geodetic System

Indian Geodetic System/Datum based on Everest Spheroid as reference surface was defined peace-meal at various times. Astronomical observations were carried out at least twice. More precise observations carried out at a later date were accepted. Hence meridional and prime vertical deflection of vertical, were defined at Kalyanpur. Parameters of the datum are given below:-

Initial Point (Origin)	Kalyanpur
Latitude of Origin	240 07' 11".26
Longitude of Origin	770 39' 17".57
Meridional deflection of vertical	- 0". 29
Prime vertical deflection of vertical	+ 2". 89
Geoidal undulation	0 metres
Semi major axis	6,377,301.243 metres
Flattening f	1/300.8017
Azimuth to Surantal	190°27' 06". 39

Everest Spheroid Definition

Everest Spheroid is the reference surface for India and

adjacent countries. It was named after Sir George Everest who was The Surveyor General of India from 1830 to 1843. He was responsible for meridian arc measurements to estimate size of the spheroid. It was originally defined in feet in 1830. Values in feet are given below :-

- Semi major axis a = 20,922,931.80 feet
- Semi minor axis b = 20,853.374.58 feet
- Flattening f = 1/300.8017

It is important to mention here that varying values of a and b or a and f are being used in respect of Everest Spheroid by different people in the world. This is due to variation in conversion factor from foot to metre. India uses 0.3047996 as the conversion factor. Some differing values are given below:

	Conversion factor	a (metres)	1/f
India	0.3047996	6,377,301.243	1/300.8017
Common	0.30479841	6,377,276.245	1/300.8017
Malaya navy	0.30479933333	6,377,295.664	1/300.8017
Mod 1967	0.304799471984	6,377,298.565	1/300.8017
-	0.3047995	6,377,299.151	1/300.8017
Malaya	0.304799734763	6,377,304.063	1/300.8017
International foot	0.3048	6,377,309.613	1/300.8017

Transformation Parameters

To convert the coordinates of Indian system to WGS 84 or any geocentric system the following transformation parameters are required:-

- 1) dx, dy, dz, the three coordinates of origin of Indian system with respect to origin of a geocentric system, known as translation parameters.
- 2) ?1, ?2, ?3, the three directions of axes of Indian system with respect to directions of axes of a geocentric system, known as rotation parameters.
- 3) da, and db, the two differences in semi major axis and semi minor axes of the two systems, or simply ds the change in scale.

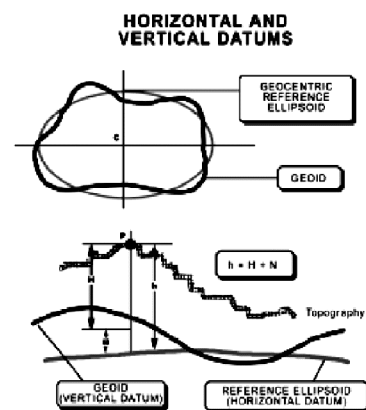
Bursa-wolf model is normally being used for transformation by many geodesists. Some organizations prefer to ignore rotation parameters. Minimum of three points are required, where coordinates in both the systems are known, to calculate transformation parameters.

Datums in North America

The two mostly used geodetic datums in North America are North American Datum 1983 (NAD83), and World Geodetic System 1984.). Reference ellipsoid parameters of the two are given below:-

Datum	a (metres)	Flattening f
NAD 83	6,378,137.0	1/298.257222101
WGS 84	6,378,137.0	1/298.257223563

The two system's parameters are nearly the same.



Dimensions of Some Well Known Spheroids.

Name	Date	a (metres)	b (metres)	$\frac{1}{f}$	User country
Everest	1830	6,377,301	6,356,100	300.80	India
Clarke	1866	6,378,206	6,356,584	294.98	USA
Clarke	1880	6,378,301	6,356,566	293.47	S.Africa
Bessel	1841	6,378,397	6,356,079	299	Central Europe
International (Hayford)	1909	6,378,388	6,356,912	297.0	USA, adopted internationally
Krassovsky	1948	6,378,245	6,356,863	298.3	Russia, Eastern Countries
Reference Ellipsoid 1967 (I.U.G.G.)	1967	6,378,160	6,356,775	298.25	Internationally
WGS 72	1972	6,378,135	6,356,750	298	NASA
WGS 84	1984	6,378,137	6,356,752	298.257	GPS-Internationally

The WGS-84 Coordinate System:

A geocentric equipotential ellipsoid of revolution was taken as reference surface known as Geodetic Reference Surface 1980. The following parameters were selected to define WGS84 Ellipsoid. i) Semi major axis $a=6378137+ 2$ meters (one sigma)

ii) Earth's Gravitational Constant $GM = (3986005 +0.6) \times 10^8 \text{ m}^3 \text{ s}^{-2}$ (one sigma)

This value includes the mass of earth's atmosphere and is based on several types of space measurements.

The derived geometric and physical constants are given below:-

Geometric Constants:

Flattening	f	=	1/298.257223563
Semi minor axis	b	=	6356752.3142 meters
First eccentricity	e	=	0.0818191908426
First eccentricity squared	e^2	=	0.00669437999013
Second eccentricity	e^1	=	0.0820944379496
Second eccentricity squared	e^{12}	=	0.00673949674227
Linear eccentricity	E	=	521854.0084 meters

Concluding remarks

In India we have been using Indian system based on Everest spheroid. All our maps were based on this system. Now as per new Map Policy all maps are being/have been converted to WGS84 system. GPS is based on WGS84.

*N K Agrawal is former Director of Indian Institute of Surveying and Mapping of Survey of india. He is author of books : Essentials of GPS,

Essentials of Geodesy and Map Projections
(Email mapstodaygis@gmail.com for copies/information)

Humour



“The computer says I need to upgrade my brain to be compatible with the new software.”

Road accidents

Avinash Mohanty, Cyberabad Traffic DCP, Telangana
If rules are enforced strictly, the road accident rate can be brought down considerably though factors like better road conditions and fitness of vehicles contribute to the fatalities
Source: Strict enforcement of rules may bring down fatal accidents
By Marri Ramu; Hindu dated 21 Dec 2014

ROAD MAP FOR DRONES: GOVERNMENT ANNOUNCES 13-MEMBER TASK FORCE

The Indian Express
October 14, 2018

Apart from developing a road map, the task force would also lay down implementable recommendations for central and state governments, industry and research institutions.

The committee's road map would also focus on R&D, acquisition and commercialisation, application and adoption in specific sectors, regulatory framework as well as preference for Make in India. (Illustration: C R Sasikumar)

The price of these drones - which can fly up to 59 minutes at once - range from approximately Rs 12.6 lakh to Rs 21 lakh depending on the area it can map.

When it was hit by the recent unprecedented floods, one challenge the government and local administrations in Kerala faced was in locating exactly where people were stranded in the state's densely populated villages and towns. As a result, rescue workers not familiar with the area and terrain spent precious time finding ways to reach them.

Now imagine a small flying machine, capable of taking 3D images of the area, giving precise locations of the people, and ways to reach them.

Experts and industry insiders say UAVs can do much more than take pictures or be used for surveillance - they can deliver medical supplies, make high-risk jobs safer, help plan disaster prevention, improve farming, and protect endangered species.

Switzerland, with its reputation for excellence and innovation and a long history of precision engineering, is becoming a hub of this micro-technology development.

Earlier this year, an association for drone manufacturers - Drone Industry Association - was formed in the country. The association calls itself Home of Drones, and already claims to have nearly two dozen members.

Johnson said drones will be a great help in monitoring dams, nuclear plants and even making tourism much more exciting. Johnson, who pointed out that the industry has already provided more than 3,000 jobs in the last two years in Switzerland, is already talking about drone ports - a spot for fixing, re-charging and making parts. "Evolution of its infrastructure will be interesting," he said.

Stringent regulations or absence of proper policy prevent drones from meeting their potential growth. But Robert Leake, sales manager at SenseFly, the Lausanne-based company that produces drones, is excited to see that the Indian government has firmed up regulations.

Founded in 2009, SenseFly manufactures approximately 100 drones a month. It is into researching and developing drones that can give more precise and efficient topology monitoring that would come in use in disaster management.

"Geospatial (industry) is the main market for drones as of now and

Now imagine a small flying machine, capable of taking 3D images of the area, giving precise locations of the people, and ways to reach them.

flood management is one of the main component in it," Leake said. "If drones can be used for relief and rescue operation during floods, they can be used to map flood... (or) to prepare against it. Exact aerial views are beneficial in understanding the nature of flood and infrastructure can be built to protect those areas," Leake explained.

Juan Herrera, an Argentinian who came to Switzerland to work with Agroscope in Changins, a Swiss centre of excellence in agricultural research, said drones can be a big leap in digital innovations in farming. "With the government focusing on new innovations in agriculture sector, focusing on the protection of environment and the entire chain of food sector, the use of drones and robots are significant," Herrera said.

There are a number of start-ups in this country that offers drones for crop duster spraying. It is used not just for pesticides, but for spraying organic and alternative treatments because drones have to ability to be very precise and it would not impact as intense are tractors and other methods on the soil, or on other crops.

Under the project 'Flourish - Collaborative Robots for Precision Farming', researchers have come up with a prototype robot that identifies, mark and stomp even the smallest weeds, or pumps fixed at the machine would use herbicide against them. Raghav Khanna, of ETH Zurich, said the idea behind both the drone and the robot was to "automate all hard stuff about precision farming so that it can enable more sustainable farming". However, in sectors such as farming, and even in transportation, earning trust and confidence of farmers and common people in drones could be a tough task. "People will have to feel safe and effective. Earning the confidence of the users is a challenge in getting it a wider acceptance," Johnson said.

.....drones will be a great help in monitoring dams, nuclear plants and even making tourism much more exciting.

GIS FOR SMART CITIES

The concept of smart cities became one of the most frequently mentioned buzzwords in the terms of building and designing sustainable urban. Although there is no absolute definition of a smart city, we can easily pinpoint the key areas crucial for building more sustainable, resilient and responsive cities - those are smart transportation, public administration, governance and public services including utilities as well as the health system and education.

The geospatial component together with new technologies has an important role to play in the architecture of a smart city

At present, planning system prepares master plans, zonal plans, urban land management schemes and site planning schemes to achieve the goals of the spatial system that needs a careful relook for the creation of smart cities. Management and governing systems now in operation are legacy colonial with inefficient hierarchical system that is least responsive and in real-time outmoded and cumbersome for the end users.

Unlike the traditional planning system, a smart city is knowledge based city that develops extra ordinary capabilities to be self-aware; functions 24 hours and 7 days a week; communicates, selectively, knowledge in real-time to citizen end users satisfactory way of life with easy public delivery of services, comfortable mobility, conservation of energy, environment and other natural resources and creates energy face to face communities and a vibrant urban economy even at a time of national economic downturns.

The geospatial component together with new technologies has an important role to play in the architecture of a smart city. Relevant data about traffic (roadworks, traffic jams, optimal routes...), road infrastructure (signs, potholes, road damages), public health (hospital infrastructure, spreading of the diseases) or important community practices (citizen initiatives, projects and cultural heritage) can be easily visualized, organized and interpreted using interactive web maps.

Cities need a complete shift to the use of spatial technology, geographic information system (GIS) and related advancements as routine process

BENEFITS OF APPLICATION OF GIS IN SMART CITIES

1. Enable smart communities to analyze and find issues for local community.

2. Identify appropriate representatives for multi-level local governance as part of self organizing policy.
3. GIS Technologies can increase efficiency in public services and utilities by increasing collaboration between departments, crews, and different stakeholders. This reduces resource consumption, energy and water, reduction in carbon emission
4. Improve utilization of existing infrastructure capacity, improving quality of life
5. Can provide real-time guidance on how best to exploit multiple transportation modalities, make new services available.
6. GIS can help visualizing spatial impacts of situations and migratory patterns and help in planning for urbanization.
7. Public maps are a great way to inform and engage citizens, therefore improving governance and city administration
8. Geospatial component can assist emergency response and help saving lives
9. Geospatial awareness plays an important role in controlling diseases and improving public health
10. Cloud-based collaboration on a map improves communication, decision-making, and efficiency in conducting different projects such as watershed cleanup events and landfill remediation

CREATING SMART CITIES

The intent of smart cities is to make urbanization more inclusive, bringing together formal and informal sectors, connecting urban cores with peripheries, delivering services for the rich and poor alike, and integrating the migrants and poor into the city. GIS is being used in existing cities and adapting these to be smart as well as those cities that are being created from scratch. ICT is used as a means of achieving the smartness.

The planning for urban settlements has to graduate from a cosmetic "GIS Mapping" approach to a comprehensive geo spatial analysis and solution approach. Cities need a complete shift to the use of spatial technology, geographic information system (GIS) and related advancements as routine process. GIS and related technologies like GPS can be used for accurately mapping of existing settlement patterns at national, state and regional levels. GIS helps in delivery of creation of multiple scenarios in time which help in time-saving and efficient decision-making.

Smart cities are being technology driven with key focus on sustainability, likewise, for smart urbanization GIS and related technologies should be used, which will be time-saving and enhance quality of decision-making. Existing urban and rural schemes should be used towards achieving this.

GIS-based graphical outputs can help to quickly generate reports that clearly demonstrate how compliance requirements and building bye-laws are being met.

GIS APPLICATIONS FOR SMART CITIES

Site Selection & Land Acquisition: GIS can combine and integrate different types of information to help making better decisions and also provides high quality visualization tools that can improve the understanding and enhance decision making capability w.r.t to site identification, valuation and finally selection. By analyzing location data - proximity to road network, fertility of soil, land use, soil bearing capacity, ground water depth, and vulnerability to disasters such as floods, earthquakes - the real estate organizations can arrive at the right property valuation. By analyzing, mapping, and modeling the merits of one site or location over another can be evaluated. In addition, this can also be used for arriving at appropriate market linked compensation to owners based on valuation parameters and in rehabilitation and resettlement planning

Environmental / Legal Compliance: GIS makes meeting regulatory requirements less time consuming and easier to accomplish by providing a common platform for communication with regulators and public. The existing data can be directly connected to a compliance workflow ensuring adherence. Also, GIS-based graphical outputs can help to quickly generate reports that clearly demonstrate how compliance requirements and building bye-laws are being met.

Planning, Design & Visualization: Geodesign will be the key framework for conceptualizing and planning for smart cities; it will assist at every stage from project conceptualising to site-analysis, design specifications, stakeholder participation and collaboration, design creation, simulation and evaluation. GIS enables planners to integrate a variety of data from multiple sources like road, sewerage and drinking water and to perform spatial analyses and planning. Utilities can manage and map the location of millions of miles of overhead and underground circuits.

By integrating imagery, elevation, and environmental information with the CAD / BIM environment, engineers can continue working with familiar software while gaining access to important GIS data. Design files can be brought into a GIS and linked to financial software for better labor and materials and total project cost estimation. With these types of capabilities, GIS is an essential component of the engineering information systems of the future.

A 3D geographic information system can be used to create a realistic simulation of a project, environment, or critical situation.

GIS can help increase a facility's sustainability by reducing energy and water use, finding better waste disposal, and decreasing a building's carbon footprint. By managing information both inside and outside buildings down to the asset level, GIS can help in for example differentiating the environmental impact of development, planning and evaluating neighbourhood patterns and design, estimate the "walkability" for LEED-ND projects based data on streets, pedestrian routes, bicycle routes, transit accessibility, building entrances, and a variety of other factors.

Construction & Project Management: GIS, integrated with project management and financial software provides a comprehensive view of projects and their current status and helps in tracking performance. GIS helps organize all relevant project information, from soil data, and geotechnical studies to planning, environmental studies, engineering drawings, project maps, inventory and asset control.

Sales & Marketing: With GIS, city developers can win over

prospective businesses by creating informative sales tools and marketing reports that highlight the economic potential of a new location or future development. For residents, GIS helps in presenting a visual representation of all the information affecting the desirability and value of a property giving them a far more accurate picture of a property's suitability to their needs.

Facility Management (FM): A GIS-based information system provides a powerful foundation for better facility management by generating integrated information that helps make better allocation decisions. GIS can integrate with and extend the current facilities management system. By importing and aggregating into a GIS the geometries and tabular data of the multiple BIM and/or CAD files required to accurately represent the built environment, the efficiencies and power of BIM can be leveraged, extended, and connected in geographic space to other relevant site, neighbourhood, municipal, and regional data.

Operations & Reporting: GIS can track and analyze assets over space and time and provide insight through visualization of information via maps and easy-to-understand reports. It supports creating an operations view that include maps, lists, charts, gauges, and more based on live geographic data defined in a web map or web service. Multiple operation views can be defined to meet the needs of stakeholders focusing on different aspects of the operation. With this ability to integrate disparate information sources into a common operational picture of all facilities, GIS provides greater power to control township operations and positively impact bottom line.

CONCLUSION

GIS can be used throughout the life cycle of a smart city - from site selection, design and construction to use and maintenance. GIS is an ideal technology that has the ability to scale across any expanse, from the individual asset within a building to a virtually global context tying all aspects of a Smart City planning and development.

3 D analysis

A city planner views how a new skyscraper would cast a shadow on neighbors.

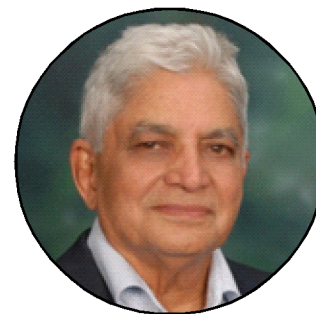
Michael S. Goldberg; in the article "Asset managers crave location data" (GIS India, August 2015)

Bribes

The US engineering consultancy firm has admitted to the violations and has agreed to pay \$17.10 million penalty in the US. According to the US indictment, the company paid bribes in India, Indonesia, Vietnam and Kuwait.

Extracts from news article " Louis Berger paid bribes in India despite inquiries in the US" TNN | Jul 21, 2015

WHY GEOSPATIAL TECHNOLOGIES ?



GS Kumar,

Former Director, Survey of India; Managing Editor GIS India
Editor, MAPS TODAY

We are shifting from GIS India journal to MAPS TODAY. On this occasion of rededicating ourselves to the cause of GIS, one thought is causing us concern. Digital maps combined with other technologies are holding the key to many issues. Geo Spatial Technology (GST) based study helps in managing issues related to encroachments; roads & railways; Telephone & power lines; pollutions; disasters;

I feel a map symbolises ancient Indian concept - Satyam, Shivam, Sundaram.

accidents; monitoring/surveillance; ...

Today a Map means a digital map. Google maps are example. It is a combination of old map + Imagery from space, air and ground + field surveys + software/hardware + human expertise. Future is maps on Mobiles. Maps have become part of our lives - ordering food; getting cab; looking for facilities around a place or any where. Common people are using map based websites for locating addresses and for many other uses. Maps are used for planning, implementation, maintenance, monitoring etc for various development activities including the Defence.

Map is akin to life - finding proper route, confirming correctness with landmarks and symbol, finding unknown from known (With the help of scale, one can know distances), Infinity aspect on maps, representation of earth and its visible/ invisible features, assessing resources like cultivable land, forest, water resources, habitations, connectivity etc. I feel a map symbolises ancient Indian concept - Satyam, Shivam, Sundaram. When Truth is presented in a beautiful manner in colours and symbols, it becomes POWER !!

GST and other approaches have evolved as good tools to identify violations. But, who are those indulging in violations? Take the examples of adulteration, prostitution, tobacco consumption, gambling, bribery, exploitation... A person can be rich or poor. When an opportunity arises, most persons seem to be opportunistic and exploitative. In case a person is caught violating a legal provision, one has to complain to Police with evidence. This itself is a challenging task for a normal person. (Example "Me Too" movement !!) Then Police may file a case in the court. Judgement/appeal/

judgement/ appeal can take years. Thus the system indirectly encourages violations. I may not be able to explain the scenario in India in which law abiding persons seem to be at a disadvantage. Science and technology is assisting diagnosis. It is not able to help preventing violations.

Can GST fill this gap ????

YES there is hope. Let us take the example of traffic lights on roads. If there is red, traffic stops. Green means go. This method discourages road users from violations and helps avoid chaos. In the same way, science & Tech i.e. GST should prevent people/organisations from violations.

Applications are generally developed to detect encroachments. Applications should be to deal with the persons who kept quiet including neighbours even when they knew about the unfair event. This approach of involving people should be refined and applied. Then violations will reduce. Political systems encourage certain types of violations because they allow exploitation (black mailing) - an exploitative legacy. There are examples where precautionary type of approach has worked - Traffic signals on roads.

A typical example is permitting manufacture of alcoholic drinks and penalising people who consume and distribute/sell. Same is the case of tobacco!!

Through regular and proper YOGA many are leading a healthy life. This approach prevents diseases. Science & Technology (GST) also can adopt this kind of approach to prevent/ reduce violations instead of focussing on detecting/ controlling violations and attempting penalisation.

Our group is willing to extend support to such R&D activity. Persons interested in developing applications that can prevent violations can write to : geomapsociety@gmail.com

GIS to support crop Insurance

The high resolution imagery of crop assessment from drones will be collated with satellite imaging and other geospatial technologies to get accurate data to enable crop insurance companies to give proper compensation to affected farmers.

GIS India, December 2015

GIS – A VIEW

Edited extracts from the email letter of Prof IVM to Instn of Engineers Hyderabad

From: Iyyanki Murali Krishna <iyyanki@icorg.org>

Date: Wed, Oct 31, 2018 at 5:34 PM

Subject: Fwd: World GIS Day on 14 Nov 2018

To: IEI TSC <ieitelanganasc@gmail.com>

Cc: geomapsociety GEMS <geomapsociety@gmail.com>, dprasada39 <dprasada39@yahoo.co.in>, Raghavaswamy V <raghavaswamy53@gmail.com>

Greetings to Chairman, Hon Secretary and New members and Officers of IE TS State centre

I fully support the proposal from GS Kumar on world GIS Day on 14 Nov 2018

The geospatial technology which embraced science of GIS and tools of ICT is the most powerful branch of technologies which is all pervasive and already enhancing the scope for development in all spheres -

GIS has moved far far if not very far and beyond the application of Mapping or Geography

Today we talk about geospatial technologies for modeling, analysis, prediction and prescription thanks to advancement in IT and adoption as a mainstream tool on par with AI or Java scripts or Python etc

Institution of Engineers TS/AP centres can play a very effective role by taking forward the efforts of several people and also bringing the young technologists into the forefront by exposing them to the opportunities for research, Professional development and entrepreneurship.

In fact A new Section on "Geospatial Technology and Gandhian Engineering" can be created by IoE which has no borders between knowledge and technologies.

The borders between Earth sciences, Data Analytics AI/ML/DI and Entrepreneurship, Business Management are blurred and it is our firm duty as Professionals and Seniors to rise to the needs of the society and current occasions, and show our younger graduates and post graduates a professionally rewarding skill and knowledge enriching way forward and



BY Muralikrishna Iyyanki

tell them need for Frugal innovation, inclusive innovation or frugal engineering or Gandhian Engineering - Public health, crime, demography, and infrastructure management are the emerging areas with immense potential and made GIS extend the tentacles through geospatial technologies.

The most important problems facing the educated and law abiding persons in the country (others are not bothered) in day to day life are related to extensive air pollution and horrible traffic conditions in any part of the country. Both are related to Municipal administration.

Let us promote Geospatial innovation for Gandhian Engineering as it becomes an effective tool to bring down complexity as well cost in any developmental effort please - Innovation and creativity are crucial for this and all my support in promoting the activities in general and Technology activities in particular

Kind regards

Muralikrishna Iyyanki

PhD (IISc-Bangalore} M Tech(IIT-Madras) FIE FIS

FAPAS FISG FIGU

www.linkedin.com/in/iyyanki-v-muralikrishna.

Former

Raja Ramanna DRDO Distinguished Fellow, RCI, Ministry of Defence, Govt of India (2014-17)

National Coordinator -Geospatial Public Health Data Analytics Program, DST, Govt of India

Professor of Excellence, Chiba University, Chiba, Japan

Adjunct Professor, Asian Institute of Technology -Bangkok, Thailand.

Chief Advisor, UC Berkeley Andhra Smart Village Program

Professor & Director [R&D] Spatial IT and Weather Modification Technologies,

JN Technological Univ, Hyderabad, India.

Address: SMR Acropolis - Block 4, Flat 201, White Field, Kondapur, HYDERABAD 500084, INDIA.

Phone +91-9848049624 and +91 [040] 48511210

LAND DISPUTES

Hyderabad: 95% land subject to legal dispute for lack of owners

DECCAN CHRONICLE. Oct 21, 2018

Land ownership is therefore presumptive, and subject to challenge.

Land ownership in India is established largely through a sale deed recording the transfer of property, but there is no government guaranteed title, and the onus is on the buyer to check the past ownership of the land and ensure it is free of encumbrances. Land ownership is therefore presumptive, and subject to challenge.

Land-related disputes account for about 80 per cent of all civil litigation in India, and as much as 95 per cent of all land parcels are subject to legal dispute. In order to check this practice, the HMDA and Greater Hyderabad Municipal Corporation have decided to conduct a comprehensive survey and adopt the Digital India Land Records Modernisation Programme (DILRMP) in the Greater Hyderabad region.

According to highly-placed sources in the HMDA, Commis-

Land-related disputes account for about 80 per cent of all civil litigation in India

sioner B. Janardhan Reddy, during a meeting, asked town planning officials to conduct a comprehensive study of land ownership, digitise the records and guarantee ownership to the rightful land owner. He told the officials to adopt DILRMP in the HMDA limits and tour Mysore which has already implemented it. Sources said that DILRMP will enable the second phase of land purification in urban areas. A senior HMDA official said DILRMP will develop a modern, comprehensive and transparent land records management system in urban areas. It will accord a unique identity to every property and enable a common base for all land transactions, including the maintenance and updating of textual records, maps and survey

Land Titling

The Department of Land Resources in the Ministry of Rural Development has released a draft version of The Land

Titling Bill, 2011 on its website. This draft is a major revision of the original draft Bill released in 2010. Public comments on this draft are invited before June 24, 2011.

Extract:

V. Register of Titles

After completion of records is notified by the Authority, the Register of Titles is prepared and maintained by the Authority. For each property, the Register will include: (a) general description, map, and locational details of the immovable property; (b) descriptive data such as a unique identification number, plot number, total area, built up and vacant area, address, site area, and undivided share in the land; (c) detail of survey entry, provisional title record, conclusive title record and status, mortgage, charges, other rights and interests in the property; (d) details of transfer of the property and past transactions; and (e) disputes pertaining to the property.

Entries in the Register of Titles will serve as conclusive evidence of ownership. These entries shall be maintained in electronic form, indemnified, and kept in the public domain.

Contd....4

using geo-informatics many years ago. The plan underwent changes several times and is not clear how much of it is being followed. The technology is useful in many ways for revenue, identifying illegal structures and encroachments, monitoring traffic lights, delimitation of electoral zones, road condition and location of manholes/potholes, zones with different pollution levels and in short the status of environment that affects the people living in Hyderabad. There is a saying that the main advantage of RS is, the capability to 'see' globally and 'act' locally. If those in power refuse to see and act the result is the negative side of SD and misery to common man. It is learnt that the failures of traffic lights in many junctions in Hyderabad are not due to shortcomings of technology but nonpayment to the contractor maintaining the lights! Technology can identify where the lights are not working but the rest is up to the administration. The present misery of residents of New Delhi due to high levels of pollution due to emissions, with added emissions arising out of burning stubble in Haryana and Punjab is another failed case leading to negative SD.

I hope readers of Maps Today will ponder over these and many related issues and contribute their thoughts which can bring change in our efforts for SD for a better environment to live.

WHAT IS THE DIFFERENCE BETWEEN GEOMATICS AND GEOGRAPHY?

(Posted on February 15th, 2016, Written by Eric Collins)

- Forwarded by Dr V Raghavaswamy

There seems to be great confusion between these two great disciplines, especially noting that some geographers and schools claim that Geomatics is a geographical science when it is not. There has been a general confusion over the term Geomatics since its adoption in the mid-eighties. Let's look at some general definitions one can find on the web to help understand the Geomatics (from the University of New Brunswick) comprises the science, engineering, and art involved in collecting and managing geographically-referenced information. There are some typical specializations:

- Geodesy is the science of mathematically determining the size and shape of the earth and the nature of the earth's gravity field.
- Cadastral work consists of geodetic and engineering surveys, survey law, land use planning, hydro-graphic surveying, and skills required for determining property boundaries and the measurement and analysis of land related information.

Geography (from the University of Calgary) focuses on places and spaces, on humankind's stewardship of the Earth, and on the inter-related problems associated with urban, environmental, economic, political, and cultural change. Geography as a discipline can be split broadly into two main fields:

- Human geography - focuses on the built environment and how humans create, view, manage and influence space.
- Physical geography - which examines nature and how life, climate, soil, water and land forms produce and interact.

So though geography and Geomatics do overlap, Geomatics is an engineering applied science involving measurement of the earth whereas geography is a social or humanities science studying human influences on the earth.

One point of confusion is that both fields use Geographic Informa-

tion Systems (GIS) to display and analyze data. A misnomer that exists (and is the fault of many schools that market GIS programs) is that GIS is a profession, when it is truly a toolset. For example, there are many people with the title 'GIS Analyst' when really they are geologists or archaeologists or geographers or surveyors or some other kind of specialists who happen to use GIS as a part of their work.

Lately the term "geospatial" has also become popular, muddying the waters even further. To break down the term, 'geo' is of or relating to the earth and Spatial is of or relating to space, or more specifically relating to the position, area or size of things.

Therefore, geospatial has to do with relating geographic position and characteristics of features on, above or below the earth's surface. Based on that, geospatial rightfully belongs more fully in the domain of Geomatics as pertains to measurements. Geography also measures, but only to support the study of human interactions, not for measurement for the purposes of engineering. An adage that is floating around states that 80% of all data has a spatial component. Therefore, it is important to understand spatial relationships from an engineering point of view via Geomatics and for the human

perspective via Geography.

One can analyze the data from either perspective with GIS, especially as GIS is great for connecting non-spatial data with spatial data and can generate unique realizations of the data once it has been spatialized. For example, take a highway network. From a Geomatics perspective, one would be interested in the slope of the crown of the road for drainage and the radii of curvature and super-elevations of the curves to allow safe transit by vehicles as well as the ability to survey such a road for the purpose of construction. Geography would be more

interested in the network capability and the ability of such a roadway to convey people from one point to another.

So why do I even bother to try to differentiate these fields? Geomatics, being a relatively new term, has suffered an identity crisis - most people have no idea what it is. Mention survey engineering or civil engineering (as survey is technically a specialization of civil), and people envision someone with GPS or a total station out measuring something. And because the field of surveying is a rare exception to be an engineering discipline with its own exclusive practice (most engineering acts specifically exclude the act of surveying as its own form of engineering) it is a

Contd....15

Geomatics!



Geography!



WORLD GIS DAY ON 14 NOVEMBER 2018

"I am happy to be in a group of experts like this. Maj Gen. Dr. R Shiva Kiran's presentation is very informative and useful for HMDA also" said Dr B JANARDHAN REDDY, IAS, Metropolitan Commissioner, Hyderabad Metropolitan Development Authority and chief guest of the function of GIS Day organised by The Institution of Engineers (India), Telangana State Centre and GeoMap Society (GEMS).

Earlier Dr G RAMESHWAR RAO, FIE Chairman, The Institution of Engineers (India), Telangana State Centre who presided over the function welcomed the audience and said GIS Day celebrations began on 19 November 1999 and IoE Hyderabad has been conducting GIS Day every year.

The Key-note presentation by Maj Gen Dr R Siva Kumar, Former President, NSDI & Vice President, GIS, IIC, Hyderabad on GIS Applications with focus on Municipalities was very well received. He gave the example of using GIS for Pune Metro Regional Development Authority by IIC Technologies, Hyderabad. With a budget of 37 crores covering about 7000 sq km of area and completed in 18 months, this GIS project is a model for many urban development bodies in India and elsewhere. While referring to geo-referenced land records system, he informed about NAUTILUS developed by IIC Technologies. In response to an observation by Dr V.Raghav Swamy, Dy Director, NRSC (retd) about managing dynamic data, he said, multi temporal imagery combined with other forms of spatial data and supported by crowd sourcing is a practical approach for Indian conditions. He further added that "Political Will" is an important condition for successful GIS applications.

GIS : Principles & Practices

by GS Kumar, former Director, Survey of India and Managing Editor, GIS India

Dr. D.P.Rao (Padmsri), former Director, NRSC in his introductory remarks on the book writes :

"GIS principles and practices" is based on professional lectures by the author in various educational institutions and other forums. Motivated by the experience of running a popular journal GIS India and training programs in GIS, the contents cover various issues that need to be considered for a successful GIS in practice

Publishers MRP is Rs350 per copy.

An introductory offer of Rs 250 per copy is made for first 100 orders.

For details of content and payment please send email to geomapsociety@gmail.com

Maj Dr Shiva Kiran asked whether PMRDA model can be used for HMDA. When the speaker said "YES", the chief guest asked them to prepare a "Concept paper " for taking this idea further.

Another participant Mr. Ram Mohan wanted to know how encroachments can be controlled through GIS. The chief guest explained how by making geo referencing mandatory this can be minimised.

The book " GIS- Principles & Practices" by GS Kumar was released by the chief guest. Er T ANJIAH, FIE, Hon. Secretary, IEI, TSC welcomed the participants and guests

Mr. GS Kumar, President, Geomap Society thanked Dr G Rameshwar Rao, FIE Chairman and his team at the centre for a good programme. He thanked Maj Gen Dr R Siva Kumar, key-note speaker; Chief guest Dr B. Janardhan Reddy and other dignitaries. He also thanked the media/ Press. He hoped that GIS in course of time will not only detect violations but also prevent them. The proposal of Dr G Rameshwar Rao to organise one-day seminar on GIS was appreciated by all. The function came to a pleasant end with National Anthem.

Photo file is separate

Names: L-R: GSKumar, Siva Kumar, B. Janardhan Reddy and Rameswar Rao (On podium T. Anjiah)

Contd....14

very small, but important, niche market that attracts employees that like to calculate and work outdoors in oftentimes harsh environments.

Being a reviewer for my local professional association over the years, a number of people that have a geography-based or GIS-based background have applied for professional credentials in the hopes of securing a professional Geomatics designation. Unfortunately, there generally is not enough overlap between Geomatics and their own backgrounds for which they are routinely denied the desired credentials to their great frustration. They are generally offered re-classifications to upgrade their skill-sets, which typically involves completing additional engineering-related training and/or experience. Although I can empathize with these applicants, the proper relevant skill-sets must be in place in order to achieve such a credential.

So in the end, although there is much overlap between tools used by practitioners of Geomatics and geographers (GIS, remote sensing, GPS, etc.), one must carefully distinguish that these two fields are significantly different enough that they cannot be considered the same. Not that we can't all work together to get things done.

E V E N T S

<u>FOSS4G Asia 2018</u>	December 2 – 5, 2018	Moratuwa – Sri Lanka	www.foss4g-asia.org/2018/
Esri Middle East	December 11-13, 2018	Dubai, UAE	
GeoWeek	January 25-31 2019	Denver USA	www.lidarmap.org/geoweeek/
International LiDAR Mapping Forum (ILMF)	January 28-30 2019	Denver USA	www.lidarmap.org/geoweeek
ASPRS Annual Conference	January 28-31 2019	Denver, U.S.A	www.lidarmap.org/geoweeek
Esri Federal GIS Conference	January 29-30, 2019	Washington, D.C	https://www.lidarmap.org/geoweeek
EUROGEO 2019	March 14-16 2019	Paris, France	www.eurogeography.eu/conference-2019
Geospatial World Forum 2019	April 2-4 2019	Amsterdam, The Netherlands	www.geospatialworldforum.org
UAV Expo Europe	April 8-10 2019	Amsterdam, The Netherlands	www.expouav.com
Geology and Earth Sciences	April 10-13 2019	Valencia, Spain	geoscience.madridge.com/
FIG Working Week	April 22-26 2019	Hanoi, Vietnam	www.fig.net/fig2019
GISTAM 2019	May 3-5, 2019	Greece	www.gistam.org
Information Fusion & GIS	May 10 – 12, 2019	St.Petersburg, Russia	
International Symposium on Deformation Monitoring	May 15 – 17, 2019	Greece	isdms2019.survey.ntua.gr/
<u>GEO Business 2019</u>	May 21 – 22, 2019	London, UK	www.geobusinessshow.com/
Urban Remote Sensing Event	May 22 – 24, 2019	Vannes, France	www.jurse2019.org
UAV-g 2019	June 10 – 12, 2019	Enschede, The Netherlands	www.gsw2019.org
Geospatial Week	June 10 – 14, 2019	The Netherlands	www.isprs.org/
GeoInformation for Disaster Management	September 3-6, 2019	Prague, Czech Republic	www.gi4dm2019.org
INTERGEO 2019	17th – 19th September 2019	Stuttgart, Germany	www.intergeo.de
InfraTech 2020	14-16 January 2020	Germany	https://www.infratech.de

Information about events has been compiled from different sources. . Readers are advised to check correctness from the organisers.

38TH INCA INTERNATIONAL CONGRESS

Brief Report on Inaugural Session

Inaugural session of 38th INCA International Congress on Emerging Technologies in Cartography was held on 29-October-2018 at Hotel Taj Deccan, Hyderabad. More than 350 delegates participated in the session. Dr Shailendra Kumar Joshi, IAS, Chief Secretary, Govt. of Telangana was the Chief Guest of the inaugural session.

Mr Uday Raj, Chairman, Local Organising Committee (LOC) welcomed all the delegates and briefly introduced about the congress, giving details on technical sessions planned covering different technologies of digital cartography, research papers submitted and invited lectures planned over three days. He also outlined the efforts put by LOC in making all the conference processes online, to make delegates' experience better.

Mr Santanu Chowdhury, Director, NRSC in his opening remarks provided insight on ISRO's current and future satellite missions supporting cartography and its application. He also provided details on NRSC's contribution for various ministries and departments to

.....for 35% of country's geographical area, geoid with an accuracy of 10cm is available and can be shared with authorised users.

adopt geospatial technology applications for better management of natural resources and improved governance.

Lt General Girish Kumar, VSM, Surveyor General of India during his special address reiterated the importance of digital cartography in the current scenario of topographical mapping. He explained various services offered by Survey of India and informed that they have created reference frames, both for planimetry and height. He also added that for 35% of country's geographical area, geoid with an accuracy of 10cm is available and can be shared with authorised users.

Dr P G Diwakar, Director, EDPO, representing ISRO HQ, in his address, explained the role of technology & gadgets in the day-to-day life, role of cartography in Location Based Service (LBS) and being updated with latest technology like cloud computing, big data management and analytics. He also stated that vast data from different platforms like UAV, drone, aerial and satellite through more challenges in data consumption and data analytics.

Mr V Raghu Venkataraman, President, Indian National Cartographic Association (INCA) during his presidential address briefly explained the history of cartography and emphasized that this congress is addressing on how the suite of space technology, digital technology and mobile technology leads to recent development of cartography.

Dr Shailendra Kumar Joshi, IAS, Chief Secretary, Govt. of Telangana, during the his address, emphasized the importance of digital cartography and geospatial technologies for the society and governance. He explained how Government of Telangana has adopted these technologies with the help of NRSC/ISRO for improved water management, tax collection, traffic management and various other e-Governance applications. Telangana government is looking forward to work with central organisations & stakeholders.

During the inaugural session, a souvenir was released, which contained abstracts of all the papers presented in the conference. The recent edition of "Indian Cartographer", which contains the full paper presented during the 37th INCA congress held last year was also released during the session. The winners of the National Map Quiz and Braille Map Quiz 2018 organised by INCA were also felicitated during the inaugural session.

The 38th INCA Congress also has organised an exhibition on geospatial products & services. More than 20 institutions representing primary data providers, field instrumentation and drone & UAVs are participating in this exhibition.

Prepared by
K. Abdul Hakeem
Organising Secretary
38th INCA International Congress

Survey true humour

Water melon orchard

Thekkile Madathil Govindan Nambisan (Retd Sol officer)

The simple logic

Survey of India follows certain conventions in the use of colour in the maps prepared by the Department to make map reading easy. For example, water features are shown in blue, man-made features like roads buildings etc. in red, vegetation in green and so on. This convention is followed in the field also when the details are surveyed using a plane table.

During the field survey, one surveyor had depicted an orchard in blue instead of green. The Inspecting officer was baffled by this. So he asked the surveyor why he has depicted the orchard in blue instead of green.

The reply was, "Sir they are watermelon plants."
(GIS India; January 2016)

Violators beware: Election Commission has apps that land you in trouble

By Adepu Mahender
THE HANS INDIA
Oct 22,2018

Warangal: Beware poll violators! The cVIGIL, which stands for 'citizens' vigil', and a host of other Android-based mobile apps launched by the Election Commission (EC) that nail violation of the Model Code of Conduct (MCC) to ensure free and fair elections in Telangana, which goes to polls on December 7.

In its bid to enable people to report code violations, the EC has developed cVIGIL app and to use it in poll-bound Telangana, Madhya Pradesh, Rajasthan, Mizoram and Chhattisgarh. Its aim is to serve as a pilot initiative before using it extensively in the next Lok Sabha General Elections.

The app will work only during the time the MCC is in place in a poll-bound State. The app will hide the complainant's phone number and identity so as to protect the whistle blowers facing any risk of possible backlash.

In the absence of a robust response system, the cVIGIL is expected to provide teeth to law-enforcers, which hitherto failed to make an impact due to delay in reporting code violations and lack of documentary evidences like photos or video clips.

The cVIGIL will allow people to report violations of MCC from the date of announcement of elections to a day after the polls. The citizens can immediately report on incidents of misconduct within minutes of having witnessed them by using this app.

They don't need to rush to the election authority to lodge complaints. All that the citizens have to do is to click a picture or record a video of the scene of poll violation and upload it on the app.

The automated location mapping will be done by the app using the Geographic Information System. It's learnt that once the complaint is lodged, it will be assigned to a field unit that consists of flying squads, static surveillance teams, reserve teams etc. Each field unit will have a GIS-based mobile application called cVIGIL Dispatcher, which allows them to directly reach the location through navigation technology.

After a field unit has taken action, it messages and uploads the relevant document as 'action taken report' via the cVIGIL Dispatcher to the authority concerned for its decision. If the incident is found correct, the information is sent to the National Grievance Portal of the Election Commission of India for further action.

The logo for the cVIGIL app, featuring the text 'cVIGIL' in a bold, white, sans-serif font against a dark grey rectangular background.

To prevent any misuse, the app will not allow uploading of the pre-recorded or old images and videos. The app, which is available on Google Play Store requires an Android smartphone equipped with a camera, internet connection and GPS access.

"People's participation is must in upholding the values of democracy. The onus is on people to make election process fool-proof. If they find any anomaly in the upcoming polls, they should come forward to report it. The cVIGIL enables vigilant citizens get to know the status of their complaint within 100 minutes," Warangal Urban District Collector Prashanth Jeevan Patil told The Hans India.

Suggestion for Map Awareness Programme (MAP)

Extract from email of Shri Gurbaksh Oberoi

Gurbaksh Oberoi <gurbakshsoberoi@yahoo.co.in>

Date: Tue, Oct 10, 2017 at 10:08 PM

Subject: Re: GS Oberoi Inspired Map Awareness Programmes (MAPs)

I, as Director North Western Circle, had inaugurated a 'Permanent Map Exhibition', at Chandigarh on 26th January 1988. This was open to the public who could visit on working days to apprise themselves with the technology of Maps and Allied Services; and also to procure their requirements of maps, etc. All the Schools in Chandigarh used to be specially invited (especially on important days/occasions) to send their students to visit the Exhibition, which was a permanent feature in SOI office, there. This gave fillip to creation of Map Awareness in Schools, there. It is desirable that similar Permanent Exhibitions are opened in All State GDC's of Survey of India for creating Map Awareness in the country. This initiative would also go a long way to improve the Public Image of Survey of India.

GEOMAP QUIZ 2018

GeoMap Society, Hyderabad is hosting 29 th annual GeoMap Quiz for school students in three categories in November 2018, coinciding with World GIS Day . Prelims:

Sub juniors - Classes 5 & 6; Juniors - Classes 7 & 8; Seniors- Classes 9 & 10

Finals (out door) will be on 15 December 2018

For more details email to : geomapsociety@gmail.com

Report of National GeoMap Quiz Finals 2017

The finals of the National GeoMap Quiz 2017, organised by GeoMap Society were held at country club, Hyderabad. Teams from Hyderabad and Dehradun took part in the National Finals. Main item was "Sand Model" based questions



Participants at sand model module of the finals

Results:

Sub Juniors- First: Abhiram and Bikram from Obul Reddy School
Second: Ekta and Kavya from Doon Global

Juniors- First: Shreja / Kartik from Narayana Olympiad
Second: Rahul and Pratham - Bharatiya Vidya Bhavan, Jubilee Hills

Seniors- First: Mubasshira Ali / Soma satwik from Bhartiya Vidya Bhavan- Atmakuri
Second: Vinish Reddy and Praneet Chari, mDAV, BDL

In the finals , students were educated on the importance of a sand model and subsequently were presented with challenges in locating facilities like an airport, pharma factory, as also exploring issues of water supply, communication linkages and planning aspects. Students were evaluated on the basis of their analytical skills in using a map and presentation on the sand model.

GS Kumar, President GeoMap Society explained the

need for a spatial perspective in addressing various planning needs. Smt Anita Nautiyal, Convenor- GeoMap Quiz , Dehradun said that Geography was for everyone and everywhere and that there was a need for teachers and students to explore methods of using geography in the real world applications. Mr Pappan, Senior Scientist Ex-NRSC explained briefly to the students concepts of mapping and satellite imagery. Sri Rakesh Bhatnagar, GeoMap Society thanked the teachers and parents for encouraging children to participate in GeoMap Quiz.



Prelims Hyderabad L - R Dr DP Rao (Padmasri), MS Swamy, GS Kumar with Prize winners

About 2500 students from various schools at Hyderabad and Dehradun participated in the GeoMap Quiz preliminary round which was based on topographical map testing the students on aspects of scale, content of a map and locational aspects. 10% of the teams qualified for the city finals which was map to ground / ground to map exercise. The top three teams in various categories participated in the National Finals.

GS Oberoi Inspired MAP CHAMP Award
Map Awareness Programme (M A P)

Prizes selected by Sunethra from Shraddha Book Store
File (20 leaves) Rs 150; Spiral note book Rs. 75; Pouch Rs. 35

Book mark Rs.50; Correction tape Rs. 60; Pen pencil Rs 25
Total Rs. 395

The above prizes were given to each of the toppers listed below. The awards were given to toppers from Finalists of Seniors; Juniors and Sub juniors qualified from about 2,500 students from classes 5 to 10 from different schools in Hyderabad and Dehradun. Questions for map Champ were related to scale, heights, contours, forests, roads, railways etc.

Seniors: VinishReddy DAV, BDL

Juniors : Srija Nrayana Olympiad

Sub-juniours Bikram Aryan Obul ReddySchool

GeoMap Society (GEMS)

- Compliments the winners for being outstanding.
- Thanks Survey of India and GHMC for the special support for the event
- Thanks Mr. GS Oberoi for supporting Map Awareness Programmes.

REVIEW

Essentials of Geodesy and Map Projections

By N K Agrawal

NK Agrawal, former Director. Indian Institute of Surveying and Mapping, Survey of India has published in the past a very useful book " Essentials of GPS". Another good book from N K Agrawal, the only Indian book by Indian author on the subject has been published this year.

The book meets the main requirements of students and practitioners of Geodesy, Geology, GIS, Mapping etc related to the subject. Topics have been explained in simple manner keeping fundamentals in view.

Knowledge of Geodesy and Map Projections is a must for every one particularly for those involved with mapping and related activities. Digital maps have become part of everyday life. Therefore this book is a must for every library. For a nominal cost one gets authentic information in a book form which can be referred repeatedly as and when one gets doubt about datum and coordinates, the basis for maps and GIS.

Price of the book is Rs. 300/-. Pages 140.

The book can be obtained from the author:

NK Agrawal, 202 KNR Apts

Habsiguda Hyderabad 500007.

Phone: 9490745875. Email: nande@rediffmail.com

VAADA

Telangana Today; 23 Oct 2018

GHMC develops app to enable the disabled to vote
Aimed at making the entire process of voting comfortable for persons with disabilities during the upcoming elections, the Greater Hyderabad Municipal Corporation (GHMC) has developed an Android-based application 'VAADA', Voter Accessibility App for the Differently Aabled, which will be launched by Chief Election Commissioner, OP Rawat on Tuesday.

According to officials, VAADA has a text, voice as well as GIS (Geographic Information System) interface, which is useful to locate the user.

The VAADA app, which can be downloaded from Google Play Store, opens with a screen in which details of the person, mobile number, type of disability and assistance required can be filled-in.

The app is voice enabled and it allows the users to record their details without typing. All these details can be filled in the form of text also. Once the details are entered, the location details are also captured using the latitude and longitude coordinates.

The location details being unique will avoid confusion, duplication and will facilitate authorities to zero-in on the exact location of persons with disabilities. All the information including the location details are stored on a server accessible to GHMC staff. Geo-referenced GIS maps, generated by GHMC-GIS cell, showing all the 3000 plus polling booth locations in the 15 constituencies have been used and linked to the app.

Locations of persons with disabilities will be geo tagged to the respective polling stations, which will facilitate providing logistic services like transport and availability of attendant at the time preferred by the voter. VAADA app will be a boon to over 20,000 differently abled voters, who now can take part in the electoral process without worrying about logistics, said GHMC Zonal Commissioner D. Harichandana.

MAPS TODAY

Monthly Publication



Subscription Rates

Period	Actual Price	Special Price
1 Year	Rs. 1200/-	Rs. 1100/-
2 Years	Rs. 2200/-	Rs. 2000/-
3 Years	Rs. 3000/-	Rs. 2700/-
5 Years	Rs. 4700/-	Rs. 4200/-

Account Name: **GeoMap Society**

Account No. **1787201000685**

Bank Name: **Canara Bank**

Branch: Somajiguda, Hyderabad - 500082

IFSC: **CNRB0001787**

MICR: **500015036**

For any more information please email to :
geomapsociety@gmail.com

GSLV MkIII-D2 SUCCESSFULLY LAUNCHES GSAT-29

India's GSAT-29 communication satellite was successfully launched by the second developmental flight of Geosynchronous Satellite Launch Vehicle MarkIII (GSLV MkIII-D2) on Wednesday from the Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota.

GSLV MkIII-D2 lifted off from the Second Launch Pad of SDSC SHAR at 17:08 hours (IST) on 14 Nov 2018, carrying the 3423-kg GSAT-29 satellite. About 17 minutes later, the

GSAT-29 is a multiband, multi-beam communication satellite, intended to serve as test bed for several new and critical technologies

Transfer Orbit (GTO) as planned.

SLV Mk III is a three-stage heavy lift launch vehicle developed by the Indian Space Research Organisation (ISRO).

Two massive boosters with solid propellant constitute the first stage, the core with liquid propellant form the second stage and the cryogenic engine completes the final stage.

GSAT-29 is a multiband, multi-beam communication satellite, intended to serve as test bed for several new and critical technologies. Its Ku-band and Ka-band payloads are configured to cater to the communication requirements of users including those from remote areas especially from Jammu & Kashmir and North-Eastern regions of India.

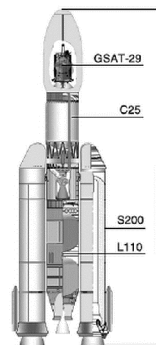
In addition, the Q/V-Band communication payload onboard is intended to demonstrate the future high throughput satellite system technologies. Geo High Resolution Camera will carry out high resolution imaging. Optical Communication Payload will demonstrate data transmission at a very high rate through optical communication link.

After the successful launch, ISRO Chairman Dr K Sivan said: "India has achieved significant milestone with our heaviest launcher lifting off the heaviest satellite from the Indian soil. The launch vehicle has precisely placed the satellite in its intended orbit. I congratulate entire ISRO team for this achievement."

Declaring GSLV MkIII operational, Dr Sivan announced that Chandrayaan-2 and Gaganyaan missions will be launched by this heavy-lifter.

Jayakumar B, Mission Director, GSLV Mark III said it is the guidance of the Mentors at ISRO that helped the team to march ahead while facing obstacles. "The industry partners

GSLV MkIII-D2 successfully launches GSAT-29



GSLV MkIII-D2

- GSLV MkIII is the fifth generation launch vehicle developed by ISRO
- GSLV MkIII vehicle is designed to place a satellite of up to 4000 kg in Geosynchronous Transfer Orbit (GTO)

GSLV MkIII-D2 Stage Characteristics

Parameters	Stages		
	S200	L110	C25
Length (m)	26.2	21.3	13.5
Diameter (m)	3.2	4	4
Propellants	Solid (HTPB based)	Liquid (UH25 + N ₂ O ₄)	Cryogenic (LH ₂ & LOX)
Propellant Mass (t)	2 x 205	116	28.6
Stage Mass at Lift-Off (t)	472	125.8	33

Targeted GTO:

Perigee: 190 km, Apogee: 35,975 km, Inclination: 21.5 deg

Salient Features

- Multibeam Communication Satellite
- Lift-off mass: 3423 kg
- I-3k Spacecraft Bus
- Power: 4600 W
- Payloads
 1. Ku-band four user spot beams
 2. Ka-band four user spot beams and one user steerable beam
 3. Q/V-Band Communication Payload
 4. Geo High Resolution Camera
 5. Optical Communication Payload
- Mission Life: 10 years

GSAT-29



Targeted Orbit:

Type: Geostationary Orbit, Height: 36000 km, Longitude: 55 deg East



too played a key role in this mission," he said.

K Pankaj Damodar, Project Director, GSAT-29 said the launch will help to bridge the digital divide. He also said several next generation payload technologies will be demonstrated with this mission soon.

The success of GSLV MkIII-D2 marks an important milestone in Indian space programme towards achieving self-reliance in launching heavier satellites. The success of this flight also signifies the completion of the experimental phase of GSLV Mark III.

The first successful mission of GSLV Mark III was an experimental suborbital flight in 2014. Subsequently, GSLV Mark III-D1 launched GSAT-19, a high throughput communication satellite, with a lift-off mass of 3150 kg, into GTO on June 5, 2017.

THE GEOSPATIAL INDUSTRY EMBRACES DIGITALISATION AT INTERGEO 2018 - 25/10/2018

Report
Intergeo 2018
26/10/2018



A highly successful Intergeo 2018 drew to a close last week in Frankfurt. The trade fair and conference reinforced its credentials as the world's number one communications and networking forum for the geo-IT sector. "The industry is embracing digitalisation in all its fascinating facets," sums up DVW President Hansjörg Kutterer. With more than 19,000 enthusiastic visitors from over 100 countries, 640 exhibitors and a conference with more than 1,400 participants, Intergeo once again showed that it is the most important international communication and networking platform for the geospatial industry.

.....pinpoints spatial information as the key to shaping and anchoring the digital transformation

Prof Hansjörg Kutterer, president of Intergeo host the DVW (German Society for Geodesy, Geoinformation and Land Management), pinpoints spatial information as the key to shaping and anchoring the digital transformation. "And that makes our industry a key player in a process of massive change," he says. Digitalisation, he adds, is rewriting the rule book - and that also applies to the geoindustry. "We're in the midst of the digital transformation, which is turning things completely on their head," Kutterer continues, citing the examples of overhauled job descriptions and the desperate search for specialists faced by employers in both the public and private sectors.

The geoindustry goes digital

What does digitalisation really mean for the geoindustry? At the international press conference accompanying the event, Dr. Jürgen Dold, president of Hexagon Geosystems, described digitalisation as taking place in stages. The first step involves converting analogue data to digital, after which stand-alone solutions to specific problems are turned into a network of heterogeneous data. At the third stage, which is happening now, algorithms are used to "distil" this data into services that deliver

added value for increasingly customised applications. Ronald Bisio, vice president geospatial at Trimble, used his keynote speech to highlight the role of the surveying profession in digital planning, building and operation - under the acronym BIM (building information modelling). "The entire BIM process - from design and construction to building management and infrastructure - would be impossible without surveyors," he pointed out, adding that geodata will play an even more vital role in the future.

Intergeo, an invaluable magnet for the industry

Once again this year, the three days of Intergeo provided an ideal platform for animated discussions between geo-IT, GIS, BIM and smart city specialists. In the thrilling and magnetic context of digitalisation, Intergeo again underlined its world-leading role as a conference and trade fair for geodesy, geoinformation and land management. After three days of conference and forums packed with information, interaction and networking, the event has drawn to a close with top marks. Some 640 exhibitors from 40 different countries and over 1,400 delegates at the international conference all played their part in this tremendous success. Frankfurt proved the ideal international hub to attract more than 19,000 visitors from over 100 countries to this year's trade fair and conference. But even more important in Kutterer's eyes was this unrivalled chance for the industry to fully immerse itself in digitalisation for three whole days. The conference and trade fair have, he says, become even more vibrant, diverse and comprehensive, and have once again brought together a global community for intensive networking. "The added value is immeasurable for exhibitors and visitors alike," Kutterer points out.

Smart city and drones

The two themed platforms Interaerial Solutions (IASEXPO) and Smart City Solutions were key components of Intergeo in Frankfurt. IASEXPO is Europe's leading platform for unmanned aerial vehicles (UAVs). It shows how wide-ranging the applications are and looks to the markets of the future. The European Drone Summit made a highly successful debut in Frankfurt. UAV DACH e.V. - the Association for Unmanned Aircraft Systems - is the ideal sponsor for this event. This year's Drone Pioneer Award was won by Wingcopter GmbH with its Deliver Future project for getting medical supplies to areas that are hard to access. Intergeo provided numerous opportunities for exhibitors and visitors to plan and discuss the future of our cities. This topic had high priority during the Intergeo conference and forums, with Smart City Solutions (SCSEXPO) providing a meeting place for the key players involved.

Intergeo 2019 in Stuttgart - 25 years of continuous further development

According to Kutterer, digitalisation in the geo-IT sector is still in its infancy despite the fact that upheavals are already in evidence everywhere you look. He is confident that Intergeo will continue to actively reflect this in Stuttgart in 2019 and stick to its chosen path for what will be its 25th anniversary. "We're committed to continuity and evolution. It's what our customers expect of us and the benchmark by which we measure ourselves," he concludes. Intergeo 2019 will take place in Stuttgart from 17 to 19 September 2019. Once again, the importance of the geoindustry for smart cities, digital building, drones and much more besides will take centre stage - interactively, visually, virtually and in actual fact.